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MASTER OF SCIENCE degree in NURSING

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**A COMPARISON OF THE LOCUS OF CONTROL
OF CHRONICALLY ILL CHILDREN
AND HEALTHY CHILDREN**

By

Leann M. Burger

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

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ABSTRACT

A COMPARISON OF THE LOCUS OF CONTROL OF CHRONICALLY ILL CHILDREN AND HEALTHY CHILDREN

By

Leann M. Burger

Advances in medical technology and scientific knowledge have greatly increased the life expectancy of chronically ill children. To tailor recommendations and provide appropriate education, perceptions about control over prevention, causation, and treatment of illness are necessary. The present study compares the differences in locus of control orientation between 27 chronically ill children with either asthma, insulin dependent diabetes mellitus, cystic fibrosis, or congenital heart defects to 16 healthy control children. Subjects were compared using a modified version of the Norwicki-Strickland Locus of Control Scale for Children (Norwicki & Strickland, 1973). This study utilized a convenience sample. It was hypothesized that the chronically ill children would have a significantly more external locus of control score than that of the healthy children. An ANOVA was performed to analyze the data. The results of the study were found to be statistically nonsignificant.

To my family, who, through their constant
encouragement and support enabled me
to successfully reach my goal.

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**A Comparison of the Locus of Control
of Chronically Ill Children
and Healthy Children**

Chapter I

Introduction

Increasing numbers of children are forced to adapt to lifelong illness and disability. Acute illnesses were once the major health concern for children, but that has since changed. Chronic illnesses have replaced acute illnesses and are now the leading cause of health concerns for children (Curtain & Lubkin, 1990). Approximately 10 million children in the United States have some form of a chronic illness compared to about 7.5 million children a decade ago (Clements, Copeland, & Loftus, 1990). This increase in the number of children known to have a chronic illness is due in part to better definitions used to classify and report chronic illnesses; however, it is the advancements in medical technology and scientific knowledge that have greatly extended the life expectancies of children with serious chronic illnesses (Hobbs, Perrin, Ireys, Moyihan & Shayne, 1984). Perrin (American Academy of Pediatrics Special Report, 1989) estimated that twenty years ago 80% of children with a chronic illness died,

while today most of these children survive, requiring continued and often complex care.

Due to the growing number of cases of children with a chronic illness, comprehensive nursing approaches are necessary to meet and understand the needs of these children. Chronic illness in children is often unstable and complicated by acute exacerbations and remissions that occur superimposed on the child's changing growth and development. Therefore, comprehensive and coordinated care must be provided by the Advanced Nurse Practitioner (ANP) in order to minimize the impact of chronic illness and empower the child to overcome potential and/or real self-care deficits and to enhance and/or prevent loss of self-care capacities (Fox and Newacheck, 1990).

One way in which the ANP can facilitate the effectiveness of nursing interventions is to consider the Locus of Control orientation of the child. The concept of Locus of Control (LOC) was theorized by Rotter (1966) to involve the perceived causal relationship between behavior and its subsequent reward and/or punishment. When an individual perceives that rewards and/or punishments are clearly a result of and contingent upon their own behavior then the individual is said to have an internal LOC. On the other hand, when individual's perceive that reinforcements and/or

punishments are the result of forces beyond personal control such as luck, fate, powerful others, their LOC is labeled as external.

Some degree of perceived lack of control is inevitable for any child and particularly one with a chronic illness. This perceived lack of control may be related to the onset or course of the illness, the treatments, the clinic visits, and /or the hospitalizations that are required (Spence, 1992). By knowing the client's LOC, the ANP is better prepared to help the child deal with the chronic illness, as well as determine the child's health behaviors (Shillinger, 1983). This is significant because childrens' perception of control over health and illness may influence how they understand, agree to, and comply with medical care regimens (Perrin & Shapiro, 1985).

Issues regarding chronically ill children's perceived control over illness have many implications for the ANP. The ANP is involved in health education and health care programs for chronically ill children that are designed to provide information and promote participation in and responsibility for their own health behavior. The child's LOC orientations may effect or even determine the child's self-care agency or may effect the capacity of a child to engage in self-care.

Problem Statement

The advances in medical technology and scientific knowledge have increased the life expectancy of the chronically ill child. Children often have little to say about the type and nature of care they receive, but by assessing a child's LOC the probability of the ANP understanding and predicting the child's health behavior will be greatly increased. The ANP will be able to guide more effectively the child in having more control over day to day interventions needed to care for his/her illness.

The purpose of this study is to gain insight into the children's LOC orientation by comparing the perceived locus of control of children with a chronic illness to a group of healthy children.

Research Question

The following research questions will be addressed:

- 1) Is there a difference in the LOC of chronically ill children compared to healthy children?
- 2) What are the mean scores of internal and external LOC of chronically ill children with asthma or insulin dependent diabetes mellitus and cystic fibrosis or congenital heart disease?

Study Relevance

The results of this study have the potential to increase the knowledge of health care providers caring

for chronically ill children in several ways. First it is important for ANP caring for chronically ill children and their families to be able to assess their attitudes, beliefs and understanding about health and illness in order for the ANP to tailor recommendations and provide the appropriate education. Children's perception about their own control over prevention, causation, and treatment of illnesses is invaluable in assisting the child in their adaptation.

Internally controlled individuals generally feel personally responsible for outcomes of their behavior and will take initiative for health care. These individuals may relate well to information giving and be actively involved in problem-solving. The ANP may take a more passive role with these individuals acting as a collaborator, educator, consultant, and planner.

On the other hand, externally controlled individuals feel that outcomes are attributed to luck, fate, or powerful others and do not perceive themselves as having personal control over their outcomes. The role of the ANP working with externally controlled individuals may be to help the child understand that he/she can control one part of their illness, such as eating a proper diet to better control their diabetes. Externally controlled individuals accordingly may respond better to role playing, modeling, or cognitive

reappraisal. The ANP may take a more active role with these clients by functioning as a client advocate, role model, educator, or coordinator.

Consequently, the assessment of the child's LOC will provide another mechanism to develop the most effective educational programs and interventions for the child. These nursing interventions will promote the child's existing self-care activities, or help the child to overcome self-care deficits, or enhance and/or prevent loss of self-care capacities.

Chapter II

Theoretical Framework

Orem's Self-Care Deficit Nursing Theory

(SCDNT) (1991) will provide the framework for this study. The SCDNT provides a guideline to facilitate the ANP in gathering baseline information about the client and their environment. This baseline information can then be used to assess why the individual needs nursing interventions and how these interventions may effect their environment.

Based on the assumption that individuals are capable of self-care because it is a learned behavior, nursing actions should be targeted at assisting the client to assume responsibility for their self-care. Accordingly, Orem's (1991) SCDNT is an appropriate nursing framework within which to develop the concept of perceived LOC in chronically ill children. The SCDNT provides the ANP with an individualized structured way of assessing the nursing care needs of the children.

Self-care, as defined by Orem (1991), consists of the health care actions a client would perform on a regular, consistent basis. Hence, anything a client does to contribute to his/her own health is considered self-care (Sacco Joseph, 1980).

Self-Care is needed to maintain life and a state of well-being, to recover from illness and injury, and to cope with the effects of a disease or injury (Orem, 1985). There are three components to the self-care theory that relate to the care of a child: Parent Agency (parent or parents), Self-Care Agency (the child), and Nurse Agency (nurse). When the demands for self-care in the child can not be met by the child himself (Self-Care Agency), the parent/s (Parent Agency) and the nurse (Nurse Agency) can help the child meet those needs (Figure 1). Negotiation between the three agencies is paramount when the self-care approach is utilized for pediatric clients in the health care setting (Meisch Eichelberger, 1980).

Self-Care Agency

Self-care agency is the capacity of an individual to engage in health related actions necessary to meet the demands of self-care in order to regulate, maintain, and promote the functioning and development of one's well-being (Orem, 1985). The development of the self-care agency evolves through trial and error, experience, and advice from others.

There are several factors which contribute to the ability of the client to care for him/herself. These factors include age, cognitive level, developmental level, sex, socioeconomic status, race, health status,

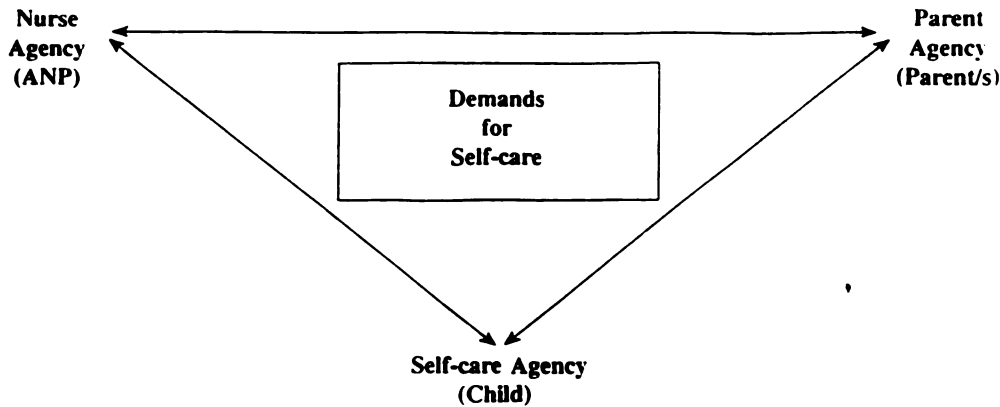


Figure 1. Modified Version of the Nurse-Child-Parent Interaction.

and cultural and familial influences (Facteau, 1980; Sacco Joseph, 1980; Orem, 1991).

