MONTANA STATE UNIVERSITY

The relationship between weight gain in high-risk infants and mothers levels of social support
by Kathleen Rae Jaeger

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Nursing
Montana State University
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Abstract:
The purpose of this exploratory descriptive study was to determine the relationship between poor weight gain in the high-risk infant and the mother's level of social support. Thirty-four mother/infant pairs participated. Infant birth weights ranged from 940 to.4010 grams with an average of 2684.44 grams. The mean gestational age was 35.88 weeks. Infants' chronological ages ranged from 18.75 to 26.25 months at study time.

There were 32 mothers in the study since two sets of twins were included. The mothers' ages ranged from 22-43 years of age with the mean of 30.69 years. Twenty-nine mothers were married, one was single, and two were divorced.

The mother of each infant completed the Personal Resource Questionnaire-85 (PRQ-85). The PRQ-85 includes two areas of social support. Part 1 is an estimate of the number of interpersonal resources a person can rely on across 10 life situations and the person's satisfaction with these resources. Part 2, a 25 item Likert scale, was developed to measure the level of perceived social support. The total PRQ-85 Part 2 sum was used to operationalize social support. Each infant's current weight was obtained via health care records. Weights were then converted to weight percentile levels by plotting measurements on growth grids. Each infant's age was corrected for prematurity.

The correlation coefficient (Pearson r) for the two variables, percentile for weight and the total PRQ-85 Part 2 sum, was -0.0354. There was no significant relationship when the entire group was used. There was a moderately positive relationship when only the infants (n=6) with weight gains of less than the 10th percentile were examined (r=0.5124). It is this low weight group which requires further nursing research.

THE RELATIONSHIP BETWEEN WEIGHT GAIN IN HIGH-RISK INFANTS AND MOTHERS' LEVELS OF SOCIAL SUPPORT

by

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A thesis submitted in partial fulfillment
of the requirements for the degree

of

Master of Nursing

MONTANA STATE UNIVERSITY
Bozeman, Montana

July 1989

N378
J1755

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ACKNOWLEDGEMENTS

I would like to thank my thesis committee chairperson and auxillary members for their guidance, support, and understanding. These members are Karen Stinger, R.N., M.S., Ardella Fraley, R.N., M.N., and Valeria Williams, R.N., M.N. I would like to extend my sincere appreciation to fellow classmates for their encouragement and willingness to share. I would like to acknowledge the M.S.U. College of Nursing Great Falls Extended Campus faculty for their contribution to my learning experience. I also thank Pat Mueller and Mary Gregory, Great Falls extended campus staff members.

I am appreciative of the cooperation I received from the Montana Deaconess Medical Center Nursing Department, Medical Records Department, and the infant high-risk specialty programs. Included in this group is Carolyn Wendell, Registered Dietician with the Montana Deaconess Medical Center. This appreciation extends to the pediatricians and physicians who took the time to answer my many letters.

I am highly grateful to the mothers who agreed to participate in my study. Without their willingness to share information I could not have completed this project.

I would also like to thank my co-workers, my family, and my best friend. Their concern and understanding carried me through this project.

TABLE OF CONTENTS

	Page
LIST OF TABLES	ix
ABSTRACT	x
1. INTRODUCTION	1
Introduction to Problem	1
Problem Statement and Purposes	5
Research Question	6
Definition of Terms	6
Significance to Nursing	9
Conceptual/Theoretical Framework	10
Infant Physiologic Growth Patterns	10
Individual Development	13
Family Systems Concepts	15
Social Support	17
2. REVIEW OF LITERATURE	21
Infant Physiologic Growth Patterns	21
The Influence of Bronchopulmonary Dysplasia on Growth Patterns	28
The Influence of Failure to Thrive on Growth Patterns	29
Individual Developmental Influences and the High-Risk Infant	37
Influences of Family Systems Concepts on the High-Risk Infant	42
Social Support	46
3. RESEARCH METHODOLOGY	50
Design	50
Sample and Setting	51
Data Collection Procedure	52
Instruments: Validity and Reliability	53
Assumptions Related to Data Collection	57
Limitations	58
Human Subjects Procedures	58
Data Analysis	61

TABLE OF CONTENTS--Continued

Page

4. PRESENTATION AND ANALYSIS OF DATA..... 62

Population and Sample Results..... 62
Descriptive Analysis of Infant Demographics..... 63
Descriptive Analysis of Maternal Demographics..... 66
Descriptive Analysis of PRQ-85 Part 1..... 69
Analysis of PRQ-85 Part 2..... 72
Correlation Between Infant Weight Gain and the Mother's Level of Social Support..... 73

5. DISCUSSION..... 77

Summary and Conclusions..... 77
Infant Demographics..... 77
Maternal Demographics..... 79
PRQ-85 Part 1..... 81
PRQ-85 Part 2..... 83
Correlation Between Infant Weight and Mother's Level of Social Support..... 84
Interpretation of Findings Related to Methodological Issues..... 86
Findings Related to Conceptual/Theoretical Framework and Literature Review..... 89
Infant Physiological Growth Patterns..... 89
Individual Development..... 91
Family Systems Concepts..... 92
Social Support..... 93
Implications for Nursing..... 94
Limitations..... 96
Recommendations for Future Research..... 97

REFERENCES CITED..... 100

APPENDICES..... 111

Appendix A..... 112
Example of Introduction Letter Sent to Each Subject's Physician..... 113
Appendix B..... 115
Introductory Letter to Mother..... 116
Appendix C..... 118
Informed Consent Form..... 119
Appendix D..... 120
Personal Resource Questionnaire-85..... 121

TABLE OF CONTENTS--Continued

	Page
Appendix E	132
Demographic Data Form	133
Appendix F	134
Release of Information Form	135
Appendix G	136
Example of letter Sent to Physician/Health Agency to Obtain Weight	137
Appendix H	139
Consent Letter to Use Questionnaire	140
Appendix I	141
Human Subjects Review Face Sheet	142
Appendix J	143
Consent Letters from Participating Agencies	144

LIST OF TABLES

Page

Table

1. Summary of Literature on Weight Gain in High-Risk Infants..... 25

2. Infant Ages and Preconceptual Factors with Potential to Influence Infant Development..... 65

3. Infant Prenatal, Perinatal, and Postnatal Factors with Potential to Influence Infant Development..... 67

4. Infant Complications and Discharge Diagnoses with Potential to Influence Infant Development..... 68

5. Maternal Demographic Characteristics..... 70

6. PRQ-85 Part 1 Descriptive Results..... 73

7. Pearson r Correlation Results..... 76

ABSTRACT

The purpose of this exploratory descriptive study was to determine the relationship between poor weight gain in the high-risk infant and the mother's level of social support. Thirty-four mother/infant pairs participated. Infant birth weights ranged from 940 to 4010 grams with an average of 2684.44 grams. The mean gestational age was 35.88 weeks. Infants' chronological ages ranged from 18.75 to 26.25 months at study time.

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CHAPTER 1

INTRODUCTION

Introduction to Problem

The intensive care nursery has developed out of a need to provide care for the high-risk infant. Typically, this neonatal critical care unit is involved with infants "at high medical risk, critically ill babies with serious pediatric or surgical problems, or infants suffering from congenital abnormalities" (O'Leary, 1985, p. 123). Included within this grouping are low birth weight infants and premature infants. At present, the term "low birth weight infant" refers to an infant whose birth weight is 2,500 grams or below, regardless of the cause and without regard to the duration of gestation (Sweet, 1986). In contrast, the "very low birth weight infant" weighs less than 1,500 grams at birth (O'Leary, 1985).

The newborn infant can also be categorized according to birth weight and gestational age factors. Gestational age is determined by assessments based on neurological examination and external physical characteristics. With this information the newborn can then be termed either "appropriate (in weight)-for-gestational-age" (AGA), "small-for-gestational-age" (SGA), or "large-for-gestational-age" (LGA) (Sweet, 1986). Neonates can also be identified as "preterm" (less than 37 weeks gestation), "term" (37 through 42 weeks

gestation), or "post-term" or "postmature" (greater than 42 weeks gestation) (Kattwinkel, Cook, Hurt, Nowacek, & Short, 1983a). Although categorization may appear redundant and time-consuming, it does serve a purpose. Based on classification, health care professionals are alerted to potential medical problems peculiar to each category.

Together low birth weight and preterm infants account for the majority of neonatal deaths. With the introduction of neonatal intensive care nurseries, the mortality rate for high-risk infants has decreased. Although the survival rate has improved, there is concern related to the developmental outcome of these infants (Trotter, Chang, & Thompson, 1982). High-risk infants may exhibit a variety of clinical problems in accordance with the degree of prematurity, birth-related trauma, and function of immature or stressed organ systems (O'Leary, 1985). Examples of specific problems that may be further related to deviations in infant physiological growth patterns include failure to thrive and bronchopulmonary dysplasia. These complex physiological deviations affect the infant's psychosocial development and influence the family system. The influence of physiologic and psychosocial deviations sometimes found in the low birth weight infant can be negative, neutral, or even positive. A key element in both the individual infant developmental outcome and the family system developmental outcome is social support.

"Follow-up reports show morbidity rates ranging from 44% to 85% for preterm and very low birth weight infants" (Trotter et al., 1982,

p. 83). It is these infants with the lowest birth weights, regardless of gestational age, that generally show the highest incidence of developmental delay (Trotter et al., 1982). Hack and Fanaroff (1984) state:

> Physical growth and ultimate body size, although strongly influenced by genetic potential, is a highly sensitive index of the effects of early environmental events on the developing organism. Any deviation from the normal trajectory of growth thus provides an easily documented, yet important outcome measure. (p. 647)

Many studies have been conducted in the last two decades regarding the physical development of the high-risk infant (Davies & Kennedy, 1985; Fitzhardinge, 1975; Fitzhardinge et al., 1976; Hack & Fanaroff, 1984; Hoskins, Elliot, Shennan, Skidmore, & Keith, 1983; Kimble, Ariagno, Stevenson, & Sunshine, 1982; Kitchen, McDougall, & Naylor, 1980; Kumar, Anday, Sacks, Ting, & Delivoria-Papadopoulos, 1980; Pape, Buncic, Ashby, & Fitzhardinge, 1978; Ross, Lipper, & Auld, 1985; Saigal, Rosenbaum, Stoskopf, & Milner, 1982; Shennan & Milligan, 1980; Teberg et al., 1982; Vohr, Oh, Rosenfield, Cowett, 1979). Varying results have been reported depending on birth weight, size for gestational age, severity of complications, and follow-up time length. Despite medical advances, growth patterns for premature and term infants still differ. Longitudinal studies involving long-term results continue to report contradictory results (Fischer, 1978). But if weight and often height continue to fall below expected standards the situation is termed "failure to thrive" (Harrison, 1986).

Bronchopulmonary dysplasia (BPD) is a term used to describe the clinical, radiographic, and pathologic changes that occur in some newborn infants after prolonged mechanical ventilation and oxygen management due to hyaline membrane disease or respiratory failure (Goldberg & Bancalari, 1986; Nickerson, 1985). BPD develops in 15% to 38% of infants under 1,500 grams who require mechanical ventilation for hyaline membrane disease (Nickerson, 1985). Associated problems involve recurrent respiratory infections, congestive heart failure, and poor growth and development (Abman, Accurso, and Koops, 1984).

Certain concepts of development apply to the infant as well as the adult. Part of growing up consists of meeting developmental tasks and developing appropriate behaviors in order to meet expectations (Meili & Murray, 1975). These tasks are significant to the newborn high-risk infant as well as the overwhelmed fearful parents. For the family of the newborn there may be a need for development of skills not yet nurtured. Individual development plays a role in parenting any infant, including the high-risk infant.

Family reactions to the birth of a high-risk infant include grieving, fears, and guilt. Socioeconomic status, age, previous life experience, and family relationships all influence parental coping ability. Parents already confident in their parenting skills are less likely to display feelings of inadequacy than firstime parents (Johnson, 1986b). These reactions can be related to family developmental levels and ultimately family systems concepts.

Particular sociological factors which increase the risk of coping difficulty involve low economic status, no insurance, communication barriers, no telephone, no transportation, low self-esteem, inability to easily change roles, no previous experience in dealing with crisis, and no social support (Johnson, 1986b). The family who is alone and without social support systems has more difficulty coping with the high-risk situation and obtaining assistance from others in supportive ways (babysitting, transportation, emotional support) (Johnson, 1986b).

It is therefore obvious that multiple factors influence the development of the high risk infant. All are important but for the purpose of this study only four elements were pursued: (1) infant physiologic growth patterns and influences; (2) individual development; (3) family systems concepts; and (4) social support.

Problem Statement and Purposes

Regardless of the admitting diagnosis, the investigator has noted that poor weight gain is a common occurrence with the developing high-risk infant. Several questions can be asked: Why do some high-risk infants develop to a normal weight level while others lag behind with failure to thrive? Are medical problems such as BPD the only contributing elements? Are there other socioeconomic or psychosocial components which have not been pursued? Of particular interest to this researcher was the psychosocial element of social support systems. Therefore, the purpose of this study was to

determine the relationship between poor weight gain in high-risk infants and the psychosocial factor of social support systems.

Research Question

Only one research question was addressed in this study: What is the relationship between poor weight gain in the high-risk infant and the mother's level of social support?

Definition of Terms

appropriate (in weight)-for-gestational-age (AGA)

a baby whose weight is above the 10th percentile and below the 90th percentile for babies of that gestational age (Kattwinkel et al., 1983a)

bronchopulmonary dysplasia (BPD)

chronic lung disease of infancy related to ventilator and oxygen management of newborns with respiratory disease - characteristics include respiratory symptoms and oxygen requirements beyond one month of age, recurrent respiratory infections and wheezing, congestive heart failure, poor growth and development (Abman et al., 1984)

failure to thrive (FTT)

failure of somatic growth, with height and/or weight below the third percentile of a standard growth chart, weight for height below the fifth percentile, or deceleration of growth velocity

resulting in a fall of two major percentiles (Berkowitz & Sklaren, 1984)

high-risk infant

for the purpose of this study, a high-risk infant is an infant, regardless of gestational age or birth weight, whose extrauterine existence is compromised by prenatal, natal, and/or postnatal factors and who is in need of special medical care (Rudolph & Garcia-Prats, 1986) which necessitates the admission to an intensive care nursery

large (in weight)-for gestational-age (LGA)

infant whose weight is above the 90th percentile for infants of that gestational age (Kattwinkel et al., 1983a)

low birth weight infant (LBW infant)

any infant whose weight at birth is 2,500 grams or below, regardless of cause or of duration of gestation (Sweet, 1986)

non-organic failure to thrive (or psychosocial FTT) (NFTT)

failure to thrive for which no medical etiology can be detected (Berkowitz & Sklaren, 1984)

organic failure to thrive (or physical growth failure) (OFTT)

failure to thrive due to a diagnosable physical disorder (Berkowitz & Sklaren, 1984)

poor weight gain

for the purpose of this study, poor weight gain is weight below the 10th percentile for adjusted age on a standard growth chart (Ross Laboratories physical growth chart) for which there is no organic explanation

post term infant

fetus or baby whose gestation has been longer than 42 weeks (Kattwinkel, et al., 1983a)

premature (or preterm) infant

fetus or baby whose gestation has been less than 37 weeks (Kattwinkel, et al., 1983a)

social support

for the purpose of this study, social support is information that leads a person to believe he is cared for and loved, esteemed and valued, and belongs to a network of communication and mutual obligation (Cobb, 1976)-social support was operationalized by using the Brandt and Weinert (1981) Personal Resource Questionnaire-85

small (in weight)-for-gestational-age (SGA)

an infant whose weight is lower than the 10th percentile for infants of that gestational age (Kattwinkel, et al., 1983a)

term infant

fetus or baby whose gestation has been between 37 and 42 weeks (Kattwinkel, et al., 1983a)

very low birth weight infant (VLBW infant)

infant whose weight at birth is less than 1,500 grams (O'Leary, 1985)

Significance to Nursing

The survival rate for infants born at progressively earlier gestational points is on the increase. With this trend comes more medical and psychological complications resulting in a need for longer follow-up care. A rising number of these high-risk infants are returning to their home environments, whether the area be urban or rural. Therefore, the pediatric nurse is destined to deal with such infants despite location of practice. Over the past nine years, this researcher has had numerous contacts with growing high-risk infants while working on a general pediatrics unit in a northcentral Montana medical center. The rising number of developing high-risk infants signals the need for increased nursing research to facilitate better care of this distinct population group.

Studies have found that the support provided by family and friends in times of stress helps to buffer the effects of many stressors, including illness. Health care providers are becoming increasingly aware of the major influence support systems have on health and illness. The impact of social support has been noted in

all areas of nursing. Although nursing research concerning social support has been conducted on a generalized basis, there is still a need for more study in specific fields of nursing. One area is the physical and psychological development of high-risk infants.

The goal of this study was to gather information concerning social support systems available to high-risk families. The topic is of significance to nursing due to the expanding needs and concerns of its clientele. The information gained can then be utilized by nurses to identify and/or prevent the potentially hazardous consequences of a high risk birth as related to the infant and the family system.

Conceptual/Theoretical Framework

Weight gain in high-risk infants is influenced by a multitude of factors. These influences make their mark throughout the infant's development and in some cases, even before conception. No one study can address all contributing factors. Four related conceptual approaches were pursued: (1) infant physiologic growth patterns; (2) individual development; (3) family systems concepts; and (4) social support.

