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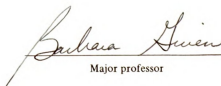
MOTHERS PERCEPTIONS OF COMMON CHILDHOOD DISEASES AND
VACCINES AS THEY INFLUENCE THE INTENT TO ACQUIRE
IMMUNIZATIONS FOR A CHILD

presented by

Heidi A. Froemke

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MOTHERS PERCEPTIONS OF COMMON CHILDHOOD DISEASES AND VACCINES
AS THEY INFLUENCE THE INTENT TO ACQUIRE IMMUNIZATIONS FOR A CHILD

by

Heidi A. Froemke

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ABSTRACT

MOTHERS PERCEPTIONS OF COMMON CHILDHOOD DISEASES AND VACCINES AS THEY INFLUENCE THE INTENT TO ACQUIRE IMMUNIZATIONS FOR A CHILD

by

Heidi A. Froemke

The decline of naturally acquired communicable diseases has resulted in the neglect of immunization programs by parents and health care providers alike. The result has been a serious decline below optimum, safe immunization levels in the U.S.

In this descriptive study, parental perceptions of common childhood diseases and vaccines were measured along the dimensions of susceptibility, severity, benefits and barriers as influencing the intent to acquire immunizations. The sample consisted of 50 mothers of a newborn child, who completed a 70-item questionnaire. Using descriptive and inferential analysis, no statistically significant relationships could be found between perceived susceptibility, severity, benefits, barriers and the intent to acquire immunizations. A major limitation of the study was a lack of variability in responses to the dependent variable. Additionally, descriptive statistics resulted in the development of a profile of the perceptions of new mothers toward the health of her child.

This thesis is dedicated to
L.S. O'Connor
whose sense of adventure, outrageous humor,
easy laughter and generous spirit
have enriched my life and eased the load.
She will never be forgotten.

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CHAPTER I
THE PROBLEM*

Introduction

There is concern among public health officials concerning the potentially serious situation of the immunization status of the nation's population. According to the U.S. Immunization Survey (1973, 1977) significant proportions of the U.S. child population was inadequately immunized. Even though obtaining immunizations is one of the most accepted preventive child health measures, national surveys as of 1977 (Blaesing, 1977) indicated that 5.8 million of the nearly 14 million, one to four-year olds in this country were unprotected against childhood diseases. Five years later, 4,358 cases of whooping cough and at least 15 deaths were reported to the Centers for Disease Control. Researchers believe that the number of children contracting the disease may be 10 times greater than reported. Additionally, two years after the federal government's target date for eliminating measles in the U.S.A., measles, a once-common childhood disease is on the rise again, up 84% from a year ago with a total of 2,322 reported for 1984 ("Measles Jump," 1984). In 1981, the Early Periodic Screening, Diagnosis and Treatment (EPSDT) program in Michigan, alone, health-screened 118,839 children. Of this number, 78,713 referrals were made for health concerns of which 16,272 or 20% were for lack of one or more immunizations (Michigan Dept. of Public Health 1981).

*This chapter written in collaboration with L. O'Connor (1985).

As recently as December 1984, the New York Times carried a feature article calling for medical reform and citing the alarming figures that 40% of all preschool children and 60% of non-white preschool children are not fully immunized against common childhood diseases.

Measles outbreaks continue to be reported from places where preschool children are concentrated. This was reported the same year that the occurrence of measles reached its lowest level since national reporting of measles began in 1912 (CDC, 1982, February 5).

During the 1970's, reported cases of communicable diseases took a significant upswing. Measles outbreaks across the country, from 1981 to 1983 reported significantly greater numbers of cases in the preschool and high school to young adult age groups (CDC, 1982, December 17; March 19; April 16; 1983, April 22).

Wehrle and Wilkins (1981) explain:

"With increased vaccine usage and the resulting declining incidence of naturally acquired disease, public apathy and neglect of continuing programs by public health agencies can be expected. The wide publicity given to untoward vaccine reactions by the news media also has had a deterrent effect. Immunization requirements for school entry, for certain occupations, and for the armed forces have counteracted at least some of the lack of interest in immunization programs. Poliomyelitis is, in the United States, the only disease for which the vaccine was awaited eagerly and embraced enthusiastically by a nervous public" (pg. 364).

Much of the debate on immunization in recent years has focused on the vaccine against whooping cough. Until an inoculation was developed in the 1930's the respiratory disease afflicted hundreds of thousands of people. In the U.S. alone, in 1934, it killed 7,000, mostly children. In Japan and England of 1980 and 1982, respectively (Kanai, 1980; CDC, 1982, December 3), widespread epidemics of pertussis occurred following adverse publicity by the media concerning neurotoxic reactions to pertussis vaccine. This followed in the wake of aggressive immunization programs for both countries, who were, at the time, enjoying low prevalence of the disease.

The United States, too, may not escape such media campaigns. The Portland Oregonian, in June 1984, suggests "a dark underside to the long pattern of vaccine successes most people take for granted that could unravel these great medical advances and perhaps even make the disease they now can prevent a threat once again" (Beck, 1984). This same year, the Idaho Statesman published the following:

"A recent study by an American Medical Association commission estimated that 43 children suffer brain damage each year after receiving whooping cough vaccine...in the United States, about 10 people a year suffer side effects from the measles, mumps and rubella vaccines. Five people, mostly unimmunized adults annually contract poliomyelitis after coming in contact with vaccinated children (1984).

Additionally, Dissatisfied Parents Together, an organization of families of children adversely affected by vaccine, have banded to support one another, to keep abreast of immunization complications, to inform the public and put pressure on the government. These parents maintain the medical profession is understating the particular risks of the vaccine against whooping cough. This same pressure finds Senator Paula Hawkins, R-Florida, pushing legislation in Congress to get financial help to those individuals harmed by immunizations (Sun, 1985).

In recent years an undertone of menace has crept onto the scene. Parents are raising questions and filing and winning multimillion-dollar lawsuits over the rare cases in which reactions to a vaccine have caused brain damage or even death. Public health experts express concern that the recent spate of court judgements could threaten the supply of vaccines ("Academy Pertussis," 1984). Tight supplies arose when Wyeth Laboratories, two of three U.S. companies manufacturing the pertussis vaccine, announced in 1984 they were halting production. The decisions were prompted by increasing litigation expenses and liability exposure from suits alleging vaccine injury and increased cost of insurance coverage.

As late as February of 1985, spot shortages of DPT vaccine continue. A survey of 583 physicians by eight health agencies shows about a third had difficulty obtaining the vaccine (Findlay, 1985). The Centers for Disease control in Atlanta optimistically predicted that the short supply of vaccines would ease by the end of 1985.

One is left to wonder how the "Immunization Objectives for 1990" (Hinman & Jordan, 1980) will be accomplished. Briefly, these goals state that by 1990, at least 90% of children have their basic immunization series by the age of two years; and at least 95% of children in day care centers and kindergarten through grade 12 are fully immunized. It would appear that what health care considers medically expedient, the public, in part, views as both medically unacceptable and socially unnecessary.

Health care has turned more and more in recent years to the social and behavioral sciences for a better understanding of the forces which shape health habits, life-style, and influence health knowledge, attitudes and practices. The Health Belief Model (Rosenstock, 1974) provides a framework on which to build a total concept to determine why some people behave the way they do in relation to their health. The future, thanks to medical technology, holds an ever increasing number of vaccines for communicable disease (Hinman & Jordan, 1983). What the response of the public will be to these medical advances remains uncertain.

Statement of the Problem

Health care providers are required to educate an apathetic and, at times, resistant individual whose child is in a good state of health, to accept what can be an uncomfortable and occasionally hazardous procedure, and to provide protection against a disease that seldom occurs. There is a need, therefore, to describe parental similarities

and differences in parental perceptions (mothers vs. fathers) concerning childhood disease and vaccines, and to identify their intent to acquire immunizations for their children.

For the purpose of this research, the investigators have chosen to divide the study into two parts. Therefore, O'Connor (1985) will investigate fathers' perceptions of childhood diseases and vaccines as they influence the acquiring of immunizations for their children. Froemke (1985) will investigate mothers perceptions of childhood diseases and vaccines as they influence the acquiring of immunizations for their children. Finally, the authors will include an analysis of the data comparing mothers' and fathers' perceptions of childhood disease, vaccines and immunizations.

Purpose

The purpose of this study is to describe those parental perceptions of childhood diseases and vaccines as they influence acquiring immunizations for their children. An increased understanding of these perceptions as they relate to immunization behavior will assist health care professionals to make knowledgeable assessments of a parent's potential for compliance to immunization schedules, to predict behavior, and to plan appropriate interventions relative to those perceptions which will modify or change health behavior.

Hypotheses

- Hypothesis I: There is a positive relationship between a mother's perception of susceptibility to common childhood disease and the intent to acquire immunizations for a child.
- Hypothesis II: There is a positive relationship between a mother's perception of severity of common childhood diseases and the intent to acquiring of immunizations for a child.
- Hypothesis III: There is a positive relationship between a mother's perception of benefits of vaccines and the intent to acquire immunizations for a child.
- Hypothesis IV: There is an inverse relationship between a mother's perception of barriers to immunization and the intent to acquire immunizations for a child.
- Hypothesis V: There is a positive relationship between mothers' perceptions of susceptibility to common childhood disease and fathers' perceptions of susceptibility to common childhood disease.
- Hypothesis VI: There is a positive relationship between mothers' perceptions of severity of common childhood diseases and fathers' perceptions of severity of common childhood diseases.

Hypothesis VII: There is a positive relationship between mothers' perceptions of benefits of a vaccine and fathers' perceptions of benefits of a vaccine.

Hypothesis VIII: There is a positive relationship between mothers' perception of the barriers to immunization and fathers' perception of the barriers to immunization.

Definition of Terms

Mothers: A mother having delivered a "normal" infant and living in the same household with the biological father of that child.

Child: "Normal" newborns (those not born with genetic defects, congenital malformations) and with no restriction placed on the number, sex, physical or mental conditions of other children in the family.

Childhood diseases: The common childhood communicable diseases of diphtheria, pertussis, tetanus, polio, measles, rubella and mumps.

Vaccines: Vaccines included in this study are measles, mumps, rubella, diphtheria, pertussis, tetanus and polio.

Immunization: The process of administering vaccine. The basic series of immunizations as recommended by the American Academy of Pediatrics (AAP) includes the optimal basic series as four DPT (diphtheria, pertussis, tetanus), three OPV (oral polio vaccine) and one measles, one rubella and one mumps (MMR) vaccination following this schedule:

<u>AGE</u>	<u>VACCINE</u>
2 months	DPT, TOPV
4 months	DPT, TOPV
6 months	DPT
15 months	Measles, Mumps, Rubella (MMR)
18 months	DPT, TOPV
4-6 years	DPT, TOPV

Intent to Acquire: A parent(s) positive indication that he/she will have a child/children immunized.

Perceived Susceptibility: The subjective risk that a child may contract or develop a disease or condition (Rosenstock, 1974).

Perceived Severity: The degree of worry created by the thought of a disease as well as by the kinds of difficulties the individual believes a given health condition will create for them and/or the medical/clinical consequences of a health problem (Rosenstock, 1974).

Perceived Benefits: The belief that a given action will be effective in reducing the threat of disease (Rosenstock, 1974).

Perceived Barriers: The belief that an action itself may be inconvenient, expensive, unpleasant, painful or upsetting, thereby resulting in avoidance (Rosenstock, 1974).

General Use of the Study

Using the original Health Belief Model (Rosenstock, 1974) as the theoretical framework for study to determine health beliefs, perceptions of susceptibility, severity, benefits and barriers identified, will be related to childhood disease, vaccines and immunizations only. Results may be used by the health care provider to influence preventive behavior and increase the validity of the Health Belief Model as a theoretical framework for predicting the intent to acquire immunizations.

Limitations

Limitations of the study are:

1. Subjects who agree to participate in this study may be different from those who refuse. Therefore, it is possible that research findings are not representative of all parents.
2. Individual perceptions of the meaning of answer-choices may affect individual responses.
3. The small number of patients participating in the study due to availability, result in data which are not generalizable to larger populations.
4. The study participants are a convenience sample selected from one hospital setting. Random selection of study participants is not employed. The variables measured cannot be assumed to be normally distributed. Therefore, a potential for bias does exist.

5. The "intent to acquire" does not prove that a behavior (immunization) will occur.
6. Parents may be too "new" to accurately measure perceptions, thereby biasing the results.

Assumptions of the Study

For the purpose of this study, the investigators make the following assumptions:

1. Health-related perceptions affect health-related behaviors.
2. The concepts of perceived susceptibility, severity, benefits and barriers, as defined in this study, are real and measureable phenomena.
3. Immunizations against childhood diseases are reasonably safe and effective.
4. The immunization schedule recommended by the American Academy of pediatrics is valid.
5. High immunization levels in the general population are of benefit to the health and physical well-being of the United States.

This study is divided into two parts: mothers and fathers. For the purpose of clarity, O'Connor (1985) will investigate fathers' perceptions of childhood diseases and vaccines as they influence the acquiring of immunizations for their children. Froemke (1985) will investigate mothers perceptions of childhood disease and vaccines as they influence the acquiring of immunizations for their children.

Chapter II

CONCEPTUAL FRAMEWORK*

Overview

A conceptual framework is presented which integrates the preventive Health Belief Model variables along with modifying and motivational factors with the nursing theory of mutual goal-setting. Parents bring to any interaction with a health care provider the totality of their individual realities, i.e., perceptions. Parent's perceptions about the potential threat of an illness to their child is weighed against the barriers and benefits encountered by seeking immunizations for their children. King's (1981) theory is presented as an organizing framework by which the health care provider may better conceptualize the dynamics of the nurse-parent interaction. The Health Belief Model (Rosenstock, 1974) aids in identifying and organizing parental perceptions within this interaction as they influence health behaviors and the intent to acquire immunizations for their children.

Presentation of the conceptual framework, therefore, includes a brief review of the origin of the preventive Health Belief Model; descriptions of the main study variables of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers; a discussion of modifying and motivating factors which may affect individual perceptions (Rosenstock, 1974); and the manner in which King's (1981) theory of nursing can be used to encourage preventive health care behavior.

*This chapter written in collaboration with L. O'Connor (1985).

The Health Belief Model

The Health Belief Model was developed to explain preventive health behavior which was defined by Kasl and Cobb (1966) as "any activity undertaken by a person who believes himself to be healthy for the purpose of preventing disease or detecting disease in an asymptomatic stage" (p. 246). The Health Belief Model described by Rosenstock (1974) is based upon the theories of decision making and behavior motivation first proposed by Lewin (1935), who postulated that behavior is derived from positively, negatively, or neutrally valued individual perceptions. Each individual constructs his/her own world view, giving meaning to events, objects or words from the symbolism they represent to the individual rather than from any universal cultural determinant or stereotype. This theoretical framework emphasizes the importance of the individual defining one's own behavior (Wagner, 1970). In developing the Health Belief Model, Rosenstock (1974) utilized an individually based definition of perception for "it is the world of the perceiver that determines what he will do and not the physical environment, except as the physical environment comes to be represented in the mind of the behaving individual" (p. 2).

Rosenstock (1974) integrates the Health Belief Model and Lewin's psychological theories of decision making into a framework which permits the analysis of the individual's process of decision making regarding health behaviors. Sociopsychological variables, then, are used to explain preventive health behavior. Using Rosenstock's (1974) interpretation of Lewin's theory, disease would then be regarded as

negative. An individual would initiate action to change health behavior to avoid or minimize the disease unless that preventive action was perceived by the individual as more negative than the actual disease process. In order for preventive action to occur, the individual would have to feel personally susceptible to the illness, would have to acknowledge the potential severity of the diagnosis, would have to recognize that the preventive action would produce benefits in the form of reduced susceptibility and/or severity, and would have to feel that there would not be insurmountable barriers in taking action.

Rosenstock (1974), working as a social scientist with the public health service, sought to formalize beliefs, attitudes and subjective responses of people in an attempt to understand why preventive measures (immunizations, health screening) are not utilized even when offered at little or no cost. The formulation of the Health Belief Model, therefore, explicates those factors which affect the likelihood that individuals will follow certain recommendations for preventive health action. These beliefs - susceptibility, severity, benefits, and barriers - are the conditions which influence an individual's decision to seek and comply with recommended health care. Later additions to the model postulated that in order for an individual to take an action (a choice or decision) to prevent disease he/she must first be motivated to do so whereupon "cues to action" and "general health motivation" were added as components influencing decision making.

For the present research, the preventive Health Belief Model (Rosenstock, 1974) is utilized to describe the individual perceptions of new parents regarding childhood diseases and vaccines and the intent to acquire of immunizations. In the following section, individual variables of perceived susceptibility, severity, benefits and barriers will be examined. Additionally, a discussion of modifying and motivational factors as they influence these perceptions will be included.

Parental Perceptions

Perception is the process of information extraction (Forgus & Malamed, 1966). It is the person's ability to think (to form a judgement or opinion of, to center one's thoughts on, to meditate, or reflect upon), to know (to apprehend as true, to have direct experience of, to have experiential/mental certitude of, to discern the character of), the development of abstractions, concepts and judgements (Bartley, 1958). Thus, perception includes an action as well as a simple receiving of information.

King (1981) states that one's perception is related to past experience in the concept of self, to biological inheritance, to educational background, and to socioeconomic groups. Also, the behavior of individuals has been described as human acts. Human acts are then interpreted as actions. Observations of human acts indicate that the perceptions and judgements of individuals are involved in every type of interaction. "Since perceptions, judgements, mental

action, and reactions are not directly observable, inferences are made about these components of human behavior" (p. 59-60). Perception, therefore, is fundamental to all human interactions for from perception flows human behavior. For the purpose of this study, perception is "each individual's representation of reality" (King, 1981, p. 189).

The parent, then, is a rational, thinking, sentient individual able to develop and form concepts and judgements about the world around him/her. Such judgements are the parent's own interpretation about reality. The formulation of these perceptions is influenced by many factors including past experience, self-concept, biological inheritance as well as socioeconomic and educational background. From these influences perceptions are shaped and behaviors manifested.

Perceived Susceptibility

In order to perceive a disease (measles, mumps, etc.) as a potential threat to one's own (or child's) health, the individual must feel both susceptible to the disease, and believe the disease with all its ramifications will be severe. Susceptibility is defined by Rosenstock (1974) as "the subjective risk of contracting a condition" (p. 3). One may believe his/her child can never contract a disease while another believes that there is significant danger of doing so given the same set of circumstances. It is this variability of response which requires further investigation. Perception of susceptibility to an illness thus influences health-care seeking behavior and is a significant factor (See Figure 1) in understanding how beliefs motivate actions.

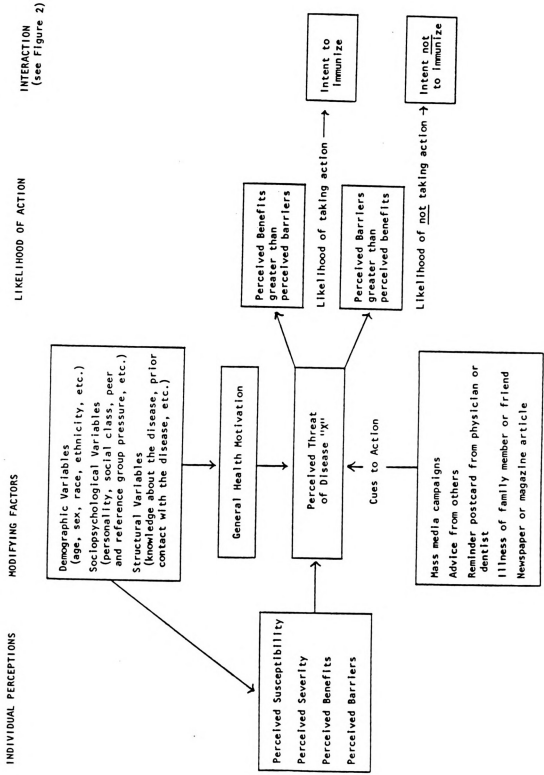


Figure 1: The Health Belief Model as a predictor of preventive health behavior. (Source: Becker, M. (ed) (1974). The Health Belief Model and Personal Health Behavior. New Jersey: Charles B. Slack, p. 7.

Perceived Severity

The perceived severity of a condition is dependent upon the perceptions of the present or potential physical limitations to be incurred, the socioeconomic burdens imposed and the degree to which one worries (Rosenstock, 1974). Perceptions of severity vary widely. The degree of severity may be judged both by the emotions it arouses in an individual as well as by the kinds of difficulties the condition will create for him or her. That is, one may not perceive an illness as serious unless it should cause physical, psychological or economic suffering within the home. The belief that one's child should be exposed to childhood illness in young age while such illnesses will be less severe bears out this perception. Because one's perceptions of susceptibility and severity are strongly cognitive, it is imperative that the individual possess some medical knowledge base in making a decision (Rosenstock, 1974). That is, to have a perception of one's susceptibility to a disease or the severity of that illness, one must have some knowledge of the disease/illness and its potential consequences.