Age, cognitive level and developmental level are interrelated. The cognitive level of the child will determine his/her ability to understand how to care for him/herself and the importance of why it is necessary to care for the self. Furthermore, developmental level will identify if the child is physically capable of caring for him/herself.

Socioeconomic status of the family is another important factor to assess. Health care providers need

to know if the family can afford to buy the proper foods to make a balanced diet and if the family can afford to seek the services of a health care provider when necessary.

Health status of the child can also effect the self-care agency. If it has been determined that the child has a chronic illness the health care provider must then assess the severity and duration of the illness. This includes an assessment of the child's disability level. Does the child's illness cause limited or no disability or does it cause complete mental and/or physical disability?

Finally, it is necessary to assess the child's race, cultural and familial influences. Does the child belong to a race and culture that believes health and illness is determined by a chi, god or spirit? This may effect the external LOC orientation of the child.

The above mentioned factors also help to determine a client's locus of control orientation. Locus of control (LOC) refers to an individual's perception about whether or not the outcome of an action is the result of one's own behavior (internal LOC) or a result of forces outside of the client's control such as, luck, fate or powerful others (external LOC).

If a child believes outcome reinforcements are related to chance, fate or powerful others, he/she may not understand that taking their medications as prescribed and eating a proper diet also effects the outcome of their disease. In this situation the child is prone to develop a self-care deficit.

Self-care is a learned behavior and requires use of knowledge in conjunction with motivation and practical skills (Orem, 1991). A decision must be made to perform self-care measures.

Persons who produce effective self-care have knowledge of themselves and of environmental conditions. They have also affirmed the appropriate thing to do under the circumstances. Before they could affirm the appropriate thing to do, they had to gain knowledge of the courses of action. Effective producers of self-care bring the first phase of self-care to closure by making a decision about the actions they will take and those they will avoid (Orem, 1985, p. 119).

The ANP has the ability to influence the self-care agency of the child in several ways. The ANP has the capability to assess and increase a child's knowledge level of their health status. Empowering clients with knowledge about managing their own

health care may promote independence and reinforce their own ability to care for themselves. In addition, the ANP can encourage the child to participate in decision making, leading to a sense of more control.

If it has been determined that a child has a self-care deficit the ANP needs to target appropriate nursing interventions to the self-care agent. Orem's (1991) SCDNT is an appropriate conceptual framework to use when caring for a chronically ill child. It is first important for the ANP to identify those factors which influence a child's belief in perceived control over outcomes. These factors include health status of the child, how long the child has been diagnosed with a chronic illness, race, developmental level, cognitive level, familial influences and finally cultural influences.

Identifying a child's locus of control orientation can then be used by the ANP to identify potential areas which may lead to the development of a self-care deficit. If a self-care deficit is assessed the ANP needs to intervene with the self-care agency (child) to promote better care of the self (Figure 2).

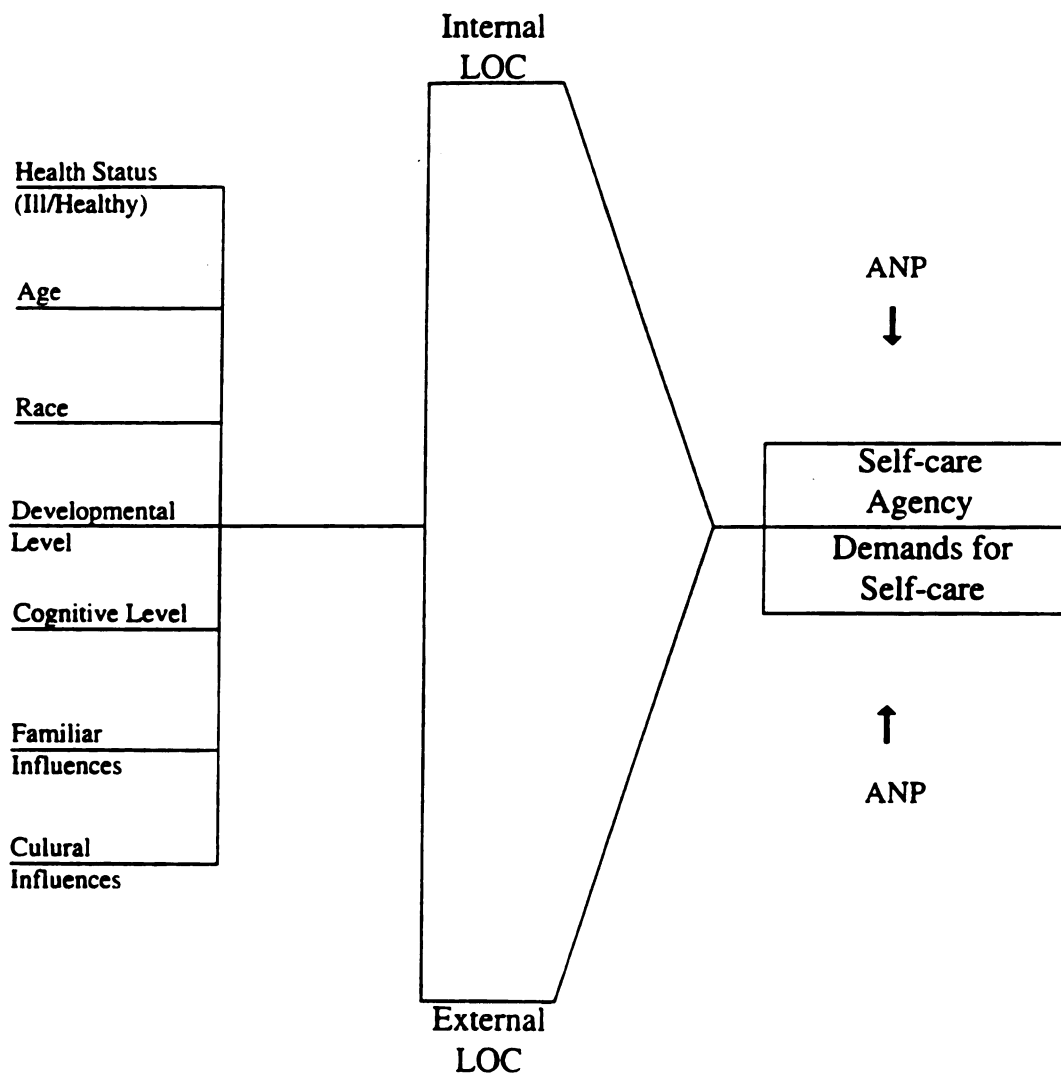


FIGURE 2. A Conceptual Framework of Self-care Agency for the Chronically Ill Child.

Chapter III

Conceptual Definitions

The independent variable under study is the health status of a child. More specifically this study is concerned with children ages 7 through 12 years of age, who have been diagnosed at Lansing area pediatric subspecialty clinics for at least one year prior to data collection with a chronic illness of insulin dependent diabetes mellitus, cystic fibrosis, asthma, or congenital heart disease. In addition the comparison group of healthy children were also required to be between the ages of 7 and 12 years. Verification for the healthy children was from the parents stating that the child had never been diagnosed or treated for any kind of chronic illness or developmental disability.

For the purpose of this study a pediatric chronic illness is defined as any physiologic or anatomic impairment lasting three or more months in one year or requiring at least one month of hospitalization, thereby inhibiting the individuals' ability to function fully in the environment (Jessop and Stein, 1988). It is an illness characterized by a long duration with a need for specialized health

care services and ongoing management. The course of the disease is often uncertain and life expectancy may potentially be limited (Stein, Jessop, & Riessman, 1983). In this study, insulin dependent diabetes mellitus, asthma, cystic fibrosis and congenital heart defects are the chronic childhood illnesses.

Insulin Dependent Diabetes Mellitus (IDDM) is characterized by the inability to metabolize carbohydrates caused by destruction of the body's insulin producing cells (Mosby, 1990). It can appear at any age, though it is most commonly diagnosed from infancy to the late 30's (Diabetes Research Foundation, n.d.) and affects approximately 1:600 school age children (Whaley and Wong, 1991).

Asthma is characterized by recurring attacks of paroxysmal dyspnea, wheezing, prolonged expiration and irritable cough caused by constriction of large and small airways as a result of bronchial smooth muscle spasm, excessive production of mucus, or edema or inflammation of the bronchial wall. Asthma is a very common childhood illness, with an onset usually between 3-8 years of age. Approximately 5% to 10% of children in the United States have manifestations of asthma sometime during childhood and 80 to 90% of these children develop symptoms

before the age of four to five years (Whaley and Wong, 1995).

Cystic Fibrosis (CF) is the most common fatal genetic disease in the United States (Cystic Fibrosis Foundation, 1994). CF affects approximately 30,000 children and young adults. It accounts for approximately 1 in every 2,500 live births. CF is an inherited disorder of the exocrine glands causing very salty-tasting skin; persistent coughing, wheezing, pneumonia; excessive appetite but poor weight gain; and bulky foul smelling stools. The average life expectancy for those with CF is 29 years (Cystic Fibrosis Foundation, 1994).