Infant Physiologic Growth Patterns

"Growth may be defined as an increase in the physical size of the body as a whole or as an increase in any of its parts associated with an increase in cell number and/or cell size" (Pipes, 1985, p. 2). Development is the acquisition of function related to cell differentiation and individual organ system maturation. Both growth

and development are influenced by genetic, hormonal, environmental, and behavioral factors. Growth and development proceed in an orderly, predictable manner while each organ has its own period of rapid growth (Pipes, 1985).

Birth weight is affected by the mother's pre-pregnancy weight and pregnancy weight gain. Typically, the newborn experiences a weight loss immediately after birth with a return to birth weight by approximately ten days. Weight gain during infancy progresses at a rapid but decelerating rate. By four months, most infants have doubled their birth weight. By 12 months, birth weight has usually been tripled. Males double their birth weight sooner than females while smaller newborns double their birth weight earlier than larger infants. Weight gain during the second year is slightly less than the birth weight (Pipes, 1985). Males also grow faster than females in height and head circumference while still in utero up until three to six months of age. After that time, gender differences level out (Wieczorek & Natapoff, 1981).

Racial differences also affect growth rates. Black American infants are smaller than Caucasian American infants. But they grow more rapidly during the first two years and from that time through adolescence are taller than Caucasians of the same age group. Asian children tend to be smaller than either black or Caucasian children (Pipes, 1985).

"During the first year of life, the healthy premature infant who is appropriate for gestational age grows at approximately the same rate as the full-term infant of the same postconceptual age"

(O'Leary, 1985, p. 165). Growth patterns are comparable provided the premature infant's age is corrected for prematurity. Infants who have encountered severe medical stress or undernutrition in the early postnatal time or those small for gestational age frequently require a period of catch-up growth. The catch-up time involves acceleration of all growth parameters. Once the infant has caught up, the growth rate should slow to a more normal curve (O'Leary, 1985).

With the heightened survival rate of low birth weight infants, there is concern for the short-term and long-term neuro-developmental outcome of these children (O'Leary, 1985). One factor is the development of bronchopulmonary dysplasia. Attention to the nutritional needs of infants with BPD is imperative to support physiological growth and repair new lung tissue. The energy requirements of BPD infants may range from 150-200 kcal./kg./day to offset losses in the premature intestine and increased respiratory requirements (Sirois, 1984). This compares to energy requirements of approximately 120-130 kcal./kg./day for most low birth weight infants who are fed enterally (O'Leary, 1985).

"If inadequate growth in height or weight occurs in the absence of disease or other medical concerns, environmental and/or nutritional deprivation is suspected" (Pipes, 1985, p. 25). This state is labeled failure to thrive. Some researchers believe that nonorganic failure to thrive is the result of endocrinological changes in children suffering from inadequate mothering. Others believe the condition involves mothers, with unmet needs and distorted perceptions of food, that do not offer their children

adequate food. Therapy is then directed at correction of the psychosocial problems (Pipes, 1985).

Individual Development

Several theorists have established theories concerning human development. The more well known authors include Freud, Erikson, Sullivan, Piaget, and Bowlby (Wieczorek & Natapoff, 1981). Two theorists were reviewed: Erikson and Sullivan.

At present there is no authoritative theory of personality development. Erik Erikson, who is considered to be an important figure in the field of psychoanalysis, has described the "Eight Stages of Personality Development". Erikson received national acclaim when he presented this theory to the White House Conference in 1950. Since that time his model has been adopted by many disciplines, including nursing, as a useful theory of human development (Howe, 1979).

Erikson's theory looks at the whole life span from "infancy" to the "aged" stage. Listed in order, the stages are infancy, toddler, pre-school, middle years, adolescence, young adulthood, adulthood, and aged. In each stage of development there is a central problem that must be solved, at least temporarily, if the person is to proceed to the next stage. These problems, conflicts, or crises are never entirely solved. Each new experience and environment presents the problem in a new form. If conflict is well solved at the time, the basis for progress to the next stage is laid. The developmental task for the infant is trust versus mistrust. According to Erikson,

basic trust develops in relation to the mother who feeds, reassures, and cuddles. The psychosocial attitude to be learned at this stage is that the infant can trust the world in the form of his mother, who will feed and comfort at the appropriate time. Trust can exist only in relation to something. The learning of mistrust is also important. The individual must eventually learn to differentiate how much to trust and mistrust (Tribe, 1973).

Autonomy is the developmental task for the toddler, the child approximately 15 or 18 months to 30 months of age. At this stage the child establishes himself as an independent human being while still using the help and guidance of others in important matters. This is a time of muscle system maturation and a time of choices. The polarity for this stage is shame and doubt. According to Erikson, the ratio should favor autonomy (Tribe, 1973).

Erikson identified identity as the goal of adolescence, intimacy as the goal of young adulthood, and generativity as the goal of adulthood. The adolescent must clarify who he is and what his place in society is to be. Intimacy refers to the ability to fuse with someone else without fear of losing self. Generativity occurs as the person takes his place in society and assists in the development and perfection of whatever it produces (Tribe, 1973).

Sullivan saw personality development as stages involving various patterns of interpersonal relationships. In early childhood interpersonal relations are characterized by parental efforts toward the child's socialization. The capacity to love other people emerges in later childhood. There is then a gradual emancipation from

parents and an increased importance of peer relationships in adolescence. With young adulthood there comes the establishment of love and then marital and parental relationships in a new family setting (Coleman & Broen, 1972).

Sullivan identified interpersonal communication between mother and infant as one of the more significant stages in infancy. The infant has physiological and psychological needs that must be met by interpersonal cooperation or a process of tenderness. Anxiety in the mothering person leads to disruption in this tender cooperation. Persistent tension leads to sleep disturbances, apathy, and detachment. The concept of "good" or "bad" mother evolves from how anxiety is handled. "Good me, bad me" is then a reflection of "good" mother, "bad" mother (Wieczorek & Natapoff, 1981).

Family Systems Concepts

"The family is the most important unit for the individual and for society. For the individual the family provides the critical unit for development and interactions; for society the family provides new members and socialization of members" (Johnson, 1986a, p. 91). The family composes the most significant social context within which illness occurs and resolves. Understanding the client requires an understanding of the patient's family context (Jones & Dimond, 1982).

Since the 1950's, family theorists have endeavored to organize the bulk of conceptual knowledge on the family. By 1971 after several attempts at categorization, it was finally decided only four

family approaches were theoretically viable. Some authors define three frameworks by combining two theories: 1) structural-functional; 2) interactional; and 3) developmental (Jones & Dimond, 1982). Other writers concur that family concepts can be better organized under four frameworks: 1) structural; 2) functional; 3) interactional; and 4) developmental (Johnson, 1986a).

The family is viewed as a structure or system within society in the structural model. In the family itself, there are additional subsystems such as the parents and children. The family system maintains a boundary between the family structure and society. The goal of the family is to serve as a unit in society (Johnson, 1986a). Using this approach, the family is examined in terms of its relationship with other major social structures (Jones & Dimond, 1982). The family is an open system since it is open to the outside and influenced by society. Homeostasis is then considered the desired state of comfort for the family (Johnson, 1986a).

In the functional model the family is seen as a set of functions that the family provides for society in general. The goal of the family is then to meet society's needs. Universal family functions include affective, socialistic, reproductive, coping, economic, and physical duties. The family is an open system since its functions ultimately affect society. Homeostasis is the desired state (Johnson, 1986a).

The interactional model views the family as sets of interacting roles between members. The focus is on the family and member relationships. The goal is for compatible interactions. The family

is more of a closed unit with low influence from outside. Changes in role relationships are more significant than homeostasis (Johnson, 1986a).

The developmental approach focuses on the family as an ever-changing and developing unit. The goal is growth of relationships with focus on developmental changes (Johnson, 1986a). Several well-defined stages of family life are delineated. Each stage has its own level of family conflict and solidarity. The framework views family behavior according to three dimensions (Jones & Dimond, 1982):

> 1) the changing developmental tasks and role expectations of the children; 2) the changing developmental tasks and role expectations of the parents; and 3) the developmental tasks of the family as a unit which flow from the cultural imperatives at various stages in the family life cycle. (p. 14)

Thus the model involves both an open system with its relationship to society and a closed system due to influences by family members (Johnson, 1986a).

Social Support

The concept of social support has earned much attention as a major psychosocial variable in health-related research in recent years. Social support has been defined differently by various researchers. Support can be defined as "any action or behavior that functions to assist the focal person in meeting his personal goals or in dealing with the demands of a particular situation" (Tolsdorf, 1976, p. 410). Still another definition by Kaplan, Cassel, and Gore (1977, p. 50) describes support as the "'metness' or gratification of

a person's basic social needs (approval, esteem, succorance, etc.) through environmental supplies of social support."

According to Crnic, Greenberg, Robinson, and Ragozin (1984) social support encompasses several dimensions, including instrumental assistance, information provision, and emotional empathy and understanding. Henderson, Byrne, and Duncan-Jones (1981) have proposed that social support operates on a number of levels such as close affectional relationships, friendships, and less formal community contacts.

Cobb (1976) describes social support as information leading the subject to believe three points: (1) he is cared for and loved; (2) he is esteemed and valued; and (3) he is part of a network of communication and mutual obligation. The feeling of being cared for and loved is communicated via trust or emotional support. "Information that one is valued and esteemed is most effectively proclaimed in public. It leads the individual to esteem himself and reaffirms his sense of personal worth" (Cobb, 1976, p. 301). Esteem support is a frequent label for this public affirmation. Knowledge that one belongs to a network of mutual obligation must be shared and common. It is shared when each participant is aware that every other member knows. It must be common in that everyone in the network has the information (Cobb, 1976).

Dean and Lin (1977) state that the primary group is the major type of group seen as fulfilling social support functions. The primary group had two major axes of organization: 1) the instrumental system geared to the fulfillment of tasks; and 2) an

expressive system focusing on satisfaction of individual needs and the maintenance of solidarity. Within the primary group, the emphasis is upon fulfillment of expressive functions.

The family is the best example of the primary group. According to Dean and Lin (1977) the family has the following six distinct properties or social support functions:

a) emphasis on mutual responsibility, caring and concern;
b) strong mutual identification;
c) emphasis upon the person as a unique individual rather than upon his/her performance;
d) face-to-face interaction and communication;
e) intimacy;
f) close association and bonds; and
g) provision of support, affection, security, and response. (p. 407)

Weiss (1974) also viewed social support as a combination of categories. The categories of relational provisions include six points: (1) attachment or a sense of security and place, a sense that one is loved; (2) social integration; (3) opportunity for nurturance; (4) reassurance of worth; (5) reliable alliance where there is an expectation for continuing assistance; and (6) obtainment of guidance or access to a trusting figure.

Social support begins in utero. With birth it is communicated in a variety of ways, but especially by the way the baby is held or supported. "As life progresses, support is derived increasingly from other members of the family, then from peers at work and in the community, and perhaps, in case of special need, from a member of the helping professions" (Cobb, 1976, pp. 301-302). In the American culture, social support is then again provided by family members as life ends (Cobb, 1976).

The review of theories pertaining to growth patterns, individual development, family systems concepts, and social support further emphasizes the significance of each as they relate to the high-risk infant and family. The degree of interrelatedness is obvious by the blending of concepts especially since it is often difficult to identify the specifics of one framework from the others. The conceptual similarities are not a detriment to this researcher's framework but an indicator of the need to include each concept.

The degree of interrelatedness between growth, individual development, family systems, and social support make it difficult to distinguish between the four concepts. The nurse cannot separate the client from his source(s) of social support established through personal and family development without disturbing a delicate network which may ultimately affect the illness process. Each concept is influenced by changes in the other concepts. It is this meshing process which makes all four concepts significant to the client and the nurse. This level of significance exemplifies the need for further study in regard to physical/individual/family development and social support.

CHAPTER 2

REVIEW OF LITERATURE

Chapter 2 contains a summary of the literature reviewed for each subject area pertinent to this study. The high-risk infant, the high-risk family, and this research project are influenced by four areas of concern: infant physiologic growth patterns and the effects of bronchopulmonary dysplasia and failure to thrive; individual development; family systems concepts; and social support.

Infant Physiologic Growth Patterns

"Normal pregnancy is an alteration of the normal health state of the mother rather than an illness. The high-risk pregnancy, however, presents a risk to the health or the normal development of the child or mother" (Jones, 1986, p. 111). The cause of most premature births is unknown. It is most likely a combination of several factors: maternal, paternal, fetal, and environmental. Some maternal physical aspects which may contribute to prematurity are hypertensive disease, toxemia, placenta previa, abruptio placentae, and cervical incompetence. Maternal personal contributions may include cigarette smoking, very young or old age, history of other premature births, lack of prenatal care, and malnutrition. Genetic background and older age are possible paternal factors. Some fetal contributors may be congenital anomaly, fetal disease, or multiple birth.

Environmental factors that may lead to premature birth involve nutrition, stress, and trauma. Many yet unknown factors may be of equal influence (Johnson, 1986b).

The mortality rate for high-risk infants has decreased since the introduction of neonatal intensive care units (NICU) in the 1960's. "With increasing numbers of NICU survivors, the developmental outcome of these infants continues to be a major concern" (Trotter et al., 1982. p. 83). Weight gain, even with all its imperfections as a specific measurement of growth, is the most widely used clinical determinant of overall nutritional well-being and physical development during infancy (Davis & Kennedy, 1985). Despite current research, there is a lack of general agreement as to what constitutes a normal rate of postnatal growth in the low birth weight infant. It is known that low birth weight infants typically lose some weight after birth. This loss needs to be closely monitored since greater than a 15% to 20% deficit can result in dehydration and tissue wasting. Once the infant's condition stabilizes and full nutrient intake is possible many high-risk infants grow at a rate that parallels intrauterine growth curves, resulting in a gain of 20 to 30 grams per day (O'Leary, 1985).

During the first year of life, the healthy premature infant who is appropriate for gestational age grows at a rate similar to the full-term infant of the same postconceptual age. Growth is comparable as long as the premature infant's age is corrected for prematurity (O'Leary, 1985). There are special growth charts for low birth weight or premature infants that attempt to account for

gestational age (Gifford & Lieberman, 1980). Using longitudinal data, Tanner and Whitehouse (1973) have developed growth curves for children 32 weeks gestation through five years of age. Babson and Benda (1976) have also created standards useful for work with infants of 26 weeks gestation through one year.

If nutrition and care are adequate, the growth pattern for AGA preterm infants is largely dependent on postmenstrual age (of the fetus), regardless of postnatal (chronological) age (Brandt, 1978). "For weight, there are significant differences between corrected and uncorrected age from birth until 21 months" (Brandt, 1978, p. 610). After 24 months no correction is necessary (Brandt, 1978). More current growth curves established by the National Center for Health Statistics (NCHS) may be used with this older group of preterm infants. Examples of this data are the Ross Laboratories growth charts adapted from work performed by Hamill, et al., (1979) of the NCHS.

Infants who have encountered severe medical stress or undernutrition in the early postnatal period and infants who are small-for-gestational-age often exhibit a catch-up growth period. High energy intakes are required to facilitate this accelerated growth. This catch-up period is characterized by rapid growth in all parameters. Once the infant has caught up, the rate of growth slows to a more normal increment (O'Leary, 1985).

The literature regarding the growth of SGA preterm infants is incomplete. The SGA infant may have experienced asymmetrical intrauterine growth retardation (where intrauterine weight gain was

poor but linear and head growth were appropriate) or symmetrical intrauterine growth retardation (where weight, length, and frontal occipital circumference were all below the 10th percentile standard). Symmetrical intrauterine growth retardation is usually due to early and prolonged intrauterine deficit with an increased probability of later growth and developmental detriment (O'Leary, 1985).

Infants of low birth weight may be either premature or more mature infants who are small due to intrauterine growth retardation. The distinction is important due to clinical problems specific to each category. Many of the causes of prematurity are unknown while intrauterine growth retardation has been associated with maternal hypertension, congenital infection, and chromosomal abnormalities. Approximately seven percent of all live births in the United States are low birth weight (Trotter et al., 1982). About one-third of this group are SGA, and two-thirds AGA and preterm (Sweet, 1986). Analysis of the U.S. Natality Statistics showed a 7.1% decline in the incidence of preterm low birth weight for all races between 1970 and 1980. During the same time period, the number of term low birth weight infants decreased by almost three times as much. The term LBW incidence was 24.6% lower among whites and 14.9% lower among blacks for the same period (Kessel, Villar, Berendes, & Nugent, 1984).

Over the past decades many studies have been conducted regarding the developmental outcome of high-risk infants. Table 1 presents a summary of a limited number of studies and their findings regarding weight gain. More recent studies reveal that AGA low birth weight infants are achieving better weight measurements by two to five years

Table 1. Summary of literature on weight gain in high-risk infants.