Perceived Benefits

The physical and psychosocial benefits to be incurred from a preventive health measure (immunization) must be weighed against possible barriers related to the action itself such as cost, inconvenience or painful physical/emotional risks. If the perceived benefits outweigh the barriers to action, it is highly possible that

the individual will initiate action without any outside intervention (sanctions, teaching, counseling). If, however, the perceived barriers to action outweigh the benefits, or if both the benefits of action and the barriers to it are costly in terms of material, physical, or emotional consequences, outside intervention may be necessary to instigate an action (Rosenstock, 1974). Therefore, it may be said that the direction an action takes is influenced by the individual's beliefs regarding the effectiveness of available alternatives in reducing the threat of disease.

Perceived Barriers

Regardless of how many benefits the parent may perceive as the potential result of immunizing a child/children, the positive reward symbolized by the benefits must be weighed against the perceived barriers related to the action of immunization itself. In order for immunization to occur, the barriers must be reduced to a minimum so that the benefits clearly outweigh the barriers. Such barriers include time, cost, fear, physical pain, emotional consequences, risk of injury, as well as illness from vaccine side effects. Barriers which are perceived to be insurmountable will require an intense "cue" to trigger a response to take action. That is, one must be motivated to respond.

"Cues to Action" as a Motivational Influence to Take Action

In addition to factors which modify the individual's perception of the threat of disease, there are "cues to action" which may trigger the individual to preventive action (see Figure 1). When perceived barriers outweigh perceived benefits the nature and intensity of that "cue" will need to be critical enough to overcome this unbalanced ratio.

The "cue", therefore, becomes a critical incident which triggers a response to take an action. The "cue to action" serves to make the individual consciously aware of his/her feeling so that they may come to bear upon a particular problem. Such cues may be internal (how one feels physically/emotionally), or external (advice from friends, health care professionals, the media), and are strongly dependent on one's perception of the incident which serves to "remind" him or her of the need to engage in a particular health behavior.

Fifty states now require documentation of completed immunizations upon admission of the child to school. Any child not able to produce such "proof" is not allowed to enter school. Therefore, parents are now waiting until a child reaches age four or five to begin immunization. The "cue" is external and becomes the motivational factor in prompting a parent to seek immunization for a child.

General Health Motivation

Becker, Drachman, and Kirscht (1972) suggests that the Health Belief Model should include the concept of "general health motivation" in which behavior is predicted from the value of an outcome and the expectancy that a given action will result in that outcome. While the Health Belief Model traditionally dealt only with the negative aspects of health (the threat of disease or pathological condition) it did not explicitly state that "frank motives towards good health do exist" (p. 853). The general health motivation concept now includes dimensions related to concerns about overall good health. Such concerns may involve parents concern for their own and their families health involving preventive health measures such as adequate nutrition and the taking of vitamins. The general health motivation concept now includes those dimensions related to concerns about overall good health. As a modification of the Health Belief Model, this aspect is included in the study as a determinant of health action.

Modifying Factors

In addition to the individual perceptual variable of susceptibility, severity, benefits, and barriers previously defined, Becker (1974), postulated that there are a variety of modifying factors which may deter an individuals perception of the threat of disease (see Figure 1). For the purpose of this study, demographic, stage of family development, knowledge of childhood disease and vaccines, and culture-related modifying variables are included.

The demographic variables of age, sex, income, education and ethnicity are determined to identify how these related differences influence perceptions. The stage of family development as identified by Duvall (1977) will also be included. That is, does family size and stage of development influence parental perceptions and knowledge about childhood disease, vaccines and immunizations?

Summary

Applicable to the scope and content of this study, the HBM provides the organizing theory for identifying and understanding the determinants of voluntary health-related actions. The HBM is a practical, clinically applicable framework for intervention, providing potentially modifiable components, i.e., perceptions and beliefs. Therefore, findings have considerable potential for clinical application. Becker, et al. (1977), states, "by knowing which Health Belief Model components are below a level presumed necessary for behavior to occur, the health worker might be able to tailor interventions to suit the particular needs of the targeted group (p. 30).

There are implications for further research on the Health Belief Model. Becker, et al. (1977), states various elements of the model require more extensive research in different settings with different population groups and with long run recommendations and therapies. Additionally, other research should be directed at "determining the origins of these beliefs and the conditions under which they are acquired" (p. 40).

Janz and Becker (1984) evaluated 10 years of research using the HBM. Results summarized over the decade (1974-1984) provide "substantial empirical support" for the HBM (p.1). Perceived barriers proved to be the most powerful of the HBM dimensions across the various study designs and behaviors. While both over all were important, perceived susceptibility was a stronger contributor to understanding preventive health behavior than sick role behavior. The reverse was true for perceived benefits. The most noticeable difference among the HBM dimensions is the relatively lower power of perceived severity with the major exception of its importance to understanding sick role behavior. Janz and Becker (1984) further conclude that "on the basis of the evidence compiled, it is recommended that consideration of HBM dimensions be a part of health education programming" (p. 1).

While there are a variety of mechanisms available which are capable of altering attitudes and actions, these approaches or techniques exist without reference to the nature of the beliefs or behaviors that are to be modified. This can only develop from a conceptual or content knowledge of the field.

Additionally, the selection of appropriate health education strategies can be derived from examination of perceptions about particular health conditions and from surveys of health beliefs held by various at-risk populations (Becker, et al., 1977). The HBM is not a specific strategy for change, however, those findings, prompted by its use, should inspire innovative interventions for specific areas of interest.

The Health Belief Model is not complete in accounting for all variations in how people behave with respect to their health (Drachman, 1974). Sufficient evidence has been gathered to conclude, however, that the model provides a reliable theoretical and practical foundation for further study. While the HBM specifies relevant attitudes and belief dimensions, it does not recommend any particular intervention strategies for altering them. Also, there exists a need to standardize and refine the tools used to measure the sub-components of susceptibility, severity, benefits, barriers and motivational factors (Janz & Becker, 1984).

In summary, the HBM is presented as the organizing framework for understanding the influence of internal and external factors upon the development of individual perceptions. These perceptions of severity and susceptibility to disease, balanced against the perceived barriers and benefits presented by the thought of taking an action ultimately influence behavior. Therefore, the HBM provides a framework for conceptualizing the relationship of these perceptions to making a preventive health decision. Thus, it aids the health care provider to both understand and predict health behaviors. It is with this knowledge that a parent may be assessed to understand how perceptions of childhood diseases and vaccines influence their behavior relative to the acquiring of immunizations for their children.

Parents

Caring about a child does not guarantee parents will be able to provide for that child adequately. Commitment to the welfare of that child does not ensure that the best health interests of that child/children will be met. Expectations expressed by health care providers for a child are weighed by the parents in light of their perceptions. These perceptions are shaped by the totality of their past and present experience. Perceptions about the potential threat of illness to their child is weighed against the barriers and benefits encountered by initiating a particular health behavior. The Health Belief Model (Becker, 1974) is presented in this study as the organizing framework for understanding how these perceptions influence individual behavior.

This potential conflict between provider/nurse expectations and parents perception of a situation indicate assistance may be needed which will facilitate an awareness of the health needs of their child/children and to help them carry out these responsibilities for the promotion of physical/mental well-being of the family.

Studies concerning parental participation in the care of children has focused primarily on the role of the mother in decision making relative to the welfare of the child/children (Becker, Drachman & Kirscht, 1972; 1977; Graham, 1982). The literature is noticeably lacking in research directed at understanding the fathers participation in this responsibility. Stolz (1967), however, studied 39 families in which separate interviews with both the mother and father were taped,

transcribed and coded. Almost all (92% of the mothers and 82% of the fathers) volunteered information about interaction with their spouses as an influence in the rearing of their children. Of those giving data about such interaction, 69% of the mothers and 92% of the fathers cited what they should do as a frequent occurrence. About two-thirds of the parents stated that their discussions ended in mutual agreements. When disagreements did occur, the mother's opinion tended to prevail. Many statements of values the parents held for parenthood and childrearing were made and included (in order of emphasis); moral, family, interpersonal, emotional, security, education, orderly living, biological, play and economic.

This study would lead one to believe both parents are contributing significantly to the decision-making process concerning the care of children. Hughes (1980), however, states that mothers still face the burden of feeling continually and ultimately responsible for the health, development and happiness of their children. However much help a mother may get in bringing up her children, she is still likely to feel that she is the person beyond whom there is no recourse or appeal and who is answerable for whatever happens.

The 1970's saw a movement of women out of the household and into the workplace. The result has been an intrapersonal conflict between the traditional expectations as mother/wife and those of employer/employee. Increasing obligations to family, home and work have placed greater emphasis on the role of the father as an active participant in caring for the home and children. The extent to which

this is carried out is, of course, highly individualized and may, in fact, be far more theoretical than actual. In spite of this shift in spouse expectations and responsibilities and greater sharing of family and home obligations, it has not changed the fact that women continue to be the primary decision maker concerning the family's health related needs (Graham, 1982).

One is left to surmise what impact these increased demands upon a mother's time and resources means in terms of following an immunization schedule for her children; and whether her perceptions are "accurate" enough to initiate a positive action. Similarly, this change in roles assumes the father now (or has potential for doing so) plays a significant part in making these health-related decisions. Finally, one is left to wonder what his perceptions of acquiring immunizations for his children are and to what extent they match the mothers.

Vaccines

A vaccine is a type of antigen consisting of either living or dead organisms (Anderson, 1962). For the purpose of this study, the following vaccines only will be discussed. These vaccines are for those illnesses which are highly communicable and are common in childhood. They include measles, mumps, diphtheria, pertussis, tetanus, polio and rubella.

Immunization

Immunization is the process of administering vaccine. The basic series of immunizations as recommended by the American Academy of Pediatrics (AAP) includes the optimal basic series as four DPT (diphtheria, pertussis, tetanus), three OPV (oral polio vaccine), one measles, one rubella and one mumps (MMR) vaccination following this schedule:

<u>AGE</u>	<u>VACCINE</u>
2 months	DTP, TOPV
4 months	DTP, TOPV
6 months	DTP
15 months	Measles, Mumps, Rubella
18 months	DTP, TOPV
4-6 years	DTP, TOPV

This immunization schedule lends itself to noncompliance by the parents. Attending to it requires an availability of resources, be it time, transportation, money, or a provider. Mothers - in particular the poor, the employed and those with more than one child (Peterson, 1969) - find it increasingly difficult to meet the demands brought about by this schedule while trying to attend to other commitments and obligations. Additionally, the perceived threat of a childhood disease may not be great enough to overcome the perceived barriers to acquiring those immunizations.

The role fathers play in meeting this responsibility is unknown. Traditional role expectations have not included him in this aspect of child care. However, as parental role boundaries blur, it might be anticipated that fathers will become not only more aware of the immunization process but more actively involved in making the decision to immunize their child/children.

The Preschool Child and Childhood Diseases

Immunization programs have been most successful at immunizing children at the school age level (Peterson, 1979). This has been due, primarily, to individual state legislation now requiring documented proof of immunization against common childhood diseases upon entry to school.

Excluded, however, are preschool children, for whom no law now ensures their immunization. Failure to immunize these children has resulted from the fact that, unlike the school age child, they are not a "captive" group. Additionally, preschool children are more at risk for the common childhood diseases and are, in fact, considered by many health officials to be a critical period for immunization (Imperato, 1977). It is for this reason the immunization schedule proposed by the American Academy of Pediatrics presents appropriate ages for initiation of immunization with specific spaced intervals for a vaccine series based upon optimum effectiveness (AAP, 1974).

Certain groups of children, being "at risk" for complications from a vaccine itself, are excluded from immunizations. The American Academy of Pediatrics identifies these children as including those with 1) an acute febrile illness, 2) an active cerebral process, 3) failure to thrive, 4) immunosuppressed children, 5) a "serious" reaction to a previous vaccination, or 6) those with specific long-term illness (1984). Legally, children may be exempted from immunization based upon parents religious convictions.

For purposes of this study, preschool children will include "normal" newborns (those not born with genetic defects, congenital malformations) and with no restriction placed on the number, sex, physical or mental conditions, of other children in the family. Childhood disease includes those vaccine-specific diseases presented previously. They include: diphtheria, pertussis, tetanus, polio, measles, rubella and mumps.

In summary, children unable to make decisions concerning their own immunization status, must depend upon the parent(s) to accomplish this for him/her. The parent(s) develops and organize perceptions in terms of the internal and external factors (modifying factors, cues to action) influencing their daily lives. These perceptions, as the parent(s) individual representation of reality may or may not be an accurate interpretation of the situation. Additionally, perceptions of a mother and father may differ significantly and thus influence the final decision to act. Thus, the child is, in a sense, "at the mercy"

of his/her parent(s). It is imperative, therefore, that health care providers intervene on the child's behalf to assist them, through their parent(s) to achieve optimum immunization levels.

The HBM, as a framework, aids the health care provider in accurately assessing a parent(s) individual interpretation of childhood disease and vaccines. By understanding perceptions of susceptibility, severity, barriers and benefits, the health care provider can then selectively influence, alter and/or change a parent(s) perceptions/beliefs in order to achieve immunization for a child/children.

Relation to Nursing Theory

The goal of nursing is the absence of childhood communicable diseases in the preschool child through optimal immunization levels. The child, not responsible for seeking out his/her own health care, must rely upon the parent(s) to assist them in maintaining health. Therefore, the nurse interacts with the parent(s) in working toward the acquisition of immunizations for the child/children. Within this interaction, the Health Belief Model can be used as a framework for identifying and organizing perceptions relative to health behaviors. Kings' (1981) theory provides the framework within which the nurse, in clinical practice, interacts with the parent(s) to share information, knowledge and to set goals as a means for modifying health behavior (see Figure 2).

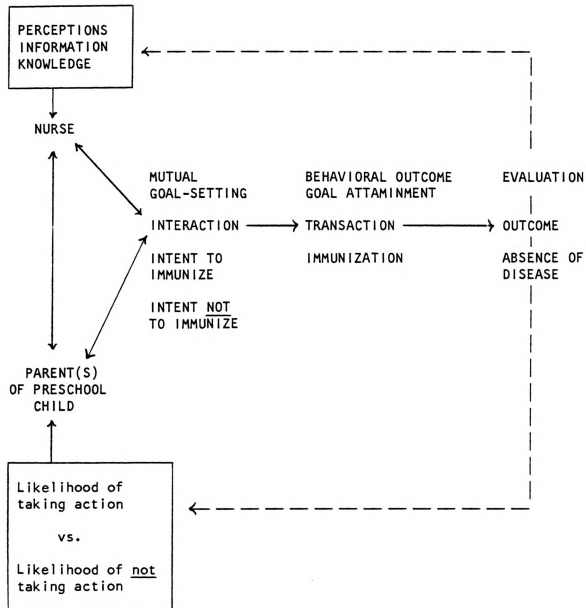


Figure 2: Integration and schematic representation of the conceptual model.

Kings' (1981) theory involves five basic concepts. These include Man, the social system, perception, interpersonal relationships and health. It is from mans ability to carry out certain activities that the theory is derived. Thus, man has the ability to: 1) perceive (to develop his/her own awareness or interpretation of a situation), 2) think (perception and thinking help man to generalize, to discriminate and to identify relationships), 3) feel emotions, 4) choose between alternative courses of action which are influences by perception, thoughts, and emotions, 5) set goals, 6) select means to achieve those goals, and 7) make decisions.

Man is able, therefore, to interpret, to organize and to transform information from his experience to memory, whereupon the composite of thoughts, feelings and attitudes represent his/her own unique image of reality. This image of reality is termed "perception" and from perceptions flow behavior.

Three systems interact continuously. Individuals make up the personal system. When these individuals form groups they become interpersonal systems, e.g., the family. Groups with common interests, goals and values coming together form a social system. Man functions within these three systems through interpersonal relationship in terms of his or her own perceptions.

It is within the interpersonal system that interaction between two or more persons takes place and here that each person brings to the situation his/her own knowledge, needs, goals, expectations, perceptions and past experiences which ultimately influence their

behaviors within that interaction. While all behavior is communication, it is but a small part of the process. It is the ability to understand the meaning for behaviors by first, understanding the perceptions influencing it that makes up "good" communication (King, 1981).

Communication, therefore, takes place in an atmosphere of mutual respect and a desire for understanding which is ultimately influenced by the interrelationships of a person's goals, needs and expectations. Both the nurse and parent bring with them their own individual perceptions of reality. Therefore, in trying to help parents cope with obligations and responsibilities, it is important that the nurse find a "common ground" with the parent(s). This shared frame of reference between nurse and parent(s) consists of sharing facts, beliefs, expectations and preferences. This shared reality -- perceptions -- provides the basis of common understanding necessary for mutual goal-setting.

The activity of mutual goal-setting involves helping parents to make decisions and to choose between alternatives. This decision-making process requires information and is an interactive process going in two directions. That is, as the nurse shares information/knowledge with the parent(s), he/she, in turn shares concerns, problems and perceptions of the problem. Based upon this, the nurse assists the parent(s) in setting a goal for health behavior.

To summarize, the interaction process involves the following underlying assumptions as represented by King (1981). They are:

1. Perceptions of the nurse and of the parent influence the interaction process.
2. Goals, needs, and values of the nurse and the parent influence the interaction process.
3. Individuals have a right to knowledge about themselves.
4. Individuals have a right to participate in decisions that influence their lives, their health, their community and their families.
5. Nurses have a responsibility to share information that helps individuals make informed decisions about their health care.
6. Individuals have a right to accept or to reject health care.
7. The goals of the nurse and of the parent(s) may be incongruous (p. 143).

Goal-attainment takes place in the transactional phase and, for purposes of this study, it is here the parent(s) acquires immunization for the child/children. Attainment (or lack of attainment) of the goal is a function of the quality of the interaction between the nurse and parent(s). Should the goal not be met, the nurse and parent(s) must return to the beginning of the interaction process to once again understand perceptions and behavior; and thereby develop the common frame of reference necessary to redefine the needs, goals, and strategies consistent with individual perceptions (see Figure 2). Finally, evaluation and the measurement of the effectiveness of care takes place in the outcome. For purposes of this study, effectiveness of care is the absence of those childhood communicable diseases previously identified.

This, Kings' theory is selected as the basis for understanding the nursing process relative to the study problem. It is utilized as a mode for implementing nursing interventions where the aim of nursing is to assist the parent to take responsibility for those health-related behaviors directly affecting their child/children.

Integration and Schematic Representation of Conceptual Models

In summary, individual perceptions are influenced and shaped by many factors. Among them are demographic, developmental, knowledge and social-psychological variables. Additionally, general health motivation, as an individual interest and control in ones own health is included. "Cues to action" also impact perceived threat and are instrumental as a critical incident which may propel an individual in a particular direction - either toward or away from a preventive health action.

The perceived risk of contracting an illness is a subjective state resulting from the interaction of individual perceptions and the modifying factors. This perceived threat may be high or low and is operant in deciding whether the perceived benefits of overcoming this threat are sufficient to take action. If it is believed that the benefits of taking an action significantly outweigh the barriers there is likelihood of taking an action i.e., immunization. Conversely, if the threat of illness is not perceived as being great enough (benefits do not outweigh the barriers) the individual is unlikely to take the preventive health action. Should benefits and barriers balance, the

individual will probably vacillate back and forth between taking/not taking a health action until such time as a "cue" or critical incident occurs to tip the balance in either direction.

Individual perceptions, beliefs and values are formed prior to entering the interaction phase (Figure 2), with the health care provider. The nurse, therefore, must understand that when the parent(s) enters this relationship they bring with them the totality of their own individual realities. It is, therefore, within the interaction phase that both the nurse and the parent develop a common, shared understanding for working toward a goal(s).

The nurse and patient explore and agree upon the means by which specific health behaviors might be attained (mutual goal-setting) by exploring alternatives and making decisions concerning the means for achieving it. With the goal of immunization identified, the parent and the child move toward the transaction phase where goal-attainment takes place. The outcome of the model is the absence of those communicable diseases previously defined.

The Health Belief Model, then, is a tool by which the nurse, at the point of interaction, is able to assess the parent in terms of their perceptions, and by knowing which components are below a level presumed necessary for behavior to occur can assess the likelihood the parent(s) will take action. Thus, interventions and strategies can be appropriately modified.

Both Kings' theory and the Health Belief Model assume that change in behavior is possible. As perceptions are identified, steps can be taken to change them and as perceptions are alterable, so too, are behaviors.

Summary

In this chapter, the concepts and theories relevant to this study have been integrated into a conceptual framework. Presented in Chapter III is a review of the literature covering pertinent background related to the research problem.

Chapter III

REVIEW OF LITERATURE*

Introduction

The research questions posed in this study are concerned with the relationships between parents' (mothers) perceptions of their child's susceptibility to common childhood diseases, the severity of that disease if contracted by the child and the benefits and barriers to acquiring immunizations to protect their child from contracting such illnesses.