Finally, Congenital Cardiac Anomalies are "any structural or functional abnormality or defect of the cardiac or great vessels existing from birth" (Mosby, 1990, p. 293). Other than deaths related to prematurity congenital cardiac anomalies account for the highest number of deaths in newborns. The incidence of congenital cardiac anomalies is approximately 8 to 10 per 1000 births (Whaley & Wong, 1991).

Health is defined as a condition of physical, mental, and social well-being and the absence of disease or other abnormal conditions (Mosby's 1991).

Child is defined as a boy or girl between the ages of 7 through 12 years. The definition for healthy children for this study are boys and girls who have no known physical abnormalities, chronic illness or developmental deficits between the ages of 7 through 12 per confirmation by their parents.

The dependent variable that is of concern in this study is the LOC orientation of the chronically ill child and the LOC of healthy children. Locus of control is an expectancy that an outcome, whether positive or negative, is influenced either by one's own behavior or by factors beyond one's control (Antonovsky, 1992). Rotter (1966, 1975) defined LOC as the perceived causal relationship between behavior and subsequent reward and/or punishment. There are two components of LOC: Internal Control and External Control.

Internally controlled children perceive the outcome of an event as the result of their own actions, forces that they can control. Externally controlled children perceive the outcome of an event as the result of unpredictable forces, forces outside of their control, such as fate or luck, or actions of powerful others.

Chapter IV

Review of Literature

Concept locus of control developed out of social learning theory (Rotter, 1975) and has been used successfully in research and in the clinical setting. This literature review focuses on four areas; (1) Background of LOC, (2) Instruments used to assess LOC, (3) Weaknesses of Instruments, and (4) Research studies measuring LOC in children.

Background

According to Rotter's (1966) social learning theory, reinforcements and punishments can greatly effect the occurrence or nonoccurrence of specific behaviors. In addition, Rotter (1966) asserts that the effects of the reinforcement or punishment on subsequent behavior is directly related to the persons perceived causal relationship between his or her behavior and the outcome. Therefore, a child's behavior is not determined in a straightforward manner but instead is dependent upon his/her perception of who or what has control over the outcome of their behavior. A child's perception of control is not inborn, but rather develops through a learning process related to past experiences, in which the child comes to expect that certain

outcomes of behaviors are a result of their own action or a result of forces outside of their control. Locus of control is an alterable personality characteristic.

Rotter (1966) states that the outcome of a situation will be perceived differently among individuals because each individual is unique and has his/her own array of learning experiences. In addition, individual perceptions of control may vary with time, across situations, and even in degrees, depending upon past experiences of a similar situation.

These differences in perceived causal relationship between action and behavioral outcome has led to the development of the LOC construct. LOC simply refers to an individual's perception about whether or not the outcome of an action is a result of one's own behavior or a result of forces outside of one's own control such as, luck, fate, or powerful others.

LOC has been divided into two categories, internal and external. When the outcome of an action is perceived by an individual to be the result of forces outside of their control, United States middle class culture typically explains the outcome to be related to unpredictable forces such

as luck, fate, chance, or powerful others. When an individual interprets the outcome of the action in this way, one is said to be externally controlled. However, when an individual perceives the outcome of the event to be a result of one's own actions, he/she is said to be internally controlled.

Over time the LOC construct has been shown to be a relatively stable personality factor. LOC orientation develops through past learning experience and changes with the introduction of new experiences, increasing age, socioeconomic status, sex, culture, and health status (Antonovsky, 1992; Richaud de Minzi, 1990).

Instruments

A variety of instruments have been developed to measure the construct of LOC for various age groups ranging from pre-school through adolescence (Bailer, 1961; Battle & Rotter, 1963; Crandall, Katkovsky, & Crandall, 1965; Mischel, Zeiss, & Zeiss, 1974; Norwicki & Strickland, 1973; Parcel 1978; Stephens & Delys, 1973). The variety of instruments have emerged out of a need to develop age-appropriate measures of generalized LOC expectancies in addition to a need for more subject specific measures of LOC expectancies. Those children's instruments specifically designed for use with children and or

adolescents include: the Children's Locus of Control Scale (Bailer, 1961); the Children's Picture Test of Internal-External Control (Battle & Rotter, 1963); the Crandall Intellectual Achievement Responsibility Scale (IAR) (Crandall, Katkovsky, & Crandall, 1965); the Norwicki-Strickland Locus of Control Scale For Children (Norwicki & Strickland, 1973); the Stephens-Delys Reinforcement Contingency Interview (Stephens & Delys, 1973); the Stanford Preschool I-E Scale (SPICES) (Mischel, Zeiss, & Zeiss, 1974) and the Children's Health Locus of Control scale (CHLOC) (Parcel, 1978). Two additional instruments not developed specifically for children but used in child studies are the Health Locus of Control scale (HLC) (Wallston, Wallston, Kaplan, & Maides, 1976) and the Multidimensional Health Locus of Control scale (MHLC) (Wallston, Wallston, & Devillis, 1978).

Bialer Children's Locus of Control Scale

The Bialer Children's Locus of Control Scale (1961) was the first published measure developed to assess a child's LOC orientation. This scale was designed to provide a way to measure success-failure conceptualization in mentally retarded and normal elementary school children. Bialer felt that a child must perceive him/herself as having failed to attain a certain level of acceptable behavior in

order to feel inadequate or inferior. This scale is a 23-item yes-no orally presented questionnaire that is scored by the total number of responses in the direction of internal control. In the initial publication of this scale no reliability data were reported, however re-test reliability after seven days was reported to be high ($r = .84$, $N = 60$) (Gozali & Bialer, 1968). Norwicki- Strickland (1973) reported a low split-half reliability for the Bialer scale. This scale can be used to assess children with special educational needs.

Children's Picture Test of Internal-External Control

Another early LOC measure, specifically developed to assess children's LOC was The Children's Picture Test of Internal-External Control developed by Battle (Battle & Rotter, 1963). Children are shown 6 cartoons of lifelike situations and asked "what would you say if you were the one in the cartoon situation?" The children's responses are scored on a seven-point scale with three degrees of internality, three degrees of externality and a neutral point. With this scale a higher overall test score reflects an external LOC, while a low score indicates an internal LOC. No reliability or validity information for this scale was reported, however when the Children's Picture Test of

Internal-External Control was compared to the Bialer (1961) LOC questionnaire, a significant negative correlation was reported ($r = .42$, $p < .01$) for sixth and eight grade students. This suggests that internally controlled children compared to externally controlled children have a higher expectancy for success.

Crandall Intellectual Achievement

Responsibility Scale (IAR)

Developed by Crandall, Katkovsky and Crandall (1965) to test a child's reinforcement responsibility in the intellectual domain, they believed situations altered a child's perception of control and were interested in assessing the reasons why children may or may not accept personal responsibility for control. The IAR was developed to measure the differences between children's perception of acceptance of responsibility in both success and failure situations. Unlike any other LOC scale, the IAR does not measure unpredictable sources of externally controlled such as luck, fate, or chance. External control sources were limited to predictable sources of control, persons who have the most face-to-face contact with the children, such as parents, teachers, and peers. Unknown sources of control were excluded in order to produce a more

accurate assessment of known external sources of control.

The IAR scale consisted of 17 positive situations (I+) and 17 descriptions of negative situations (I-), followed by a forced choice response. The child is to determine if the outcome is related to him/herself or if the outcome is attributed to known sources of external control. Scoring of the instrument produces an internal responsibility for success score (I+), an internal responsibility for failure score (I-), and a total internal responsibility score (total I). Reported test-retest reliabilities over a two month period for children in grades 3 through 5 were .66 (I+), .74 (I-), and .69 (total I). Test-retest reliability for ninth graders were .47 (I+), .69 (I-), and .65 (total I). Internal consistency was demonstrated with split-half reliabilities of .54 (I+), and .57 (I-) for third through fifth graders, and .60 (I+) and .60 (I-) for the ninth graders.

Reinforcement Contingency Interview

Stephens and Delys (1973) developed a free-response instrument to test a success-failure dichotomy, similar to the Intellectual Achievement Responsibility Scale (IAR), for use with pre-school age and older children. Stephen and Delys believed

a free-response measure would limit the complicated judgement processes of the forced-choice measures as well as limit the tendency to choose the more socially desirable response.

Five reinforcement agents (self, peers, mothers, fathers, and teachers) were crossed with two different types of reinforcement (success and failure) to produce a total of ten possible response categories. Each response category contained four questions, for a total of 40 questions.

Like the IAR, the Reinforcement Contingency Interview (1973) does not include external forces such as luck, fate, or chance, or any other unpredictable sources of control. Inter-rater reliabilities were very high (.98) and split-half re-test reliabilities were moderately high (.60). Intercorrelations were reported to be low (.10 to .30) between the Reinforcement Contingency Interview, Norwicki-Strickland LOC Scale for Children and the IAR.

Norwicki-Strickland Locus of Control Scale for Children

Since its development this instrument has been used in over 700 studies (Strickland, 1989). It has been widely used because it measures generalized locus of control orientation of children, in

addition, it can easily be administered to groups of children.

The Norwicki Strickland Locus of Control Scale for Children (1973) is a 40 item yes/no questionnaire that examines children's perception between action and outcome. The scale is measured in the internal direction, with a higher score representing internal control. Norwicki and Strickland did not specify the score used to determine internal control.