Reference	Years of Birth	Newborn Survival %	Birth Weight (kg.)	Growth Category	Gestational Age (wks.)	Study N	Time Followed	Wt. Percentile Attainment	Comments
Kitchen et al. (1980) Melbourne, Australia	1966-1970	not indicated	≤ 1.5	AGA, SGA	not indicated	158	8 yrs.	at 2 yrs. 17.6% <10th; at 8 yrs. 7.6% <10th	-age corrected for prematurity -Tanner growth charts used -lower socioeconomical status over-represented
Fitzhardinge (1975) Montreal	1970-1972	52%	mean; girls-1.403 boys-1.480	AGA	≤ 32	67	1 yr.	not explicit -girls had lower indices at 12 months than did controls; -boys did not differ from controls	-age corrected for prematurity -Stuart percentiles used -all referral cases -a greater proportion of girls had a lower caloric intake
Fitzhardinge et al. (1976) Toronto	1970-1973	25.5%	<1.501	AGA, SGA	mean: 29.26	73	3 yrs.	mean weight: Girls: AGA-1 yr: 10-25th 2 yr: 25th 3 yr: 25th SGA-1 yr: <3rd 2 yr: 3-10th 3 yr: <3rd Boys: AGA-1 yr: 10-25th 2 yr: 10-25th 3 yr: 3-10th SGA-1 yr: 10th 2 yr: <3rd 3 yr: <3rd	-age corrected for prematurity -Stuart percentile used -all referral cases -all infants treated with positive pressure ventilation
Teberg et al. (1982) Los Angeles	1973-1975	62%	≤1.5	AGA, SGA	not indicated	178	1-3 yrs.	22% <3rd	-not explicit about corrected age -National Center for Health Statistics growth curves used -referral and in hospital cases -Mexican Americans accounted for 61% of sample population
Saigal et al. (1982) Hamilton, Ontario	1973-1978	62.6%	≤1.5	AGA, SGA	mean 30.0 ± 2.9	184	5 yrs.	3 yrs: 22% <3rd 5 yrs: 19% <3rd	-Stuart percentiles used -referral and in hospital cases -most patients in lower socioeconomic brackets

Table 1.--Continued

Reference	Years of Birth	Newborn Survival %	Birth Weight (kg.)	Growth Category	Gestational Age (wks.)	Study N	Time Followed	Wt. Percentile Attainment	Comments
Pape et al. (1978) Toronto	1974	47%	≤1.0	AGA, SGA	mean 27.7±2	43	2 yrs	2 yrs: mean 3rd-10th	-age corrected for prematurity -Stuart percentiles used -all referral cases -many suffered from prolonged undernutrition in the immediate postnatal period
Kumar et al. (1980) Philadelphia	1974-1977	45.5%	≤1.25	AGA, SGA	mean 29.5±0.2	50	1 yr.	1 yr: AGA: 8% <3rd SGA: 46% <3rd	-age corrected to 1 year postnatal age -Children's Medical Center (Boston) growth charts used -all in hospital cases -majority of patients black
Vohr et al. (1979) Providence, Rhode Island	1975-1976	60%	<1.5	SGA	mean 33.4±2.2	21	2 yrs.	mean 3-25th	-age corrected for prematurity -Stuart percentiles used -referral and in hospital cases
Kimbel et al. (1982) Stanford, California	1975-1977	not indicated	≤1.5	AGA	mean 30.0	66	3 yrs.	Girls: 1 yr: 18% <5th 2 yr: 12% <5th 3 yr: 12% <5th Boys: 1 yr: 24% <5th 2 yr: 16% <5th 3 yr: 19% <5th	-age corrected for prematurity -National Center for Health Statistics used
Shennan & Milligan (1980) Toronto	1976-1977	91%	1.0-2.0	AGA, SGA	not indicated	73	2 yrs.	mean: 1 yr: 15 - 23rd 2 yr: 22 - 24th	-seen at 1 and 2 years from birth date -Children's Medical Center (Boston) growth charts used -all in hospital cases
Hack & Fanaroff (1984) Cleveland	1977-1978	66%	≤1.5	AGA, SGA	26-36	182	3 yrs.	20 mo. corrected age: AGA: 19% <3rd SGA: 46% <3rd 33 mo. corrected age: AGA: 17% <3rd SGA: 46% <3rd	-age corrected for prematurity -Wingerds' at Standaeds & Stuart percentiles used -referral and in hospital cases
Ross et al. (1985) New York	1978-1979	not indicated	≤1.5	not indicated	mean: 29±1.8	79	3 yrs.	mean: 30.8th	-standards based on normative data from Centers for Disease Control

Table 1.--Continued

Reference	Years of Birth	Newborn Survival %	Birth Weight (kg.)	Growth Category	Gestational Age (wks.)	Study N	Time Followed	Wt. Percentile Attainment	Comments
Hoskins et al. (1983) Toronto	1979-1980	68%	≤1.0	AGA, SGA	23-33	69	2 yrs.	18 mo. corrected age: 49% <10th	-age corrected for prematurity -referral and in hospital cases
Davies & Kennedy (1985) London	1980-1981	not indicated	<1.5	AGA	27-32	30	1 yr.	17% <3rd	-age corrected for prematurity -Tanner & Whitehouse standards used -all in hospital cases

although there is a slight tendency for such infants to gain less weight. SGA low birth weight infants are showing poorer weight gains.

The Influence of Bronchopulmonary Dysplasia on Growth Patterns

Infants with chronic illness will always be at risk for delayed growth and failure to thrive. Disease entities of concern include bronchopulmonary dysplasia (BPD), short bowel syndrome, congestive heart failure, neurological impairment, and genetic disorders (Gaddy & Copps, 1986). This researcher has encountered many pediatric NICU graduates who are hospitalized and rehospitalized with bronchopulmonary dysplasia. Thus, there seems to be a need for further review in this area.

BPD is thought to be a complication of positive pressure ventilation and oxygen administration utilized during the treatment of hyaline membrane disease in the premature patient. The lung damage caused by support measures can be progressive with involvement of the lung parenchyma and airways. X-ray reports include fibrosis, alveolar destruction, and atelectasis (Sirois, 1984).

Growth patterns for infants with BPD vary depending on the severity of the condition. Retarded growth for survivors of BPD has been reported. Northway (1979) found 29% of those infants surviving Stage IV BPD to have minor handicaps including weight less than the third percentile. Markestad and Fitzhardinge (1981) also followed infants (n=20) who developed BPD. By two years post term, weights for both sexes were at the third to 10th percentile. In still

another study, Vohr, Bell, and Oh (1982) compared three groups of low birth weight infants: (1) group A, infants with a severe neonatal course who subsequently developed BPD (n=26); (2) group B, infants with a severe neonatal course with no development of BPD (n=8); and (3) group C, infants with a mild neonatal course (n=25). At four months of age, there were a significant number of BPD children who fell below the third percentile on the Stuart and Reed growth curve when compared with group C children ($p < .05$). This difference continued at 12 months of age ($p < .025$). By 24 to 36 months of age, there was no difference between group A and group C.

There are several possible explanations for growth failure with BPD infants. These include prolonged hypoxia, hypercapnia, increased oxygen dependency, and prolonged emotional deprivation related to long term hospitalization (Sirois, 1984).

The Influence of Failure to Thrive on Growth Patterns

The term "failure to thrive" is defined as "failure of somatic growth, with height and/or weight below the third percentile of a standard growth chart, weight for height below the fifth percentile, or a deceleration of growth velocity leading to a falloff of two major percentiles" (Berkowitz & Sklaren, 1984, p. 191). Although growth below the third percentile is often the criteria used when defining failure to thrive, it must be remembered that the rate of growth is more significant when determining normalcy (Corcoran, 1978).

Failure to thrive (FTT) relates to symptoms and not to a particular cause of the difficulty. The disorder has been divided into two broad categories: organic failure to thrive (OFTT) and non-organic failure to thrive (NFTT). Organic failure to thrive is attributed to a diagnosable physical disorder. The reported percentage of all admissions for failure to thrive involving organic causes varies from 10% to 60% (Peterson, Washington, & Rathbun, 1984). Bekowitz & Sklaren (1984) state that most authors report fewer than 20% of patients with FTT fit this category. Organic causes include gastrointestinal disorders (gastroesophageal reflux, chronic nonspecific diarrhea, malabsorption, bowel malformation), central nervous system disturbances (cerebral palsy, neurofibromatosis, microcephaly, asphyxia), cardiac lesions, endocrinopathies, and pulmonary disease (Berkowitz & Sklaren, 1984; Peterson, et al., 1984).

Non-organic failure to thrive is growth delay for which there is no organic explanation. Environmental deprivation is the most frequent cause of non-organic FTT, but other causes do exist. These include familial short stature, constitutional delay, and isolated nutritional inadequacies (Berkowitz & Sklaren, 1984).

Familial short stature is related to ethnic group status with growth velocities being normal. Children with constitutional delay show a brief deceleration in growth velocity between six and 24 months of age. After this period of deceleration, growth returns to normal. Nutritional inadequacy may result from improper preparation of formula, inadequate supply of milk (breast milk, formula), or

intentional withholding of food. Parental education is significant in this case (Berkowitz & Sklaren, 1984).

Originally, non-organic FTT was though to account for 30% of all hospital admissions due to FTT. It is now recognized to be responsible for up to 60% of all hospital cases and 90% to 100% of rural outpatient setting cases (Peterson, et al., 1984).

Environmental failure to thrive is a complexity of symptoms manisfested by physical, emotional, and developmental retardation. These effects are secondary to abnormal interaction between the infant, the mother, and the family (Berkowitz & Sklaren, 1984).

Children with environmental failure to thrive exhibit distinct characteristics denoting depression and withdrawal. Behaviors include gaze avoidance, apathy, listlessness, self-stimulatory play, preference for inanimate objects instead of people, developmental delay, rigidity, back arching, and hypertonicity (Berkowitz & Sklaren, 1984).

Powell and Low (1983) examined 21 infants shortly after hospital admission for FTT. All infants were subsequently diagnosed with non-organic failure to thrive. Five of eight noninterpersonal behaviors were present in 14 of the 21 infants. General inactivity was present in all infants. Other noninterpersonal behaviors included expressionless face, disporportionate hand and finger activity, excessive crying and irritability, infantile posturing, excessive thumb sucking, flexed hips and knees, and rumination. Four of six interpersonal behaviors were noted in 17 of the 21 infants. Absent

or diminished vocalization was most frequently observed. Indifference to separation, lack of response, and poor eye contact constituted the three remaining interpersonal behaviors. In a later study, Powell, Low, and Speers (1987) examined 67 hospitalized infants three to 24 months of age for similar interpersonal behaviors. Seventeen organic FTT, 17 non-organic FTT, and 33 children with no signs of failure to thrive were included. The frequency of these same behaviors per infant as well as the intensity of the behaviors were greater for the non-organic FTT group.

Evaluations of the mothers of infants with environmental FTT show distinctive psychosocial characteristics. In many cases the mothers have themselves experienced poor parenting. They often have unresolved conflicts or feeling about their own childhood. Additional characteristics include feelings of anger, helplessness, low self-esteem, and inability to deal with daily stresses. A review of records maintained by the Harbor-UCLA Medical Center failure to thrive clinic indicated that 47% of the mothers in the clinic were significantly depressed (Berkowitz & Sklaren, 1984).

Another area of concern with children suffering with environmental FTT is the interaction between mother and infant. Researchers have observed specific behaviors such as diminished maternal and infant vocalizations, decreased mutual interactions and gazing, and increased infant self-stimulatory play (Berkowitz & Sklaren, 1984).

Kotelchuck and Newberger (1983) interviewed the mothers of non-organic FTT infants (n=42) and matched controls. Three factors

distinguished the FTT families from the controls. The FTT families had a more sickly child, were more isolated from neighborhood and family support, and had a larger discrepancy in parental education. Gagan, Cupoli, and Watkins (1984) also found that mothers of FTT infants did not have good social support networks. When comparing organic FTT children (n=11) with non-organic FTT children (n=44) parental age, stressful events, socioeconomic status, and marital disorganization were similar in each group. Findings did indicate that infants with non-organic FTT are more likely to present during the period of infant-caretaker role development. Sherrod, O'Connor, Vietze, and Altemeier (1984) again found that children with non-organic FTT appeared to be ill more often than control children, particularly during the first few months after birth.

Fifty children hospitalized for non-organic FTT and 25 thriving children were studied by Haynes, Cutler, Gray, and Kempe (1984). A majority of the mothers of the FTT infants had negative memories of childhood while more positive memories were reported by mothers of the thriving group. There were also clear differences in mother-child interaction patterns between the two groups. Casey, Bradley, and Wortham (1984) found the total HOME Inventory and subscale scores (maternal acceptance of the child, organization of the physical environment, and emotional responsivity) to be significantly less favorable ($p < .05$) in the non-organic FTT group (n=23) as compared to a control group (n=23).

Altemeier, O'Connor, Sherrod, and Vietze (1985) interviewed 274 low-income pregnant mothers. They found non-organic FTT to correlate

significantly with aberrant nurturing during the mother's childhood, conflicts between parents, and perinatal events such as medical complications of pregnancy, slightly shorter gestations, and minor residual problems at discharge from the nursery. Conversely, areas that did not show a correlation with non-organic FTT were infant gender, Apgar scores, dysmaturity, premature or twin birth, cesarean section, labor and delivery complications, or postpartum complications. Some other potential events identified as contributors to maladaptive mothering include premature and postnatal problems, early parental separation, physical difficulties in the child, adolescent parents, and socioeconomic or psychosocial strains on the family (Harrison, 1986).

One early study with failure to thrive children was conducted by Hannaway (1970). Of the 100 FTT children admitted to a pediatric hospital, 51 were found to exhibit non-organic FTT, with 40 of the cases related to environmental-maternal difficulties. Of the premature infants studied 52% had non-organic FTT. In another earlier project, Goldson, Cadol, Fitch, and Umlauf (1976) reviewed the charts of 140 children diagnosed with non-accidental trauma or failure to thrive related to social factors, or both. A disproportionate number of children (25.3%) with birth weights under 2,500 grams were found within the sample group. Fifty-seven percent of the infants' mothers were 20 years or younger at the time of the child's birth.

More recently Mitchell, Gorrell, and Greenberg (1980) compared FTT children (n=30) with other children (n=282) seen in three rural

primary care centers. Neonatal problems were significantly more frequent in the FTT group. But birth weight, incidence of prematurity, and maternal problems during pregnancy were not significantly different. Family problems were noted more often in FTT cases. No differences were found in the occurrence of acute or chronic illnesses. In contrast, Bithoney and Newberger (1987) found the most significant distinctions between 41 non-organic FTT hospitalized children and a matched control group were poor child health ($p < 0.001$), reactivity to visual and auditory stimuli ($p < 0.001$), and disordered feeding interaction ($p < 0.005$). Other case-comparison differences included social isolation, few maternal opportunities to escape caregiving, the presence of a male adult in the family, fewer extended family, fewer volatile disagreements between parents, and increased number of maternal unmarried years.

Infants and children who are involved in disturbed parent-child relationships may exhibit abnormal behaviors as well as developmental delays. Close and prolonged therapeutic follow-up is therefore needed for children who fail to thrive (Yoos, 1984). One hospital in southern Florida took a unique approach. Karniski, Van Buren, and Cupoli (1986) compared 17 non-organic failure to thrive infants admitted to foster medical placement homes (MPH) with 18 infants treated in a more traditional hospitalization manner. Five children were admitted to the MPH without hospitalization. The MPH group gained 29 grams per day in excess of expectation. This was twice that of the comparison group.

Field (1984) re-examined 17 infants diagnosed with non-organic FTT one and three months post discharge. At three months the group as a whole had reached normal ranges of weight and mental development, but lagged behind in motor development. Gestational age and the initial measure of mental development were more powerful in predicting outcome than age, social, or intervention factors.

Casey, Wortham, and Nelson (1984) also followed FTT children (n=93). After one year, 52% of the non-organic FTT children showed considerable improvement. In a more long range follow-up by Singer and Fagan (1984), groups of non-organic FTT, organic FTT, and normal control infants were assessed in the first year of life, at 20 months, and at three years of age. At three years of age the non-organic FTT infants were functioning intellectually in the borderline range. Outcomes for the entire sample were associated with parental educational level which was then related to the number of caretaking placements infants experienced outside the home.

Singer (1986) followed 29 FTT children who had received extended hospitalization in infancy as an intervention for growth failure. The children had been divided into three groups at infancy: (1) infants in county custody who had additional medical problems not etiologic of their growth failure; (2) infants in county custody with no additional medical problems; and (3) infants in parental custody who had received additional outpatient treatment. At approximately three years of age, it was found that the children manifested persistent intellectual delays despite maintenance of weight gains achieved during early hospitalization. More than half the group

suffered from chronic health problems. Children who achieved optimal growth tended to be full term at birth, later born, and without a question of physical abuse.

Swedish researchers Kristiansson and Fallstrom (1987) reinvestigated the growth patterns of 21 OFTT and 34 NFTT children at four years of age. Normalization of growth for weight and height was found in most children with OFTT. Much lower values occurred for the NFTT group. NFTT children with high psychosocial (high-risk) scores showed more favorable growth patterns if they were subjected to strong social and/or psychological intervention.

Oates, Peacock and Forrest (1985) reviewed 14 children who had been admitted to the hospital for non-organic failure to thrive at an average of 12.5 years previous to the study. The FTT children were smaller in height and weight than a comparison group matched for age, sex, social class, and ethnic group. The FTT group was also behind the comparison group in language development, reading age, and verbal intelligence.

In summary, non-organic failure to thrive is a complex entity involving multiple factors. All facets including the non-thriving infant, the mother, and the family must be considered.