The review of literature will include an overview of immunization practices and controversy surrounding the acquisition of immunizations, the likelihood of a parent's taking health action and the Health Belief Model as it describes a mother's health care behavior for her child.

Childhood Disease and Vaccines

In 1980 the Public Health Service, Department of Health & Human Services issued a report entitled "Promoting Health/Preventing Disease: Objectives for the Nation." This report included the following immunization objectives to be achieved by 1990 for the United States. They are as follows:

1. "Childhood immunization-improved services and protection.

-At least 90% of children have their basic immunization series by age two.

*Written in collaboration with O'Connor (1985, p. 39-57).

- At least 90% of children in day care centers and kindergarten through 12 are fully immunized.
 - Development of a national plan for mass immunization programs.
2. Childhood immunization-increased public and professional awareness.
 - All new mothers receive immunization instruction before leaving the hospital.
 3. Childhood immunization-improved surveillance and evaluation.
 - At least 95% of all children through age 18 should have up-to-date official immunization records in a uniform format.
 - Surveillance systems that report at least 90% of those hospitalized and at least 50% of those not hospitalized with vaccine-preventable definitions" (Hinman & Jordan, 1980, p. 438).

The control or elimination of infectious disease has been a subject of great interest for many years. Of all the approaches to date, the most effective, and certainly the most feasible, has been that of stimulating active immunity by the inoculation of attenuated agents, inactivated whole organisms, or purified antigens. The goal for active immunization is the induction in susceptible individuals of an immunity resembling that found during convalescence from an infectious disease, but without the risk of the accompanying morbidity and mortality attributed to the naturally occurring disease. An ideal immunizing agent should be a) immunogenic, particularly in the age groups at greatest risk of infection or disease, b) well tolerated by those

immunized, without undue discomfort or disability, c) nontransmissible to others, d) free of early or late complications, e) nononcogenic, f) capable of quantity production with uniform characteristic, i) stable under conditions likely to be encountered prior to administration, j) inexpensive, and k) administered by a technique acceptable to those who are immunized (Wehrle & Wilkins, 1981). Many currently available vaccines lack one or more of these criteria, yet have remained useful in providing at least some control of disease. Unfortunately, the deficiencies in individual vaccines have not always been detected during the initial trial of evaluation, but have often become apparent only after widespread administration.

For example, reactions encountered among recipients of inactivated measles vaccine were seen after exposure to natural measles infection or attenuated measles virus months or even years after the vaccine had been administered. For other vaccines, like oral poliovirus vaccine, the occasional adverse effects among recipients with impaired resistance became more apparent and of greater concern with the decline in occurrence of this disease. Each disease presents unique problems. The benefit to be derived from immunization must be measured against the cost and resources needed to achieve the gain anticipated - the absence of childhood communicable disease.

While all common childhood disease are included in this study, only those illnesses for which vaccines are now being debated will be included in the review of the literature in order to limit the scope of the problem. Therefore, immunizations for poliomyelitis, measles, and pertussis will be reviewed in this chapter.

Poliomyelitis has several prominent characteristics that have favored support for vaccine development and an acceptance of immunization by the public. First, the disease was highly visible and greatly feared. The paralysis, often extensive and permanent, along with the highly publicized respiratory cases drew more attention to this disease than to many other health problems. At this time, two vaccines for the prevention of the paralytic disease have been developed. Two approaches were utilized: IPV (inactivated polio vaccine) and OPV (oral polio vaccine), a live attenuated virus. The problem of a small but appreciable risk of paralysis among OPV recipients and unimmunized members of their families persists today and fuels the debate concerning these vaccines (Fedson, 1979). Although inactivated polio vaccine (IPV) and trivalent oral polio vaccine (OPV) are both effective in preventing poliomyelitis, the Immunization Practices Advisory Committee (ACIP) of the Public Health Services has considered the benefits and risks of each vaccine to the entire population and has recommended OPV as the vaccine of choice for primary vaccination of children in the United States.

Vaccine-associated poliomyelitis is a complication of the widespread use of OPV. In the period 1969 - 1980, 191.4 million doses of OPV were distributed in the United States, and 93 cases of vaccine-associated poliomyelitis were reported. Of the 93 cases, 36 occurred among vaccine recipients (1 case per 8.1 million doses of vaccine distributed) and 57 among household or community contacts of vaccinees (1 case per 5.1 million doses distributed). Most vaccinees

(92%) who acquired polio were less than or equal to 4 years of age, whereas most persons (73%) who acquired polio after contact with vaccinees were more or equal to 20 years of age (Wherle and Wilkins, 1981).

Because of the overriding importance of ensuring complete immunity of children and because of the rarity of OPV-associated disease, the ACIP recommends that responsible adults be informed of the small risk of vaccine-associated poliomyelitis and that OPV be administered to a child regardless of the vaccination status of adults in the household (CDC, 1982, March 5).

Sporadic imported cases continue to be reported along with the vaccine-associated cases, averaging nine cases per year. With declining incidence of the naturally acquired disease, it appears likely that vaccine-associated cases represent a problem that will hamper efforts at eradication of the disease. Localized outbreaks continue to occur among members of religious sects who have traditionally refused all vaccines (CDC, 1982, March 5).

Measles

A safe, effective and stable vaccine providing lasting immunity offers the possibility of measles eradication. The introduction of the first live attenuated measles vaccine in 1963 and the subsequent widespread use of live further-attenuated measles vaccine since 1965 substantially reduced the incidence of measles in the United States. Despite the promise of success in eradicating the disease, measles

remains endemic in the U.S. and increased prevalence has been observed every three to five years since 1967 (CDC, 1982, April 16). The Center for Disease Control reported in 1984 that measles was up 84% from the previous year with a total reported cases of 2,322. While these numbers remain significantly less than the half million per year in prevaccine days, this report comes two years after the federal governments target date for eliminating measles in the United States ("Measles," 1984).

The measles virus has persisted in communities with a large proportion of immunes. Past measures for control have relied primarily upon extensive use of vaccine in preschool and young, school-aged children and mass immunization programs when an increase in reported measles cases was recognized. Additional measures, such as school immunization laws and school exclusion, have been utilized to increase immunization coverage (Middaugh & Zyla, 1978). In recent years, the median age of reported cases has increased and more adolescent and young adult cases have been recorded (CDC, 1983, August 12). The inability to identify and successfully immunize those susceptible to measles in the U.S. has hindered attempts to eradicate the disease. These individuals were vaccinated between 1963 and 1967 with a vaccine of unknown type since their only vaccination may have been with inactivated vaccine. Since killed measles vaccines was not distributed in the U.S. after 1967, persons vaccinated after 1967 with a vaccine of unknown type are not in need of revaccination (CDC, 1982, May 7). A recommendation to increase the age for routine measles immunization

from 12 months to 15 months of age (Krugman, 1977) was based on indirect and direct evidence that small amounts of persistent maternally acquired measles antibody affect the seroconversion rates in infants 12 months of age (Hinman, 1979).

It is unlikely that eradication of measles in the United States will be realized as long as substantial numbers of susceptibles remain. It has been estimated that in a population of 100,000, only 26 new cases are necessary to keep measles endemic (Black, et al., 1971). Currently in the United States, approximately 24,000 cases are reported in endemic years (CDC, 1983 January 7).

Amler, et al. (1982) state that as long as measles incidence rates are 10 to 100 times higher outside the United States than within it, international importations will be potential sources of measles infection. Although relatively few imported cases are preventable, transmission has been limited when immunity levels are high (Turner, Amler, & Orenstein, 1982). Because indigenous measles is extremely rare in the United States, a major challenge exists to maintain high immunization levels. Measles and other preventable diseases will return if the imperative to vaccinate children is relaxed and immunization levels allowed to fall (Kirby, 1982).

The cornerstone of the measles elimination program is the achievement of high immunization levels, with requirements for all children fundamental for success. Past studies have demonstrated that states with such regulations have the lowest incidence rates for

measles and that enforcement of these regulations with exclusion of noncompliant students correlates best with low measles incidence (Middaugh & Zyla, 1978).

Pertussis

Immunization in infancy is recommended because of the severe complications and high mortality associated with pertussis in early life. Five to 20 persons die each year and the incidence of the disease has been reduced to 1,000 - 2,000 cases per year. The vaccine has a high frequency of transient, nondamaging side effects, a lesser frequency of potentially serious adverse effects, and a remote risk of permanent neurological sequelae or death (Baraff, et al., 1984).

In a double-blind study conducted by Baraff, Cody and Cherry (1984), the rates of minor and short-term reactions following DPT (vs. DT) immunization were high. Local reactions occurred in 64% of DPT recipients and minor systemic reactions (fever, drowsiness, fitfulness, vomiting, anorexia, persistent/fretful crying) occurred in 50%. Children who received DT immunization experience less frequent and less severe reactions. Convulsions and hypotonic/hyporesponsive episodes each occurred in 1:1,750 immunizations. No evidence of encephalopathy or permanent brain damage was seen in any vaccine recipient. Little discussion has taken place concerning these adverse reactions until recently. Quite the opposite is true, however, in Europe.

In Great Britain over the last 8 years, there has been an extensive debate in the public media and in professional circles over the risks and benefits of routine infant immunization against whooping cough. The media picked up on the controversy, keeping cases of children with brain damage, alleged to have been caused by vaccine, before the public. Pictures of children with immunization-induced brain damage were shown on television. In the late 1970's immunization rates dropped dramatically throughout the country, resulting in whooping cough developing into an epidemic far beyond anything experienced in over 20 years (Williams & Dajda, 1980). As late as 1982, pertussis vaccination was still being contested in Great Britain with an alarming rise in the incidence of whooping cough. From 1977 to 1979, 102,500 cases of the disease were reported in the United Kingdom resulting in a total of 36 deaths.

Account must be taken, however, that many children suffered prolonged and sometimes severe illnesses with sequelae. It has been estimated that during the epidemic in England and Wales, when some 5,000 children were admitted to hospitals (2,000 cases under 6 months of age), 50 children required admission to intensive care units, 200 developed pneumonia, and 83 had convulsions induced by the disease. These figures do not include the many cases of severe and complicated illnesses in children who were cared for at home. The late effects of these illnesses are unknown, but evidence supports that some may continue to have persisting after-effects (Miller, Alderslade & Ross, 1982).

Kanai's (1980) extensive investigation reveals similar difficulties in Japan where the incidence of whooping cough had undergone large changes in the past 30 years. During this time, the nation-wide vaccination against whooping cough had been carried out with concomitant improvement of vaccination procedure. With improvement of vaccine quality and vaccination procedure the incidence of whooping cough declined to a low of 393 reported cases and no fatalities in 1974. Because of the low incidence of disease, neurotoxic reactions to pertussis vaccine gained notice and spurred much discussion of the benefit-risk ratio of the vaccine. In Japan, at this time, Public Health authorities must deal with the decline in public acceptance of vaccination resulting from the publicity created by mass communication networks as well as by the Association of Parents of Vaccine Damaged Children (Kanai, 1980).

Miller, et al. (1982) states that, at present, it is not clear whether the concern expressed about the side effects of pertussis vaccine in different countries reflects true variation in the incidence and nature of the problem or whether the vaccines used vary in toxicity. The British Department of Health and Social Security has attempted to gather such information with only partial success due to poorly kept records (Miller, et al., 1982).

The controversy concerning pertussis vaccine side-effects has escalated in the United States. In March of 1979, the Tennessee State Department of Public health reported four deaths in infants aged 2 to 3 months who had received, within 24 hours of their deaths, a dose of DPT

vaccine from a single lot. Oral polio from multiple lots had been given at the same time. Further investigations of infant death in Tennessee from August 1977 through March 1978 and August 1978 through March 1979 indicated 8 cases of infant death in the 1978 to 1979 time period and two deaths in the 1977 to 1978 period, within one week of vaccination (CDC, 1979, March 19). Further update on the controversy surrounding infant deaths, however, indicates that countries where immunizations with pertussis antigen-containing vaccines are started at six months of age, the age distribution of infant deaths is the same as reported in the United States (CDC, 1985, March 17).

The Federal Center for Disease Control reported that in 1984 2,400 cases of whooping cough were reported. It is estimated that perhaps 10 times this number actually suffered from the disease but were never reported. Thirteen of the 1,339 infants under 6 months of age who contracted whooping cough died (Engleburg, 1984).

Imperato (1977) states that "public apathy has historically been neutralized by panic reactions to outbreaks and epidemics, resulting in increased numbers of immunizations" (p. 1972). Relatively safe and effective vaccines exist to immunize children against the common communicable disease. In spite of this, immunization levels in the United States continue to be less than optimum. This has been due largely to the apathy, not only in the public, but health care community as well. It is an apathy generated by the relatively low incidence of these diseases brought about by the vaccines themselves. Consequently, large pools of susceptible children have been left vulnerable to outbreaks of these illnesses.

There is no medication or vaccine that does not have the potential at some time, under the proper set of circumstances, to cause some reaction in a given individual. The majority of vaccine-related reactions, however, are mild and self-limited. The more severe reactions can be reduced to a minimal incidence by adhering to the immunization guidelines and excluding those from whom there are medical complications. The risks from immunizing children are far less with pertussis vaccine as well as other vaccines than those inherent in their acquiring any of the vaccine preventable diseases.

Parents organizations, U.S. drug companies manufacturing biologicals, as well as the government have entered into the controversy surrounding mass immunization programs, sanctions (school entrance requirements), and ultimate responsibility for potentially serious side effects. It would appear that what the health care profession considers medically expedient, the public, in part, now views as both medically unacceptable and socially unnecessary.

Due to the success of previous immunization campaigns and low incidence of communicable diseases in the general population an apathetic and, at times, resistant individual whose child is in a good state of health to accept what can be an uncomfortable and occasionally hazardous procedure. The challenge for health care providers is the maintenance of adequate immunization levels in the midst of this growing apathy in the United States. There is a need, therefore, to identify and describe parental perceptions as they influence health care decisions and immunization-seeking behavior.

Health Belief Model as it Describes Preventive Health Behavior

Hochbaum, Leventhal, Kegeles, and Rosenstock (1966) developed the Health Belief Model in an effort to explain preventive health behavior. Since its development, the Health Belief Model has served as a framework for a significant number of studies relating to preventive health behavior (Rosenstock, 1974), illness behavior (Kirscht, 1974), sick role behavior (Becker, 1974), and chronic illness behavior (Kasl, 1974).

To have a perception of susceptibility or severity to a disease one must have knowledge of a disease/illness and its' potential medical consequences. Further, it proposed that a particular action would be beneficial by either reducing susceptibility to, or severity of the disease. Also, barriers should not outweigh the perceived benefits of the health action. Some cue to action (either internal or external) is believed to be necessary to trigger the individual to want to achieve the desired health behavior. Later modification of the Health Belief Model included addition of the notion of general health motivation (Becker & Maiman, 1975) and an ability to alter the perceptions and beliefs that make up the model (Kegeles, 1969, Kirscht & Haefner, 1973).

Rosenstock (1974), states that a patient will not comply with a health regimen unless he exhibits the following set of characteristics: 1) health motivation, 2) perceived susceptibility to a particular illness, 3) perceived severity, 4) perceived benefits of intervention, 5) perceived barriers to taking an action and

6) knowledge of the medical condition and the prescribed regimen (1975). Perceived severity implies that the patient believes a future occurrence of a given illness would have a serious impact on his life, or an existing illness state, if left untreated, would have an undesirable impact. Perceived barriers to action means that the patient believes the cost (social, financial) of the recommended action is outweighed by the perceived benefits.

Likelihood of Parents Taking Health Action

Relatively low levels of public participation in preventive health programs have been documented in the literature (Hingson, 1974; Prather, 1974). Additionally, poor rates of compliance with prescribed regimens for medical care have been identified (Marston, 1970; Dracup, 1982), and specifically with immunization schedule (Hingson, 1974; Peterson, 1979).

The literature is extensive related to discovering and understanding the determinants of voluntary health-related actions. These studies range from the medical (Anderson, 1968), economic (Muller, 1965), demographic (Anderson, 1973; Markland & Durand, 1977), organizational (Becker, et al., 1974), geographic (Colliver, et al., 1967; Marks, et al., 1979), social (Langlie, 1977); and personal and motivational (Becker, et al., 1972). In the last 15 years there exist a number of eclectic reviews of research which summarize findings across all or most of the previous perspectives.

Investigators have attempted to determine what differences exist between families who have their children immunized against common childhood disease and those who do not. A prospective study done over a one-year time period in Kentucky ($n = 487$), was designed to assess the effectiveness of notices urging DPT and polio immunizations; and to show characteristics of families that had not begun immunization of their child/children by an acceptable time after birth. The investigation indicated that parents of inadequately immunized children had lower incomes, more children, and were less likely to visit a physician for any reason (Martin, Fleming, Fleming & Scott, 1969). There was no statistically significant difference between the results of immunization and those who did not receive notices. This would tend to indicate that sending out notices to parents as a "cue to take action" (acquiring immunization) does not result in increased immunization levels, but that more research is required involving different populations. The major limitation to this study was a sample drawn from an all white population. Thus, its ability to be generalized is limited.

In an effort to improve the immunization delivery system in Missouri, a statewide study of the sociopsychological factors effecting infant immunizations was undertaken (Markland & Durand, 1976). A mail survey was conducted of the parents of all two year olds ($n = 19,000$) to determine the child's immunization status. From this population, a random sample of 427 parents was drawn. The test instrument used asked information concerning the child's immunization history, demographic,

socioeconomic and "psychological" factors, and parents' exposure to the media. Initial statistical analysis of the data used a simple descriptive approach with a 95% confidence level. The results of the study revealed the following profiles for the adequately and inadequately immunized. Adequately immunized children had parents with a higher perception of disease seriousness and risk of disease, higher age levels, higher education levels, smaller families, greater media exposure, and showed a greater proportion of white children.

The parents of children who were inadequately immunized had a low perception of disease seriousness and risk of disease. These parents were also younger, had a lower education level, had larger families, less media exposure and smaller proportion of white children. These study results are hardly surprising, however, the profiles are based on general samples. A comparison was done by geographic location throughout the state and several subgroups were identified with differing demographic variables. Education and unemployment of rural mothers was not a demographic concern but was with urban mothers. There was no breakdown differentiation identified for fathers. A weakness of the study was a lack of explanation of the measurement for risk of disease and disease seriousness (Markland & Durand, 1976).

In Ohio, over a one month period, a population for study was selected from all children born to married parents. From this base a 10% random sample consisting of 1,003, 2 year old children was selected in order to identify those factors associated with failure to receive the recommended vaccinations. Parental education, family size and

maternal age were compared with the completion rate for the basic immunization series. Several factors were found to be related to lower levels of immunizations. Children who received their vaccinations from private doctors had a better vaccination rate than those who attended clinics run by the Public Health Department. A child having one parent with less than 12 years of education or having three or more siblings had a forty times greater risk of failure to complete his immunization series than a child whose parents are both college graduates, or had less than three siblings ($p = .01$). Rural populations had less response rate to obtaining immunizations than did urban populations (Marks, Halpin, Ervin, Johnson, & Keller, 1979). Results further revealed that when socioeconomics were controlled, the association with race no longer holds; that is, no differences in completion rate are found between white and non-white children in the same socioeconomic level. However, an overall effect of socioeconomics remains with higher rates of completion in the higher socioeconomic level" (Marks, et al., 1979, pg. 306). Although a large sample size, this study was done over a relatively short period of time and included only married families, therefore limiting its ability to be generalized. This differs with the Markland and Durand study which found that white children were more likely than non-white children to be adequately immunized.

Ferguson, Harwood, and Shannon (1983) sampled attitudes of mothers ($n = 1123$) to a series of issues relating to compulsory protection of children. The issues examined were: the introduction of

car seat restraint legislation, compulsory fencing of domestic swimming pools, preventive health care linked to family benefit and desirability of water fluoridation. Included in Family Benefit payment was the suggestion that "to ensure all children are immunized and receive routine checkups, that these procedures be linked to the Family Benefit payment so that Family Benefit is not paid unless the parents produce evidence that the child has been immunized, etc." (pg. 338).

Approximately 90% of respondents favored car restraints and pool fencing. Sixty to 70% favored health care linked to Family Benefit ($p = 0.05$), but less than one-half were in favor of water fluoridation. There were slight but nonetheless statistically significant tendencies for maternal attitudes of the issues explored to vary with family social background and the age of the mothers. Results of this investigation support the introduction of compulsory methods for protecting a child's health. Its generalization is limited, however, due to its use of a New Zealand population in which questions were linked to a Family Benefit (insurance) payment.

In a more recent study in England (Burney & Cook, 1983), 197 mothers were interviewed before discharge from the hospital to ascertain their initial intentions about vaccination of their children. The mothers studied went either to their general practitioner or to a Public Health Center to have follow-up care and their babies vaccinated.