In the original scale estimates of the internal consistency ranged from .63 to .81 in third through twelfth grade students, and split-half reliability coefficients range from .63 to .74. Test-retest reliabilities six weeks apart were .63 (third graders), .66 (seventh graders), and .71 (tenth graders) (Norwicki & Strickland, 1973). There was no significant correlation between the locus of control scores and an abbreviated form of the Children's Social Desirability Scale (Crandall, et. al., 1965). Construct validity was established for the Norwicki-Strickland instrument, with reported correlations of .41 with the Bailer Scale and .31 and .51 with the Internal and External scale of the IAR.

Staford Preschool Internal-External Scale

This scale was designed for children from ages 3 through 6 years of age. Mischel, Zeiss and Zeiss

(1974) developed this 14 item forced-choice scale describing either a positive or negative event. This scale produces three scores: expectancy for internal control of positive events (I+), expectancy for internal control of negative events (I-), and a sum of these two scores (total I). Heterogenous sampling of specific events involving LOC produced low split-half reliabilities of .14 (I+), .20 (I-), and .04 (total I). Test-retest reliabilities over a mean interval of seven months were reported at .42 (I+), .52 (I-), and .47 (total I).

Children's Health Locus of Control Scale

(CHLOC)

Parcel (1978) CHLOC scale was developed specifically to measure children's health LOC in order to understand and explain health behavior. This instrument consists of 20 yes (agree) no (disagree) statements with moderately high internal consistency, moderate test-retest reliability and evidence of construct validity. Two points are given for each internal responses and one point is given for each external response. A value of 1.5 is given for items with multiple responses or items with no responses.

Health Locus of Control Scale

The Health Locus of Control scale (HLC) was developed by Wallston, Wallston, Kaplan, & Maides (1976) to assess area-specific measures of adults LOC expectancies. This 11 item instrument uses a six-point Likert-type scale and is scored in the external direction. Item scores range from 1 (strongly disagree) to 6 (strongly agree) for each external question and internal items are reversed scored.

The Multidimensional Locus of Control Scale (MHLC)

The MHLC scale consists of three, six item, self administered subscales with two equivalent forms. Each form has 18 items. Internal Health LOC (IHLC), Chance Health LOC (CHLC), and Powerful Others Externality (PHLC) make up the three subscales. The scales are scored using a six-point Likert-format ranging from strongly disagree (1) to strongly agree (6). Internal consistency values range from .61 to .80 (IHLC), .55 to .83 (CHLC), and .56 to .75 (PHLC). Test-retest correlations at the time interval of four to six months have been .66 (IHLC), .73 (CHLC), and .71 (PHLC). It should be noted that this scale was not specifically developed to test the LOC of children.

Weaknesses of Early Measures

Measures of children's LOC have suffered from several major design problems. First, many of these scales are modifications of adult instruments. Hence, the length of the scale and the language used may be inappropriate for some children. Children may have difficulty focusing their attention for scales that have more than 20 questions. In addition comprehension may be limited for children with limited vocabularies. Concepts such as luck, fate and skill may be incomprehensible to some children (Gorsuch, Henighan, & Barnard, 1972; Stephens & Delys, 1973).

Secondly, many scales have assumed that children's perceptions of control are generalized, rather than domain or situation specific. These scales do not account for the fact that one's perception of control in one particular circumstance may be completely different in another circumstance. Crandall, Katkovsky and Crandall (1965) Intellectual Achievement Responsibility scale and Parcel's (1978) Children's Health Locus of Control scale are the only instruments that attempt to measure situation specific LOC orientations in children.

Other weaknesses occur when LOC scales divide the concept of LOC into internal and external

sources. This dicotomization does not adequately represent all relevant sources of control present in a child's belief system. Hence, scales that divide a child's perception of control into internal or external orientations fail to account for the fact the children think differently than adults and thus are likely to have different perceptions about control sources and causes of events (Coster & Jaffe).

Finally, external sources are often defined differently among the instruments. Some researchers define external sources of control as unpredictable factors such as luck, fate or chance, while other researchers define external sources as being more predictable, such as parents, peers, and teachers.

In summary, each LOC scale developed for children and or adolescents has at least one desirable feature which may attract its use for a researcher with a particular purpose in mind. Caution is needed however, when choosing scales with limited reliability and validity data. Because of its consistent demonstration of reliability and validity the Norwicki-Strickland LOC Scale for Children is the best choice for measuring generalized LOC expectancies.

Research

Children's perceptions of their chronic illness, and disability and perceptions of adaptation are important concepts all health care providers must understand to care effectively for the chronically ill child. One way to determine these perceptions is to assess the children's LOC orientation. According to Rotter (1966) LOC can be used to characterize the degree to which a child perceives mastery over life events and circumstances.

Chronically ill children make up a unique population that is faced with many day to day activities necessary for the management of their illness. These children are required to take daily medications or follow a specific diet and/or make frequent visits to a health care provider. By assessing a child's LOC orientation the health care provider can better understand and predict self-care behaviors.

Most research utilizing the LOC construct to assess a chronic illness has been conducted with adults. Therefore a brief overview of characteristic differences among internally oriented and externally oriented adults is discussed.

In a study with adult hemiplegic Finlayson and Rourke (1978) found that an internal LOC orientation significantly correlated with patient's motivation to participate in rehabilitation programs. Other studies have shown that internally oriented adults take strides to improve their surroundings and place great value on skill acquisition and achievement (Lefcourt, 1967; Phares, Ritchie & Davis, 1968; Rotter & Mulry, 1965; Strickland, 1970).

Lipp et al.(1968) studied attributes of denial related to having a physical disability. In this study externally oriented disabled adults were less likely to deny their disability than those who were internally oriented. However, while exhibiting less denial about their illness, externally controlled adults felt less responsible for outcomes because they perceive outcomes to depend on luck rather than skill (Shillinger, 1983).

In addition, other studies have shown that externally oriented adults find anxiety producing situations to be more debilitating than stimulating to achievement, to withdraw from challenges and to avoid involvement with health care providers (Butterfield, 1964; Watson, 1967).

As previously mentioned most research utilizing the LOC construct to assess a chronic illness has

been conducted with adults. The LOC of children with a chronic illness has been less diligently assessed, and the results of the few studies completed give inconclusive results. The few studies of the LOC construct conducted with chronically ill children will be reviewed and because of limited research on chronically ill children 7 to 12 years of age, studies conducted with developmentally , physically disabled and chronically ill adolescents will also be included in the discussion.

Using the Health LOC scale, Kellerman (1980) studied 30 adolescents with various types of cancer, 22 with congenital heart disorders, 30 with diabetes mellitus, 23 with cystic fibrosis, 25 with renal disorders, and 30 with various rheumatologic disorders to assess if these adolescents would be more externally controlled than healthy adolescents ($N = 349$). Statistically significant differences in LOC orientations were found between the healthy adolescents and all the illness groups, with the exception of adolescents with cystic fibrosis and diabetes.

The authors believed that the children with diabetes and cystic fibrosis were more internally controlled because they are able to exert some

degree of control over their illness and symptoms by manipulation of diet and self-administration of medications. In contrast adolescents with cancer, cardiac disorders, renal disease and rheumatologic disease, do not have control over their care as health care providers are more responsible for the control of the individual's disease, such as with chemotherapy and dialysis treatments.

In an Australian study Center & Ward (1986) compared handicapped children with cerebral palsy (CP) who were integrated into regular schools with healthy classmates using the Norwicki-Strickland LOC Scale for Children (NSLOC). It was hypothesized that the children with CP would have a more external LOC than their healthy peers. The sample included 85 mildly handicapped children with CP who ranged in age from 6 through 16 years. The control group consisted of 1391 peers in grades 1 to 10 , aged 6 through 16, who were in classes in which the handicapped children were placed.

Mean scores were computed and no statistically significant difference was observed between the control group ($M = 15.2$) and children with CP ($M = 14.8$). Center and Ward believed that the NSLOC scale is not generalizable to Australian children,

thus leading to the statistically nonsignificant results of the study.

In another study, locus of control orientation was measured in 156 juvenile diabetic children at the beginning and end of a three week camp experience compared to 30 juvenile diabetics from local subspeciality clinics who have never attended the camp (Moffatt & Pless, 1983). All the children had to be between the ages of 8 and 14 years. The NSLOC scale and the Children's Health LOC Scale (CHLOC) were used to measure the children's LOC orientations. The CHLOC scale was chosen because it is a more specific health-related measure for children aged 12 years and younger, whereas the NSLOC scale was chosen because it measures general life LOC expectancies.

It was hypothesized that by the end of the camping experience after being taught about their disease, about proper techniques of self-injection and about the importance of a positive emotional and physical attitude toward their disease, the diabetic children would move from an external LOC to an internal LOC orientation. The hypothesis was supported and the majority of diabetic children were more internally oriented by the end of the camping experience.

A sample of 23 non-random campers were also assessed after one year of their camping experience to determine if the changes in LOC orientation were long lasting. At the beginning of the camping experience this sample of children had a mean LOC score of 11.8. One year later the mean score for 12 of these children continued to move toward an internal LOC orientation ($M = 10.8$), whereas 6 children showed a regression toward an external LOC and finally, the remaining 5 children's scores did not change. The results of this study suggest that an increase in knowledge can lead to a more internal LOC, a trait Moffett and Pless (1983) believe is more desirable in the control of diabetes.