Individual Developmental Influences and the High Risk Infant

Parental age and thus individual development may influence coping abilities, development of parenting behaviors, and support systems. Previous experiences, past parenting behaviors, and past

encounters with death or illness (spontaneous abortions, stillbirths, and difficulty conceiving) all contribute to coping mechanisms (Johnson, 1986b). Each parent brings his own life experiences and human developmental level into the high-risk parenting situation. Conversely, each high-risk infant is beginning his own human development. It is therefore important to pursue the available literature on the subject.

Erikson identifies eight stages of human development in his psychosocial theory. Each stage involves the successful completion of a developmental crisis. The developmental crisis for infancy is trust versus mistrust. "Basic trust involves confidence, optimism, reliance on self and others, faith that the world can satisfy needs, a sense of hope or a belief in the attainability of wishes in spite of problems without overestimation of results" (Meili & Murray, 1975, p. 47-48). Trust includes establishing a trusting relationship with a consistent caregiver while mistrust is a sense of emotional or physical dissatisfaction. A sense of trust may be demonstrated by the newborn through ease of feeding, the depth of sleep, and overall appearance of contentment. Without a predictable (to the infant) caregiver, the infant cannot accomplish this task (Meili & Murray, 1975).

Study infants were at the toddler stage of human development. The developmental crisis for the toddler is autonomy versus shame and doubt. Autonomy is depicted in the ability to gain control over motor abilities and sphincters, to make decisions, to cope with problems, to gain patience, to distinguish between self and others,

and to develop a feeling of good will and pride. This is the "me do it" stage. A negative self-concept results in shame and doubt (Grohar, Leonard, Murray, & Zentner, 1975).

The parent of the high-risk infant may be in Erikson's adolescence, young adulthood, or adulthood stage depending on age and life experiences. Both age and life experiences will affect parental reaction to the child. The adolescent is involved in identity formation. Identity occurs when the individual feels he is a specific unique person. Identity formation is then a synthesis of biopsychosoical characteristics from numerous sources: gender identity, parents, friends, social class, religion, and ethnic beliefs. Identity diffusion occurs when the adolescent fails to achieve a sense of identity. Instead, there is doubt and confusion related to life roles (Nolan, Leonard, Grohar, Murray, & Zentner, 1975).

The young adult's goal is to develop a sense of intimacy with isolation being the polarity. The individual who has grown beyond the need to establish an identity can move toward intimate relations with others. It is time for the person to enjoy adult liberty and face adult responsibilities. The achievement of adulthood entails sociopsychological time devoted to study or work at a specified career, and social interaction with the opposite sex in order to select a partner in marriage. The counter crisis involves feelings of social emptiness and isolation within a world of family units (Tribe, 1973).

Erikson's adulthood stage involves generativity versus stagnation. The individual takes his place in society and assists in the development and perfection of whatever it produces. The term generativity refers to everything which is generated from generation to generation: children, products, ideas, art work, and human services. Even without children, the person can fulfill generativity through helping to create a better world for others. Failure to develop the generativity personality component results in stagnation or self absorption. The mere desire for obtainment of parenthood does not bring generativity, especially if previous stages have not been met (Tribe, 1973).

Harry Stack Sullivan's theories on personality development are basicly interpersonal. According to Sullivan, the origins of anxiety-producing situations and responses are established during infancy. The beginning of self-esteem also emerges in infancy, particulary middle and end infancy. Development is related to the intrajection of mothering or caretaking behavior into self. Infant personality thus develops through interpersonal socialization. The infant who finds warmth and security develops a "good me" concept opposed to the "bad me" concept seen with disharmony and anxiety (Wieczorek & Natapoff, 1981).

In later childhood, the child develops the capacity to love. He becomes as concerned about the well-being of others as about his own. With adolescence comes a gradual emancipation from parents with an increased importance of peer relationships. Sullivan also addresses the interpersonal relationships expected in young adulthood. There

is the establishment of love, and then marital and parental relationships in a new family setting (Coleman & Broen, 1972).

A key concept of the interpersonal model is that of communication, the connecting link between people. Both nonverbal and verbal cues are significant to the way people interpret messages and actions of others. The infant is capable of crude communication through gestures and actions. With the language comes precise and reality-oriented communication. When individuals in close interpersonal relationships have serious conflicts, there is most likely difficulty in their communication (Coleman & Broen, 1972).

The mother's (caretaker's) ability to manifest attachment and caretaking behaviors is related to a complex of socioeconomic, educational, and personality factors. In general, mothers (caretakers) from middle or upper socioeconomic classes, with greater than a high-school education, a stable family emotional life, and a secure personal identity are at an advantage. When the caretaker has problems with her own self-identity, the person tends to focus on her own needs, anxieties, and emotions rather than on those of the infant. A caretaker overly involved with her own needs cannot focus on the child (Sameroff, 1987). Cohen, Sigman, Parmelee, and Beckwith (1982) followed 62 preterm infants born between 1972 and 1974. They found the strongest correlates of developmental level, using Gesell Developmental Scales and the Stanford-Binet Intelligence Test, to be social factors rather than medical factors. The most important factor associated with developmental status was responsive caregiving.

Parents of high-risk infants have special needs. Hymovich (1976) identified the four basic needs of parents with an ill child as trust, information, resources, and guidance and support.

"Parents need to trust themselves, the infant, and the health professional" (Trotter et al., 1982, p. 88). Kennedy (1973) states:

> A key element in the developing acquaintance is the mother's ability to trust herself, her social support system, and her infant. It is possible that the mother's trust in her infant is a necessary prerequisite to the formation of his (the infant's) own sense of basic trust. (p. 556)

If the parents cannot trust themselves because of the child they have produced it can have lasting effects on the parent-child relationship and the child's sense of trust (Barnard, 1976).

Parents of high-risk infants need information. Parents need to know and understand diagnoses and risks, thus facilitating informed decisions. Community resources such as financial aid, public health nurses, parental support groups, developmental day-care centers, and evaluation facilities should be made available to the family. Parents of high-risk infants also need support and guidance. Unless parents are given the opportunity to have their own needs met, they cannot be expected to meet the needs of their infant (Trotter et al., 1982).

Influences of Family Systems Concepts on the High Risk Infant

No infant is an entity of himself. Each influences the life of at least one care-giver. Conversely, each child is influenced by at least one care-giver. In most cases, numbers influenced are far

greater than one. Entire family systems are often affected by the presence of a high-risk infant. Effects may escalate long before the actual birth of the child or at least weeks before the expected birth date.

Potential family reactions to the birth of a preterm high-risk infant include grief, fears (fear of the unknown, death, abnormal development), guilt, parental detachment (physical separation, mechanical separation, emotional separation), dissatisfaction with parenting, reshifting of family roles, and inability to express emotional needs (Johnson, 1986b). "Socioeconomic status, age, previous experiences, and family relationship factors all influence the parents' reactions to the premature birth situation" (Johnson, 1986b, p. 131). Related considerations include poverty or near-poverty, nonuse of medical services, lack of finances, lack of transportation, and language barriers (Johnson, 1986b).

Family relationships which affect problem-solving, family flexibility, and support systems influence the coping mechanism in high-risk situations (Johnson, 1986b). The impact of the family relationship justifies the investigation of family concepts, particularly that of family systems.

General systems theory has recently been applied to the study of families. This theory known as family systems theory utilizes basic systems theory concepts to provide a theoretical foundation for understanding the family as a system or "a complex of elements in mutual interaction" (Wright & Leahey, 1984, p. 10). Natural and

man-made systems share basic characteristics, which include six points (Christie-Seely, 1984):

1. They are composed of interacting components;
2. The component parts differ from one another;
3. Each of the component parts subserves a specific function that is not fulfilled by any of the other component parts;
4. The component parts interact with one another in an orderly manner;
5. The orderly interaction of the component parts is the result of some form of communication and feedback, whether it be chemical, mechanical, electrical, emotional, or verbal;
6. By virtue of the coordinated interaction of its specialized component parts, a system is able to perform functions or to achieve goals that lie beyond the capacity of any of its component parts. (p. 4)

A system (cell, organ, person, family, community) is more than a collection of parts. It behaves as a whole surrounded by boundaries through which interactions occur between the system and its environment. The controller subsystems (nucleus, cortex, parents, government) within the system receive information, make decisions, and transmit information that affects the processes of other subsystem units. A closed system is static with no communication with the environment. Systems are self-regulating with feedback mechanisms being responsible for maintaining relationships among the system component parts (Christie-Seely, 1984).

Basic concepts of family systems theory can be identified. These concepts include five points (Wright & Leahey, 1984):

1. A family system is part of a larger suprasystem and as well is composed of many subsystems.
2. The family as a whole is greater than the sum of its parts.
3. A change in one family member affects all family members.
4. The family is able to create a balance between change and stability.

5. Family members' behaviors are best understood from a view of circular rather than linear causality. (pp. 10, 12, 13, 14).

The family system must be viewed as a whole to be understood (Christie-Seely, 1984). The family is therefore seen as an unit with interacting family members rather than just individual family members. With time certain behavioral events can be linked to form sequences. Repetitive sequences become patterns which are often governed by the rule structure in the family. Ultimately, intervention focuses on patterns, whether they be adaptive or maladaptive (Wright & Leahey, 1984).

According to family systems theory, dysfunction of the family involves either disturbances within the particular family system or a disturbance between the family system and another system. Dysfunction is not seen to be within one individual but the result of some system deficit. A disturbance in any one part of the family system or any impinging systems has an effect on all involved systems (Sedgwick, 1974).

Five points can be employed to examine relationships within a group, social unit, or family. These indices include productivity, decision-making, utilization of information or data, implementation of decision-making, and resolution of conflict or disagreement. Productivity refers to a family's ability to complete a task. Decision-making relates to how the family uses information, how they refer to each other, and how they identify and utilize resources with the family. Utilization of information means seeking, sharing, listening, and utilizing each other to reach the best decision.

Implementation of decision-making involves the actual process of carrying out the decision. Resolution of conflict occurs when the problem area is identified and solutions pursued (Sedgwick, 1974).

Systems concepts combined with other communication theories can then be used to examine family function and provide therapeutic intervention or direction. Such explanations may be helpful when working with high-risk infants or their families. This is especially true since a change in one family member affects all family members.

Social Support

Parental age may influence coping abilities, development of parenting behaviors, and support systems. Previous experiences can also affect familiar reactions to the newborn. Past parenting behaviors and past encounters with death or illness (including spontaneous abortions, stillbirths, difficulty with conceiving) all contribute to coping mechanisms (Johnson, 1986b).

Support has been shown to be a significant buffer against the potential negative aspects of many life stressors, including parenting. Information relating to social support can be organized into two broad statements: (1) family and kinship bonds, and the person's more extended social network are the basic sources of social support; and (2) changes in society have placed new burdens on these social forms of support, especially in times of need (Pilisuk & Froland, 1978).

Holahan and Moos (1985) found that women categorized into a stress resistent group had better family support than their

counterparts in the distressed group. Muhlenkamp and Sayles (1986) sampled 98 adults and found that respondents with high self-esteem perceived their social support to be adequate, and maintained more positive health practices than did those with lower self-esteem and social support. According to a study by Wethington and Kessler (1986), perceived support may be more important than received support in predicting adjustment to stressful life events.

Brown (1986) conducted a study with expectant mothers and fathers (313 couples) regarding the influence of social support and stress on their health. Results indicated that social support and stress were useful in predicting health. In a study more specific to parenting, Cronenwett (1985) interviewed 50 primigravid fathers and mothers. Emotional support was found to be the best predictor of satisfaction with the parenting role and infant care for both men and women.

Lenz, Parks, Jenkins, and Jarrett (1986) studied the extent to which postpartal life change and instrumental support of parenting predict illness occurrence in the mothers (n=155) of six month olds. Life change and intensity of support were positively related to illness, while the size of the support network was negatively related to illness. There was no evidence for the buffering hypothesis. Findings did reveal that characteristics of instrumental support differ in their significance as predictors.

Crnic et al. (1984) studied both premature (n=33) and full term infants (n=36). These researchers found that the mothers' perceived satisfaction with intimate and community support had positive

relationships to reported life satisfaction, satisfaction with parenting, and the quality of behavioral interactions with their children during infancy.

Minde et al. (1978) indicated that maternal caretaking behaviors with premature infants (n=18) are affected by the mother's relationship with friends and the infant's father. In another study by Minde, Marton, Manning, and Hines (1980), the mother's relationships with her mother and the father of the infant proved to be high predictors of the interaction level between the mother and her very low birth weight infant.

Parent support groups have been found to affect maternal child adaptation with high-risk infants (n=22) (Meier, 1978). Minde et. al (1980) found that families (n=28) in a support group for parents of premature children had a higher incidence of contact with infants, touching, talking, and nursery visiting. In a more inclusive study, Dunst, Trivette, and Cross (1986) studied 137 parents of mentally retarded, physically impaired, and developmentally at risk infants. More supportive networks were associated with better personal well-being, more positive attitudes, and positive influences on parent-child play time and child behavior and development.

Fraley (1986) studied the relationship between premature children experiencing a stressful event and parents' (n=47) chronic sorrow. Data indicated that parents had feelings of loss/grief and fear when their child encountered particular stressor events. Parents also revealed that more support from health care providers, family, and friends would have increased their coping ability.

Based on the review of literature and observations by experts in the field of maternal-child health, there seems to be a link between parental social support and parenting behaviors in the high-risk family system. However, the relationship between social support levels of high-risk parents and later weight gain in high-risk infants has not been established, let alone thoroughly examined in the research literature.

The goal of this study was to investigate the relationship between weight gain in high-risk infants and their mothers' levels of social support. Interrelated concepts include infant physiologic growth patterns, individual development, family systems concepts, and social support. One concept cannot be separated from another. All interact to influence the high-risk infant's world and his ability to gain weight.

CHAPTER 3

RESEARCH METHODOLOGY

Chapter 3 discusses the methodology of this study. Included in this section is a description of the design, sample and setting, data collection procedures, instruments, assumptions, limitations, human rights procedures, and data analysis.

Design

This study addressed poor weight gain in the high-risk infant and the mother's level of social support. Researchers have established the existence of poor weight gain in the high-risk infant group, and the association of social support with a variety of positive health outcomes. However, there is limited research which examines the relationship between weight gain in high-risk infants and social support.

Therefore, the design utilized for this study was a Level II, descriptive survey/explanatory plan. A Level II descriptive design asks the question: What is the relationship between or among variables? The descriptive survey/explanatory design is appropriate in three situations: 1) when the variables are known and measurable; 2) when the variables have been studied previously; or 3) when the variables can be related to a concept or conceptual framework (Brink & Wood, 1983).

Sample and Setting

The sample was a non-random sample of convenience. Subjects consisted of 34 infant/mother pairs with the infants being high-risk. The infants, ages 18.75 through 26.25 months, had previously been admitted to a Level II intensive nursery and had no organic cause for failure to thrive. According to the researcher established definition of a high-risk infant, any admission to an intensive care nursery was "high-risk" and a potential candidate for this study if age and physical requirements were met. Infant age requirements consisted of a preferable range of 18 to 24 months. The only physical requirement was the absence of organic failure to thrive. Potential subjects were chosen from a register list of infants who had been admitted to a Level II intensive care nursery in a northcentral Montana medical center. The average yearly admission to this NICU in 1982 through 1988 was 177 infants. Fifty-two percent of those admitted during the seven year span weighed $\leq$ 2,500 grams at birth. The mother of each high-risk infant was also included in the study.

The infant's pediatrician or primary physician was asked to screen records to determine the occurrence of any organic dysfunction which may have resulted in organic failure to thrive. A current address was also requested. See Appendix A for one example of letters sent to the physicians.

Data Collection Procedures

The initial contact with the mother of each potential subject was by letter. The contact letter explained the purpose of the study and asked if the mother would be interested in participating in the study (see Appendix B). Included with the letter was a stamped envelope and reply form. The message on the reply form indicated that either the mother was interested or disinterested in participating in the study and requested a preferred date or time of day for a telephone call for further explanation of the study. The potential participant was asked to mail this form back to the researcher. If no response to the contact letter was obtained within two months, a second letter was mailed to the first group of participants.

The study was explained to the mother participant, either via telephone or in person. Each mother then completed a consent form and received a questionnaire, demographic data form, and information release form (see Appendix C, D, E, F). The mother filled out the consent form, questionnaire, demographic form, and information release form in the privacy of her home. The completed papers were then returned to the researcher in a prepaid mail packet. On occasion the researcher picked the packet up at the participant's home.

Each infant's perinatal history was obtained from the child's hospital chart. Information as to growth parameters was obtained via charts maintained by the High-Risk Infant Follow-Up Screening

Program, the child's primary physician, or a health care agency. See Appendix G for one example physician/health agency letter.

The High-Risk Infant Follow-Up Screening Program was developed by the same northcentral Montana medical center. The function of the high-risk infant program is to identify infants at risk for developmental impairment through screening evaluation. In 1987, 117 infants were seen by a team which included a physical therapist or occupational therapist, speech pathologist, audiologist, and dietician. A clinical social worker is also included as necessary.

The data collection was conducted over a period of 15 months. Two separate groups of potential subjects were utilized in order to obtain the 34 infant/mother pairs. Each subject underwent the same process as described: 1) selection from the intensive care nursery register; 2) physician review for organic failure to thrive; 3) contact letter to mother; 4) discussion with mother; 5) paperwork completion by mother; 6) chart review for perinatal history, and 7) current infant weight per physician/health agency records. Due to military regulations concerning confidentiality, the records of two participants were reviewed by their physicians after their mothers completed the paperwork.