On follow-up nine months later, 154 mothers were interviewed, 92% of the infants had received at least one polio, diphtheria and tetanus vaccine. Eighty-five percent had received at least one vaccine against whooping cough, 19 mothers had been advised against the vaccine by either Public Health Officials or their physician. Failure to have their children vaccinated against whooping cough correlated with the mother's initial intention, although a high proportion of mothers who were initially against the vaccine started vaccination by the 9-month follow-up time (1983). Results of the study showed that mothers attending general practitioners were more likely to have their children vaccinated against whooping cough than those attending public health clinics.

It should be pointed out that during this time in England the use of whooping cough vaccine was controversial. The mother's initial intention to use whooping cough vaccine was less than for other immunizations. The services used, however, also played an important part and those attending their general practitioners were likely to have their babies vaccinated regardless of their initial intentions.

In summary, one's ability to predict the likelihood of taking a positive health action (immunization) is largely influenced by the recognition of a common "parent-profile" as gleaned from a review of the literature. Thus, those parents most likely to have their child/children immunized are more educated, with high socioeconomic level, older, married with smaller families, white, urban and more likely to receive immunizations through a private physician.

The Health Belief Model and Mother's Preventive Health Behavior

A review of the literature reveals extensive research using the HBM. Specifically, that research related to well-child care, pediatric medical regimens and clinic utilization behavior has focused, almost exclusively, on the mother. For the purpose of the present research, a review of the more pertinent studies is presented. The HBM, as an organizing framework for these investigations, has provided the health care community with a tool for predicting those mothers most/least likely to take a preventive health care action.

Researchers have turned to the investigation of social and psychological dimensions (i.e., subjective attitudes and perceptions) as determinants of health care utilization. A 1977 prospective study (n = 250; 240 black, 10 white) on low socioeconomic mothers' health beliefs and children's clinic visits focused on the utilization of pediatric clinic services for their children. Visits to a hospital outpatient department for well-child care, acute illness and accidents were studied. Mothers were chosen for the study using random sample technique, given an initial interview and then followed for three and one-half years from data retrieved from the child's medical records. Health attitudes were found to be associated with preventive health care. Mothers who perceived their child as being less susceptible to illness were high users of preventative services. Mothers who perceived their children as being more vulnerable to illness had fewer well child visits but more visits for acute illness. This may have reflected mothers' faith in the protection perceived to have been

bestowed by regular preventive visits. Mothers who saw a child's illness as being more severe made even fewer well child visits. This pattern reversed for benefits. Mothers with a "preventive orientation," who saw a potential benefit in taking a preventive health action, were significantly more likely to bring the child for preventive services. It was also shown that the mother who seeks preventive care for her child has an active, controlling orientation towards her own and her child's health. "Furthermore, she believed the control to be effective, for she judges both herself and her child to be in good health, and the child is perceived as relatively immune to disease" (Becker, Nathanson, Drachman, & Kirscht, 1977, p. 131). "In this study, perceived susceptibility was measured, first by the mother's evaluation of her child's general health on a scale from excellent to poor and, second, by her extent of agreement/ disagreement with the statement "my child gets sick easily" (Becker, et al., 1977, pg. 132).

In conclusion, susceptibility, benefits and barriers were significant predictors of a mother's clinic appointment-keeping behavior. The authors concluded that their data provided support for the hypotheses, that knowledge of an individual's health beliefs is useful in attempting to predict future utilization of preventive health care services. The ability to generalize is limited due to use of subjects from a single clinic, all of whom were of low socioeconomic status. Additionally, "preventive orientation" was used as a

substitute for the traditional measure of benefits. It's significance for the purpose of this study is the support it lends to the predictive capability of the model in the preventive health behavior of mothers.

Maiman, et al. (1977) addressed four concerns related to the Health Belief Model using data from a prospective study of mothers' ($n = 199$) adherence to a diet regimen prescribed for their obese children. They looked at the mother's perceptions of her child's vulnerability to illness, her views about the seriousness of the threat of illness in general and obesity in particular, her faith in the benefits of medical care and in the efficacy of the regimen, and her belief that the diet was safe.

During a two year period, 199 mothers of children newly diagnosed as obese were referred to a dietician. The study's main outcome measure was change in the child's weight over a two-month time period. They did not directly attempt to measure the mother's compliance with the diet, but, rather, assessed the weight change as the dependent variable. It was assumed that weight loss was the result of adherence with the recommended diet.

Independent variables were the major components of the Health Belief Model made operational by multiple questionnaire items with responses permitted along a six choice rating scale of agreement. An index measure was obtained by adding the responses of an individual on two or more items related to a particular dimension and then dividing the sum score by the number of items included in the index to obtain a mean score. Indices reflecting major belief dimensions of the model

were tested for predictive value, and examined for internal consistency and intercorrelation. A general compliance measure, long-term clinic appointment-keeping, was calculated for each child by dividing appointments kept by appointment made during a 12 month period.

Results indicate that the Health Belief Model provides a helpful framework for interpreting the phenomenon of noncompliance with long-run therapies. The mother's perceptions of her child's vulnerability to illness, her views about the seriousness of the threat of illness in general and obesity in particular, her faith in the benefits of medical care and in the efficacy of the regimen and her belief that the diet was safe were all found to be substantially associated with weight loss by the child. General measures of health motivation were also shown to be predictive of compliance. Thus, each of the HBM care components was found to be, statistically, a predictor of compliance with the diet regimen. There was some lessening of the strength of these correlations over the study period. It was suggested (Becker, et al., 1977) that health beliefs may be most important at the beginning of the regimen, but with time, experience with the diet, and weight change outcomes, other variables may become important as well. These variables were not identified. Similar findings were obtained between the HBM dimensions and long-term appointment-keeping. When these dimensions were examined in combination (through multiple regression analysis) almost 40% of the variance in initial weight loss was explained.

The findings lend further support to the large body of evidence linking these belief dimensions to various types of personal health behavior "they also suggest the value for health educators of assessing these beliefs as part of the educational diagnostic process and incorporating such knowledge in whatever educational strategy he/she decides to employ" (pg. 227).

While compliance is not central to the present research, it may be said that a mother must, in a sense, comply with a medical regimen requiring a personal commitment to an immunization schedule over an extended period of time.

Becker and associates (1972) tested the HBM in a study of 125 mothers and their compliance with pediatric medical regimens for otitis media. Those aspects studied were medication compliance and appointment-keeping behavior. Becker's et al. (1972) reformulation of the HBM is used as a predictor of compliance in pediatric situations.

Mothers were read a list of 11 illnesses (colds, measles, mumps, polio, asthma, pneumonia, bad cut on the arm, rheumatic fever, anemia, strep throat and accidentally drinking something poisonous) and asked 1) of those the child has had, which ones could he ever get again, and 2) of those the child has not had, which ones might he ever get. Both scores were significantly related to long-run appointment-keeping and potential susceptibility was related to knowledge about the medication. Mothers who felt that their children contract illness easily and often, and who saw illness as an important threat to

children in general, were also more likely to keep appointments and to administer the medication. Study measures of general health motivation consistently predicted long-run appointment-keeping behavior.

Together, the variables depict the compliant mother as one who worries about her child's health, who perceives him as easily and often ill, who brings him to the doctor at the first sign of sickness, and who takes steps to maintain his good health. The severity score predicted compliance with the medication regimen, but not with appointment-keeping behavior. Finally, each mother indicated the extent to which the present illness would interfere with both the child's and her own activities; the correlations show the latter measure to be the more useful because of its ability to predict knowledge, giving of medicine, and appointment-keeping behavior. The mothers evaluation of the degree to which doctors could help or cure each illness on the list described earlier proved to be significantly correlated with appointment-keeping behavior.

Becker and associates (1972) further conclude that "the mother may be shown to be generally concerned about health matters, to be threatened by her child's present illness, and to believe that a particular action will reduce that threat, her readiness to take the recommended health action remains subject to modification by a variety of powerful factors" (p. 848).

A higher level of satisfaction with the clinic (convenience and accessibility) increased the probability of the mother's giving the medicine and keeping both immediate and future appointments. The

presence of more persons in the home predicted long-run appointment-keeping behavior. Age, marital status, education were not useful in predicting compliance.

The authors (Becker et al., 1972) concluded that "the model appears to be useful in the explanation and prediction of compliance with pediatric medical regimens. Whether at a general level or at a level dealing with a specific illness, factors are found which are related to compliance knowledge and behavior" (p. 851).

Limitations of the study were a sample of primarily lower socioeconomic, non-white women and grandmothers obtaining free medical care from a single clinic. The study was conducted with an interview format, however, the authors concluded this procedure did not ultimately influence compliance and attitudes as evidenced by subsequent low compliance rates.

Aho's (1977) study of the relationship of wives' preventive health orientation to their beliefs about heart disease in husbands looked at levels of preventive health orientation on a continuum from low to high. The study variables (susceptibility, severity, benefits and barriers), like those of the present research, are once removed from the potentially ill person. Analysis focused on the relationship of these four variables to the likelihood of a wife's taking preventive health action.

The wives' (n = 199) preventive health orientation was cross-tabulated with several variables in the Health Belief Model (Becker, 1974) and also with several sociodemographic variables.

Emphasis was placed on the wives who ranked low ($n = 35$) on the preventive health orientation continuum since these people would be of most concern to health educators and providers. Compared with the medium-ranked ($n = 77$) and high ranked ($n = 75$) respondents, fewer of the low-ranked group a) had ever suggested any health-related behavior to their husbands, b) felt that their husbands were very susceptible to heart disease, or 3) believed that treatment was very effective. The wives in this group, nevertheless, considered heart disease to be a serious condition that would reduce a person's chances of living a normal life.

Statistically significant support was found for the relationships between the wives' preventive health orientation and their perceptions of a) the seriousness of heart disease, b) their husband's susceptibility to it, c) the effectiveness of treatment, and d) the disease's preventability, as well as between the orientation and place of residence, years of education, and both respondent's and husband's age. These relationships, however, were not very strong.

Results tend to be consistent with Becker's et al. (1975) observations of higher levels of perceived seriousness among non-participants in a genetic screening program. Previous research has consistently indicated that when severity is perceived as either very high or very low, maladaptive behavior may occur (Rosenstock, 1974).

Additional questions were asked on wives' sources of information. Magazines and television headed the list for each of the three categories. The role immediate families, relatives, friends and neighbors played in supplying information was small.

This study does provide some support for the relevance and usefulness of several of the variables in the Health Belief Model as previously described, particularly as it addresses the evaluation of those individuals once removed from the potentially ill person.

In summary, the Health Belief Model shows susceptibility plus severity equals threat or readiness to take action. Benefits minus barriers equals possibility of threat reduction. A person's willingness to take action, which is determined by that individual's perceived likelihood of susceptibility to an illness and by his or her perceptions of the probable severity of consequences to contracting the illness. An individual's estimate of benefits (in reducing susceptibility) and/or severity are weighed against that person's perception of the barriers involved in the action. Those barriers may be psychological, physical and/or financial.

Modifying and Motivational Factors

Langlie (1977) explored the relationships of preventive health behavior to several modifying and motivational variables, including socioeconomic status, cosmopolitan versus parochial orientation, ability to control one's life versus a belief in the power of external forces and beliefs in the value of health. Langlie (1977) agreed with Rosenstock's (1974) hypothesis that the preventive Health Belief Model would have greater applicability to middle-class individuals who exhibit goal-oriented, future-directed behavior, than to low-income individuals who supposedly opt for immediate gratification.

A random sample of the adult population of Rockford, Illinois were questioned by mail with a 62% return rate of 383 subjects. Preventive health behaviors measured by Langlie included driving habits, smoking, exercise, nutrition and preventive medical and dental check-ups. Perceived susceptibility, benefits, and barriers were measured. Severity was excluded due to earlier failure to prove its significance in studies of preventive health behavior.

Langlie's (1977) findings were generally consistent with the predictions based on previous work with the preventive Health Belief Model in terms of sociodemographic data. Individuals who engaged in preventive health behavior tended to be of high socioeconomic status, to interact frequently with others, to have positive attitudes towards health care providers, to believe they could control their own lives and to be older and female. Conversely, those who exhibited few signs of engaging in preventive health behavior tended to originate from the parochial group and were low income. Langlie (1977), unlike Rosenstock (1974), found no substantiation for the belief that high perceived susceptibility led to increased preventive health behavior. Both Rosenstock (1974) and Langlie (1977) conclude that the person of low-income and/or ethnic origin is less likely to engage in preventive health behavior than the middle-class white.

Bullough (1974) hypothesized that the low income individual faced social alienation/isolation which translated itself into feeling of powerlessness and hopelessness, with subsequent psychological barriers, either real or imagined; and which ultimately hindered preventive

health care behavior. Bullough (1972) further asserts that poverty is negatively related to utilization of health care and may be better explained by this concept of social isolation. While ethnic minorities, poverty and social isolation do not have direct implications for the present research, it does lend credence to the aspect of sociodemographic and other modifying factors.

The concept of "cues to action" as a significant modifying factor became evident in an earlier prospective study by Kirscht et al. (1966) which analyzed beliefs and behaviors of 1,500 persons followed by a repeat survey of 589 persons 15 months later. Data were collected on cancer, tuberculosis, tooth decay and gum disease from a stratified multi-stage probability sample of adults in 70 geographic areas of the U.S. Personal interviews were conducted and information gathered on toothbrushing behavior over the past day, dental visits over three years, preventive medical check-ups over five years, and tuberculosis and cancer screening over 10 years. Complete data were gathered on only 297 persons. Those individuals who took one preventive action were found to be likely to engage in another preventive health care behavior. However, there were no significant correlations between susceptibility, severity or benefits and the four types of preventive action.

The subjects were also compared for actions in relation to sociodemographic factors. It was found that those persons with higher income, education, and job status were more likely to undertake preventive actions, even relatively inexpensive ones such as

toothbrushing. Kirscht et al. (1966) noted the similarity of these findings to those of other studies and concluded that more than knowledge and an ability to pay are included in preventive health behavior. Persons at varying socioeconomic levels possess different socially defined views of what is appropriate behavior, and that these views determine what action they will manifest.

Rosenstock (1974) went on to hypothesize that the lack of correlation between the Health Belief Model variables and actions as manifest in the Kirscht et al. (1966) study may have been related to the absence of a direct stimulus to take preventive action. Previous studies cited some incentives to seek preventive care as accessibility (Hochbaum, 1958) or prepaid health plans (Kegeles, 1963). In contrast, Kirscht et al. (1966) nationwide sample had not been exposed to intensive health teaching nor was free or easily accessible health resources offered. Thus, Rosenstock (1974) concluded that "cues to action" at the time of the earlier studies may have been a significant variable which affected behavior.

Two more studies lend further support to the general explanatory model of health behavior. Haefner and Kirscht (1970) attempted experimentally to increase readiness to follow preventive health practices by presenting communications about selected health problems. These messages were intended to increase both perceived susceptibility and/or severity regarding the health problems, and beliefs in the efficacy of professionally recommended behavior. Significantly more

persons exposed to such messages visited a physician for a check-up (in the absence of symptoms) in the eight months after the experimental manipulation than in a control group not exposed to the messages.

Fear arousal attempts to influence the person's perception of severity has only been effective in changing behavior in certain circumstances and then, only for a short period of time. It was assumed that if a person thought his/her disease was serious, he/she would be more likely to do something about it. However, fear arousal may immobilize the individual or incite denial. Alternately, a minimal amount of fear arousal may not be enough to motivate. Moderate fear arousal often appears to be the most effective, but fear messages must be accompanied by a specific action recommendation that the individual can take to reduce his fear (Becker & Maiman, 1975).

Personal sense of control over a situation is identified in Becker's et al. (1977) study of mothers of obese children which tested the efficacy of two levels of fear-arousing communications in enhancing regimen compliance. Subjects were randomly assigned to one of three groups: receipt of "high fear" (booklet), receipt of a "low-fear" message (booklet) with similar (but less threatening) information and receipt of usual care (control group). Fear arousal interventions were found to be significantly associated with weight loss. (Further analyses, however, demonstrated that when the effects of interventions were controlled, the HBM variables continued to significantly predict weight change.)

Leventhal, et al. (1965) have concluded that once a person has reached some subjective threshold of fearfulness, it is doubtful that any attempt to increase perceived severity will lead to further acceptance of health recommendations.

In a more recent work, the Health Belief Model was adapted to measure compliance with an insulin-dependent diabetic regimen. The thirty subjects were comprised of male and female patients between 18 and 73, with 80% of the subjects being over the age of 50. The subjects were interviewed in their homes to obtain data about the patient's compliance levels, health beliefs, as well as demographic data. "Three items were used to measure each of the five aspects of the Health Belief Model (perceived susceptibility, perceived severity, and perceived benefits and perceived barriers to acquiring health care and cues to action)" (Cerkoney & Hart, 1980, pg. 395). Responses to each item were made on a five-point Likert scale, where subjects indicated their degree of agreement with the statement. Maximum score possible on the measurement tool was 61 with this group's scores ranging from 36 to 55.

Cues to action included in the study were adherence to diet, using diabetic exchange lists, foot care (both by observation and self-report), carrying a source of sugar, ability to describe the signs and symptoms of hypoglycemia and the wearing of a diabetic identification band. There was found to be a correlation between health beliefs and compliance with this group of subjects. Those subjects who perceived their disease to be serious, and responded to cues, were more compliant

with their diabetic regimen than those subjects who neither perceived their disease to be serious nor responded to cues (Cerkoney & Hart, 1980).

In this same study "cues to action" were found to be the aspect of the Health Belief Model that had the highest correlation with health seeking behaviors. Susceptibility, severity, treatment benefits and barriers had a correlation of 0.5 or better when measured against a composite of the level of health belief. The ability to generalize these findings is limited due to the use of a small, non-random group of subjects, the retrospective nature of the study, and the arbitrary doubling of the compliance scores obtained by investigator observation.

In summary, other factors have been found to influence preventive health behavior. Correlations between the Health Belief Model dimensions and actions may be related to other modifying variables which ultimately provide the motivation to take action. Some of these factors include a preventive health orientation as defined by one's ethnic group and/or socioeconomic status. Additionally, a direct stimulus may be necessary to take action. Such a stimulus, or "cue," may include overt messages (postcards, telephone calls, media) which change one's perception of susceptibility and/or severity and thus providing the incentive to take an action.

Summary

Due to the effectiveness of past immunization campaigns, an apathetic public has developed which has not been confronted with the side effects of potentially serious communicable disease in their

children. This problem has been amplified by the recent spate of popular press releases related to the potentially serious side effects of vaccines. Subsequent moral and legal issues have been raised both by parents and politicians. In this chapter, studies have been reviewed in an attempt to understand a parent's perception of preventive health measures. The HBM has been reviewed as a tool whereby one might understand and thereby predict parents' preventive health behavior related to their children. Janz and Becker (1984) state that "despite the impressive body of findings linking HBM dimensions to health actions, it is important to remember that the HBM is a psychosocial model; as such, it is limited to accounting for as much of the variance in individuals' health-related behaviors as can be explained by their attitudes and beliefs" (Janz & Becker, 1984, p. 45).

In summary, as presented in the literature, investigators have studied, almost exclusively, mothers preventive health care behavior for themselves and/or their family. No research has been found which addresses a father's preventive health behavior in relation to his children. Additionally, no research has been found related to the comparison of mothers and fathers perceptions of vaccines and immunizations. The major limitation of the HBM at this time is the lack of standardized scale development and scoring for each dimension. Additionally, no particular intervention strategies for altering these dimensions has been done.

Chapter IV

METHODOLOGY*

Overview

In this research, an attempt is made to describe similarities and differences in parental perceptions (mothers vs. fathers) concerning childhood disease and vaccines, and to identify their intent to acquire immunizations for their children. Parents' perceptions of their child's susceptibility to specific illnesses, perceptions of the severity of that illness, belief in the benefits of preventive health services, and general health motivations along with "cues to action" are the study variables derived from the preventive Health Belief Model (Becker, et al., 1977). Potential modifying variables such as age, education level, income, ethnicity, and number of children are assessed on a self-report demographical questionnaire. The techniques for analysis of the data include both descriptive and correlational statistics.

The purpose of this chapter is to present the methodology and procedures utilized in this research study. The sample, setting, data collection procedure with human rights protection, development of an instrument, scoring techniques and procedures for data analysis are discussed. The research hypotheses are, thus, presented as an introduction to a discussion of the methodology.

*This chapter is written in collaboration with O'Connor (1985).

Hypotheses

Hypothesis I: There is a positive relationship between a mother's perception of susceptibility to common childhood disease and the intent to acquire immunizations for a child.

Hypothesis II: There is a positive relationship between a mother's perceptions of the severity of common childhood disease and the intent to acquire immunizations for a child.

Hypothesis III: There is a positive relationship between a mother's perceptions of benefits of a vaccine and the intent to acquire immunizations for a child.

Hypothesis IV: There is an inverse relationship between a mother's perception of the barriers to immunization and the intent to acquire immunizations for a child.

Hypothesis V: There is a positive relationship between mothers' perceptions of susceptibility to common childhood disease and fathers' perceptions of susceptibility to common childhood disease.