Using the Children's Health LOC scale and the Multidimensional Health LOC scale, Perrin & Shapiro (1985) compared chronically ill children with asthma ($n = 73$), diabetes ($n = 36$), an orthopedic condition ($n = 48$), or a seizure disorder ($n = 50$) to healthy children ($n = 71$). For analysis purposes, the children were grouped according to illness category and age in six two-year periods beginning at age 5 and ending with age 16.

There were no statistically significant differences between healthy children and those chronically ill children with asthma or diabetes in

health LOC beliefs. However, statistically significant differences using the Children's Health LOC scale were found in total, chance, and powerful others scores between healthy children and children with an orthopedic or seizure disorder. The results indicate that children with chronic illnesses that can be managed with manipulation of diet, exercise and medications have health LOC beliefs similar to healthy children.

Engstrom (1991) using the NSLOC scale measured the LOC between children with inflammatory bowel disease (IBD) ($n = 20$), diabetes ($n = 20$), and healthy children ($n = 20$). The subjects ranged in age from 7 to 18 years ($M = 16.5$). Significant differences were reported between the groups. Children with IBD were found to score significantly higher on the LOC indicating an external orientation ($M = 17.3$) than children with diabetes ($M = 12.0$), or the healthy children ($M = 11.4$). There was no significant difference in the LOC between the healthy children and the children with diabetes. The results of the study show that the severity of a chronic illness correlates with an external LOC orientation. The more severe the illness the more external the LOC orientation.

Using the NSLOC scale for children Janelle (1992) measured the LOC of children diagnosed with arthrogryposis, nemaline, myopathy, severe juvenile arthritis, cerebral palsy and muscular dystrophy ($n = 8$) and compared them to healthy children ($n = 13$). The children ranged in age from 10 to 14 years, were wheelchair bound, and scored in the normal IQ range. Using the Mann Whitney U test, Janelle (1992) found no significant difference between the children with a physical disability and the control group. This author believes the results of this study were limited by the very small sample size, Janelle (1992) however, speculates that the NSLOC scale has not been used extensively with children with disabilities, therefore contributing to the statistically nonsignificant results of the study.

Greenberg, Kazak & Meadows (1989) used the NSLOC scale to assess the LOC orientations related to adaptation of children who were cancer survivors. The sample consisted of ($n = 138$) 8 through 16 year old long-term cancer survivors and a comparison group of healthy children ($n = 92$). It was hypothesized that the long-term cancer survivors would have poor self-concepts and an external LOC. This study shows that long-term cancer survivors are

more externally controlled and have poorer self-concepts than do control children.

In a non-random sample of 186 children from Buenos Aires, ages 6, 9 and 12, Richaud de Minzi (1990) assessed changes in LOC associated with increasing age. It was hypothesized that children would change from a more dominant external LOC orientation at age 6 to a more dominant internal LOC orientation by age 12. The Multidimensional Scale of LOC for Children (Richaud de Minzi, 1990) was used and administered orally to the six year old children. The 9 and 12 year old children completed the scale individually in a group setting. The results of the study supported the hypothesis that internal LOC orientation increases with age. Even though at age 6 no differences were found between internal and external LOC, at ages 9 and 12 internal LOC orientation prevailed over external LOC orientation. This is an important finding because it shows that age is a variable that must be considered when assessing LOC orientations.

Even though the concept of LOC has been proven to be a good indicator of achievement and well-being, the concept has not been widely used in studies of pediatric populations, especially for children with a chronic illness (Steinhausen, 1982;

Gilmore, 1978). In all of these studies there is a pattern that certain illnesses significantly influence the LOC of the children. Several of these studies concluded that illnesses that allow for a considerable amount of self-maintenance and control lead to a higher incidence of internal LOC. In contrast, those illnesses which are less predictable and require regular interventions by health care providers lead to more externally controlled children.

Chapter V

Methodology

This study is a secondary analysis of data collected for a larger primary research study entitled "Family Adaptation to Childhood Illness: Chronic Pediatric Respiratory Disorders", funded in part by a grant from the American Lung Association of Michigan, conducted by Carla Barnes Principal Investigator, and Patty Peek and Linda Spence at the College of Nursing at Michigan State University. The focus of the primary study was to investigate the on-going adaptation process of families with a chronically ill child. The study utilized a family theory framework and was designed to include all members of the family. A modified version of the Norwicki-Strickland Locus of Control Scale for Children was used to collect data related to LOC.

The current study will utilize the Norwicki-Strickland Locus of Control Scale for Children (NSLOC) and will focus solely on the data collected from the chronically ill children and their comparison group. This secondary study is concerned with the differences in the LOC between the chronically ill children and healthy children, and the differences among the four chronic illness

categories on the LOC. This section will include a description of the methods utilized and an outline of the sample procedures, instrumentation, scoring, data collection and data analysis. A section will also be included discussing the protection of human subjects.

Sample:

The sample for this study consisted of a total of 43 school age children (7-12 years). The target children ($n = 27$) are those who have been diagnosed with a chronic illness for at least one year prior to the data collection. There are 7 children with insulin dependent diabetes mellitus, 8 with asthma, 8 with cystic fibrosis, and 4 with congenital heart disease. There are 16 children in the comparison group, who had no physical or developmental deficits.

The criteria for the chronically ill child included: verification of a chronic illness (asthma, insulin dependent diabetes mellitus, cystic fibrosis, or congenital heart disease) by a physician at the pediatric subspecialty clinics in the Department of Pediatrics and Human Development at Michigan State University; initial diagnosis of the illness had to have been made at least one year prior to the data being collected; and the child

must have been between the ages of 7 and 12 years at the time the data were collected. The healthy child was also required to be between the ages of 7 and 12 years. Verification for the healthy children was parental acknowledgement stating that the child did not have a chronic illness or developmental disability.

The comparison group was recruited from well-child settings and the target group was recruited through the pediatric subspecialty clinics in the Department of Pediatrics and Human Development at Michigan State University. These subspecialty clinics encourage family and patient participation in their management. In an effort to control the philosophical approach to the medical management of chronic childhood illness, recruitment was limited to these clinics. Due to the limited number of chronically ill children in the diagnostic categories all families who met the criteria were asked to participate.

Procedures:

All procedures were the same for the target child and the comparison child. Families meeting the criteria were sent a letter explaining the study and inviting their participation. The letter contained a return postcard that indicated the

families willingness to participate, in addition to family composition and convenient times for participation. Families conveying an interest to participate in the study received a follow-up phone call from one of the investigators to answer any questions or concerns and schedule an appointment for a home visit with the entire family. At the home visit, the investigator explained the study to the entire family, answered questions, and obtained written informed consent from the adults and assent from the children (Appendix B).

Sociodemographic and illness demographic (for families with a chronically ill child) data were also obtained from the families by interview at the home visit. The socioeconomic data included: identification of all individuals living in the home; annual family income; the age, sex and birth order of all children; religion; educational level; occupation and hours working of both parents. All family members were asked to complete the questionnaires. Two home visits were made to guard against fatigue in the children. The investigator was present to answer questions and assist the children.

Instrument

For this study a modified version of the Norwicki-Strickland Locus of Control Scale For Children (1973) was used. Over 700 studies have been conducted since the development of the original instrument (Strickland, 1989). It has been widely used because it measures generalized locus of control orientation of children, in addition, it can easily be administered to groups of children.

This scale has shown high internal consistency and test-retest reliability has been shown not to relate to social desirability, intelligence measures, or sex (Strickland, 1989). Research studies analyzing children's adaptive behaviors and academic success revealed good construct validity with internal scores (Gilmore, 1978; Norwicki & Duke, 1983). Hence, this scale was chosen because it has proven to be a valid, reliable, forced choice test that could be easily administered to a wide range of children.

The original scale (1973) was a paper-and-pencil measure consisting of 40 yes-no questions. These questions described reinforcement in a variety of general areas, such as affiliation, achievement, and dependency. Scores ranged from 0 (internal) to

40 (external), one point given for each internal response.

To maintain response format consistency and flexibility in data analysis, the original yes-no response format has been modified to a 4 point Likert scale from very untrue to very true. Points ranges from 0 to 4 for each question, and scoring is done in the direction of internality, with a high score representing an internal locus of control and a low score an external locus of control

(Appendix A). Two sample questions include:

Do you believe that you can stop yourself from catching a cold?

Very Untrue Sort of Untrue Sort of True Very True

Do you feel that one of the best ways to handle most problems is just not to think about them?

Very Untrue Sort of Untrue Sort of True Very True

In the original scale estimates of the internal consistency ranged from .63 to .81 in third through twelfth grade students, using the split-half method corrected by the Spearman-Brown formula. Test-retest reliabilities six weeks apart were .63 (third graders), .66 (seventh graders), and .71 (tenth graders) (Norwicki & Strickland, 1973). There was no significant correlation between the locus of control

scores and an abbreviated form of the Children's Social Desirability Scale (Crandall, et. al., 1965). Construct validity was established for the Norwicki-Strickland instrument, with reported correlations of .41 with the Bailer Scale and .31 and .51 with the Internal and External scale of the IAR. According to Gay (1985) researchers using attitude scales usually report correlation coefficients in the range of .6 to .8. Thus the NSLOC scales is reliable.