Instruments: Validity and Reliability

The Personal Resource Questionnaire (PRQ), designed by Brandt and Weinert (1981) was the standardized tool utilized in this study (see Appendix D). Early psychometric testing indicated respectable measurement properties. Brandt and Weinert have continued to test

the instrument since its conception. The Personal Resource Questionnaire-85 is a result of further evaluation and was used in this study (Weinert, 1987). See Appendix H for a copy of the consent letter to use the questionnaire.

The PRQ-85 includes two areas of social support. Part 1 is an estimate of the number of interpersonal resources a person can rely on across ten life situations and the person's satisfaction with these resources. This first portion addresses aspects of network structure and provides descriptive data concerning situational support. Part 2, a 25 item Likert scale, was developed to measure the level of perceived social support. The questionnaire can be self-administered and completed in approximately ten minutes (Weinert, personal communication, May 23, 1986).

The test-retest estimate of reliability for a group of 100 adults ages 30-37 in a study by Brandt and Weinert was .81 ($p < .001$) for interpersonal resources (PRQ Part 1) and .72 ($p < .001$) for perceived social support (PRQ Part 2) (Weinert, personal communication, May 23, 1986). Estimates of reliability for the total PRQ-Part 2 have varied from .85 to .93 using Chronbach's alpha (Weinert, personal communication, February 24, 1987).

There is evidence to support content, construct, and criterion-related validity. According to Weinert (personal communication, May 23, 1986) there is no data to suggest social desirability response bias or gender related patterns. Further study has indicated that social support is related to mental health constructs but not the

same as the constructs anxiety or depression (Weinert, personal communication, February 24, 1987).

The demographic data form contained six questions. The original demographic form developed by Weinert and Brandt was revised by deleting one question, the gender question. The questions were included in order to facilitate the development of the PRQ-85 and provide the researcher with the following pertinent maternal demographic information:

1) age in years
2) marital status
3) education (highest degree or number of years)
4) occupation
5) employment status
6) race.

The researcher developed a tool to obtain perinatal history information. Most of the elements were those addressed in a study by Knobloch, Malone, Ellison, Stevens, and Zdeb (1982) which evaluated significant associations between neuropsychiatric outcomes and preconceptual, prenatal, perinatal, and postnatal factors. Levels of significance varied ($p < .05$ to .001). Risk factors for general postnatal growth retardation were compiled by Manser (1984). The researcher designed tool had face validity. Reliability of the tool had not been established.

The researcher reviewed each infant's hospital chart in order to obtain the perinatal history. The perinatal history form included the following categories:

1) Preconceptual

   a. Parity (gravida, para, abortion)

   b. previous premature infant

   c. previous fetal loss

2) Prenatal

   a. major complications, other complications

   b. sex

   c. birth weight

   d. gestational age

   e. weight for gestational age

   f. transport to NICU

   g. health insurance

   h. type of delivery

3) Perinatal

   a. Apgar score - at 1 minute, 5 minutes

   b. oxygen needed

   c. initial BP < 35 mm. Hg.

4) Postnatal

   a. ventilator therapy - any, longer than 3 days

   b. bilirubin > 10 mg./dL. - need for bilirubin lights

   c. respiratory distress syndrome

   d. apnea/bradycardia

   e. seizures

   f. septicemia/infection

   g. surgery while in NICU

5) Complications

   a. risk factors for general postnatal growth retardation

      - bronchopulmonary dysplasia
      - short bowel syndrome
      - neurological damage
      - anemia
      - cholestatic jaundice
      - patent ductus arteriosus
      - other congenital heart disease
      - renal disease
      - subglottic stenosis
      - other

   b. hospital stay - < 30 days, 30-60 days, > 60 days

   c. readmission (transport) to ICN - from Level III NICU, from home

6) Weight parameters

   a. birth weight

   b. hospital discharge/transport weight

   c. weight at time of study

7) Discharge diagnosis

Assumptions Related to Data Collection

There were four assumptions within this study:

1) the researcher-developed perinatal history form had face validity;

2) the recorded weights for each infant were relatively accurate, taking into consideration the use of different scales and different people performing the weights;
3) each infant's chart contained factual information;
4) each mother completed the demographic data form and Personal Resource Questionnaire-85 honestly.

Limitations

There were eight limitations in this study:

1) reliability had not been established for the researcher-developed perinatal history form:
2) a sample of convenience;
3) the limited number of possible participants due to the population served in northcentral Montana;
4) the inability to personally speak with each mother;
5) infrequent child check-ups resulting in the lack of current growth records;
6) the inability to follow each child's rate of growth;
7) re-calling past experiences may lead to retrospective distortion;
8) results cannot be generalized to all high-risk infants across the United States.

Human Subjects Procedures

This study was reviewed and approved in March of 1987 for utilization of human subjects in research by the MSU College of

Nursing Human Subjects Review Committee. Please see Appendix I for the face sheet of the Research Proposal for Human Subjects Review.

The major participating agencies were contacted prior to the subject selection process. The purposes of the study and the expectations of each facility were explained. Consent letters from the major participating agencies were then obtained (see Appendix J). All major participating agencies received an abstract of the study results upon completion of the project. The agencies were also informed that a copy of the completed thesis will be on file with the MSU Renne Library in Bozeman, Montana.

Several methods were utilized to assure the protection of the rights of participants in this study. Study participation was strictly voluntary, with freedom to withdraw at any time without penalty. There was no monetary exchange. Subjects were fully informed of the nature of the study before signing a written consent for participation. Each mother gave consent (see Appendix C) for herself and her infant to participate at the time of receiving a questionnaire, demographic data form, and information release form. The information release form gave the infant's physician/health care provider permission to release growth data to the researcher (Appendix F).

No physical risks were anticipated in this study, but some psychological risks may have existed. Some persons may have found the questions to be thought-provoking and thus experienced some psychological discomfort when reflecting on their personal feelings

and attitudes. These risks were made apparent upon providing participants with the consent form.

Confidentiality of the subjects' responses was maintained throughout the study. Neither the name of the infant nor the name of the mother appeared on the questionnaire, demographic data form, or health history. No mention of any participant (infant or mother) occurred in the data analysis or discussion of results of the study. Data analysis pertained mainly to grouped data. Each participant pair received a number. Only the researcher had access to the identity of each subject pair. This method increased the effectiveness of protecting each subject's rights through anonymity.

Consent forms, completed questionnaires, demographic data form, information release forms, and identification numbers were stored in locked files until the completion of the study. Consent forms will be stored per guidelines set forth by the MSU College of Nursing. The completed questionnaires will be destroyed after ten years if not needed for further research.

Each mother was informed that the study had no immediate direct benefit. This study has the ability to provide information that will be useful in working with high-risk infants in the future. For most participants there is potential benefit in knowing other parents may be helped. Each mother received an abstract of the completed study if she indicated this option on the consent form.

Data Analysis

Descriptive statistics were utilized to analyze demographic data, perinatal history data, and PRQ-85 results. Tables were employed to reflect the infant demographic data including weights, maternal demographic data, and PRQ-85 data. Frequency tabulations, ranges, means, and percentages were demonstrated in tables.

Each infant's weight was plotted against a growth grid (Ross Laboratory physical growth chart) with age corrected for prematurity. This process involved reviewing gestational ages and adjusting postconceptual time to a normal period of forty weeks. A weight percentile was then obtained.

The Personal Resource Questionnaire-85 Part 2 provided a social support score at the interval level of measurement. Reliability results were calculated via Cronbach's alpha. The Pearson r statistical test was employed to determine the degree of correlation between infant weight percentiles and the mother's level of social support. Although a random sample is preferred when working with parametric statistics, the Pearson r was deemed the most appropriate test for this study.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to determine the relationship between poor weight gain in the high-risk infant and the mother's level of social support. A Level II descriptive design was utilized. Data were collected through the use of a questionnaire (PRQ-85), physiological measurement (infant weights), and available data (infant perinatal history). Data analysis involved five areas: (1) descriptive analysis of demographic characteristics of infants; (2) descriptive analysis of demographic characteristics of mothers; (3) descriptive analysis of data obtained from the PRQ-85 Part 1; (4) analysis of the PRQ-85 Part 2; and (5) correlation between infant weight gain and the mother's level of social support.

The Crunch Version 3 Statistical Package (1987) was used to determine statistical results for the data collected. Particular statistical measurements included mean, ranges, percentages, Cronbach's alpha coefficient, and Pearson r.

Population and Sample Results

The target population for this study consisted of a minimum of 30 high-risk infants, preferably ages 18 through 24 months, who had been previously admitted to a Level II intensive care nursery and had no organic cause for failure to thrive. Up to 50 infant/mother pairs

would have been accepted. Potential subjects were chosen from a register list of infants who had been patients in a northcentral Montana medical center. The mother of each high-risk infant was also to be included in the study. Eighty-seven contact letters were mailed to mothers. Three of the mothers had twins and one had triplets. Six letters were returned due to lack of a forwarding address. Two infant subjects were disqualified since they had been discharged to home prior to their NICU admission.

The researcher had planned to spend not more than three months reviewing records to obtain suitable subjects and to determine current residence. Due to lack of participants, the process was repeated to obtain the final number of subjects. Data collection therefore took over 15 months.

The final number of acceptable subjects consisted of 34 infant/mother pairs with the infants being high-risk. The infants, ages 18.75 through 26.25 months at the time of the study, had previously been admitted to a Level II intensive care nursery and had no organic cause for failure to thrive. None of the infants had been discharged to home prior to their NICU admission.

Descriptive Analysis of Infant Demographics

There were 34 infant subjects in the study. All infants had spent time in an intensive care nursery following their birth. A complete perinatal history form was completed for all but three infant subjects. Two of these infants required transport to a Level III NICU within a day after birth. The other infant was born at a

Level III NICU and later transferred to the Level II NICU located in a northcentral Montana setting.

Infants' chronological ages ranged from 18.75 to 26.25 months at the time of questionnaire completion. Infrequently recorded weight measurements resulted in less than current growth parameters for some subjects. Weights recorded at chronological ages 13 through 29.5 months were used for analysis. Once postconceptual time was adjusted to a normal time of 40 weeks, weight analysis ages ranged from 11.25 to 29.25 months.

Eleven of the infants were born to primigravidas (32.35%). Three infants had mothers who had experienced a previous premature birth while nine infants had mothers who had experienced a previous fetal loss. See Table 2 for a summary of infant ages and preconceptual factors with potential to influence infant development.

The two most frequent primary NICU admitting diagnoses/symptoms were prematurity (n=14) and respiratory distress (n=11). Twenty infant subjects were male and 14 infant subjects were female. Birth weights ranged from 940 to 4010 grams with the mean birth weight being 2684.44 grams. The average birth weight is 3300 grams for males and 3200 grams for females (Pipes, 1985). Gestational age (normally 40 weeks) ranged from 29 to 40 weeks with a mean of 35.88 weeks. Twenty-eight subjects were appropriate-for-gestational-age, five were large-for-gestational-age, and one subject was small-for-gestational-age. Many infants (n=14) were neonatal transports from nearby hospitals. One-half of the subjects were born vaginally, and the remaining subjects were born by cesarean section. The mean Apgar

Table 2. Infant ages and preconceptual factors with potential to influence infant development.

Factors	Number N=34	Range	Mean	Percentile
Infant Ages				
-age at study time, in months	34	18.75-26.25	22.02	
-age at time study wt. obtained, in months	34	13-29.5	21.21	
-corrected age at time study wt. obtained, in months	34	11.25-29.25	20.18	
Preconceptual Factors				
-primigravida	11			32.35
-multigravida	23			67.65
-previous premature infant	3			8.82
-previous fetal loss	9			26.47

score at one minute was 6.265 and at five minutes it was 7.647. Twenty-five subjects required oxygen at birth and 13 were placed on a ventilator. Of the thirteen requiring ventilation at least seven were ventilated for more than three days.

At least 18 subjects showed a peak bilirubin of greater than 10 mg./dL. Dangerous bilirubin levels are dependent on birth weight, infant age, and the presence of complications. Most experts agree that a reading of greater than 20 mg./dL. is dangerous to any infant. A level of 5-9 mg./dL. in an infant less than 2,500 grams and older than 24 hours would result in need for phototherapy (Kattwinkel, et al., 1983b). At least 19 subjects were under bilirubin lights. Nineteen showed signs of respiratory distress syndrome. Postnatal

conditions such as apnea, bradycardia, seizure activity, and infection occurred infrequently. See Table 3 for infant prenatal, perinatal, and postnatal factors with potential to influence infant development.

Only 10 subjects exhibited perinatal factors which may have resulted in growth failure. The most common symptom was a heart murmur (n=4). Such factors were no longer significant at the time of the study according to physician chart reviews conducted to eliminate potential organic failure to thrive subjects.

At least four subjects spent 30 to 60 days in the intensive care nursery before being discharged to home. Only one subject was admitted to the Level II NICU after spending time in a Level III NICU. Hospital discharge/transport weights ranged from 1450 to 3864 grams with a mean of 2744.03 grams. The most common discharge diagnosis was prematurity with respiratory distress syndrome (n=16). The next four more common discharge diagnoses were prematurity (n=3), respiratory distress syndrome (n=3), transient tachypnea of the newborn (n=3), and hypoglycemia (n=3). Table 4 summarizes infant complications and discharge diagnoses with potential to influence infant development.

Descriptive Analysis of Maternal Demographics

The mother of each infant subject was also included in the study. There were 32 mothers since two sets of twins were included. Maternal demographics were obtained from the demographic data form each mother completed.

Table 3. Infant prenatal, perinatal and postnatal factors with potential to influence infant development.

Factors	Number N=34	Range	Mean	Percentile
Prenatal				
-most frequent complication				
premature	14			41.18
respiratory distress	11			32.35
maternal gestational diabetes	4			11.76
fetal hypoglycemia	4			11.76
-sex: male	20			58.82
female	14			41.18
-birth weight in grams	34	940-4010	2684.44	100.00
-gestational age, in weeks	34	29-40	35.88	100.00
-weight for gestational age; AGA	28			82.35
LGA	5			14.71
SGA	1			2.94
-transport to NICU				
neonatal	14			41.18
maternal	7			20.59
other (from newborn nursery, operating room, labor & delivery, Level III NICU)	13			38.23
-health insurance	27			79.41
-type of delivery;				
vaginal	17			50.00
c-section	17			50.00
Perinatal				
-Apgar score, at 1 minute	34	1-8	6.265	100.00
at 5 minutes	34	1-10	7.647	100.00
-oxygen needed	25			73.53
-initial BP < 35 mm. Hg.	4			11.76
Postnatal				
-ventilator therapy, any	13			38.24
longer than 3 days	7*			20.59
-bilirubin > 10 mg./dL.	18*			52.94
-need for bilirubin lights	19*			55.88
-respiratory distress syndrome	19			55.88
-apnea/bradycardia	6*			17.65
-seizures	2*			5.88
-septicemia/infection	2*			5.88

*information not available for all subjects

Table 4. Infant complications and discharge diagnoses with potential to influence infant development.

Factors	Number N=34	Range	Mean	Percentile
Complications				
-potential growth retardation factors				
-none	24			70.59
-murmur; persistent, transient	4			11.77
-anemia	2			5.88
-bronchopulmonary dysplasia	1			2.94
-? heart problem	1			2.94
-mild CNS asphyxial injury	1			2.94
-mild necrotizing enterocolitis	1			2.94
-hospital stay < 30 days	28			82.35
30-60 days	4			11.77
not sure	2			5.88
-readmission from Level III NICU	1			2.94
Weight Parameters (in grams)				
-birth weight	34	940-4010	2684.44	100.00
-hospital discharge/ transport wt.	34	1450-3864	2744.03	100.00
-weight at study time	34	7898-14545	11260.88	100.00
-weight percentile at study time	34	1-96	42.5	100.00
Discharge Diagnoses				
-premature with RDS	16			47.06
-premature	3			8.825
-respiratory distress syndrome (RDS)	3			8.825
-transient tachypnea of newborn (TTNB)	3			8.825
-hypoglycemia	3			8.825
-transient heart murmur, ? PDA	1			2.94
-phlebotomy	1			2.94
-idiopathic pulmonary hypertension	1			2.94
-double exchange volume	1			2.94
-respiratory distress	1			2.94
-premature with TTNB	1			2.94

The mothers' ages at time of questionnaire completion ranged from 22-43 years of age with the mean of 30.69 years. Twenty-nine mothers were married, one was single, and two were divorced. Years of education ranged from 10-18 years with the average of 13.88 years. Eleven women listed their occupation as housewife. Other more common occupations included teacher (n=5), farmwife/ranchwife (n=2), and clerk/typist (n=2).

The majority of the mothers (n=15) were not employed outside the home (46.88%). Thirteen of the mothers were employed full time outside the home at study time (40.62%). Four subject mothers indicated they were employed part-time (12.5%). All mothers were Caucasian except for one mother of Caucasian-Native American descent and one of Japanese-American descent. Table 5 displays maternal demographic characteristics.

Descriptive Analysis of PRQ-85 Part 1

The PRQ-85 includes two areas of social support. Part 1 is an estimate of the number of interpersonal resources a person can rely on across 10 life situations and the person's satisfaction with these resources. This first portion addresses aspects of network structure and provides descriptive data concerning situational support.