Hypothesis VI: There is a positive relationship between mothers' perceptions of severity of common childhood diseases and fathers' perceptions of severity of common childhood diseases.

Hypothesis VII: There is a positive relationship between mothers' perceptions of benefits of a vaccine and fathers' perceptions of benefits of a vaccine.

Hypothesis VIII: There is a positive relationship between a mothers' perception of the barriers to immunization and fathers' perception of the barriers to immunization.

Sample

The study participants were a time sample of 50 sets of parents drawn from all parents having just delivered an infant on the post-partum unit and who voluntarily agreed to complete study questionnaires. Questionnaires were administered and collected over a five-week time period (1 March to 6 April, 1985). The following were the criteria for selection:

1. Both parents (the biological father and mother) agreed to complete and return the questionnaire.
2. Both parents must share the same household.
3. Both parents must be age 18 or over.
4. Both parents must be able to read and write English.
5. The newborn infant would be "normal" i.e., no genetic defects or congenital malformations.

Because the sample was voluntary and not the result of random section, the results of this study can be generalized only to new parents possessing characteristics which are like those of the sample. Results should not be considered to be representative of all new parents.

Data Collection Site

A single site, located in a midwestern urban area with a population of approximately 250,000, was utilized in obtaining subjects for this study. One hundred study participants (50 sets of parents) were obtained from the post-partum unit of a 240-bed, acute care hospital. Approval and written permission were obtained from the hospital research committee (Appendix A) to allow patients to be contacted by the researchers.

Data Collection Procedure

The investigators ascertained the appropriateness of parents for inclusion in the study according to the previously listed selection criteria (Appendix B). It was explained to the parents that in an effort to better understand parents' beliefs about the health of their child, two graduates students (Heidi Froemke, R.N., and Lyn O'Connor, R.N.) from the Michigan State University College of Nursing were conducting a study. It was further explained that involvement in the study would require that both parents be given separate questionnaires that would take approximately 15 minutes of their time to complete. Those expressing interest were given two blank envelopes each containing a questionnaire (Appendix D) and an explanatory letter (Appendix C). Additionally, a consent form was provided for those parents who expressed a willingness to be contacted by telephone in 2 to 6 months time for follow-up (Appendix E). Because of the limited time available for data collection, mothers were approached for

inclusion in the study by the investigators. Questionnaires were left for both the mother and father with instructions for completion. Mothers were informed that should the father elect not to participate, both questionnaires should be returned unanswered.

Parents were assured that their names and all information on the questionnaire would be kept confidential. Parents were also informed that becoming a participant in the study would not change the medical treatment they were receiving and that they might withdraw from the study at any time. Those deciding not to take part in the study were thanked for their time and consideration. Parents had the opportunity to discuss, with the investigators, their participation in the study. For those parents deciding to participate, it was stressed that completion of both questionnaires (mother's and father's) was essential and that questionnaires should be filled out independently with no discussion of individual responses taking place. Parents were informed that the investigators would return every other day to collect completed questionnaire and to answer questions. Questionnaires not collected by the investigators were given to staff nurses by parents to be placed in a box on the unit.

A total of 83 children were born during the time in which data was being collected. Sixteen sets of parents were eliminated because they did not fit selection criteria. Thirteen sets of parents were approached by the investigators but declined participation in the study. Four sets of parents were missed due to early discharge. The length of stay for new mothers ranged from one to seven days. Verbal

consent to participate in the study was received from 166 parents. Of those who consented to participate, 100 parents returned completed questionnaires. Of those who returned questionnaires, 27 signed consent forms to be contacted by telephone in two to six months. Consent forms returned for the purpose of follow-up were retained by the investigators for future research.

Development of the Instrument

The instrument used was a modification of the preventive Health Belief Model by Becker, et al. (1977). The original questionnaire was developed to be used in an interview situation with mothers of newly diagnosed obese children. Questions covered five subscales reflecting susceptibility, severity, benefits, barriers, and modifying factors. Alpha coefficients for the Health Belief Model subscales employed in the study were above .90 for the category of perceived susceptibility and perceived severity, over .80 for perceived benefits, .70 for general health motivation and over .50 for perceived barriers.

The low coefficient for barriers was felt by the original investigators to be the effect of individuals having to make an immediate assessment about a future problem/event, resulting in a lower internal consistency. Subsequent studies, using further modifications of the Health Belief Model and perceptions to barriers and asking individuals to make an assessment of a problem in "here and now," have been shown to have higher coefficients (Becker, 1984; Cerkoney & Hart, 1980).

The modified instrument, utilized by the present researchers, contains items adapted from the original questionnaire of Becker et al. (1977), after consultation with Marshall Becker and a review of the literature. The present instrument contains 50 items which measure each of the major perceptual subscales. In an effort to develop questions relevant to the study population, alternative questions for the subscale of barriers were asked. Also included were sociodemographic questions. The scale was placed on a four response alternative Likert-type format. The major perceptual variables are: perceived susceptibility to a disease (11 items), perceived severity of all illness (11 items), perceived benefits of preventive health measure (11 items), perceived barriers of preventive health measures (8 items), general health motivations (4 items) and "cues to action" (5 items). Potential modifying factors are assessed through collection of sociodemographic data and are used to characterize the nature of the obtained sample. All questions were positively worded to avoid participant confusion.

Operational Definitions of the Study Variables

In order to describe parental perceptions regarding the health of their child, a modification of the Health Belief Model questionnaire developed by Becker et al. (1977) was used (Appendix D). Parents' responses were assessed by summing items on a questionnaire designed to look specifically at the following categories:

Perceived Susceptibility

Perceived susceptibility is the subjective risk of contracting an illness or condition. parents' perceptions of their child's susceptibility to specific illnesses were evaluated by 11 questions. Specifically, these questions include numbers 20, 21, 28, 29, 30, 31, 32, 42, 43, 53, 54.

Perceived Severity

Perceived severity is the degree of worry created by the thought of a disease as well as by the kinds of difficulties an individual believes a given health condition will create for them and/or the medical/clinical consequences of a health problem. Parental perceptions of the severity of specific illnesses or conditions were evaluated by responses to questions 22, 26, 27, 33, 34, 36, 37, 38, 41, 48, 58.

Perceived Benefits

Perceived benefits is the belief that a given action will be effective in reducing the threat of a disease. Belief of parents in the benefit of preventive health measures are evaluated by responses to questions 35, 39, 40, 44, 45, 49, 50, 51, 52, 56, 57.

Perceived Barriers

Perceived barriers is the belief that an action itself may be inconvenient, expensive, unpleasant, painful or upsetting, resulting in avoidance. Perceptions of parents of the barriers to obtaining preventive measures were evaluated by responses to questions 46, 47, 55, 59, 61, 62, 63, 64.

General Health Motivations

General health motivation states that frank motives towards good health do exist. Such motivations are evaluated by responses to questions 23, 24, 25, 65.

"Cues to Action"

"Cues to action" are those critical incidents which propel or motivate an individual to take an action or preventive health behavior. "Cues to action" are evaluated by responses to questions 16, 17, 18, 19, 66.

Modifying Factors

Modifying factors are those sociodemographic, developmental and general background questions which characterize the nature of the sample. Modifying factors are identified by parents' responses to questions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

Intent to Acquire

The intent to acquire is a positive or negative indication about one's intentions to have a child immunized and is measured by parents' responses to question 67 and 68.

Scoring

Responses to each question were given a numerical score. An arbitrary point value from 1 to 4 was assigned to each variable's response format: strongly disagree (1 point); disagree (2 points); agree (3 points); and strongly agree (4 points). Parents' perceptions of susceptibility, severity, benefits, barriers, and general health

motivations were operationally defined as high or low on the basis of total score for each subscale created by summing individual items. Total point values for each category ranging from high to low were: perceptions of susceptibility (11 to 44 points); perceptions of severity (21 to 44 points); perceptions of benefits (11 to 44) points; perceptions of barriers (8 to 32 points); and general health motivations (4 to 16 points). Parents' perceptions were operationally defined as high or low on the basis of mean scores obtained for each subscale. "Cues to action" and modifying factors were not placed on a Likert format and were, thus, analyzed descriptively. Intent to acquire was scored by responses to a yes/no question.

Pretest of Instrument

A total of eight individuals who did not participate in the study critiqued the instrument at several stages of its development for readability and clarity of instructions and questions. A subsequent pilot study of eight sets of parents indicated that sample selection, procedure and instrument required no revisions. The study was conducted utilizing the format presented in this chapter.

Statistical Analysis of Data

Sociodemographic/economic data and information regarding family size, immunization status of other children and other background information were analyzed using descriptive statistics. The range,

mean and percentages, along with tables summarizing frequencies of sociodemographic categories and other related factors are presented in Chapter V.

Because all hypotheses in this study consisted of statements of hypothesized correlations between study variables, a correlation matrix was constructed to correlate each of the Health Belief subscales. The level of significance was set at .05 for the Pearson Product Moment Correlation. Mothers responses were compared to fathers responses utilizing paired t-tests to determine the significance of mothers perceptions of susceptibility, severity, benefits, barriers and general health motivation when compared to the perceptions of fathers along the same dimensions.

Protection of Human Rights

Specific procedures were followed to assure the rights of study participants were not violated. Approval of the human rights protection procedures was granted by the Michigan State University Human Subjects Review Committee on February 6, 1985 (Appendix D). On January 24, 1985, approval for clinical investigation was granted by the site hospital's Human Subjects Committee (Appendix A). An attempt was made by the investigators to contact physicians of those patients qualifying for inclusion in the study for the purpose of explaining the research study.

An explanation of the research study and goals, the approximate time involved in participation, the nature of the questions to be encountered and assurances of anonymity were provided each participant as part of the letter of explanation (Appendix C). Number-coded questionnaires were separated from patient-identifying data upon receipt by the investigators and all data were transcribed in aggregate form for computer analysis.

Study Division

The first four chapters of this investigative study have been written in collaboration with O'Connor (1985). Chapter V and VI are written separately. Froemke presents an analysis of the data and implications related to mother's responses to questionnaire items. O'Connor (1985) presents an analysis of the data and implications for fathers' responses to questionnaire items. Both investigators, jointly, will include in Chapter V and VI an analysis of the correlations between mothers' and fathers' responses to study variables as identified by the study hypothesis.

Summary

A discussion of the methodology utilized in this study was presented in Chapter IV. A detailed discussion of the sample, collection site, questionnaire, human rights protection, procedures, and statistical analysis strategy was presented.

In Chapter V, the sample will be described. The reliabilities obtained for the Health Belief instrument will be presented. Values obtained for study variables and correlations between variables will be presented in relation to specific hypotheses.

CHAPTER V

DATA PRESENTATION

Overview

The purpose of this study is to describe parental perceptions of childhood diseases and vaccines as they influence their intent to acquire immunizations for their child/children.

In this chapter, data which describes the study sample and addresses the research hypotheses are presented. The study sample is described by age, sex, race, marital status, education, income and area of residence. Additional descriptive data, although not directly related to the study variables are presented to broaden the description of the sample to include number of other children and their immunization status, where those immunizations were received, and those sources influencing parental decision making. Data pertaining to the research hypotheses are based on the scores generated from the individual scales of the Health Belief Model including perceived susceptibility, perceived severity, perceived benefits, perceived barrier, and general health motivation.

Several statistical analysis techniques were used to analyze the data. Descriptive statistics include frequencies, percentages, means, modes, ranges and standard deviations. Inferential techniques used were chi-square and t-test for independent samples. The data are presented as follows: descriptive data pertaining to the sample, reliability data, and descriptive and inferential data pertaining to the research hypotheses.

Descriptive Analysis of Data

Study Sample

The sample consisted of 50 sets of new parents in the post-partum unit of a midwestern, urban hospital. All parents meeting the selection criteria between March 1, 1985 and April 6, 1985 were approached by the investigators for inclusion in the study. Study subjects reported in this investigation include all mothers. All father data collected in the investigation is reported by O'Connor (1985).

Sociodemographic Descriptors

The sociodemographic descriptors used in the present study were age, race, marital status, education, income and area of residence (see Table 1 for frequencies and percentages). The age of the study subjects ranged from 19 to 37 years with a mean age of 27.4 years and a standard deviation of 4.8 years (see Table 1).

Table 1
AGE DISTRIBUTION OF MOTHERS

Age	N	Percentage
19-24	16	32.0
25-30	22	44.0
31-37	<u>12</u>	<u>24.0</u>
TOTAL	50	100.0

Ninety percent ($n = 45$) of the sample was white. The remaining 10 percent ($n = 5$) was distributed fairly evenly across five other race categories (Black, Mexican-American, American Indian, and Middle-Eastern) (see Table 2).

TABLE 2
DISTRIBUTION OF MOTHERS RACE

Race	N	Percentage
White	45	90.0
Black	1	2.0
Mexican-American	2	4.0
American Indian	1	2.0
Other (middle-Eastern)	<u>1</u>	<u>2.0</u>
TOTAL	50	100.0

Ninety-four percent ($n = 47$) of the sample was married while 6 percent ($n = 3$) were single, but currently living in the same household with this baby's father (see Table 3).

Fifty-two percent ($n = 26$) of the study subjects lived in an urban area at the time of this hospitalization. Twenty percent ($n = 10$) lived in suburban areas and 28% ($n = 14$) in rural areas (see Table 4).

TABLE 3
DISTRIBUTION OF MOTHERS MARITAL STATUS

Marital Status	N	Percentage
Married	47	94.0
Single	<u>3</u>	<u>6.0</u>
TOTAL	50	100.0

TABLE 4
DISTRIBUTION OF SUBJECTS BY AREA OF RESIDENCE

Area of Residence	N	Percentage
Urban	26	52.0
Suburban	10	20.0
Rural	<u>14</u>	<u>28.0</u>
TOTAL	50	100.0

The education level of mothers was distributed across five categories. Two percent ($n = 1$) had not finished high school, 32 percent ($n = 16$) completed high school while 36 percent ($n = 18$) had some college education. Twenty percent ($n = 10$) and graduated from college while 10 percent ($n = 5$) had done postgraduate work (see Table 5).

TABLE 5
DISTRIBUTION OF MOTHERS EDUCATION

Education	N	Percentage
Some high school	1	2.0
Graduated high school	16	32.0
Some college	18	36.0
Graduated college	10	20.0
Postgraduate	<u>5</u>	<u>10.0</u>
TOTAL	50	100.0

Household income ranged from less than \$5,000 a year to more than \$40,000 per year with a median of \$35,000 and a mode of \$30,000 - \$39,999 per year (see Table 6).

Modifying Factors

Additional modifying factors include general background questions which characterize the nature of the sample. Sixty percent (n = 30) of the mothers had other children. The median number of other children was 1 with a range from 1 to 16 years and a mode of 2 years. Ninety-seven percent (n = 29) of these mothers stated that these other children had received immunizations while one did not respond. Of those who answered "yes", 100% (n = 29) stated their child/children had received DPT, 96% (n = 28) identified both polio and MMR as having been given. Thirty percent (n = 9) received those immunizations from the

TABLE 6
PARENTS COMBINED ANNUAL HOUSEHOLD INCOME

Income	N	Percentage
0 - \$ 9,999	8	16.0
\$10,000 - \$19,999	5	10.0
\$20,000 - \$29,999	12	24.0
\$30,000 - \$39,999	16	32.0
> \$40,000	<u>9</u>	<u>18.0</u>
TOTAL	50	100.0

Public health Department, sixty-three percent (n = 19) from a private physician and 3.3% (n = 1) from a hospital based child health center. Three percent (n = 1) did not respond.

Cues to Action

"Cues to action" are those critical incidents which propel or motivate an individual to take an action or preventive health behavior. Those influences upon a mothers' decision making concerning the health of her child include the nurse with 10% (n = 8), the physician 74% (n = 37), family and friends 42% (n = 21), spouse 74% (n = 37), magazines, books and newspapers 18% (n = 9) and self 80% (n = 40). Of these, the one which most influences the mothers decision making regarding the health of her child were the physician 54% (n = 27), herself 38% (n = 19) and spouse 4% (n = 2). Additionally,

70% (n = 35) of the sample had read or heard information about immunizations while 39% (n = 14) said this information was "against" immunizations. Twenty-eight percent (n = 14) had not read any information concerning immunizations. Only 20% (n = 10) specified that they had been given information regarding immunizations during this hospitalization.

Open-Ended Questions

The age at which mothers stated children should first be immunized ranged from one to 6 months with a mean age of 2.76 months and mode of 2 months. When mothers were asked to state why they would have their children immunized at these ages, reasons were grouped by the investigator according to the similarity of responses. Six major response categories were found. Reasons for giving immunizations at these times were as follows: "I don't know" 8% (n = 4), "whenever the doctor says" 36% (n = 18), based on baby's weight 2% (n = 1), "as soon as possible" 2% (n = 1), "because it's best for baby" 30% (n = 15) and "because of what I've read" 6% (n = 3). Sixteen percent (n = 8) did not respond.

When mothers were asked to share suggestions as to how health care providers might best help parents get immunizations for their children the following responses were given. Fourteen percent (n = 7) felt the consequences of not immunizing a child should be better explained to parents. Four percent (n = 2) wanted immunizations offered free, 4% (n = 2) wanted immunizations made a requirement by state law. Fourteen percent (n = 7) felt more education should be provided new parents



while still in the hospital. Four percent ($n = 2$) wanted immunizations provided in a way that was more easily accessible for parents. Sixty percent ($n = 30$) did not respond to this question.

In summary, mothers tend to be white, married, well educated, have higher socioeconomic status, and living primarily in an urban area. Additionally, family size was small with the majority of these other children having received their immunization through a private physician. Mothers cited the physician and self as the greater influences in making health care decisions concerning their child. Many (70%) read/heard information concerning immunizations. In response to the question concerning age at which a child should be immunized, mothers gave ages ranging from one to six months with a variety of reasons why children should be immunized at that age. Additionally, suggestions were provided by mothers for ways in which a health care provider might help parents to have their children immunized and which will be discussed later in the present chapter.

Dependent Measure-Intent to Acquire Immunizations*

Mothers were asked to state whether or not they planned to have their child immunized. Ninety-six percent ($n = 48$) of the mothers stated "yes" while 4% ($n = 2$) indicated they were "undecided." Additionally, a second indicator was selected in order to predict the probability that a mother would actually carry through on her intent to immunize. Mothers were asked to state at what age they would begin immunizing their child. For the present research, 2 months of age, as

*In collaboration with O'Connor (1985).



identified by the American Academy of Pediatrics, was selected as the "correct" response. Ages other than 2 months were considered to be "incorrect." Analysis on this variable is included later in this chapter and shows that while mothers have "good" intentions, they may have insufficient knowledge to carry through with the recommended immunization schedule.

Health Belief Model

The Health Belief Model was used as the organizing framework for this investigation. Parental perceptions regarding the health of their child were assessed by summing items on a questionnaire to look specifically at the following categories: perceived susceptibility, severity, benefits, barriers and general health motivation.

General health motivation states that frank motives toward good health do exist and may ultimately influence one's health care behavior. Therefore, while general motivation is not included as a part of the research hypotheses, it was measured on a subscale similar to the other HBM dimensions.

Factor Analysis of Health Belief Model Subscales

Varimax factor rotation was used to identify unidimensional concepts for the subscales of susceptibility, severity, benefits, barriers and General Health Motivation. Factor analysis of the instrument items was found to be not unidimensional with few of the items "falling into" the original five subscales as proposed by Becker

(1977). Instead, items fell into 14 different dimensions. No items were deleted from the instrument for the purpose of factor analysis. Confirmatory factoring was not done. Becker (1977) did not report that factor analysis of the instrument had been carried out. Alpha coefficients only, were identified in the presentation of the statistical analysis. For purposes of this study, the investigators will proceed with the analysis on the assumption that Becker (1977) developed the subscales conceptually. Therefore, it can only be established that items "hang together" conceptually.

Reliability of the Health Belief Model Instrument

The reliability of the instrument was measured by computing coefficient alpha, which is an indication of homogeneity or internal consistency and estimates the extent to which different subparts of an instrument are equivalent in terms of measuring the critical attributes (Polit and Hungler, 1978). The subscales of the Health Belief Model were evaluated individually for internal consistency; perceived susceptibility, perceived severity, perceived benefits, perceived barriers and general health motivation.

The initial analysis revealed a trend toward homogeneity among the item responses. That is, the responses tended to cluster under two of the four possible response categories with little spread over the whole spectrum of possibilities. Since the scores were not more evenly distributed within the four response categories, only moderately

reliable scales could be constructed (see Table 7). The subscale with the best reliability was "benefits" with a coefficient alpha of .84. That subscale having the lowest alpha was "barriers."

One item (Appendix D) was eliminated from the barrier subscale to yield an alpha coefficient of .23. Because the alpha coefficient was so low, the barriers subscale has been eliminated from further analysis in the present research. One item (Appendix D) was eliminated from the subscale of General Health Motivation to yield an alpha coefficient of .47 for mothers. Because scores on this subscale were not central to the research hypotheses and for subsequent analysis of data obtained for fathers (O'Connor, 1985), the General Health Motivation subscale was retained for further discussion. Scale intercorrelations were subsequently corrected for reliabilities following deletion of these items from the instrument.