Design

A non-experimental case-control comparison design will be used to study the dependent variable of LOC of chronically ill children to the LOC of healthy children. The two groups consist of children with a chronic illness (asthma, diabetes, congenital heart defect and cystic fibrosis) and healthy children. The independent variable is the child's health status, chronic versus healthy.

This study is not an experimental design because there is neither random group assignment nor manipulation of independent variables, however there is a comparison group.

Operational Definition of the Variables

By the establishment of criteria which determined if the child was either chronically ill or healthy, the independent variable of the child's

health status was operationalized. The criteria for the chronically ill child included: verification of a chronic illness (asthma, insulin dependent diabetes mellitus, cystic fibrosis, or congenital heart disease) by a physician at the pediatric subspecialty clinics in the Department of Pediatrics and Human Development at Michigan State University; initial diagnosis of the illness had to have been made at least one year prior to the data being collected; and the child must have been between the ages of 7 and 12 years at the time the data were collected. The healthy child was also required to be between the ages of 7 and 12 years. Verification for the healthy children was parental acknowledgement stating that the child did not have a chronic illness or developmental disability.

The dependent variable of locus of control was operationalized by the self-report of each child completing the Norwicki-Strickland Locus of Control Scale for Children (1973). More specifically, the dependent variables were operationalized as follows:

Internal LOC- (The mean of questions 2, 4, 6, 9, 13, 15, 20, 22, 25, 26, 28, 30, 32, 34, 38, 40). This variable measures the extent to which one believes that outcomes are a result of personal control.

External LOC- (The mean of questions 1, 3, 5, 7, 8, 10, 11, 12, 14, 16, 17, 18, 19, 21, 23, 24, 27, 29, 31, 33, 35, 36, 37, 39). This variable measures the extent to which one believes outcomes are related to forces outside of personal control such as, luck, fate, and powerful others. See Appendix A for a copy of the questionnaire.

Data analysis

Data for this research study will be analyzed using the Statistical Package for the Social Sciences (SPSS). A oneway analysis of variance (ANOVA) will be performed to test the mean score for LOC between chronically ill children and healthy children. The oneway ANOVA is an inferential statistical procedure that is used to compare the mean of the chronically ill group with the healthy group on their values for one variable. The oneway ANOVA will test the differences between the groups of chronically ill children on the dependent variable of locus of control.

In the first research question the oneway ANOVA will test the variance in responses between chronically ill children and healthy children on the dependent variables of internal or external locus of control. In the second research question the oneway ANOVA will test the variance in responses among

children with asthma or IDDM and cystic fibrosis or congenital heart defects on the dependent variable of locus of control.

Descriptive analysis will also be done to determine if there are any significant differences between the chronically ill children and healthy children with respect to age.

Assumptions

Assumptions of this study include: 1) The children completed the instrument correctly ; and 2) The data were coded accurately in the primary research. Whereas, limitations include: 1)The current study is restricted to instruments/data of the original study and will reflect the limitations of the original study; 2) The sample for this study was one of convenience. Therefore, the results may not generalize to the general population.

Protection of Human Rights

The rights of the individuals who participated in this study were protected according to the guidelines developed by the University Committee on Research Involving Human Subjects (UCRIHS) at Michigan State University. Approval to conduct this present study was received from UCRIHS prior to data analysis (Appendix C for copy of approval letter).

The identity of all study participants remained confidential. Names and addresses of the participants were kept only for the initial phone calls and home visits. No records were kept there after. The responses of the study participants remained anonymous. Code numbers were assigned to the participants' responses to the questionnaire. Additionally, the responses were coded in such a way that they could not be linked back to any participant.

Hypotheses

The following hypotheses are based on the literature specific to the Locus of Control of chronically ill children and their healthy counterparts.

1. Children diagnosed with a chronic illness will be more externally controlled than healthy children.
2. Children with asthma or insulin dependent diabetes mellitus will be more internally controlled than children with congenital heart defects or cystic fibrosis.

Chapter VI

Results

The total sample size for this analysis includes 43 children. The results are gathered from the Locus of Control questionnaire administered once to the chronically ill children and the control children. Socio-demographic data on the sample are presented in Table 1.

Socio-demographic Characteristics

The sample for this study is one of convenience. The subjects in the sample consisted of two groups: 27 chronically ill children and 16 healthy children. The two groups were composed of children between the ages of 7 and 12. The mean age for the target children was 9.2 and the mean age of the control children was 9.7. The difference between the ages of the two groups was nonsignificant ($t = 1.13$, $df = 29$, NS).

The number of children in the home varied only slightly between the chronically ill children and the healthy children and was also statistically nonsignificant ($t = 1.23$, $df = 29$, NS).

Table 1**Socio-demographic Characteristics of the Samples**

<u>Variable</u> <u>Age</u>	<u>Target Group</u>		<u>Comparison Group</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
7	3	11	0	0
8	6	22	4	25
9	7	26	4	25
10	6	22	4	25
11	2	8	1	6
12	3	11	3	19
	Mean = 9.2		Mean = 9.7	
Number of Children in the Home	Mean = 2.8		Mean = 2.36	

The sample consisted of 20 males and 23 females.

Due to the convenient sample the size was small and the group participants were fairly homogeneous.

Hypotheses Results

The two hypotheses are analyzed using Oneway Analysis Of Variance(ANOVA)to examine the differences in locus of control in chronically ill children compared to healthy children. ANOVA analysis is also used to compare within group variance of locus of control of chronically ill children.

Table 2

Means, Standard Deviations and ANOVA results
For Target and Comparison Groups

<u>Variables</u>	<u>Target Group</u>		<u>Comparison Group</u>		<u>ANOVA</u>	
	<u>(n=23)</u>		<u>(n=16)</u>		<u>(N=43)</u>	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>F</u>	<u>P</u>
					(1,40)	
Internal	2.96	.29	3.00	.35	.16	.683
LOC						
External	2.45	.44	2.21	.35	3.19	.081
LOC						

Hypothesis 1: Children diagnosed with a chronic illness will be more externally controlled than healthy children. This hypothesis is not supported statistically. The variance in the means for internal locus of control ($F_{1,40} = .17$, NS) for chronically ill children ($M = 2.96$, $SD = .29$) and healthy children ($M = 3.00$, $SD = .35$) are not statistically significant. The variance in the means for external locus of control ($F_{1,40} = 3.20$, NS) are not statistically significant, however, there is a trend that chronically ill children ($M = 2.45$, $SD = .44$) are more externally controlled compared to healthy children ($M = 2.21$, $SD = .35$) (Table 2).

Table 3
Means, Standard Deviations, and ANOVA Results
For Illness Groups

<u>Variables</u>	<u>Cystic Fibrosis & Congenital Heart Defect</u>		<u>IDDM & Asthma</u>		<u>ANOVA</u>	
	<u>(n=12)</u>		<u>(n=15)</u>		<u>(N=27)</u>	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>F</u> <u>(1,25)</u>	<u>P</u>
Internal LOC	3.06	.23	2.80	.42	3.84	.061
External LOC	2.58	.50	2.36	.36	1.76	.196

Hypothesis 2: Children with asthma or diabetes will be more internally controlled than children with congenital heart defects or cystic fibrosis. This hypothesis is not supported in the statistical analysis. The variance in the means for external locus of control ($F_{1,26} = 1.76$, NS) for children with asthma or diabetes ($M = 2.58$, $SD = .50$) compared to children with congenital heart defects or cystic fibrosis ($M = 2.36$, $SD = .36$) is not statistically significant.

The variance in the means for internal locus of control ($F_{1,26} = 3.85$, NS) for children with asthma or diabetes ($M = 3.06$, $SD = .23$) compared to children with congenital heart defects or cystic fibrosis ($M = 2.80$, $SD = .42$) is not

statistically significant, however, there is a trend that children with congenital heart defects or cystic fibrosis are more internally controlled (Table 3).

Results of Other Analyses

Correlation coefficients were also computed to determine if the age of the child correlated with LOC orientations. The mean age of the sample was 9.4 years. According to (Richaud de Minzi, 1990) beginning at age 9 children start the analytical thinking period. This is a relatively stable period in which the child has obtained a stable self-identity. In Richaud de Minzi's (1990) study, there was support for the hypothesis that children go from a more external LOC orientation to a more internal LOC orientation beginning around age 9. What Richaud de Minzi however did not assess was the duration and severity of the chronic illness.

Chapter VII

Discussion

The purpose of this present study was to investigate the differences in the LOC orientation between children with a chronic illness and healthy children. More specifically it was hypothesized that children with a chronic illness would be more externally controlled than their healthy peers. It was also hypothesized that children with either asthma or insulin dependent diabetes mellitus would be more internally controlled than children with either cystic fibrosis or congenital heart defects.

Both hypotheses used the Norwicki-Strickland Locus of Control Scale for Children (Norwicki-Strickland, 1973) to measure the children's LOC orientation. The following section will discuss the results of the two hypotheses and some limitations of the study.

Hypothesis I

A major finding in this present study is one of marked similarity in LOC orientation between children with a chronic illness and the control children. Contrary to what was predicted, compared to healthy children, the chronically ill children did not display external LOC orientations.

The results of this present study can be interpreted in several ways. First, children with a chronic illness are no different than healthy children in terms of LOC orientations. The lack of differences may be related to the fact that the chronically ill children in this study were treated at speciality care clinics in which active participation in the management of their illness was encouraged. At a specialtiy care clinic it is more likely that the children receive specific information about their particular disease. Also a team approach is utilized to care for these children, hence, a variety of specialists are involved in educating the chronically ill children about their disease, its management and potential complications.