Of the 10 life situations addressed in the PRQ-85, the situations most commonly experienced by subject mothers in the six months prior to questionnaire completion were "day to day personal concerns" (n=27), "conditions of life" (n=16), "felt lonely" (n=15), "urgent needs" (n=13), "problem with family member or friend" (n=12),

Table 5. Maternal demographic characteristics.

Characteristic	Number N=32	Range	Mean	Per-centile
Age In Years	32	22-43	30.69	100.00
Marital Status				
-married	29			90.63
-single	1			3.12
-divorced	2			6.25
Education, In Years	32	10-18	13.88	100.00
Occupation				
-housewife	11			34.38
-teacher	5			15.62
-farmwife, ranchwife	2			6.25
-clerk/typist	2			6.25
-salesperson	1			3.125
-dental hygienist	1			3.125
-florist	1			3.125
-accountant (CPA)	1			3.125
-bartender	1			3.125
-aerobics instructor/ librarian	1			3.125
-secretary	1			3.125
-library clerk	1			3.125
-lay-up person (printer)	1			3.125
-teacher/social worker	1			3.125
-archeologist	1			3.125
-registered nurse	1			3.125
Employment Status				
-unemployed outside home	15			46.88
-employed full time outside home	13			40.62
-employed part-time	4			12.50
Race				
-Caucasian	30			93.75
-Japanese-American	1			3.125
-Caucasian-Native American	1			3.125

"financial problems" (n=11), "concern about relationship with spouse, partner, or intimate other" (n=11), and "problems with work at home or at place of employment" (n=10). Less frequently chosen life situations included "needed help for an extended time in caring for sick or handicapped family member" (n=7) and "been sick for a week or so and not able to carry out usual activities" (n=6).

The questionnaire asked who the mother would turn to if she were experiencing any one of the ten life experiences. "Spouse or partner or significant other" was the most frequent choice. In order of frequency the other choices were "parent", "friend", "relative or family member", "neighbor or co-worker", "child or children", "professional", "spiritual advisor", "no one (prefer to handle it alone)", "agency", "other", "self-help group", and "no one (no one available).

"Day to day personal concerns" was cited as the life situation most commonly experienced in the six months previous to the completion of the questionnaire. The resource people most frequently chosen were "spouse or partner or significant other", "friend", and "parent". Of those who had needed someone to talk to about day to day personal concerns in the past six months, 16 felt very satisfied with the help they received. Ten felt fairly satisfied, and one a little satisfied.

The second most frequently noted life situation in the previous six months was "feeling upset and frustrated with the conditions of life". Again the first choice for a resource person was "spouse or partner or significant other". Listed in order of preference, other

choices included "parent", and "relative or family member" or "friend". Five mothers indicated they were very satisfied with the help they received. Six were fairly satisfied, three were a little satisfied, and two were a little dissatisfied.

The third most frequent life situation choice was "felt lonely". "Spouse or partner or significant other" and "friend" were the first choices for support. Other more frequent choices were "parent" and "relative or family member". Six mothers stated they were very satisfied with the help they received. Seven felt fairly satisfied and one felt fairly dissatisfied. See Table 6 for a summary of PQR-85 Part 1 descriptive statistics.

Each mother was asked to indicate the number of available support persons/categories for each life situation. The average number of supports per life situation was 2.79 persons/categories.

Analysis of PRQ-85 Part 2

The second part of the PRQ measures a respondent's perceived level of social support. Part 2, a 25 item Likert scale, was developed by Brandt and Weinert (1981) according to Weiss's (1974) relational dimensions: (1) attachment/intimacy; (2) social integration; (3) nurturance; (4) worth; and (5) assistance.

Possible PRQ-85 Part 2 scores range from 25 to 175, with a higher score indicating a higher level of perceived social support. Total PRQ-85 Part 2 scores for subject mothers ranged from 112 to 175 with the mean score of 150.625.

Table 6. PRQ-85 Part 1 Descriptive Statistics.

Most frequently cited needs in past 6 months. N=32			Most frequently cited support person for need at any time.
	n	%	
Personal Concerns	27	84.38	-spouse, partner, significant other -friend -parent
Conditions of Life	16	50.00	-spouse, partner, significant other -parent -relative, family member/friend
Felt Lonely	15	46.88	-spouse, partner, significant other/friend -parent -relative, family member
Urgent Needs	13	40.63	-spouse, partner, significant other -parent -friend
Problem with Family Member or Friend	12	37.5	-spouse, partner, significant other -relative, family member -parent/friend

Cronbach's alpha coefficient was used to determine the degree of reliability (internal consistency) for PRQ-85 Part 2 responses. A score of 0.8835 was obtained indicating a high level of internal consistency. This compares to reliability coefficients for the total PRQ Part 2 obtained in studies by Brandt and Weinert (1981), Brandt (1984), and Aaronson (1989). Those coefficients ranged from .88 to .91.

Correlation Between Infant Weight Gain and the Mother's Level of Social Support

The Pearson r statistical test was utilized to determine the degree of correlation between infant weight gain and the mother's

level of social support. Weights were obtained from the infants' pediatricians or general physicians or health care providers. Gestational ages were obtained from the infants' hospital records. Each infant's weight was then plotted against a growth grid (Ross Laboratory physical growth chart) with age corrected for prematurity. This process involved reviewing gestational ages and adjusting postconceptual time to a normal period of 40 weeks. A weight percentile for each infant subject was then obtained.

The total score for Part 2 of the PRQ-85 was used to operationalize the level of social support for each mother subject. The mothers had filled out the questionnaire in the privacy of their own home after agreeing to participate in the study.

The correlation coefficient for the two variables, percentile for weight and the total PRQ-86 Part 2 sum, was -0.0354. The variable, percentile for weight, was divided into those infants with poor weight gain at less than the 10th percentile and those infants with weights at or greater than the 10th percentile. There were six subjects in the group composed of infants at less than the 10th percentile for weight and 28 subjects in the second group. The correlation coefficient for those infants less than the 10th percentile for weight and the mothers' total PRQ scores was 0.5124. The correlation coefficient for the second group was -0.2168. The score indicates no significant relationship between the two variables when the entire group was used. There was a moderately positive relationship when only the infants with poor weight gain were examined.

There were only six infant subjects in the group of infant subjects at less than the 10th weight percentile. Because two sets of twins were included, the subgroup contained four subject mothers. "Parent" was the most frequent choice as to whom the subject mother would turn to if experiencing one of the life situations. In order of frequency, other choices were "spouse or partner or significant other", "friend", and "relative or family member". These choices were similar to the entire group, although the entire group indicated the "spouse or partner or significant other" as their first choice. The four mothers indicated four life situations as the most commonly experienced situations in the six months prior to completing the PRQ-85: (1) "day to day personal concerns": (2) "conditions of life"; (3) "felt lonely"; and (4) "financial problems". These life situations are also similar to the results of the entire group. The four mothers had an average of 2.975 resource persons/categories which is higher than the entire group.

The lack of correlation between infant percentile for weight and maternal perceived level of social support prompted further correlation investigation. The Pearson r coefficient was used to examine possible relationships between maternal total PRQ-86 scores and two maternal demographics (age and education level). Maternal demographics were also examined in relation to infant weight percentiles. No significant relationships were found for either group of variables. See Table 7 for a summary of correlation results.

Table 7. Pearson r correlation results.

	Total PRQ-85 Part 2 Results (r results)	Infant Weight Percentile (r results)
Infant Weight Percentile		
-entire group (N=34)	-0.0354	
-infants <10th % (n=6)	0.5124	
-infants ≥ 10th % (n=28)	-0.2168	
Maternal Demographic Data		
-age	0.0505 (N=32)	-0.3749 (N=34)
-education, in years	0.0935 (N=32)	-0.0637 (N=34)

CHAPTER 5

DISCUSSION

Chapter 5 contains a summary of study results and conclusions. This chapter also includes an interpretation of findings as related to methodological issues, findings related to the conceptual/theoretical framework, implications for nursing, limitations, and recommendations for future research.

Summary and Conclusions

The purpose of this study was to determine the relationship between poor weight gain in the high risk infant and the mother's level of social support. Thirty-four infant/mother pairs were included in the study.

Infant Demographics

There were 34 infant subjects in the study. All infants had spent time in an intensive care nursery following their birth. Twenty subjects were male and 14 were female. The mean birth weight was 2684.44 grams. The mean gestational age was 35.88 weeks. Twenty-eight infants were appropriate-for-gestational-age, five were large-for-gestational-age, and one was small-for-gestational-age.

Four of the large-for-gestational-age infants were born to mothers who experienced gestational diabetes or diabetes mellitus.

The small-for-gestational-age infant was born to a mother with pregnancy induced hypertension and lupus erythematosus.

These demographics can be compared to those compiled for the same northcentral Montana Level II intensive care nursery from which study subjects were recruited. For the year of 1987, the average admitting weight for newborn NICU admits was 2561 grams. The average gestational age for newborn admits was 35.95 weeks. For the year of 1988, the numbers were 2417 grams and 35.09 weeks, respectively. The average weight for study subjects was slightly higher than the entire NICU population while the study group mean gestational age coincided closely with the NICU group.

The mean admitting weight and gestational age for the sample and population group may be related to the Level II status of the NICU utilized. Mothers exhibiting severe high-risk signs are often transported to a Level III setting before delivery. Therefore the Level III NICU probably has a population with lower mean birth weights and gestational ages as well as more high-risk factors. The one subject born at a Level III NICU was 940 grams at birth and 30 weeks gestation. Of the two infants transported to a Level III NICU after being admitted to the Level II NICU, one was 1600 grams and the other 3600 grams at birth. Gestational ages were 31 and 39 weeks, respectively.

Infant weights at study time ranged from 7898-14545 grams. Weight percentiles for these infants were from the first to the 96th percentile. The average weight percentile was 42.5 after infant ages had been corrected for prematurity. Although a large range was

represented, the group mean was very close to average weight percentile at the 50th mark. Such an average group included few infants with poor weight gain. This had an influence on study findings and conclusions.

Maternal Demographics

The mothers included in this study did not represent the expected maternal factors related to high-risk births. Jones (1986) describes several maternal high-risk characteristics. General information characteristics include eight categories. Five of the categories were addressed in the infant perinatal history form or the maternal demographic data form:

1. age- less than 18 years, greater than 40 years
2. marital status- single, separated, divorced, widow
3. ethnic-cultural group - minority
4. educational level- 10th grade
5. familial health history- diabetes, chronic hypertension.

Thirty-two mothers were included in the study since the mothers of two sets of twins agreed to participate in the study. Subject mothers' ages ranged from 22 to 43 years at study time with a mean age of 30.69 years. No mother was less than 18 years at the time of the infant's birth. Only one mother was over 40 years at the time of the infant subject's birth.

Twenty-nine mothers were married, one was single, and two were divorced at study time. The infants of those mothers without husbands were all above the 10th percentile in weight. Two of the

unmarried mothers had total PRQ-85 Part 2 scores less than the mean for the group (150.625). The scores for the mothers were 147 and 133.

Thirty mothers were Caucasian, one was Japanese-American, and one was Caucasian-Native American. The infants of the mothers of Japanese-American and Caucasian-Native American descent were both above the 10th percentile in weight. The total PRQ-85 Part 2 scores for these two mothers were 169 and 147. The scores were close to or above the group average.

Years of education ranged from 10-18 years with a mean of 13.88 years. The Pearson r correlation for the variables maternal education and maternal total PRQ-85 Part 2 scores was 0.0935. The Pearson r correlation score for the variables maternal education and infant weight percentile was -0.0637. Neither score was of significance. This may be related to the high educational mean, high total PRQ-85 Part 2 score mean, and almost average infant weight percentile mean.

Thirteen mothers were employed outside their homes on a full time basis. Four were employed part time. Fifteen were not employed outside the home. Of the children less than the 10th weight percentile, three had mothers who were employed outside the home. No conclusions regarding time spent away from the infant while at work and its effect on infant weight gain can be made due to the small number of subjects accessed.

The only factor seen more frequently in the study group was that related to the health history category. Three infants had mothers

who were diabetic. Four infants had mothers with gestational diabetes and another infant mother had pregnancy induced hypertension.

Although this group did not represent the expected maternal factors related to high-risk birth, it did represent those mothers that could be expected to participate in a study. The average subject mother was older, better educated, and married. It is this kind of stability that incites participation and probably affected study results.

PRQ-85 Part 1

The PRQ-85 Part 1 is an estimate of the number of interpersonal resources a person can rely on across 10 life situations and the person's satisfaction with these resources. The most frequently chosen life situations mothers of the study had encountered in the six months previous to completing the questionnaire were "day to day personal concerns", "conditions of life", "felt lonely", "urgent needs", and "problem with family member or friend". The least frequent choices were "needed help for an extended time in caring for sick or handicapped family member" and "been sick for a week or so and not able to carry out usual activities".

The more frequent choices mostly center around the mother and her needs rather than the needs of the extended family. The infants in this study were chosen due to their lack of health problems. This situation may have allowed the mother more time to concentrate on her

individual needs. The choice "conditions of life" may relate to young motherhood since twelve mothers had no other children.

Many subject families resided in rural areas. Almost half (46.88%) of the mothers were not employed outside the home. Both factors may account for the frequent response of "felt lonely".

The questionnaire also asked who the respondent would turn to if she were to experience any one of the ten life situations. "Spouse or partner or significant other" was the most frequent choice. In order of frequency the other choices were "parent", "friend", "relative or family member", "neighbor or co-worker", "child or children", "professional", "spiritual advisor", "no one (prefer to handle it alone), "agency", "other", "self-help group", and "no one (no one available)".

The large number of mothers choosing "spouse or partner or significant other" as a resource person is most likely related to the high number of mothers married at study time. The second choice of "parent" suggests that many study mothers may live close to their parents and/or siblings. Telephone communication is another option but seems less likely.

The option of a "professional (nurse, counselor, etc.)" was an infrequent choice. There is no way to know why the nursing profession was seldom sought out as an interpersonal resource. The two least frequent chosen life situations of "needed help for an extended time in caring for sick or handicapped family member" and "been sick for a week or so and not able to carry out usual activities" may be related to the infrequent use of the nursing

profession. Again this low response may be due to the well health status of infant subjects.

The average number of supports per life situation was 2.79 persons/categories for the entire group. These supports were usually the spouse or partner or significant other" and then the "parent", "friend", and "relative or family member". This is of importance according to Minde et al. (1980) who found that the mother's relationships with her mother and the father of the infant proved to be high predictors of the interaction level between the mother and the very low birth weight infant.

PRQ-85 Part 2

The PRQ-85 Part 2 measures a respondent's perceived level of social support. Total PRQ-85 Part 2 scores for subject mothers ranged from 112 to 175 with the mean score of 150.625. The mean score is high when compared to other studies using the PRQ. The mean total PRQ Part 2 for subjects (n=98) in a study by Muhlenkamp & Sayles (1986) was 130.8. The original version of the PRQ was used in the study. The mean PRQ Part 2 sum scores for three other studies consisting of primarily Caucasian, middle-class adults from the general population ranged from 139.03 to 142.78 (Weinert, 1987).

The high mean total PRQ-85 Part 2 score for this sample may be related to the large number of mothers who were married. Another factor may be age in general, not years of age as shown by the Pearson r coefficient for maternal years of age and the total PRQ-85 Part 2 scores (0.0505). Mothers ages ranged from 22-43 years. Women

of this age group are physically and socially able to seek out support people through work settings, community events, and educational opportunities. Once again, extended family may be living nearby.

Correlation Between Infant Weight and Mother's Level of Social Support

The correlation coefficient for the two variables, infant percentile for weight and the maternal total PRQ-85 Part 2 sum, was -0.0354. The percentile for weight variable was then divided into weight percentile categories. The correlation coefficient for those infants less than the 10th percentile for weight and the mothers' total PRQ-85 scores was 0.5124. The correlation coefficient for those infants at or greater than the 10th weight percentile and the mothers' total PRQ-85 scores was -0.2168. The only score of any statistical significance was that indicating the degree of relationship between weight percentiles for infants less than the 10th weight percentile and their mothers' total PRQ-85 scores. It is an interesting result since the purpose of the study was to determine the relationship between poor weight gain in high-risk infants and their mothers' levels of social support. It may be that adequate weight gain in high-risk infants is not strongly influenced by social support levels.

Despite the low correlation score, study results show a large number of high-risk infants with adequate growth. Study results also show a large number of infant mothers with good social supports

systems. Both results are positive outcomes for the high-risk infant.

The poor weight gain subgroup contained only six subjects. Two sets of twins were included. Birth weights ranged from 940 to 2380 grams with the mean of 1903.33 grams. This subgroup birth weight mean was considerably lower than the mean of 2684.44 grams for the entire group. Gestational ages ranged from 30 to 36 weeks with a mean of 33.83 weeks. The mean was somewhat lower than that of the entire group (mean=35.88 weeks). One subject was small-for-gestational-age at birth. Even as a toddler, the small-for-gestational-age low birth weight subject can be expected to maintain a lower weight percentile than the AGA low birth weight infant (Kumar et al., 1980; Hack & Fanaroff, 1984).

Four of the poor weight gain subjects exhibited perinatal factors which may have resulted in growth failure. These factors included a murmur (n=2), anemia (n=1), and mild necrotizing enterocolitis (n=1). These factors should have been of no significance since each infant's chart was reviewed by the primary physician to rule-out potential for organic failure to thrive.