TABLE 7
RELIABILITY COEFFICIENT ALPHAS
FOR THE HEALTH BELIEF MODEL SUBSCALES (MOTHER)

Subscale	Alpha	Item $\bar{X}$	Actual Range	Number of Items
Susceptibility	.78	3.1	23-41	11
Severity	.77	3.0	27-45	11
Benefits	.84	2.5	16-39	11
Barriers	.23	1.3	7-12	6
General Health Motivation	.47	3.1	6-12	3

TABLE 8
 RANGE, MEAN, MODE, S.D. OF HBM SUBSCALES FOR MOTHERS

Subscales	Actual Range of Scores	$\bar{X}$	Mode	S.D.
Susceptibility	23-41	33.7	33.0	3.6
Severity	27-45	36.6	35.0	3.7
Benefits	16-39	27.0	27.0	5.0
Barriers	7-12	8.5	8.0	0.8
General Health Motivation	6-12	9.3	9.0	1.3

Correlation Matrix

In general, the subscales were not correlated with each other. However, they did correlate moderately with the total (with the exception of "barriers"). Moderate correlations were contributed to be perfect correlations between a subscale with itself being included as part of the total. The correlation matrix indicates that a score on one subscale tended to reflect the total score. Statistically significant correlations were found between the subscales of severity and susceptibility (.346); GHM and susceptibility (.390); GHM and Severity (.306). Thus, responses on the subscale of severity predicted 10% of the variability in responses on the scale of susceptibility. Responses on the subscales of GHM predicted 10% of the variability in responses on the subscale of susceptibility and 9% of the variability for the subscale of severity.

TABLE 9
CORRELATION MATRIX FOR SUSCEPTIBILITY, SEVERITY, BENEFITS,
AND GENERAL HEALTH MOTIVATION

	Susceptibility	Severity	Benefits	GHM
Susceptibility	1.00			
Severity	.346*	1.00		
Benefits	-.139	-.057	1.00	
GHM	.390*	.306*	-.097	1.00
TOTAL	.561*	.617*	.566*	.398*

*Significant $p \leq .05$.

Presentation of the Data Related to the Research Hypotheses

In this section, descriptive and inferential statistics are presented as related to the individual research hypotheses.

Hypothesis 1: There is a positive relationship between mothers perceptions of susceptibility to childhood disease and the intent to acquire immunizations for a child.

Hypothesis II: There is a positive relationship between mothers perceptions of the severity of common childhood illnesses and the intent to acquire immunizations for a child.

Hypothesis III: There is a positive relationship between mothers perceptions of the benefits of childhood immunizations and vaccines and the intent to acquire immunizations for a child.

Because the question concerning the intent to acquire immunizations produced no variation in response, it was not possible to utilize Pearson Product Moment Correlations. Therefore, responses to all Health Belief Model dimension of perceived susceptibility, severity, and benefits, could not be shown to have a relationship to intent to acquire.

Comparison of Mothers and Fathers

In collaboration with O'Connor (1985) a descriptive analysis of both mothers and fathers is provided in relationship to sociodemographic descriptors, modifying factors, the research hypotheses, the dimension of General Health Motivation and the correct vs. incorrect age to begin immunizations.

Sociodemographic Descriptors

The age of study mothers ranged from 19 to 37 years with a mean age of 27.4 years. Fathers ranged in age from 21 to 38 years with a mean of 29.2 years. Ninety percent ($n = 45$) of the mothers were white

compared to 92% (n = 46) of the fathers. The remaining 10% of the mothers and 8% of the fathers were distributed fairly evenly across the five other race categories. Education for both mothers and fathers was distributed across five categories. Two percent (n = 1) of mothers and 8% (n = 4) of fathers had not finished high school. Thirty-two percent (n = 18) of mothers and 26% (n = 13) of fathers had completed some college. Twenty percent (n = 10) of mothers and 30% (n = 15) of fathers had finished college while 10% (n = 5) of mothers and 12% (n = 6) of fathers had postgraduate or professional education. Income did not differ between mothers and fathers as household, not individual, income was asked.

Thirty mothers and 30 fathers reported having other children with the number of children reported differing slightly. This was probably due to prior marriages with subsequent reconstituted families. Mean number of children for mothers was 1.1 and for fathers 1.8. In response to the question concerning previous immunizations for these other children 97% (n = 29) of both mothers and fathers stated these other children had immunizations. One hundred percent (n = 25) of the mothers and 86% (n = 25) of the fathers reported DPT as having been given, 96% (n = 28) of mothers and 74% (n = 23) of fathers reported oral polio. Ninety-six percent (n = 28) of mothers and 85% (n = 25) of fathers reported MMR. Seventeen percent (n = 5) of mothers and 10% (n = 3) of fathers reported other immunizations which included BCG and TB time tests. While mothers reported slightly more immunizations than fathers it was found to be statistically not significant.

When parents were asked to identify where their other child/children had received their immunizations the following answers were elicited: 65% (n = 19) of the mothers and 74% (n = 22) of the fathers identified the private physician, 30% (n = 9) of the mothers and 23% (n = 7) of the fathers stated the Public Health Department. Only 5% (n = 1) of the mothers and 3% of the fathers checked "other."

Parents were asked to check all of the sources of influence that helped them make decisions concerning their child's health care. The following information was elicited: 16% (n = 8) of the mothers and 24% (n = 12) of the fathers cited the nurse, 74% (n = 37) of the mothers and 78% (n = 39) of the fathers indicated the physician, 42% (n = 21) of the mothers and 48% (n = 24) of the fathers cited family and friends. Seventy-four percent (n = 37) of the mothers and 72% (n = 36) of the fathers indicated the spouse, 18% (n = 9) of the mothers and 10% (n = 5) of the fathers cited magazines or books while 80% (n = 40) of the mothers and 64% (n = 32) of the fathers cited themselves.

Seventy percent (n = 35) of mothers and 48% (n = 24) of fathers had read books, magazines, newspapers or heard over radio or television, information concerning immunization. Of these, 40% (n = 14) of the mothers and 33% (n = 8) of the fathers stated that this information had been "against" immunization. Twenty percent (n = 10) of the mothers and 20% (n = 10) of fathers stated they had received information regarding immunizations during this hospitalization. When asked if they intended to have this baby immunized 96% (n = 48) of the mothers

and 98% (n = 49) of the fathers said "yes." Four percent (n = 2) of the mothers and 2% (n = 1) of the fathers stated they were "undecided" about having this child immunized.

The age at which mothers stated children should first be immunized ranged from one to 6 months with a mean age of 2.76 months and a mode of 2 months. Fathers cited ages ranging from one to 12 months with a mean age of 4 months and mode of 2 months. Reasons for giving immunizations at these times are presented in Table 10.

TABLE 10
DISTRIBUTION OF MOTHERS AND FATHERS REASONS FOR
IMMUNIZING AT SPECIFIC AGES

	Mothers*		Fathers*		Total
	N	%	N	%	
I Don't Know	4	8	4	8	8
When Doctor Says	18	36	14	28	32
As Soon As Possible	1	2	2	4	3
Because it's Best for Baby	15	30	8	16	23
Because of Information Read	3	6	1	2	4
No Response	9	18	21	42	30

*Parents could provide more than one response.

Those parents who were "undecided" about having their baby immunized all stated that it was because of news articles they read and fear of bad reactions. When parents were asked to share suggestions as to how health care providers could help parents get immunizations for their children the following responses were given: 14% (n = 7) of the mothers and 4% (n = 2) of the fathers felt the consequences of not immunizing a child should be better explained to parents. None of the mothers, but 16% (n = 8) of the fathers were in favor of more publicity. Four percent (n = 2) of the mothers and 10% (n = 5) of the fathers wanted immunizations to be offered free of charge to parents. Four percent (n = 2) of the mothers and 2% (n = 1) of the fathers wanted immunizations to be made required by state law. Fourteen percent (n = 7) of the mothers and 8% (n = 4) of the fathers felt that more education should be provided while parents were in the hospital. Four percent (n = 2) of the mothers and 6% (n = 3) of the fathers wanted immunizations provided in a way that was more easily accessible for parents. Sixty percent (n = 30) of mothers and 54% (n = 27) of fathers did not respond.

In Table 11, mothers and fathers mean scores for each of the subscales are presented. In addition, t-tests, as a test of significance between groups means, are identified. Statistical significance was not reached as a result of a lack of variability in both mothers and fathers responses. Both mothers' and fathers', however, scored similarly for each of the dimensions.

TABLE 11
T-TESTS ON MATERNAL VS. PATERNAL RESPONSES
TO THE HEALTH BELIEF MODEL SUBSCALES

Subscale	Mothers		Fathers		t-test*
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	
Susceptibility (11-44)	33.7	3.6	33.7	4.1	.03
Severity (11-44)	36.6	3.7	36.2	4.0	-.56
Benefits (11-44)	27.0	5.1	27.1	4.2	.11
Barriers (6-24)	8.5	0.8	8.5	0.9	1.00
General Health Motivation (3-12)	9.3	1.3	8.8	1.3	.067

*No t-tests were significant.

In summary, no sociodemographic differences were found between mothers and fathers. Fathers tended to have more children than mothers. Fathers reported slightly fewer immunizations for these children than mothers. Mothers had read or heard slightly more information concerning immunizations and relied more on themselves for health care decisions. More mothers knew the correct age to begin immunizations.

Hypothesis V: There is a positive relationship between mothers perceptions of susceptibility to childhood disease and fathers perceptions of susceptibility to common childhood disease.

Eleven items were utilized in the analysis of perceived susceptibility. Each item could be scored from 1 to 4, rendering a total possible score from 11 to 44 for each mothers and father (see Table 8). For mothers the mean score for susceptibility was 33.7 and for fathers 33.7. Because of the lack of variability in response between mothers and fathers, the hypothesis can be neither accepted nor rejected.

Hypothesis VI: There is a positive relationship between mothers perceptions of severity of childhood disease and fathers perceptions of severity to common childhood disease.

Eleven items were utilized in the analysis of perceived severity. Each item could be scored from 1 to 4, rendering a total possible score from 11 to 44 for each mother and father (see Table 8). For mothers the mean score for severity was 36.6 and for fathers 36.2. Because of the lack of variability in response between mothers and fathers, the hypothesis can be neither accepted or rejected.

Hypothesis VII: There is a positive relationship between mothers perceptions of benefits for childhood immunizations and vaccines and fathers perceptions of childhood immunizations and vaccines.



Eleven items were utilized in the analysis of perceived benefits. Each item could be scored from 1 to 4, rendering a total possible score from 11 to 44 for each mother and father (see Table 8). For mothers the mean score for benefits was 16.6 and for fathers 16.3. Because of the lack of variability in response between mothers and fathers, the hypothesis can be neither accepted or rejected.

General Health Motivation

In an effort to remain consistent with the presentation of data for fathers, items number 65 (see Appendix D) was deleted and a coefficient of .47 obtained. 'As for 'barriers' the scale was collapsed from a 4 to 2 response format - 'agree' and 'disagree.' These three items were utilized in the analysis of general health motivation. Each item could be scored from 1 to 4, rendering a total possible score from 3 to 12 for each mother and father (see Table 10). For mothers, the mean score for GHM was 9.3 and for fathers 8.8 ($t = -1.86$, $p = .067$). Although not statistically significant, a trend was found indicating that mothers had a slightly higher perception of general health motivation than fathers" (O'Connor, 1985, p. 106).

Correct vs Incorrect Age

"Although correlations could not be accomplished due to the lack of variability on the response concerning intent to acquire immunizations, an additional question concerning age at which immunizations should be started revealed a wide range of responses from 1 to 12 months of age.

Twenty percent ($n = 10$) of the mothers and 10% ($n = 5$) of the fathers stated the correct age of 2 months. Fourteen percent ($n = 7$) of the mothers and 12% ($n = 6$) of the fathers stated incorrect ages ranging from 1 - 12 months. Sixty-six percent ($n = 33$) of the mothers and 78% ($n = 39$) of the fathers did not respond to the question concerning age.

Response to correct age vs. incorrect age was correlated with those parents already having other children and those for whom this child was their first. Twenty-seven percent ($n = 8$) of those mothers having other children gave the correct age of two months and 10% ($n = 2$) of first-time mothers gave the correct age. Thirteen percent ($n = 4$) of those fathers having other children gave the correct response while 5% ($n = 1$) of first-time fathers stated the correct age. Although no statistical significant difference was found between first-time and other parents and the statement of correct age ($t = -1.02$, $df = 98$, ns), a pattern is observed which has further implications for the present research.

Seventy percent ($n = 35$) of the mothers and 48% ($n = 24$) of the fathers had read or heard information concerning immunizations. Of these parents, 22% ($n = 13$) who stated the correct age had read information. Only 5% ($n = 2$) of those who failed to read any information gave the correct age. Those parents who read information were more accurate in identifying the correct age to begin immunizations ($p \leq .05$).

No statistically significant level could be reached when correct vs. incorrect age was correlated with the individual Health Belief Model dimensions of perceived susceptibility, severity, benefits, and barriers" (O'Connor, 1985, p. 106-108).

Summary

In Chapter V, data were presented which describe the characteristics of the sample, modifying factors and "cues to action." Data were presented concerning each of the four hypotheses related to mothers perceptions of susceptibility, severity, benefits, barriers and general health motivation, and were analyzed with both descriptive and inferential statistics. Using the Coefficient Alpha, reliable scales were found only for the subscales of susceptibility, severity and benefits. In addition, demographic variables modifying factors and cues to action were presented comparing mothers and fathers. Data were presented concerning each of the four hypotheses comparing mothers and fathers. None of the hypotheses could be tested due to a lack of variability in responses concerning intent to immunize.

Mothers having other children was a poor predictor of one's ability to cite the correct age for beginning immunizations. No statistically significant correlations could be found between sociodemographic variables, the HBM dimensions and a mothers ability to state the correct age. Additionally, no mother saw the nurse as most influencing

her decision to immunize. Mothers, unlike their spouses, were more likely to rely on themselves to make health care related decisions and also scored higher on the dimension of general health motivation.

An overall summary of the research study and findings is presented in Chapter VI.

CHAPTER VI

SUMMARY, INTERPRETATION, AND IMPLICATIONS OF FINDINGS

Overview

In Chapter VI, a summary and interpretation of the research findings are discussed. Implications for nursing education and practice along with recommendations for future research are offered.

Summary and Interpretation of Findings

The age distribution for the subjects in the present research sample was 10 to 37 years with a mean age of 27.4 years. This is comparable to the study done by Burney and Cook (1983) who found mothers having a mean age of 25 years. However, those mothers who did not have their children immunized were slightly older with a mean age of 28 years. This was dissimilar to a study done by Fleming et al (1969) which found mothers ranging in age from 15 to 45 years. Becker (1972) using a sample of mothers and grand mothers with ages ranging from 14 to 70, found age to be a poor predictor of compliance behavior. Markland and Durand (1976) stated that those mothers considered to be "high risk" - consistently not obtaining immunizations for their children - were at the "lower age levels."

Ninety-four percent (n = 47) of the present sample was married with only 6% (n = 3) being single. All mothers, however, were currently living in the same household with this baby's father as specified by the investigators in the selection criteria. A two-parent household was considered to be a significant factor in assuring that both parents

had the opportunity for the shared responsibility of the child. Becker (1972) found that the presence of more than one person in the home predicted long-run appointment-keeping behavior, perhaps reflecting the convenience of having another adult to stay with the other children while mother took the child to the clinic. Further, Becker (1972) states that marital status was a poor predictor of other compliance behavior (knowledge of medications, medication schedules, follow-up dates). Burney and Cook (1983) found that single mothers had a higher percentage of vaccinated children (74%, n = 35) than married (64%, n = 81) although this did not reach a level of statistical significance and was not seen to be a reliable predictor of immunization behavior.

Mean household income for the present research subjects was \$25,000 per year with a mean educational level of "some college." Rundall and Wheeler (1979) studied the effect of income on preventive health care and found a mean income of \$12,500 per year with the average respondent having some college education. They also found that "low-income" individuals were less likely to seek out preventive care than "high-income" individuals. Martin et al (1969) found that those mothers with higher incomes (> \$3,000) and higher education (> 10th grade) had significantly better immunization levels in their children. Burney and Cook (1983) identified mothers by "social class" in Britain. Those described as being in the "nonmanual" class had higher immunization rates than those in the "manual" class. Markland and Durand (1976) stated that those populations with low immunization levels were found to have mothers with "lower educational levels."

Some investigators have looked at the geographic residence of parents. The present research involved mothers whose place of residence was urban or suburban 72% (n = 36) and rural 28% (n = 14). Martin et al. (1969) found those families residing in rural areas to have lower immunization levels associated with lower socioeconomic status and education. Markland and Durand (1976) looked at urban, suburban and rural areas of residence as potential factors in poor immunization status, but found no significant difference among the three geographic areas.

In the present research 60% (n = 30) of the mothers had other children with a mean family size of 1.1 children. This was slightly smaller than Rundall and Wheeler (1979) who found mean family size to be 2.73 children, but ultimately having no significant effect on preventive health behaviors. Markland and Durand (1976) stated only that "larger families" were found to be inadequately immunized. Becker (1972) found that while the presence of another person in the household predicts long-run appointment-keeping behavior, it was not significant in predicting other areas of compliance involving knowledge. Martin and associates (1969), however, found greater parity to be an attribute of those families with inadequate immunizations. Mean family size was not provided. However, as the number of children in the family increased from one to three or more, the number of inadequately immunized children quadrupled. In the present research, the presence of other children did not significantly correlate with a mother success at identifying the "correct" age for immunization although they did cite more side effects.

Ninety percent (n = 45) of the present sample was white, with the remaining 10 percent distributed fairly evenly over four other ethnic categories. Burney and Cook (1983) found their sample to 65% (n = 82) white with the remainder identified simply as "other." Slightly more "other mothers (74%) than caucasians (60%) carried through on their initial intention to immunize. Becker's (1972) sample included 122 white mothers with only three blacks. Becker and associates (1977) studied mothers of obese children (n = 199) found that all but 11 were black. Race, however, was not found to be significant in predicting compliance. Markland and Durand (1976) found that those populations with "lesser proportions of white children" were inadequately immunized. Martin and associates (1969) investigation was limited to white mothers only. Immunization levels were, therefore, attributed to factors other than race.

In the present research 100% (n = 39) of those mothers having other children had begun immunizations. Sixty percent (n = 19) received those immunizations from a private physician. Thirty-one percent (n = 9) received them from the Public Health Department and 3% (n = 72) of the mothers took children to a Public Health Clinic while 37% (n = 42) went to a private physician. Of those who attended clinics, 54% were actually immunized compared to 83% of those mothers who visited private physicians. This was seen to be a significant indicator of a mothers likelihood of vaccinating her child regardless of her initial intentions. Becker (1972), too, found that seeing the same physician on repeat visits was associated with an increased probability that the

follow-up visit would be kept. The extent to which a mother reported seeing the same pediatrician correlated significantly with all compliance variables and was, therefore, considered an indicator of the continuity of health care.

In summary, the present research study was found by the investigators, to have a predominantly white, moderately young and married parents with higher educational and income levels and residing predominantly in urban areas. Additionally, of all mothers who had other children ($n = 30$), 60% ($n = 19$) of these used a private physician for immunizing their family. Based on sociodemographic descriptive data, alone, it may be surmised that the research sample was one considered to be at "low risk" for maintaining an immunization schedule. However, not all sociodemographic data can be considered to be an accurate predictor of preventive health behavior as there are many other influences which affect one's health care decisions.

Hypotheses

Hypothesis 1: There is a positive relationship between a mothers perception of the susceptibility to childhood diseases and her intent to immunize a child.

Eleven items were utilized in the analysis of perceived susceptibility. Each item could be scored from 1 to 4, rendering a total possible score for each mother from 11 to 44. Mothers' mean score was 33.7 with a S.D. of 3.6 and ranging from 23 to 44. Total item $\bar{x}$ score was 3.1. Because of a lack of variability on responses

to the question concerning "intent," no relationship could be shown to exist between the dependent variable and perceived susceptibility. However, a content analysis for the dimension of perceived susceptibility identifies a pattern having implications for health care providers. Susceptibility, as one's subjective risk of contracting a disease or condition, elicited fairly homogenous responses from mothers.