This interpretation alone is limited; the small sample of participants and other factors that could possibly influence the LOC orientations of the children need to be considered. The mere presence or absence of a chronic illness does not lead to specific LOC orientations rather it appears to be a combination of factors such as the duration and severity of the illness, developmental and cognitive level, age, socioeconomic status, and cultural and familial influences.

Variables such as cognitive and developmental level, age, duration and severity of the illness were not considered in this study and may have contributed to the nonsignificant results of this present study. The primary study did not assess the children's cognitive level prior to the administration of the questionnaire, therefore the results of this secondary analysis are limited.

This is a major limitation because it is documented that internal control increases as the child matures cognitively (Bialer, 1961; Richaud de Minzi, 1990). Studies also show that children at different ages may interpret the same question differently, thus highlighting another potential source of developmental variability (Weisz, 1986).

The primary study did assess the duration and severity of the child's illness however, this secondary analysis did not take these factors into account. This is another limitation. It is well known that a newly diagnosed child has a tremendous amount of information to comprehend. The child must first deal with the fear and anxiety of being diagnosed with a chronic illness. The child may go through phases of denial and acceptance, sometimes oscillating between the two. In addition, children must comprehend the basic information about their

illness, be able and ready to change their presence life style, build skills for dealing with the health problem, and develop strong social support systems.

Therefore, children who have been diagnosed for any length of time should have had the opportunity to work through the initial shock of the situation. This however, is also related to the severity of the chronic illness. If the illness is very severe the child may not have the energy and or ability to work through the initial shock of being diagnosed with a chronic illness. Hence, it is very important to determine the duration and severity of the child's illness.

This study also did not take into account the influences of varying ethnic backgrounds. Because the sample was so homogenous, almost all the children are caucasian, the results of this study should be applied with caution to other ethnic groups.

In addition, it is not known how the chronically ill children and their parents interact. Are the parents overprotective of the chronically ill child, thus taking over most of the control of the child's disease management?

Without analyzing the duration and severity of the children's illnesses, cognitive and

developmental level and ethnic influences it is difficult to make a clear interpretation of the results of this study.

The results of this study are also limited as a result of the low standard deviation for internal LOC and external LOC ($SD = .29$ and $SD = .35$) respectively. There is very little variability in the degree to which the scores between chronically ill children and healthy children deviate from one another. Thus, as the present studies shows, there is no statistically significant difference between chronically ill children and healthy children.

Finally, another limitation of the study is the result of the small sample size. The sample size is one of convenience obtained from subspecialty clinics at a local university. Therefore, the results of the study can not be generalized to the rest of the population. This study did not include children who see a primary care provider for the sole management of their disease.

Hypothesis II

Once again the results of this research question do not support the second hypothesis that children with either asthma or insulin dependent diabetes mellitus would be more internally

controlled than children with cystic fibrosis or congenital heart defects. Children with cystic fibrosis and congenital heart defects are combined due to the small sample size. The results of this research question fall under the same limitations as Hypothesis I.

The results of this hypothesis are directly related to the very small sample size. The standard deviation was also low for internal and external LOC ($SD = .50$ and $SD = .42$) respectively. Therefore, there is little variability in the degree to which the LOC scores deviate between the illness groups.

Other Limitations

One last limitation of this study may relate to a nonsignificant influence of health status on LOC orientations. The results of this study may indicate that health status of the child does not influence LOC orientations to a great extent.

Although other factors such as age and socioeconomic status were matched in the study, the variables of cognitive level and cultural and familial influences were not matched. These other variables may exert a great influence on a child's LOC orientation. Even though this study has several limitations, the concept of LOC is still applicable to nurses in advanced practice.

Chapter VIII

Implications

This next section will discuss implications of this study for the Self-Care Deficit Nursing Theory, implications for the ANP in the primary care setting, and finally implications for future research.

Implications for the Self-Care Deficit Nursing Theory

Implications for ANP's using a self-care model, such as Orem's Self-Care Deficit Nursing Theory (1991) include determining the degree to which LOC orientations may affect or determine a child's self-care agency and determining the degree to which LOC orientations may affect the capacity of the child to engage in self-care. Children who are more externally oriented may have a higher potential for a self-care deficit due to an inadequacy of the self-care agency to care for the self. Whereas, children who are internally oriented may take initiative in performing self-care actions that maintain wellness and alleviate health problem because they believe they have the ability to control the outcome of events.

Until the LOC of the child is determined primary nursing interventions in advanced practice should focus on decreasing or overcoming self-care deficits and or preventing loss of self-care capabilities. The ANP can promote self-care by helping the child recognize small ways in which he/she can take increasing control over their illness. Therefore, the ANP should continuously encourage the chronically ill child to take responsibility for monitoring and treating their illness.

In this study the chronically ill children tended to have a more internal LOC orientation. This would suggest that the children perceive they have some control over outcomes in their lives. Locus of control however, is not the only modifying factor that may effect the ability of a child to care for themselves. Other contributing factors that effect the ability of a child to care for themselves include perceived severity and susceptibility of the illness, health motivation, social supports, previous behavior, attitudes towards health professionals, socioeconomic status of the family, and finally demographics such as age, sex, and race (Wallston et al., 1978).

Implications for Advanced Practice

With advancements in medical technology and scientific knowledge health care providers have the ability to greatly extend the lives of children with a chronic illness. As a result of the growing number of children with a chronic illness, comprehensive health care approaches are necessary to meet and understand the needs of these children. A team approach utilizing a ANP, physician, social worker, dietician, child, and their parents will be the most effective method to comprehensive coordinated care. However, many primary care settings do not have the resources to provide all the above health care providers. Therefore, it is paramount that nurses in advanced practice utilize their skills to help contact community resources and services that will increase the comprehensiveness of the child's care.

Children with a chronic illness may also face limited access to pediatric specialty care clinics for their care due to cost, lack of medical insurance or limited coverage. Again, the ANP in the primary setting or clinic must rely on consultation with other health care providers to manage effectively the child's illness.

Nurses in advanced practice must also utilize their skills to assess and understand the child and their perceptions about their illness and its control in order to provide appropriate recommendations and education to them. The ANP must identify each chronically ill child's abilities and limitations in caring for their illness. One important component in this process is identifying the child's LOC orientation.

The purpose of assessing a child's LOC orientation is not for labeling purposes, but rather to gain insight into who or what the child perceives as having the most control over his/her illness. This is significant for the ANP to know because a child's perception over health and illness may influence how he/she understands, agrees to and complies with medical care regimens. Therefore, by assessing a child's LOC the ANP will have an increased awareness of how the child perceives his/her ability to control the environment rather than using subjective interpretations and judgements of the child's behavior, attitudes, and beliefs.

Assessment of the child's LOC orientation may also guide the ANP in choosing an approach or a conceptual model for use in the care of the chronically ill child. Shillinger (1983)

states that in the case of an internally orientated child, the ANP may emphasize a self-care approach which would allow the child to maintain as much control over their care as possible, whereas an externally controlled child may benefit from a more directive nursing approach. If the child is externally orientated a more directive approach is best because the child perceives control to related to sources outside him/herself. In this situation the ANP may provide the externally controlled child with choices related to managing the their care, whereas in the case of an internally controlled child the ANP may ask the child for their suggestions related to the management of their illness. The ANP's main goal should be to provide education and recommendations that best fit the child's learning abilities. No matter which type of approach is chosen, the ANP must provide the child with the opportunity to have some control over his/her illness and its medical care regimen.

Another function of the ANP in the primary care setting is educating other heath care providers regarding the effects LOC orientation may have on the management of the child's illness. If the child is returning to the setting with numerous exacerbations or complications the ANP needs to

completely assess all factors which may be influencing the course of the child's illness and this includes assessing the child's LOC orientation.

If the child is externally oriented and believes the course of their illness is related to forces outside of their control, following a diet and taking medications as prescribed may not be perceived by the child as having any effect on the severity of their illness. The severity of the illness is also related to the home environment of the child. If the parents of an asthmatic child continue to smoke the control and severity of their illness is out of the child's direct control.

Therefore, all providers in advanced practice must be aware of factors which influence how a child perceives their ability to care for themselves. If all health care providers are aware of the child's perception of control, appropriate measures can be taken to help the child understand which aspects of their care are under their control.

Interventions the ANP can use to increase awareness of LOC issues specific to the chronically ill child include: having case conferences involving all health care providers associated with the chronically ill child's care, speaking at workshops, participating in and presenting research. In

addition, it is important to incorporate issues related to chronically ill children in the curriculum for ANP's. As the number of children with a chronic illness increase, so to will the number of visits these children will be making to the primary care setting.

Finally, and most importantly nursing interventions need to provide the child with the opportunity to lead the highest quality of life possible. Whether it be through nursing interventions that promote internal LOC orientations or through interventions that promote external LOC orientations the child must be given information to make informed choices. The health care team, the child's parents and the chronically ill child must continually assess the choices the child makes in order to ensure the highest quality of life possible.

This research did not find statistically significant differences in the LOC between chronically ill children and healthy children. Despite these findings, assessing the LOC of all children is still an integral aspect to providing comprehensive and coordinated care.