A sample of six subjects is far too small from which to draw any statistical conclusions. The inclusion of two sets of twins again made this small subgroup atypical and resulted in only four mothers. The four mothers had an average of 2.975 resource persons/categories in the PRQ-85 Part 1 section. This average number is higher than for the entire group (2.79). The total PRQ-85 Part 2 scores ranged from

133 to 167 with a mean of 147. This mean is slightly lower than the group total PRQ-85 Part 2 score of 150.625.

"Parent" was the most frequent choice as to whom the subgroup subject mother would turn to if experiencing one of the 10 life situations. In order of frequency, other choices were "spouse or partner or significant other", "friend", and "relative or family member". All four mothers were married. This preference to turn to a "parent" over a "spouse or partner or significant other" may be related to the somewhat lower perceived level of social support for this small subgroup.

The four mothers indicated four life situations as the most commonly experienced situations in the six months prior to completing the PRQ-85: (1) "day to day personal concerns"; (2) "conditions of life"; (3) "felt lonely"; and (4) "financial problems". These results are similar to the entire group with the exception of "financial problems". Perhaps the burden of financial problems influenced this subgroup to indicate a lower level of support. It may also be responsible for the higher average number of resource persons/categories. People with financial problems may need to go beyond their usual resources to find assistance. Once the resource is established, that person/category could be utilized for problems other than financial.

Interpretation of Findings Related to Methodological Issues

The target population for this study consisted of a minimum of 30 high-risk infants, preferably ages 18 through 24 months, who had

been previously admitted to a Level II intensive care nursery and had no organic cause for failure to thrive. The mother of each high-risk infant was also to be included. Up to 50 infant/mother pairs would have been accepted.

The researcher had planned to spend not more than three months reviewing records to obtain suitable subjects and to determine current residence. Due to lack of participants, the process was repeated to obtain the final number of 34 infant/mother pairs. Data collection therefore took over 15 months. A total of 87 contact letters were mailed to mothers. Six letters were returned with no forwarding address. To promote consistency two infant participants were disqualified since they had been discharged to home prior to their NICU admission.

All but two subjects underwent the same process: (1) selection from the NICU register; (2) physician review for organic failure to thrive; (3) contact letter to mother; (4) discussion with mother; (5) paperwork completion by mother; (6) chart review for perinatal history; and (7) current infant weight per physician/health agency records. Due to military regulations concerning confidentiality, the records of two participants in the second group were reviewed by their physicians after their mothers completed the paperwork. This confidentiality concern by the military also prevented the obtainment of updated addresses for potential subjects in the second group, thus decreasing the sample size.

Originally eight additional mothers had agreed to participate in the study. This would have resulted in 10 more subjects since two

more sets of twins would have been included. Packets were mailed to these mothers but not returned. Most mothers were contacted to follow-up on possible questions or loss of the packet. Despite follow-up, none of the packets were returned.

The issues related to the obtainment of subject infants/mothers affected the sample number. A larger sample would have provided better representation of the population and more accurate findings.

The sample was not a random sample but one of convenience. This was obvious by the mean age of mothers (30.69 years), the mean educational level of mothers (13.88 years), and the marital status of mothers (29 married). The youngest mother participant was 22 years of age. No teenage mother was represented in the study. Only three subject mothers were without the potential support of a husband. These characteristics resulted in a group which did not represent the expected maternal factors related to high-risk birth and probably affected maternal level of social support.

A complete perinatal history form was not filled out for all infants. Two infants were transported to a Level III NICU within a day after birth. One infant was born at a level III NICU and then transported to the Level II NICU located in a northcentral Montana setting. The primary postnatal record could not be reviewed for these three subjects. Thus demographic data were incomplete for some characteristics.

Not all mothers were able to return paperwork as quickly as the researcher had hoped. Therefore some infants were older than the proposed 24 month old upper limit for age. Infrequently recorded

weight measurements resulted in less than current weights for some subjects. Weights recorded at chronological ages 13 through 29.5 months were used for analysis. Once postconceptual time was adjusted to a normal time of 40 weeks, weight analysis ages ranged from 11.25 to 29.25 months. The age variance may have affected infant weight percentiles and thus the correlation coefficient.

Findings Related to Conceptual/Theoretical Framework and Literature Review

Infant Physiological Growth Patterns

The healthy premature infant who is appropriate for gestational age grows at approximately the same rate as the full-term infant of the same postconceptual age during the first year of life (O'Leary, 1985). "For weight, there are significant differences between corrected and uncorrected age from birth until 21 months" (Brandt, 1978, p. 610). After 24 months no correction is necessary (Brandt, 1978). Of the 18 study subjects who were premature and appropriate-for-gestational-age, all but five were at weight percentiles greater than the 10th percentile.

One subject was small-for-gestational-age at birth. This subject continued to be below the 10th percentile for weight at study time. According to a study by Hack and Fanaroff (1984) 46% of the small-for-gestational-age low birth weight subjects maintained a low weight percentile (<3rd percentile) even at 3 years of age.

One factor which may affect the high-risk infant is bronchopulmonary dysplasia (BPD). One subject had developed this

physiological process which is thought to be a complication of positive pressure ventilation and oxygen administration utilized during the treatment of hyaline membrane disease in the premature patient (Sirois, 1984). Retarded growth patterns for young survivors of BPD have been reported (Markestad & Fitzhardinge, 1981; Vohr et al., 1982). In this case, the subject had long outgrown the need for supplemental oxygen and was at the high end of the weight chart.

The term failure to thrive (FTT) is defined as failure of somatic growth with height and/or weight below the third percentile of a standard growth chart, weight for height below the fifth percentile, or a decelerated growth rate resulting in a falloff of two major percentiles (Berkowitz & Sklaren, 1984). For the purpose of this study, poor weight gain was defined as weight below the 10th percentile for adjusted age on a standard growth chart (Ross Laboratories physical growth chart) for which there was no organic explanation. Six subjects met the criteria for poor weight gain. Three of the six subjects were below the fifth percentile for weight. Each subject's chart was reviewed by a pediatrician or general practitioner to eliminate potential for organic failure to thrive. The study provided no way to evaluate for other explanations for FTT as discussed by Berkowitz and Sklaren (1984). These causes include familial short stature, constitutional delay, and isolated nutritional inadequacies (see Chapter 2).

One early study with failure to thrive children, conducted by Hannaway (1970), found 52% of the premature infants had non-organic FTT. In another earlier project, Goldson et al. (1976) reviewed the

charts of 140 children diagnosed with non-accidental trauma or failure to thrive. A disproportionate number of children (25.3%) with birth weights under 2,500 grams were found in the sample group. Harrison (1986) identified contributors to maladaptive mothering as premature and postnatal problems, early parental separation, physical difficulties in the child, adolescent parents, and socioeconomic or psychosocial strains on the family. Conversely, Altemeier et al. (1985) did not find a correlation between non-organic FTT and infant gender, Apgar scores, dysmaturity, premature or twin birth, labor and delivery complications, or postpartum complications. The study group representing those infants less than the 10th percentile in weight was far too small and atypical to draw any conclusions which might support any of the conflicting findings related to prematurity and non-organic FTT.

Individual Development

The parent of a high-risk infant may be in any one of three stages of personality development as developed by Erikson: adolescence, young adulthood, or adulthood. Subject mothers for this study ranged in ages 22 to 43 years with a mean of 30.69 years. Therefore mothers were in the young adulthood and adulthood stages. The young adult's goal is to develop a sense of intimacy. This may have been accomplished by mother subjects due to the high percentage of mothers married or once married (96.88%). Erikson's adulthood stage involves generativity, when an individual takes his place in society and assists in the development and perfection of whatever it produces.

The term generativity refers to everything which is generated from generation to generation. This includes children (Tribe, 1973).

The infant subjects in this study were in Erikson's toddler stage of development. In this stage the child is developing a sense of autonomy which includes the choice of whether to accept offered food or reject it (Tribe, 1973). It was impossible to follow growth patterns for each subject. Interval weights would have provided a rate of growth and thus shown weight dips related to autonomy development during toddlerhood.

Infants and children who are involved in disturbed parent-child relationships may exhibit abnormal behaviors as well as developmental delays (Yoos, 1984). Harry Stack Sullivan's theories on personality development are basically interpersonal. Infant personality develops through interpersonal socialization. With time these interpersonal relationships are expanded through the establishment of love, and then marital and parental relationships (Coleman & Broen, 1972). Total PRQ-85 Part 2 scores for mothers ranged from 112 to 175 with a mean score of 150.625. The average number of support per life situation was 2.79. Both numbers are high and perhaps indicators of strong interpersonal relationships.

Family Systems Concepts

The family composes the most significant social context within which illness occurs and resolves. Understanding the client requires an understanding of the patient's family context (Jones & Dimond, 1982). Family systems theory states that a change in one family

member affects all other members. But it is the family that creates a balance between change and stability (Wright & Leahey, 1984). Subject mothers chose their "spouse or partner or significant other" as the person they would be most likely to turn to if they were experiencing one of the 10 life situations presented in the PRQ-85. In order of frequency the other choices were "parent", "friend", "relative or family member", "neighbor or co-worker", "child or children", "professional", "spiritual advisor", "no one (prefer to handle it alone)", "agency", "other", "self-help group", and "no one" (no one available). The more frequent choices indicate how often the mother turned toward a family member to create a balance between change and stability.

Social Support

For the purpose of this study, social support is information that leads a person to believe he is cared for and loved, esteemed and valued, and belongs to a network of communication and mutual obligation (Cobb, 1976). Weiss (1974) saw social support as a combination of six categories: (1) attachment; (2) social integration; (3) nurturance; (4) worth; (5) assistance; and (6) guidance. These categories are addressed in Part 2 of the Personal Resource Questionnaire developed by Brandt and Weinert.

Minde et al. (1978) indicated that maternal caretaking behaviors with premature infants are affected by the mother's relationship with friends and the infant's father. In another study by Minde et al. (1980), the mother's relationships with her mother and the infant's

father proved to be high predictors of the interaction level between the mother and her very low birth weight infant. Again this relates back to the subject mothers' most frequently chosen support persons, total PRQ-85 Part 2 scores, and the average number of support persons/categories available.

Implications for Nursing

The survival rate for infants at progressively earlier gestational ages is on the increase. A rising number of these high-risk infants are returning to their home environments. As was the case in this study, the environment is often rural. The nursing profession must be aware of the potentially hazardous consequences of a high-risk birth, especially as it relates to the development of the infant and the family system. Growth and development of the infant is one such consequence. Six of the 34 high-risk infants in this study were below the 10th percentile for weight. This was after the child's age was adjusted to compensate for a premature gestational state. The nurse is often responsible for performing growth measurements (weight, height, frontal-occipital circumference). Other nursing duties involve plotting measurements on a reputable growth chart, taking a health history (perinatal history, nutritional history, and familial characteristics), follow-up, and referral as appropriate. This process is already a nursing role and nursing responsibility. But in some cases, there is need to emphasize the importance of the role.

A program such as the Infant High-Risk Follow-Up Screening Program (see Chapter 3) is an accepted manner for following high-risk infants. But as in the case of the program developed by the northcentral Montana medical center, nursing is one discipline not represented in the actual assessment phase of the program. A registered nurse does participate in the monthly team conference but rarely has direct contact with the client. A nurse familiar with the child's past medical history would certainly be of benefit during the physical/developmental assessment. A registered nurse should be part of any high-risk infant program including those established through state agencies.

All children, not just high-risk infants, are in need of well child care, including the surveillance of growth parameters. One of the 1990 Objectives as established by the 1986 (Montana) Governors's Conference on Health Promotion and Disease Prevention is to organize a system which enables all infants in Montana to participate in primary health care, including well child care. One step identified to achieve this objective involves educating people about the advantages of well child care and encouraging their participation (Montana Action Plan, 1986). The 1990 Objectives and prescribed step are related to educating the public to health issues, a responsibility nursing has long addressed.

The statistical results of the study did not indicate a positive correlation between the high-risk infant's weight gain and the mother's level of social support. However, the literature does suggest social support to be a significant buffer against the

negative effects of life stressors. Nursing needs to become more accessible to those in need of support and to promote the accessibility of established support systems through the inclusion of those most frequently turned to in times of stressful life experiences. This study found the most common resources to be "spouse or partner or significant other", "parent", "friend", and "relative or family member".

Limitations

The sample for this study was a small sample of convenience. A larger random sample would have provided the possibility for use of more advanced statistics. A larger sample would also have resulted in a larger subgroup of infants at less than the 10th percentile in weight. This point is related to still another limitation. There was a limited number of possible participants due to the population served by the accessed northcentral Montana Level II intensive care nursery. A small sample utilizing only Montana born infants prevents generalizing results to all high-risk infants across the United States.

Reliability for the researcher-developed perinatal history form had not been established. Reliability establishment would require its use in numerous studies. This was an unrealistic goal at the time.

It was impossible to speak to the mother of each infant in person. This limitation was related to the large rural area and the military population served by the accessed Level II NICU. Many

participants did not live in the town in which the NICU was located. Short term assignments common to military life were responsible for follow-up correspondence as far as Japan.

Infrequent well child check-ups, infrequently recorded weights, moving, and health care provider changes resulted in the inability to follow rate of growth. Growth patterns are of more significance than the actual weight percentile and may have resulted in clearer explanations for weight percentiles.

Mother subjects were asked to recall events that may have occurred six months previous to the time the questionnaire was completed. Recalling past experience may have lead to retrospective distortion.

Recommendations for Future Research

Replication of this study with a larger sample is needed in order to verify results. It would also be helpful to concentrate on only those infants who are at a low weight percentile. Younger subject mothers, particulary those of adolescent age, would make the sample more representative of those most likely to have high risk infants. A streamlined data collection process would expedite any replication of this study.

Random sampling in future research studies would provide the possibility for use of more advanced statistics. It would also further justify the utilization of Pearson r.

The study should be repeated in other Level II intensive care nurseries in Montana and out-of-state sites of similar population. This would allow for the generalization of data.

A longitudinal study comparing weight percentiles at several time intervals would establish growth curves. This data may then provide a more representative picture of infant development and identify growth slumps related to developmental stages.

Maternal demographic data should be expanded to include socioeconomic status or family income. This would help to establish the presence of low socioeconomic status, another potential maternal high risk factor.

The use of another questionnaire specifically designed to measure social support systems of young adults may also be useful in future research. This questionnaire may be administered in addition to the Personal Resource Questionnaire-85.

The purpose of this study was to determine the relationship between poor weight gain in the high risk infant and the mother's level of social support. Thirty-four mother/infants pairs participated. The correlation coefficient (Pearson r) for the two variables, percentile for weight and the total PRQ-85 Part 2 sum, was -0.0354. This score showed no significant relationship when the entire was used. There was a moderately positive relationship when only the infants with poor weight gain were examined (r=0.5124). It is this low weight group which requires further nursing research.

The infant subject group was representative of the population group since the average weight for study infant subjects was only

slightly higher than the entire NICU population and gestational age numbers coincided closely. In contrast, mother subjects did not represent the expected maternal factors related to high-risk births. The average subject mother was older, better educated, and married. These factors may be responsible for the high average number of supports per life situation (2.79 persons/categories) and high mean total PRQ-85 Part 2 score (150.625). Maternal demographics may also be related to the choice of "spouse or partner or significant other" as the preference for support person. Mothers chose "day to day personal concerns" and "conditions of life" as the most frequent life situations they had encountered in the six months previous to completing the PRQ-85. The lack of infant health problems and young motherhood may have affected these responses.

The nursing professional must be aware of the hazardous consequences of a high-risk birth, including poor weight gain. There is a need to emphasize the nurse's role in documentation of growth parameters (including weight), involvement in infant high-risk screening programs, and public education related to well child care for all infants. In addition, nurses need to be more assessable to those in need of support and promote the accessibility of established support systems.

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APPENDICES

APPENDIX A

EXAMPLE OF INTRODUCTION LETTER SENT TO EACH SUBJECT'S PHYSICIAN

Date

Name of Physician
Street Address
City, State ZIP

Dear Dr. _____:

I am a graduate nursing student through the College of Nursing at Montana State University. I am currently selecting subjects for a Master's thesis which focuses on weight gain in high-risk infants and their mothers' levels of social support. I have reviewed the records of intensive care nursery patients admitted to the Montana Deaconess Medical Center between _____ and _____ 198_. The records indicate you may be providing follow-up care to potentially suitable subjects for my study. The following page contains the list of possibilities for participation. I would appreciate your time in screening the clients' records for a persistent medical problem which may contribute to organic failure to thrive. There are at least five factors to consider: (1) BPD with present oxygen needs; (2) short bowel syndrome; (3) neurological damage; (4) heart condition; or (5) renal disease.

I am also in need of current addresses. The recorded addresses are my most recent source of residence. Feel free to make any necessary corrections.

Once the family of the infant subject is located, the infant's mother will need to sign an informed consent form before entering the study. It is understood that subject participation is strictly voluntary, with freedom to withdraw at any time without penalty. Confidentiality of the subjects' names and responses will be maintained throughout the study. The mother of the subject will also be asked to allow the release of growth parameters (height and weight) from your records. Your office will be contacted for this information at a later date.

Thank you for your assistance and concern. Please return the list at your earliest convenience.