Independent item means showed that mothers had a moderately high to high perception of susceptibility to such conditions as a cold ($\bar{x} = 3.5$), anemia ($\bar{x} = 3.07$), drinking poison ($\bar{x} = 3.54$), asthma ($\bar{x} = 3.0$), a bad cut ($\bar{x} = 3.36$), strep throat ($\bar{x} = 3.3$) and chickenpox ($\bar{x} = 3.4$). Responses on all of these ranged from 2 to 4. Slightly different distributions and means were found for those communicable diseases for which immunizations are commonly provided in childhood. Such questions were found to have the full range of responses from 1 to 4 with the exception of polio with a range from 1 to 3 and a mean score of 2.4. Forty-six percent ($n = 23$) of the mothers "disagreed" or "strongly disagreed" that it was possible their child could get polio while 54% ($n = 27$) "agreed." No one "strongly agreed." Mean score for mumps was 2.98 with 82% ($n = 41$) "agreed" or "strongly agreed" and 18% ($n = 9$) "disagreed." The possibility of developing whooping cough elicited a mean score of 2.5. Four percent ($n = 2$) "strongly agreed," 52% ($n = 26$) "agreed," 35% ($n = 18$) "disagreed," and 8% ($n = 4$) "strongly disagreed." Measles elicited a mean score of 3.02 with 88% ($n = 44$) "agreed" or "strongly agreed" that their child could get measles while only 12% ($n = 6$) "disagreed" or "strongly disagreed."

Mothers appear to perceive children as being less susceptible to the common childhood disease ($\bar{x} = 2.72$) than for all other illnesses or conditions ($\bar{x} = 3.31$). Item mean scores decrease as the incidence of a communicable disease in the general population falls. Measles, therefore, as a commonly occurring illness elicited a score indicating a moderately high perception of susceptibility. Item mean scores decrease consecutively for mumps, whooping cough and polio. Conversely, those illnesses or conditions for which immunizations are not provided and which may, therefore, be seen as "beyond the control" of the mother elicited a higher perception of susceptibility.

In summary, it may be stated that mean item scores for the communicable illnesses for which vaccines have been provided with a subsequent dramatic drop in the incidence of such illnesses may have resulted in a population which has become apathetic about these illnesses and immunizations.

Becker (1972), initially, found that perception of susceptibility was significantly related to both long-run appointment-keeping behavior and to a mother's knowledge. However, Becker and associates (1977) later concluded that those mothers who perceived their child as being less susceptible to illness were high users of preventive services. It was thought this may have simply reflected a mother's "faith" in the protection she perceives to be bestowed by preventive health visits. Thus, a mother is influenced by many other things than simply "perceived susceptibility." It is, therefore, difficult to assess what the immunization behavior of mothers would be based upon mean score for

"susceptibility" alone. While a mother may not perceive her child to be particularly susceptible to childhood illnesses, her perception of the severity of these illnesses may be high enough to counteract this, tipping the balance in such a way as to positively influence her decision to act.

Hypothesis II: There is a positive relationship between a mothers perception of the severity of childhood diseases and vaccines and her intent to acquire immunization for a child.

Eleven items were used in the analysis of perceived severity. Each item could be scored from 1 to 4, rendering a total possible score from 11 to 44 for each mother. Mothers mean score on the dimension of severity was 36.6 was a S.D. of 3.6 and range from 27 to 45. Total item mean score was 3.0. Because of a lack of variability on the responses to the question concerning "intent," no relationship could be shown to exist between the dependent variable and perceived severity. However, a content analysis of perceived severity identifies a profile having implications for primary health care providers.

Mothers in the present research tended to have a moderately high perception of severity on all questions which asked "I would worry if..." Mean score for asthma was 3.06 (ranged 1 to 4), infection after a cut 3.2 (range 2 to 4), pneumonia following a cold 3.02 (range 1 to 4) and for mumps 3.0 (range 1 to 4). The mean score for measles was 3.06 (range 1 to 4) and whooping cough 3.3 (range 2 to 4). Sixty-two percent (n = 31) of the mothers "agreed" they would worry if their

child developed whooping cough while 34% (n = 17) "strongly agreed." Only 4% (n = 2) "disagreed." Eighty percent (n = 40) of the mothers "agreed" their child could be paralyzed with polio while only 10% (n = 4) "strongly agreed" and 10% (n = 5) "disagreed." Mean score was 2.98 showing a slightly lower perception of the severity of polio than for other communicable diseases.

The mean score of severity for common communicable diseases was 3.08 compared to a mean score of 3.2 for other illnesses or conditions. Becker and Maiman (1975) suggested that when mothers perceive an illness as too severe they made fewer well-child visits by immobilizing or inciting denial. Alternately, too low a perception of severity may not be adequate to incite an action.

It would appear, therefore, that mothers in the present study sample possess a "healthy" regard for the potential severity of communicable disease. It is interesting to note, however, that mothers perceive polio as being somewhat less severe than both whooping cough and measles. Becker (1972) found that the severity score predicted a mothers knowledge, but not her appointment-keeping behavior. Thus, mothers responses to the severity of polio may stem from a lack of knowledge about the disease due to its low incidence in the general population.

When asked if immunizations would make their child sick 54% (n = 27) "disagreed," 18% (n = 9) "strongly disagreed" while 26% (n = 13) "agreed." Two percent (n = 1) failed to answer. Mean item response was 2.08 showing that mothers had a moderately low perception

of the severity of side effects to immunizations. Although 72% (n = 36) felt immunizations would not make their child sick, 26% (n = 13) believed they would. Thus, only about one-fourth of the mothers perceive the side-effects as being severe enough to make the child 'sick.' Only 8% (n = 4) believed the child could have convulsions and 2% (n = 1) that he/she could have an allergic reaction. However, all these mothers intended to immunize their child. Of those who remained "undecided" about immunizations, only one "agreed" her child would be made sick. Both, however, "agreed" immunizations would interfere with their baby's normal activity. It may be that as the perception of the severity of these immunizations increases a "barrier" is formed. That is, a mother may perceive the risk too great to overcome the benefits of immunizing a child.

Hypothesis III: There is a positive relationship between a mothers perception of the benefits to immunizations and vaccines and her intent to acquire immunizations for a child.

Eleven items were utilized in the analysis of perceived benefits. Each item could be scored from 1 to 4, rendering a total possible score from 11 to 44 for each mothers. Mothers mean score of perceived benefits was 17.0 with a S.D. of 5.05 and a range from 16 to 39. Total item mean score was 2.5. Because of a lack of variability on responses to the question concerning "intent" no relationship could be shown between the dependent variable and perceived benefits. However, a content analysis for the dimension of perceived benefits elicits a pattern of responses having implications for primary care.

When asked, "could a health care provider cure/prevent...", mothers responded with the following: total item mean score for chickenpox was 2.18, a bad cold ($\bar{x}$ = 2.32), a bad cut ($\bar{x}$ = 2.24), drinking something poisonous ($\bar{x}$ = 1.8), anemia ($\bar{x}$ = 2.85) and strep throat ($\bar{x}$ = 2.94). Those questions concerning childhood disease for which children are commonly immunized elicited the following information: a mean score of 2.78 was found for polio. Sixty-eight percent (n = 34) "agreed" or "strongly agreed" that a health care provider could cure/prevent polio while 32% (n = 16) "disagreed" or "strongly disagreed." The same held true for whooping cough with a mean item score of 2.7. Seventy-six percent (n = 38) "agreed" or "strongly agreed" that a health care provider could cure/prevent whooping cough while 24% (n = 12) "disagreed" or "strongly disagreed." Perceptions of benefits was lower for both measles ($\bar{x}$ = 2.46) and mumps ($\bar{x}$ = 2.50).

Responses were widely distributed across the four response categories with one fourth or more of the mothers finding little or no value in seeking out a health care provider for the communicable disease. It would seem unlikely that such a large percentage would find no benefit in immunizing, yet indicate a moderately high perception for both susceptibility and severity, in addition to stating their "intent" to immunize. Some confusion may have occurred as a result of phrasing the benefit questions to read "cure/prevent." That is, while a mother may see immunizations as valuable to "prevent" measles, she alternately does not see the disease as "curable."

Total item mean score of common childhood illnesses was 2.61 compared to 2.36 for all other illnesses or conditions. Although the difference between these two means is slight, it might be tentatively stated that mothers appear to have a slightly higher perception of the benefits to seeking out a health care provider for the communicable diseases than for other conditions. Becker et al. (1977) found that mothers beliefs regarding the value of preventive health measures and positive feelings about the sources of health care have been found to be associated with preventive action taken on behalf of their children. Parents beliefs about the value of going to the dentist early and regularly were an important predictor of childrens dental visits (Haefner, 1974). Conversely, mothers who did not accept the purposes, or see the value, of well-child supervision obtained fewer immunizations for their own infants. Thus a belief in the benefits of immunizations has been demonstrated to be correlated to higher immunization levels.

Generally, mothers had a moderately low perception of the benefits to seeking out a health care provider for illnesses or conditions, although this is slightly higher for the communicable diseases and may reflect one's belief in the value and benefits of immunizations rather than a health care provider alone. Becker (1977) found that the mother's evaluation of the degree to which doctors could help or cure each illness was significantly correlated to appointment-keeping behavior. The question which remains concerning perceived benefits is whether or not these perceptions are "high" enough to overcome perceived barriers and motivate a mother to take action.

Hypothesis IV: There is an inverse relationship between a mothers perception of the barriers to immunizations and their intent to acquire immunizations for a child.

Because of a lack of variability on responses to the question concerning "intent" no relationship could be shown between the dependent variable and perceived barriers. Although no definitive statements can be made about the entire subscale for barriers, because of its theoretical implications for the present research, a descriptive analysis of the barriers subscale is provided.

Seven items were originally utilized in the analysis of perceived barriers. It was found, however, that mothers were polarizing on opposite ends of the scale - either "agree" or "disagree." In order to improve the reliability of this subscale one item was deleted by the investigators which read "there is not much anyone can do about common childhood illnesses." Mothers responses tended to cluster more on opposite ends of the scale for this question than for any others within that dimensions. It was felt by the investigators that mothers were not interpreting "common childhood illnesses" in the same way. Thus, some may have been thinking of "measles" while other interpreted it as a "common cold." Because of this ambiguity the question was eliminated. Additionally, the scale was reduced from a four to two response format and an Alpha Coefficient of .23 obtained based upon six items.

Individual item means for barriers were moderately low - particularly for those concerning cost ($\bar{x} = 2.0$), time ($\bar{x} = 1.78$) and transportation ($\bar{x} = 1.6$). Mothers did not perceive immunizations as interfering with their babies activity ($\bar{x} = 2.0$) were agreed that they knew where to get immunizations ($\bar{x} = 3.3$) and found it easy to call the doctors office for an appointment ($\bar{x} = 3.3$). Twenty-two percent ($n = 11$), however, "agreed" that immunizations would be expensive. Six percent ($n = 3$) agreed they would have difficulty finding transportation, 6% ($n = 3$) would find it difficult to call the doctors office to make an appointment and 26% ($n = 13$) "agreed" that immunizations would interfere with the baby's activity. Although individual barrier item means are low (indicating that an "action" is more likely to occur), it should be noted that mothers do exist who find significant barriers to immunizations (transportation, making an appointment, cost).

Haefner (1974) states that perceived barriers should not be analyzed as a separate variable. That is, perceived barriers should influence preventive health behavior only in the case of persons who possess beliefs in the benefits of preventive action. Rosenstock (1974) states that benefits must outweigh barriers in order for an action to occur. The present study sample had a mean item score for benefits of 2.5 and for barriers 1.04. The question, as posed by Rosenstock, is whether or not mothers perceptions of the benefits to immunizations is great enough to overcome the perceived barriers.

The barriers subscale has, typically, elicited a low reliability (Janz, 1984). In the present research, it may be that mothers have a difficult time making a "here and now" decision about a future event. That is, mothers cannot predict what those barriers will be when the time for immunizations does occur. It may also be that the present researchers did not address those barriers experienced by the participants in the present research. That is, in an upper socioeconomic, predominantly white population, a more appropriate question to ask might have been, "I will find it difficult to take time off work to have my child immunized." It is this investigator's opinion that, in the end, it is those actual barriers faced by the parents which will determine success or failure in obtaining immunizations.

Summary

Although mothers item mean score differences were small, a pattern does emerge which has implications for the present research. That is, mothers score slightly lower on the dimension of perceived susceptibility for those illnesses for which vaccines are commonly provided than for all other illnesses or conditions. Mothers did, however, have a slightly higher perception of the severity of these communicable diseases than for all other conditions and "disagreed" that immunizations would make their child sick. Mothers scored higher on perceived benefits for seeking out a health care provider for these communicable diseases than for all other conditions, perhaps reflecting a "faith" in the benefits of immunizations. While individual item mean

scores indicated that mothers saw few barriers, the reliability for the entire scale of barriers was so low, no definitive statements can be made concerning its contribution, as a subscale, to the present study.

Thus, mothers appear to see their child as moderately susceptible to common childhood illnesses, but with a higher perception of the potential severity of these illnesses. Additionally, mothers have only a moderate perception of the benefits to seeking out a health care provider for those illnesses and.

It should be remembered, however, that within each of these dimensions can be found those mothers who would be categorized as "at risk." That is, these mothers may have lower perceptions of susceptibility and/or severity; or may find significant barriers to immunizing their child. The stated purpose of the Health Belief Model is to assist in "targeting" those mothers presenting with a "high risk" profile in order to direct intervention strategies where they will be most effective. Caution is maintained by this investigator in accepting total mean score as indicative of all mothers being at "low risk" for obtaining immunizations.

At the same time, while 96% (n = 48) stated they intended to have this child immunized, 4% (n = 2) remained "undecided" as a result of what they had read about adverse reactions. Further analysis of the responses provided by these two mothers reveals the following profile. One mother was 19 years of age, black, unmarried with an income less than \$5,000/year and no other children. That person most influencing

her health care decisions was "myself." She "disagreed" that immunizations would make her child sick. The baby's father stated he intended to have the baby immunized.

The second mother was 23 years of age, white, married, having completed high school with an income from \$10,000 - \$19,999/year. That person most influencing her health care decisions was the "doctor." She, too, had no other children. She "agreed," however, that immunizing this child would make him sick. The father also stated he was "undecided" about immunizations.

Both mothers are strikingly dissimilar in sociodemographic background. The common denominator may be, in fact, the absence of other children. That is, having other children may, through experience and knowledge influence one's intent. When two parents out of 50 state their hesitation to immunize there should be some cause for concern in the health care community. Clearly there is a segment of the population influenced adversely by the mass media and it will be up to the health care provider to "find" these individuals and plan appropriate interventions.

Two additional concepts are included as influencing a mother's decision to immunize her child. These include first, "cues to action" as a "critical incident" which triggers an action. Also, "general health motivation" states that a mother's personal preventive health orientation may influence her decisions and behavior.

Cues to Action

"Cues to action" are those critical incidents which propel or motivate an individual to take an action or preventive health behavior. Mothers appear to rely on themselves and the physician in making health-care related decisions. Mothers still perceive themselves as bearing the primary responsibility for the health care of their family (Graham, 1983); and that the private physician plays a major role in the mothers compliance with health care regimens (Becker, 1972; Markland & Durand, 1976). While 16% (n = 8) of the mothers identified the nurse as one source of influence, no one saw her/him as most influencing their health care decisions.

Although only 6% (n = 9) of the mothers stated they were influenced by mass media, 70% (n = 35) of the sample had read or heard information related to immunizations. Thirty-nine percent (n = 14) stated this information was "against" immunizations. A later question identified that only 4% (n = 2) who were "undecided" about immunizations because of what they had read. It was found, however, that the ability to cite correct age was significantly correlated with having read/heard information. It would appear that while mothers see themselves as only minimally influenced by the mass media, those who are exposed to it have some knowledge related to immunizations which may help in actually complying with an immunizations schedule. It would seem, however, that it is the private physician who, in the majority of cases, ultimately influences the mothers decision concerning immunizations. Caution

should be maintained, however, in analyzing these results. It may be that parents citing the "correct" age differ in ways other than simply having read information.

General Health Motivation

Because a trend was found in which mothers appeared to have a higher perception of general health motivation than fathers, both parents will be discussed in this section.

Four items were originally utilized in the analysis of perceived general health motivation. It was found that parents scores were clustering on opposite ends of the scale - either "agree" or "disagree." In order to improve the reliability of this subscale one item which read, "I plan to buy special food to improve or protect my family's health" was deleted by the investigators. It was found that this item elicited the lowest item reliability and was felt, by the investigators, to be an ambiguous question. Additionally, the scale was reduced from a four to two response format. Subsequently, the alpha coefficient for fathers increased from .46 to .52 and for mothers from .46 to .47 ($t = -1.86, p < .07$). Because the Alpha Coefficient remains questionably low, no definitive statements about the scale for General Health Motivation can be made.

Mothers scored higher on that item which states "I am concerned about my own health" ($\bar{x} = 3.3$). Becker et al (1977) states that the mother who has an active preventive health orientation is more apt to seek preventive services for her child. The investigators make the

observation that mothers may be more inclined than fathers to seek preventive health care for their children based upon their perceptions of their own health.

Correct vs. Incorrect Age

While the majority of mothers intend to immunize (96%, n = 48) only 20% (n = 10) of these mothers was able to cite the "correct" age (2 months) for beginning immunizations with 14% (n = 7) giving the "incorrect" age. Sixty-six percent (n = 33) did not respond to the question of age and thus, may be interpreted as "not knowing" the age. Accepting this as a valid assumption, then fully 80% (n = 40) did not know the "correct" age for immunizing. Having other children influenced only slightly one's ability to state the "correct" age. No level of significance was found when "correct" age was correlated with race, age, education, or income. Reasons for immunizing also indicated a large proportion of mothers either lacking knowledge or misinformed about immunizations. The majority of mothers were willing to do whatever the doctor recommends. If knowledge is considered essential to compliance, over time, with a health care regimen, then clearly 80% (n = 40) of the mothers lack a significant level of knowledge to assure that her initial intent will be carried out on the recommended schedule. It is imperative that health care providers remain aware that having other children may not significantly influence immunization knowledge. It may be that mothers pay little attention to immunization "schedules" but rely simply on what they are told by the physician from one office visit to the next.

Hypothesis V: There is a positive relationship between a mothers perception and a fathers perception of susceptibility to common childhood diseases.

Hypothesis VI: There is a positive relationship between mothers perception of severity and a fathers perception of severity of common childhood diseases and vaccines.

Hypothesis VII: There is a positive relationship between mothers perception of benefits and a fathers perception of benefits to immunizing their child.

Mothers and fathers scored identically ($\bar{x} = 33.7$) on the dimension of perceived susceptibility. For perceived severity mothers mean score was 36.6 and for fathers 36.2. Perceived benefits yielded total mean scores of 27.1 each for mothers and fathers. Because there was no variation in response between mothers and fathers, no definitive statements can be made about the hypotheses. Therefore, they could be neither accepted nor rejected.

In summary, it was found, by the investigators, that mothers and fathers do not differ significantly along any of the Health Belief Model dimension of perceived susceptibility, severity, or benefits, with the exception of general health motivation. Although not statistically significant, a "trend" was found in which mothers appeared to have a slightly higher perception of general health motivation than did fathers. Both mothers and fathers were unable to give "correct" ages or reasons for immunizing their child. The presence of other children in the family did not positively influence

their knowledge concerning immunizations. However, reading or hearing information correlated significantly with a parents' citing the "correct" age. Thus, the differences between mothers and fathers are minimal.

Interpretation and Limitations of the Findings

The major limitation of the present study was the lack of variability or responses to the question on intent to acquire. This lack in variation made it impossible to do correlations between the HBM dimensions and the dependent variable. The hypotheses could not be tested as a result.

The study instrument was found, by the researchers, to factor poorly, leaving subscales which measured questionable concepts. It may be that what actually was being tapped was "knowledge" and not perceptions. A sufficient number of questions was not asked in the "barriers" and "general health motivation" subscales, comparable to the other scales.

Additional difficulties were found in the barriers subscale with mothers responding inconsistently across the spectrum of possibilities. An additional limitation was the judgment of a person once removed from the potentially ill individual. That is, the mother is having to make a judgment about the health, not of herself, but of her child.

Additionally, items for each of the HBM dimensions yielded fairly homogeneous responses, not only within each group, but between mothers and fathers as well, and is undoubtedly due to the characteristics of the study sample. Parents were found to be predominantly white, married, highly educated, and with a high level of income. More than half had other children who were being seen by a private physician for immunizations. Selection criteria required the omission, not only of single parents living alone, but also those who did not read or write English. Parents with these characteristics may have responded quite differently to the study questionnaire. Additionally, questions were all worded positively perhaps resulting in a response bias.

In addition, people will tend to respond in a socially acceptable manner. This is, undoubtedly, even more true of new parents who want to believe they are "good" parents. Therefore, parents may have responded "appropriately" to questions regardless of the long-term implications. Finally, the sample of subjects was small and data was collected over a short (5 week) period of time. Therefore, the sample may have differed in some way from the general population. A sample over a longer period of time and from a broader community base might have held different perceptions about Health Belief Model dimension and the intent to immunize their child.

It is also questionable whether clearly delineated concepts were actually being measured. That is, is there actually a concept that can be labeled "susceptibility," or one called "severity." It would appear that what may have been measured was a combination of both scales.