Implications for Future Research

More studies are needed in general to assess the LOC orientations of chronically ill children. There have been minimal studies to date focusing on this construct variable in chronically ill children.

This present research study was designed to be descriptive in order to provide a better understanding of the LOC of children with a chronic illness. In the future, it is clear that this study needs to be replicated with a substantially larger number of subjects.

Subjects also need to be chosen from primary care settings which care for chronically ill children. A comparison should then be made between chronically ill children from a primary care setting, chronically ill children from a pediatric subspecialty clinic and the control children. This will help to incorporate children who see the ANP as their only health care provider, therefore increasing the generalizability of the sample.

Future studies also need to control for variables such as age, socioeconomic status, cognitive level of the children, duration and severity of their illness and ethnic influences. These variables have been shown by previous studies

to exert some effect on the LOC orientation of the children.

Future research studies need to focus on assessing the extent of functional disabilities the children have related to their chronic illness. The duration and severity of the child's illness would help to determine the child's level of disability. An assessment of the above would give a greater insight into the relationship between LOC and the chronic illness. Knowledge of the extent of the disability may prove invaluable in developing individualized plans for increasing the self-care agency of the chronically ill child.

There is also a need for longitudinal studies focusing on developmental changes in LOC within populations of chronically ill children. Such longitudinal studies can then be used to contrast the differences and or similarities to normal developmental changes in LOC.

If health care providers plan to incorporate LOC orientations into the plan of care for the child a shorter multidimensional health LOC scale such as the Multidimensional Health Locus of Control Scale (Wallston, Wallston, and DeVellis, 1978) would be more appropriate. This scale was developed to specifically measure beliefs relevant to health, the

effectiveness of powerful others, and the role of chance in determining one's health status. The Norwicki-Strickland Locus of Control Scale for Children is not specifically designed to measure health beliefs.

Other multidimensional scales can assess for perceived control in specific domains such as academics, health, social and global domains of perceived control. Multidimensional scales can also expand upon traditional internal-external conceptualizations of perceived agents of change to include a category for unknown sources of control. A health care provider can gain more information affecting LOC orientations by using multidimensional scales.

Lastly, future research needs to focus on assessing common interventions performed by health care providers that specifically influence LOC orientations, such as educational seminars, clinics, or camps, and role playing. Research of this nature can use an experimental design. This type of study will yield information that the ANP can use to evaluate the effectiveness of his/her interventions.

Conclusion

In conclusion, the results of this present study were not statistically significant in determining differences in LOC orientations. The results of this study could be the direct result of a homogenous, small sample size. This study has also shown that few studies have been conducted over the last five years assessing the LOC orientation in chronically ill children. Studies determining the effects LOC orientation can have on the outcome of a chronic illness would be useful for the ANP and other health care providers caring for these children in a primary care setting.

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APPENDIX A

SUBJECT # _____
 DATE _____

LOCUS OF CONTROL SCALE — CA

Listed below are a number of sentences. Each sentence describes a common belief. There are no right or wrong answers. We are interested in how true or untrue you believe each sentence is.

Read each sentence carefully. Then tell us how true or untrue you believe each sentence is by putting an X in the proper box.

BELIEF	VERY UNTRUE	SORT OF UNTRUE	SORT OF TRUE	VERY TRUE
1. Most problems will solve themselves if I just don't fool with them.				
2. I can stop myself from catching a cold.				
3. Some kids are just born lucky.				
4. Getting good grades means a great deal to me most of the times.				
5. I am often blamed for things that just aren't my fault.				
6. If someone studies hard enough he or she can pass any subject.				
7. Most of the time it doesn't pay to try hard because things never turn out right anyway.				
8. If things start out well in the morning I feel that it's going to be a good day no matter what I do.				
9. Most of the time parents listen to what their children have to say.				
10. Wishing can make good things happen.				

BELIEF	VERY UNTRUE	SORT OF UNTRUE	SORT OF TRUE	VERY TRUE
11. When I get punished it usually seems like it's for no good reasons at all.				
12. Most of the time it's hard to change a friend's mind.				
13. Cheering more than luck helps a team to win.				
14. It's nearly impossible to change my parents' minds about anything.				
15. My parents should allow me to make most of my own decisions.				
16. When I do something wrong there's very little I can do to make it right.				
17. Most kids are just born good at sports.				
18. Most of the other kids my age are stronger than I am.				
19. One of the best ways to handle most problems is just not to think about them.				
20. I have a lot of choice in deciding who my friends are.				
21. If I find a four leaf clover it might bring me good luck.				
22. Whether I do my homework has much to do with what kind of grades I get.				
23. When a kid my age decides to hit me, there's little I can do to stop him or her.				

BELIEF	VERY UNTRUE	SORT OF UNTRUE	SORT OF TRUE	VERY TRUE
24. I have had a good luck charm.				
25. Whether or not people like me depends on how I act.				
26. My parents usually help me if I ask them.				
27. I have felt that when people were mean to me it was usually for no reason at all.				
28. Most of the time I can change what might happen tomorrow by what I do today.				
29. When bad things are going to happen they just are going to happen no matter what I try to do to stop them.				
30. Kids can get their own way if they just keep trying.				
31. Most of the time I find it useless to try to get my own way at home.				
32. When good things happen they happen because of hard work.				
33. When someone my age wants to be my enemy there's little I can do to change matters.				
34. It's easy to get friends to do what I want them to.				
35. I have little to say about what I get to eat at home.				

BELIEF	VERY UNTRUE	SORT OF UNTRUE	SORT OF TRUE	VERY TRUE
36. When someone doesn't like me there's little I can do about it.				
37. It's almost useless to try in school because most other kids are just plain smarter than I am.				
38. Planning ahead makes things turn out better.				
39. Most of the time I have little to say about what my family decides to do.				
40. It's better to be smart than lucky.				

APPENDIX B

**MICHIGAN STATE
UNIVERSITY**

March 16, 1995

TO: Leann M. Burger
1981 Lake Lansing Rd. #27
Haslett, MI 48840

RE: IRB#: 95-122
TITLE: A COMPARISON OF THE LOCUS OF CONTROL BETWEEN
CHRONICALLY ILL CHILDREN AND HEALTHY CHILDREN
REVISION REQUESTED: N/A
CATEGORY: 1-E
APPROVAL DATE: 03/16/95

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project including any revision listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

**PROBLEMS/
CHANGES:** Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)336-1171.

Sincerely,

David E. Wright
David E. Wright, Ph.D.
UCRIHS Chair

DEW:pjm

cc: Carla L. Barnes



OFFICE OF
**RESEARCH
AND
GRADUATE
STUDIES**

University Committee on
Research Involving
Human Subjects
(UCRIHS)

Michigan State University
225 Administration Building
East Lansing, Michigan
48824-1046

517/355-2180
FAX 517/432-1171

MICHIGAN STATE UNIVERSITY

UNIVERSITY COMMITTEE ON RESEARCH INVOLVING
HUMAN SUBJECTS (UCRIHS)
700 BERKELEY ROAD
(517) 432-2700

EAST LANSING, MICHIGAN 48824-1101

April 6, 1988

Carla L. Barnes, Ph.D., ACSW
College of Nursing

Dear Dr. Barnes:

Subject: "FAMILY ADAPTATION TO CHRONIC CHILDHOOD ILLNESS"

UCRIHS' review of the above referenced project and consent form revision has now been completed. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and the Committee, therefore, approved this project at its meeting on April 4, 1988.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval prior to April 4, 1989.

Any changes in procedures involving human subjects must be reviewed by the UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,

John K. Hudzik, Ph.D.
Chair, UCRIHS

JKH/sar

cc: L. Spence
P. Peek

APPENDIX C

MICHIGAN STATE UNIVERSITY

COLLEGE OF NURSING

EAST LANSING • MICHIGAN • 48824-1317

Dear Family,

We are currently conducting a research project on situations that may influence family functioning. Our purpose is to develop ways for health care providers to work more effectively with families who have chronically ill members. We are therefore studying both families with and without chronically ill children.

For families who agree to participate, we will request that parent(s) and all children age 8 and older living at home complete a packet of questionnaires. Families will complete the entire packet of questionnaires, once at the beginning of the study and again six months later. One of the researchers will make four home visits, twice at the beginning of the study and twice at the end to assist your family in completing the packets. The researchers will also be available by phone. Each completed packet will take about two hours of your time. In addition to the information that your family will provide, the researchers will obtain data from your asthmatic child's medical record regarding the extent of the disease.

Your participation in the study is voluntary and you are free to withdraw from the study at any time without penalty. Your decision whether to participate will not affect the health care that you or your family members will receive.

Confidentiality will be maintained and your family will remain anonymous. At no time will your names appear in any publication with results from this study.

You are free to ask questions at any time during the study by calling one of the researchers at (517) 355-6526. Participation in the study does not guarantee any beneficial results to you. At the completion of the study we would like to give you an 8 x 10 color family portrait as an expression of our appreciation.

If your family is willing to participate, please return the attached self-addressed stamped postcard. After receiving the postcard, one of the researchers will be contacting you to answer any questions you may have and to schedule a home visit.

Thank you for considering participating in this study.

Sincerely,

Carla L. Barnes, Ph.D., ACSW
Assistant Professor

Linda J. Spence, M.S., R.N.
Assistant Professor

Patricia L. Peek, M.S., R.N.
Assistant Professor

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