Sincerely,

Kathleen Jaeger, R.N., B.S.N.
Montana State University
Graduate Student

POTENTIAL SUBJECTS

	Potential for Organic FTT		No Current Record for Patient	Current Address
	NO	YES		
Name of Child	_____	_____	_____	_____
Name of Child	_____	_____	_____	_____

APPENDIX B

INTRODUCTORY LETTER TO MOTHER

Date

Mother's Name
Street Address
City, State ZIP

Dear Mrs. _____:

I am a graduate student through the College of Nursing at Montana State University. Currently, I am selecting subjects for a Master's thesis project. This study focuses on weight gain in infants who have spent time in an intensive care nursery. Part of the process involves collecting information from the mother of each infant about her family and friends. It is for this reason that I am contacting you.

If you choose to participate in this study, your permission will be needed to release information concerning the growth of your child. You will also be asked to fill out a questionnaire and a data sheet. It will not take more than 15 minutes to complete both forms. At this time, I am interested in knowing if you would consider participation in such a study. No matter the answer, I would appreciate your time in completing the enclosed letter.

Please indicate your interest or disinterest in study involvement. If you are interested, it would be helpful to know a good time to contact you by telephone. Further meetings can be arranged if necessary.

Participation in the study is strictly voluntary with freedom to withdraw at any time. Expression of interest brings no obligation for participation. The enclosed letter is not a consent form. An indepth explanation of the project will be presented during the telephone appointment.

Sincerely,

Kathleen Jaeger, R.N., B.S.N.
Montana State University
Graduate Student

I am interested _____, disinterested _____, in participating in your study.

The best time to reach me by telephone is _____

_____

(morning, afternoon, evening, weekdays, weekends, date and time if known).

Name _____

Telephone _____

APPENDIX C

INFORMED CONSENT FORM

INFORMED CONSENT FORM

Dear _____:

I am a graduate student in nursing at Montana State University. I am interested in studying factors related to weight gain in high-risk infants. Presently, I am conducting a study with children who have spent time in an intensive care nursery. The purpose of this research is to study weight gain in former NICU infants by collecting information from each infant's mother. As the mother of an infant who required care in an intensive care nursery, I would like to obtain knowledge about you, your family, and your friends.

If you choose to participate, your permission will be needed to release information concerning the growth of your child. You will be asked to fill out a questionnaire and a data sheet. It should not take more than 15 minutes to complete both forms. Participation is strictly voluntary, with freedom to withdraw at any time without penalty. There will be no money exchange. No physical risks are anticipated, but some psychological risks do exist. Some people may find the questions to be thought-provoking and may experience some discomfort when reviewing their feelings and attitudes.

Your identity and the identity of your child will remain confidential throughout the study. Neither your name nor your child's name will appear on the questionnaire or the demographic data form. No mention of any name will be made in the data analysis or discussion of the results of the study.

This study will be of no direct benefit to you or your child. This study does have the potential to provide information that will be useful in working with future infants in the intensive care nursery.

_____ _____

Signature of Investigator Date
Kathleen Jaeger, R.N.

I give my consent to participate in this study, and I have had the opportunity to ask questions. I would _____, would not _____, like to receive an abstract (summary) of the study results upon its completion.

_____ _____

Signature of Participant Date

I give my consent to allow my child, _____, to participate in this study.

_____ _____

Signature of Mother Date

APPENDIX D

PERSONAL RESOURCE QUESTIONNAIRE-85

MONTANA STATE UNIVERSITY
College of Nursing

PERSONAL RESOURCE QUESTIONNAIRE (PRQ-85)

by

Patricia Brandt Clarann Weinert, S.C.

In our everyday lives there are personal and family situations or problems that we must deal with. Some of these are listed below. Please consider each statement in light of your own situation. Circle the number before the person(s) that you could count on in each situation that is described. You may circle more than one number if there is more than one source of help that you count on. In addition, we would like to know if you have had this situation or a similar one in the past six months, and how satisfied you are with the help you received.

Q-1a. If you were to experience urgent needs, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you had urgent needs in the past six months?

1. YES
2. NO

c. If you have experienced urgent needs in the past six months, to what extent do you feel satisfied with the help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

PRQ-85 - Page 2

Q-2a. If you needed help for an extended period of time in caring for a family member who is sick or handicapped, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you needed help in caring for a sick or handicapped family member in the past six months?

1. YES
2. NO

c. If you have needed help in caring for a sick or handicapped family member in the past six months, to what extent do you feel satisfied with the help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-3a. If you were concerned about your relationship with your spouse, partner, or intimate other, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN)_____

b. Have you had concerns about your relationship with your spouse, partner, or intimate other in the past six months?

1. YES
2. NO

c. If you have had concerns about your relationship with your spouse, partner, or intimate other in the past six months, to what extent do you feel satisfied with the help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-4a. If you needed help or advice for a problem with a family member or friend who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you needed help or advice regarding a problem with a family member or friend in the past six months?

1. YES
2. NO

c. If you have needed help or advice in the past six months regarding a problem with a family member of friend, to what extent do you feel satisfied with the help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-5a. If you were having financial problems, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you had financial problems in the past six months?

1. YES
2. NO

c. If you had financial problems in the past six months to what extent do you feel satisfied with the help you received.

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-6a. If you felt lonely, who would you turn to?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you felt lonely in the past six months?

1. YES
2. NO

c. If you have felt lonely, in the past six months, to what extent do you feel satisfied with the help you have received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-7a. If you were sick and not able to carry out your usual activities for a week or so, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. During the past six months, have you been sick for a week and not able to carry out your usual activities?

1. YES
2. NO

c. If you have been sick for a week during the past six months to what extent do you feel satisfied with the help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-8a. If you were upset and frustrated with the conditions of your life, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you been upset and frustrated with the conditions of your life in the past six months?

1. YES
2. NO

c. If you have been upset and frustrated with the conditions of your life in the past six months to what extent do you feel satisfied with the help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-9a. If you were having problems with your work at home or at your place of employment who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you had problems related to your work in the past six months?

1. YES
2. NO

c. If you have had problems with your work situation in the past six months, to what extent do you feel satisfied with help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-10a. If you needed someone to talk to about your day to day personal concerns, who would you turn to for help?

1. PARENT
2. CHILD OR CHILDREN
3. SPOUSE OR PARTNER OR SIGNIFICANT OTHER
4. RELATIVE OR FAMILY MEMBER
5. FRIEND
6. NEIGHBOR OR CO-WORKER
7. SPIRITUAL ADVISOR (MINISTER, PRIEST, ETC.)
8. PROFESSIONAL (NURSE, COUNSELOR, ETC.)
9. AGENCY
10. SELF-HELP GROUP
11. NO ONE (NO ONE AVAILABLE)
12. NO ONE (PREFER TO HANDLE IT ALONE)
13. OTHER (EXPLAIN) _____

b. Have you needed someone to talk to about day to day personal concerns in the past six months?

1. YES
2. NO

c. If you have needed someone to talk to about day to day personal concerns in the past six months, to what extent do you feel satisfied with help you received?

1. VERY SATISFIED
2. FAIRLY SATISFIED
3. A LITTLE SATISFIED
4. A LITTLE DISSATISFIED
5. FAIRLY DISSATISFIED
6. VERY DISSATISFIED

Q-11. Below are some statements with which some people agree and others disagree. Please read each statement and circle the response most appropriate for you. There is no right or wrong answer.

1. STRONGLY DISAGREE
2. DISAGREE
3. SOMEWHAT DISAGREE
4. NEUTRAL
5. SOMEWHAT AGREE
6. AGREE
7. STRONGLY AGREE

STATEMENTS

a. There is someone I feel close to who makes me feel secure.....	7	6	5	4	3	2	1
b. I belong to a group in which I feel important.....	7	6	5	4	3	2	1
c. People let me know that I do well at my work (job, homemaking).....	7	6	5	4	3	2	1
d. I can't count on my relatives and friends to help me with problems.....	7	6	5	4	3	2	1
e. I have enough contact with the person who makes me feel special.....	7	6	5	4	3	2	1
f. I spend time with others who have the same interests that I do.....	7	6	5	4	3	2	1
g. There is little opportunity in my life to be giving and caring to another person.....	7	6	5	4	3	2	1

1. STRONGLY DISAGREE
2. DISAGREE
3. SOMEWHAT DISAGREE
4. NEUTRAL
5. SOMEWHAT AGREE
6. AGREE
7. STRONGLY AGREE

STATEMENTS

h. Others let me know that they enjoy working with me (job, committees, projects).....	7	6	5	4	3	2	1
i. There are people who are available if I needed help over an extended period of time.....	7	6	5	4	3	2	1
j. There is no one to talk to about how I am feeling.....	7	6	5	4	3	2	1
k. Among my group of friends we do favors for each other.....	7	6	5	4	3	2	1
1. I have the opportunity to encourage others to develop their interests and skills.....	7	6	5	4	3	2	1
m. My family lets me know that I am important for keeping the family running.....	7	6	5	4	3	2	1
n. I have relatives or friends that will help me out even if I can't pay them back.....	7	6	5	4	3	2	1
o. When I am upset there is someone I can be with who lets me be myself.....	7	6	5	4	3	2	1
p. I feel no one has the same problems as I.....	7	6	5	4	3	2	1
q. I enjoy doing little "extra" things that make another person's life more pleasant.....	7	6	5	4	3	2	1
r. I know that others appreciate me as a person.....	7	6	5	4	3	2	1
s. There is someone who loves and cares about me.....	7	6	5	4	3	2	1
t. I have people to share social events and fun activities with.....	7	6	5	4	3	2	1

STATEMENTS--(Continued)

u. I am responsible for helping provide for another person's needs..... 7 6 5 4 3 2 1

v. If I need advice there is someone who would assist me to work out a plan for dealing with the situation..... 7 6 5 4 3 2 1

w. I have a sense of being needed by another person..... 7 6 5 4 3 2 1

x. People think that I'm not as good a friend as I should be..... 7 6 5 4 3 2 1

y. If I got sick there is someone to give me advice about caring for myself..... 7 6 5 4 3 2 1

APPENDIX E

DEMOGRAPHIC DATA FORM

Demographic Data Form

1. Age in years
2. Marital status
3. Education (highest degree or number of years)
4. Occupation
5. Employment status
6. Race

APPENDIX F

RELEASE OF INFORMATION FORM

RELEASE OF INFORMATION

_____ _____
Subject's Name Birthdate

I authorize the release of growth parameter (height and weight) information concerning _____ from the records
Subject's Name
maintained by _____. This information is to be
Physician, Clinic
released to Kathleen Jaeger, R.N., Montana State University, College of Nursing graduate student for use in a thesis project. I understand I can revoke this authorization at any time with a written request. This consent will expire 120 days from the date indicated below. This information is not to be shared with any other party without written permission.

_____ _____
Date Subject's Mother

_____ _____
Witness Address

_____
City

APPENDIX G

EXAMPLE OF LETTER SENT TO PHYSICIAN/ HEALTH AGENCY TO OBTAIN WEIGHT

Date

Name of Physician
Street Address
City, State ZIP

Dear Dr. _____:

I am a MSU College of Nursing graduate student. I previously sent you a letter in regards to my thesis project which deals with weight gain in infants who have spent time in an intensive care nursery. Thank you very much for identifying potential subjects for my study and assisting me with their current location.

I am now seeking information in regards to more current weight and height parameters for each of my subjects. The subjects' names are listed on the next page. I have also included a copy of the information release form signed by each subject's mother.

If several growth measurements have been recorded, please list the height and weight which most closely correlates with the date typed after the child's name and then indicate that date. The information can then be mailed to me in the provided envelope.

Thank you for taking the time to complete this form.

Sincerely,

Kathleen Jaeger, R.N., B.S.N.
Montana State University
Graduate Student

	Height	Weight	Date Measured
Name of Child	_____	_____	_____
Name of Child	_____	_____	_____

APPENDIX H

CONSENT LETTER TO USE QUESTIONNAIRE

Montana State University
Sherrick Hall
Bozeman, Montana 59717-0005

College of Nursing

1/6/87

Kathy Jaeger
3409 9th N.E.
Great Falls, MT 59404

Dear Ms. Jaeger:

This letter is to indicate that you have permission to use the PRQ-85 in your proposed research project. I believe you have received the information packet for the PRQ. If you have further questions please contact me.

Sincerely,

Clarann Weinert

Clarann Weinert, S.C.,R.N.,Ph.D.
Associate Professor

APPENDIX I

HUMAN SUBJECTS REVIEW FACE SHEET

RESEARCH PROPOSAL FOR HUMAN SUBJECTS REVIEW

Title of Project "Weight Gain in High-Risk Infants and Mothers' Levels of Social Support"

Investigator Kathleen Rae Jaeger Date February 20, 1987

Thesis Committee:

Valerie Williams Chairperson (signed)

Karen H. Stiegel Committee member (signed)

Dawn R. Hadley Committee member (signed)

Please answer the following questions:

1. X Yes ____ No Does the project involve the administration of personality tests, inventories or questionnaires? If YES, provide the name of the tests, if standard, or a complete copy if not standard.

2. ____ Yes X No For studies to be conducted at hospitals and clinics do the proposed studies involve the use, methods, techniques or apparatus other than those used routinely at these facilities.

3. Human subjects would be involved in the proposed activity as either: ____ none of the following, or including: X minors, ____ fetuses, ____ abortuses, ____ pregnant women, ____ prisoners, ____ mentally retarded, ____ mentally disabled.

Kathleen Rae Jaeger Date February 20, 1987

Signature of Principal Investigator

APPROVAL (If disapproval, do not sign and append comments).

Eleanor Gurkowich Date 3/12/87

Signature of Education Director

Elizabeth C. Verson Date 3/3/87

Committee Member

Meredith Rowe Date 3/3/87

Committee Member

APPENDIX J

CONSENT LETTERS FROM PARTICIPATING AGENCIES

TO: Mr. Michael Missimer, Assistant Administrator, Great Falls Clinic

FROM: Kathleen Jaeger, R.N.

TOPIC: Request to utilize the medical records of previous intensive care nursery patients under the care of Great Falls Clinic pediatricians, for the purpose of identifying and locating potential subjects for a Master's thesis project.

Kathleen Jaeger, R.N., graduate student in the College of Nursing at Montana State University, requests permission to review the medical records of previous intensive care nursery patients who are under the care of Great Falls Clinic pediatricians and have been chosen as potential subjects for participation in a Master's thesis project.

The study focuses on weight gain in high-risk infants and their mothers' levels of social support. A questionnaire will be utilized to assess levels of social support. The questionnaire will not be administered within the confines of your clinic. Instead, your records will be studied to gather further demographic data, establish present growth patterns through weight and height graphs, and determine present addresses.

It is understood that subject participation is strictly voluntary, with freedom to withdraw at any time, without penalty. Confidentiality of subjects' names and responses will be maintained throughout the study.

Please return the enclosed copy of this letter if you wish to indicate approval.

Thank you for your cooperation.

Kathleen Jaeger, R.N.
Kathleen Jaeger, R.N.

Consent of clinic to participate:

Authorized signature

December 1, 1986
Date

TO: Gretchen Fitzgerald, R.N., Vice President of Nursing, Montana Deaconess Medical Center

FROM: Kathleen Jaeger, R.N.

TOPIC: Request to utilize the medical records of MDMC for the purpose of identifying and locating potential subjects for a Master's thesis project.

Kathleen Jaeger, R.N., graduate student in the College of Nursing at Montana State University, requests permission to review the medical records of your institution to identify and locate potential subjects for participation in a Master's thesis project. Requested records involve patient charts, intensive care nursery records (including the ICN register), and the High-Risk Infant Follow-up Screening Program and Pediatric Rehabilitation Clinic records.

The study focuses on weight gain in high-risk infants and their mothers' levels of social support. A questionnaire will be utilized to assess levels of social support. The questionnaire will not be administered within the confines of your institution. Instead, your records will be studied to determine potential high-risk infants via the intensive care nursery history, to gather demographic data, establish present growth patterns through weight and height graphs, and determine present addresses.

It is understood that subject participation is strictly voluntary, with freedom to withdraw at any time, without penalty. Confidentiality of subjects' names and responses will be maintained throughout the study.

Please return the enclosed copy of this letter if you wish to indicate approval.

Thank you for your cooperation.

Kathleen Jaeger, R.N.
Kathleen Jaeger, R.N.

Consent of institution to participate:

Gretchen Fitzgerald RN
Authorized signature

12-8-86
Date

TO: Dr. Jack Haling

FROM: Kathleen Jaeger, R.N.

TOPIC: Request to utilize the medical records of previous intensive care nursery patients for the purpose of identifying and locating potential subjects for a Master's thesis project.

Kathleen Jaeger, R.N., graduate student in the College of Nursing at Montana State University, requests permission to review the medical records of your previous intensive care nursery patients who have been chosen as potential subjects for participation in a Master's thesis project.

The study focuses on weight gain in high-risk infants and their mothers' levels of social support. A questionnaire will be utilized to assess levels of social support. The questionnaire will not be administered within the confines of your office. Instead, your records will be studied to gather further demographic data, establish present growth patterns through weight and height graphs, and determine present addresses.

It is understood that subject participation is strictly voluntary, with freedom to withdraw at any time, without penalty. Confidentiality of subjects' names and responses will be maintained throughout the study.

Please return the enclosed copy of this letter if you wish to indicate approval.

Thank you for your cooperation.

Kathleen Jaeger, R.N.

Kathleen Jaeger, R.N.

Consent of physician to participate:

MD

Physician's signature

12/8/82

Date

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