Analysis of the data raises the issue of internal vs. external locus of control and may, in fact, have been a far better predictor of compliance than the perceptual dimensions studied. The General Health Motivation subscale addressed locus of control in an oblique way, but was not developed fully enough to provide a reliable scale for definitive analysis. Because of the homogenous nature of the present sample, the ability to generalize the results is limited. A similar study conducted at a different study site with individuals of other ethnic and socioeconomic backgrounds may have yielded different responses.

Recommendations for Future Research

Modification of the Health Belief Model as a tool for measuring perceptions is suggested. Additional research should follow the compliance behavior of mothers with an immunization schedule over an extended period of time to determine if "intent" accurately predicts behavior. The minimum amount of time for such a longitudinal study should be two years and ranging upward to six years.

It is suggested that future researchers develop their test instrument by beginning with a larger pool of questions repeatedly administered and factored, with subsequent computation of reliabilities. This process, thus, may ensure that subscales are actually measuring unique and distinct concepts.

The present research instrument tapped knowledge indirectly. It is suggested that future researchers studying immunizations investigate knowledge more directly and extensively. Questions might address



signs and symptoms of childhood illnesses along with potential long-term complications. Further investigations might focus on the differences between first-time parents and those having other children, particularly as parity in this study correlates to knowledge.

Additionally, the theoretical concept of "barriers" would appear to be comprised of two "subconcepts." That is, barriers may be either "abstract" and psychological or "concrete" and tangible. Fear of the side-effects of immunizations is quite different from the lack of transportation to a clinic. Thus, because of its intangible quality "abstract" barriers may be more difficult to assess, and overcome in order to achieve a behavior. It is suggested, therefore that a scale for "barriers" might be broken down into two subconcepts for measurement and analysis.

One of the problems with barriers has been its measurement prospectively. Therefore, a retrospective study may be necessary in order to assess those barriers actually faced by parents which hindered having their child immunized. As population-specific barriers are elicited, interventions can be developed for clinical practice.

General Health Motivation might be better evaluated by developing an instrument which taps internal vs external locus of control as influencing preventive health behaviors and seeking immunizations.

Future research should be directed at investigating specific intervention strategies which might modify the perceptions and behavior of those considered to be "high-risk" and with known low-compliance levels. This might involve a control and experimental group with the

experimental group receiving a treatment such as prenatal/postnatal classes, postcard reminders or pamphlets. Parents should then be followed over time - a minimum of 18 months to 2 years - to determine the effects on compliance with a set immunization schedule requiring compliance over an extended period of time. Together with population-specific data, information of this type is a prerequisite to the development of effective strategies for modifying health-related behavior, such as immunizations.

Becker's (1972, 1977) research has been done, almost without exception, among black, lower socioeconomic populations. A study of other populations, such as upper socioeconomic, urban/professional parents may have yielded different information. Additionally, research involving other subcultures (Asian refugees, middle Eastern, Mexican-American or American Indian) may result in significantly different results from those of the present research. Replication of this study would be suggested using a high-risk population with known low-compliance levels. Such parents might include those from various ethnic populations with lower socioeconomic backgrounds, and/or single parents living alone or receiving health care through a Public Health Department. It is suggested that questions be developed which will elicit a more specific sociodemographic profile for each respondent. Additionally, influences upon a parents health care decisions should be expanded to include not only external, but internal factors as well, i.e., feelings, attitudes, cultural or religious beliefs.

Finally, researchers might further investigate the role nurses play in preventive health care. That is, how are nurses perceived by parents, what do parents see to be the strengths and limitations of nurses and what role would they like to see nurses play in preventive health care.

Implications for Nursing Practice

For the Clinical Nurse Specialist, the questions which must be asked, are how many people in the population fall into the "high- risk" category, why are some groups more resistant to immunizations and how can those difficulties hampering compliance with an immunization schedule be overcome? Results concerning relationships between sociodemographic characteristics, modifying factors and health beliefs regarding immunizations when combined with knowledge about that portion of the population exhibiting "at-risk" characteristics can be used to maintain and increase immunization levels as the nurse comes into contact with parents in clinical practice.

In the present research, the conceptual model (Figure 2) is derived from King's (1981) theory of goal attainment. Using King's (1981) theory to guide nursing practice it is understood that individual perceptions, beliefs and values are formed prior to entering the interaction phase with the health care provider. It is, therefore, within the interaction phase that the nurse and parent develop a common, shared understanding for working toward a goal.

The Health Belief Model is a framework by which the nurse, at the point of this interaction, is able to assess the likelihood a parent will take action. Mothers should be questioned along some of the more productive dimensions presented in the model. This may require constructing a brief, but useful set of questions whose answers could help estimate the likelihood of a mother's complying with the immunization schedule. Thus, the problem dimension(s) may be identified in each case. When these model factors considered to be below a presumed level necessary for complying are made clear, interventions may be tailored to the particular need of the mother and family. It must be remembered, however, that "barriers" may be difficult for a mother to assess prospectively.

In the interaction phase, the CNS assists the mother in developing a stage of awareness by identifying perceptions as they influence her decisions. In helping a mother cope with her obligations, the provider and client must come to share a common frame of reference from which to proceed. The nurse and parent explore and agree upon the means by which immunizations might be attained (mutual goal-setting) and where "intent" is established. With the goal of immunization identified, the parent moves into the transaction phase where immunization takes place.

It should be remembered, however, that "intent" does not "prove" a behavior will occur. A system must be developed which allows the provider to measure behavior and quantify the outcome. Evaluation of a mother's compliance with an immunization schedule must be ongoing with actual immunizations received on time used as the indicator for an

outcome. Additionally, immunization status may also be used as a parameter for assessing the quality of the interaction between the parents and provider and thus, becomes a significant indicator of one's effectiveness in an interaction. Where goals and objectives are similar and understood, the chance of success in intervention will be greatly increased. Additionally, the principle of participation asserts that people are more likely to change and maintain the change in behavior if they have participated actively in setting the goals and strategies for change (King, 1981).

The CNS in clinical practice must develop a consumer orientation while still producing a practice definition that will enable them to identify and meet consumer needs. Thus, the barriers for one population may not be the same for all. These must be met by the provider as demanded by the parents whether in terms of available appointment times, accessibility or cost. The CNS, therefore, must target the needs of the population he/she serves in order to develop effective strategies for meeting client demands. It should also be remembered that while some strategies may be possible to isolate at a population-wide level, these techniques may not be equally effective with specific, possibly high-risk sub-populations.

Health education is essential, but should not be directed just at the mother, but also the social context and relationships within which she lives, e.g., the father, family, friends and community. It is within these contexts that perceptions are formed and decisions made concerning the health of a child. Comprehensive, primary care requires

helping families gain control over the lifestyle in a way necessary to improve their health and well-being. This requires looking at financial constraints, housing problems, employment and needs of the other children.

It is evident from the present research that the nurse is seen as neither a resource person nor as influencing a parents health care decisions. Perhaps the greatest task of all facing the CNS in advanced practice is how to become visible in such a way that he/she may be seen by the community as a person of both knowledge and expertise. The CNS, therefore, must develop a practice which is both visible and flexible and seen by the community as responsive to its needs.

The apathy of the general population towards immunizations is one of the greatest challenges facing the health care community. No longer confronted with devastating effects of polio or diphtheria, many no longer find it expedient to immunize a child until "forced" to do so upon admission to school. At the same time, the health care community must share some of the blame for relaxing its standards in providing preventive health care. It is imperative, therefore, that the CNS develop creative strategies for counteracting this apathy not only among patients, but fellow health care professionals as well. The CNS's practice must incorporate immunizations at appropriate ages as part of the standard of care and remain vigilant in enforcing compliance with that regimen among professional peers and parents alike.



It is evident that immunization status affects and is affected by the family, community and society. It is imperative that the CNS understand how his/her practice either hinders or helps health-related behaviors. As a primary care provider, the CNS must develop a personal relationship with the parents, displaying familiarity with family members, place of employment and areas of concern and stress. As an awareness of this individuality of the parent is apparent, information concerning immunizations may be "tailored" to the person to meet their needs. Finally, parents must be given the opportunity and responsibility for making decisions. Increased compliance may be seen when the provider has invested time and energy into a family in a way that has developed trust, rapport and a sense of continuity to the plan of care. The clinician must engage in teaching centered around the health promotion aspects related to this study and might best be started with parents during the prenatal period either in classes or with clinic visits. Such anticipatory guidance with each patient encounter should begin with the initial contact and reinforced with subsequent visits. Thus, there is made available, a time for exchange of information and exploration of parental concerns.

King (1981) states that individuals have a right to knowledge about themselves, to participate in their own health care decisions and that nurses have the responsibility to share information that helps individuals make informed decisions. More than a fourth of the parents in the present research requested more information concerning information with emphasis placed on being informed of all potential



side effects. If parents are to be allowed the opportunity to make their own health care decisions, then the CNS must accept the responsibility and accountability for providing parents with information which will assist them to make informal decisions.

It is evident that there is a segment of the population concerned about the potentially harmful effects of immunizations. For health care providers, the challenge is how to provide this information in a way that is both realistic yet nonthreatening.

Part of working with parents must be to provide them with the skills and resources which will enable them to capitalize on present resources; to develop new ones in a manner that will facilitate appropriate health care behaviors. It is indicated by the present research that mothers still consider themselves to carry the greatest burden in caring for the health of their child. By providing mothers with a broad resource base both within the family and the community, support is provided for her decisions. Strategies which will involve the father in making these decisions is imperative in providing comprehensive family-centered care. This may require inclusion of the father in prenatal visits, well-child checks and in phone-call contacts and follow-ups. It is imperative that fathers be included in these aspects of health care, traditionally left to the mother.

Implications for Nursing Education

Educators must realize that health behavior is shaped and buffeted by more than individual motivation and choice. Primary care providers educated at the graduate level should develop an understanding of those

interventions which are directed not only at the individual, but at organizations or environments that control the resources or conditions which compel or constrain health behavior. Nurses should be educated to be aware of new opportunities for policies which might be instigated in support of organizational, economic and environmental factors having the potential for modifying health behavior.

Curriculae should be designed to assist nurses in identifying the impact they have in promoting quality of life through facilitating the decision making processes of families. This involves developing innovative strategies which will elicit and support parents perceptions as they impact their family's health. Additionally, this requires nurses who are educated in interpreting their role to parents as facilitators of health and well-being of both the individual, the family and the community.

The Health Belief Model should also be a part of health education. Findings prompted by its use should be incorporated into curriculae in a way that will inspire innovative interventions for specific areas of clinical interest. Thus, the Health Belief Model is not provided as "the answer" to health behavior, but rather as a framework for conceptualizing the relationship of perception to health care decisions. Ultimately, the nurse educated at the graduate level can continue to contribute to the body of knowledge regarding health beliefs and behaviors.



Using the HBM as a framework for education, staff may be made aware of how perceptions influence health care decisions, affecting both parent and professional alike. That is, the ability to evaluate and share individual realities is the first step to good communication (King, 1981).

Curriculae, therefore, should incorporate diverse theoretical models and research literature related to change processes in health behavior drawn from diverse disciplines such as psychology, sociology and anthropology. Additionally, an understanding of the internal dynamics of change for the individual, as well as group changes both at the institutional and community level is necessary if nurses are to impact families within the context of their environment.

Nurses involved in primary care and health promotion should be educated in ways to develop effective programs which might modify and/or develop health behavior in populations. Additionally, assistance in developing an understanding of the ethical issues related to modifying behavior along with a working knowledge of the legal/moral issues involved in promoting a program of plan of care which may, indeed, carry some risks along with the burden of responsibility.

Curriculae should also be designed which will assist the student to understand not only parental behavior, but also how they, the health care provider, carries with them their own set of perceptions, attitudes, beliefs and behaviors which may influence significantly the decision a parent makes.

Summary

In Chapter VI, a summary and interpretation of study findings was presented. Findings were related to the conceptual framework of this study and to nursing theory. Recommendation for nursing practice, education and research were presented.

In Chapter VI, a content analysis of the data presented a profile of mothers who may be lacking in knowledge concerning some of the common childhood illnesses and whose knowledge was little influenced by the presence of other children in the family. Additionally, mothers and fathers did not differ significantly along any of the HBM dimensions. Neither mothers or fathers saw the nurse as a source of influence in making health care related decisions.

Problems encountered with the research instrument were discussed and recommendations for future investigations presented. Additionally, findings were related to the conceptual framework and nursing theory as presented in the study with recommendations for nursing practice and education provided.



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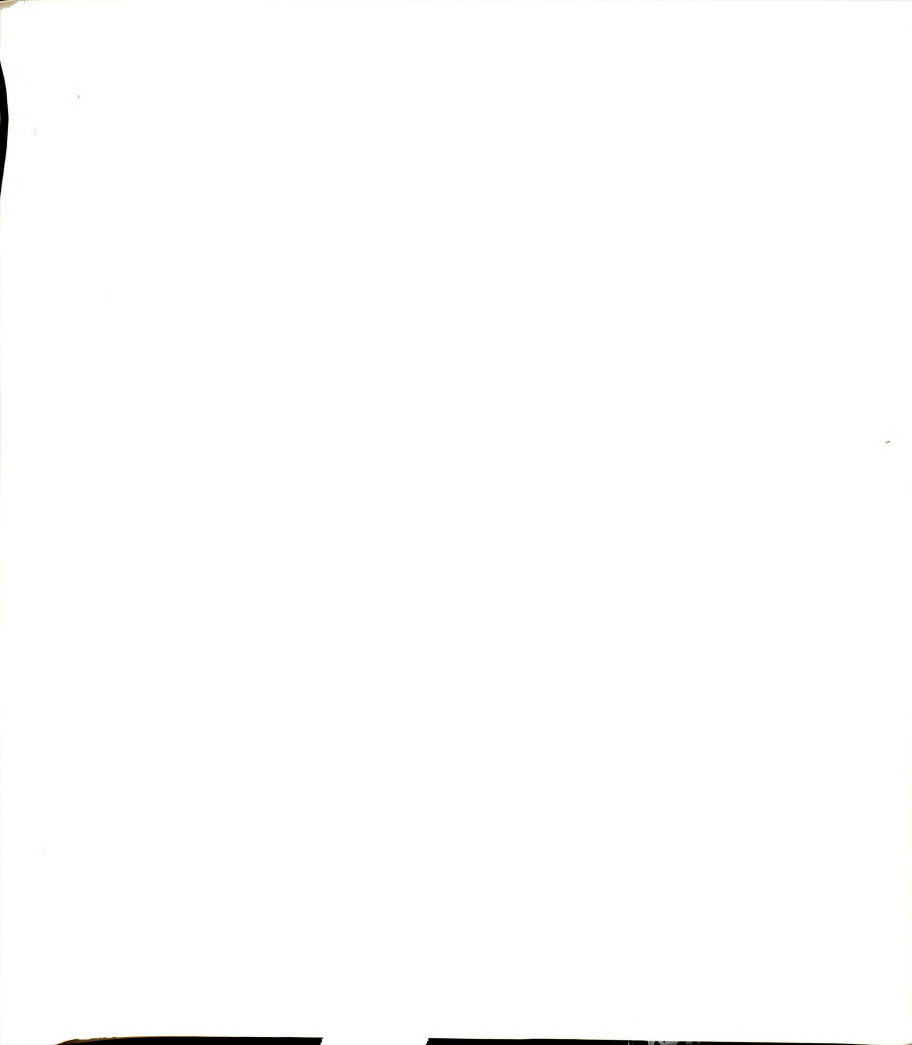
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APPENDIX A

Human Subjects Review Approval

Hospital Approval of Study Protocol

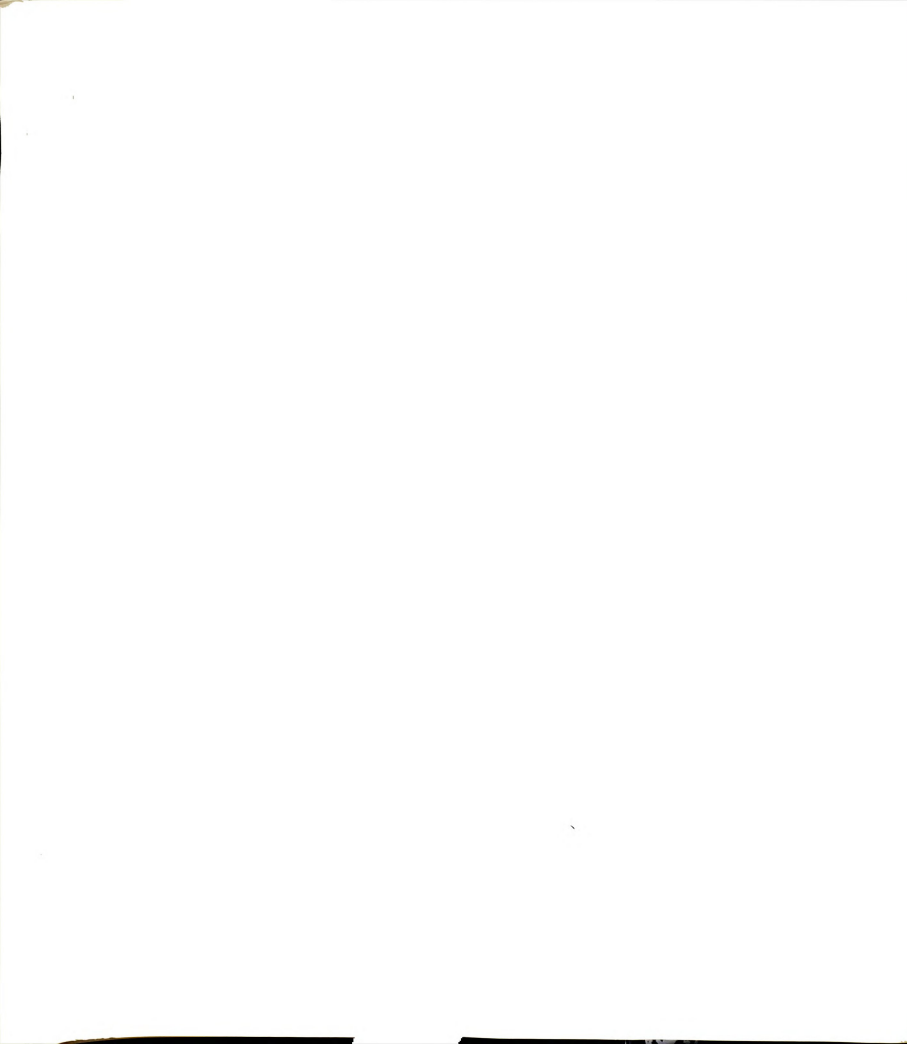
1. Abstract

This study has been designed to determine within a specific population what are those perceptions and beliefs held by parents concerning childhood diseases and vaccines which influence immunization of their children. This study is being done in response to a growing lack of immunizations among preschool children in the United States.

The overall objectives of this study are to determine those perceptions/beliefs held by both mothers and fathers concerning childhood illnesses and vaccines which influence their decision to immunize their children.

1. Determine those perceptions/beliefs which most influence a parents decision to immunize.
2. Determine perceptions/beliefs which least influence a parents decision to immunize.
3. Determine how mother's and father's perceptions/beliefs differ and/or are similar.
4. Determine the role health care providers can play in influencing parents behavior.

It is believed that by better understanding those perceptions that influence the parents decision to acquire immunization for their children, health care professionals may function more effectively to encourage immunization, thereby, enhancing child health status.



11. Study Sample

Subjects will be volunteers chosen from those women having just delivered an infant at St. Lawrence Hospital's post-partum unit. Additionally, the husband or boyfriend/father of that child will be asked to participate. Selection will be further restricted to those mothers and fathers who are at least 18 years of age and who are able to read and write English and who have delivered a normal child.

Subjects will be recruited at the post-partum unit of St. Lawrence Hospital during the post-partum period in which mothers are still in the hospital. The investigators, with assistance from nursing staff, will offer the questionnaire to all mothers and fathers meeting the criteria for the study. Parents meeting these qualifications will be informed that a study is being conducted by graduates students from the Michigan State University College of Nursing, to better understand parents attitudes toward childhood illness and immunizations and that they are eligible to take part in the study. Those expressing interest will be given a questionnaire and explanatory letter in a stamped, addressed envelope. Parents who decide not to take part in the study will be thanked for their time and interest and requested to return the blank questionnaire.

III. Risk-Benefit Analysis

A. Potential Risks

The study involves no physical, psychological or social risks to the parents who take part. Any parent is free to refuse to fill out the study questionnaire, or after beginning the questionnaire, is free to terminate completion at any point. Parents will be assured that refusal to participate will not alter the quantity or quality of the care the mother and child are receiving at St. Lawrence Hospital. Parents will have the opportunity to discuss their participation in the study and questions will be encouraged. Becoming a study participant will involve no financial expense to women who volunteer.

B. Procedures for Protection of Participants

The anonymity of study participants and confidentiality of their responses will be protected by the following procedures:

1. Questionnaires will be given to study participants and returned by them in sealed, unmarked envelopes. Neither the hospital staff nor the investigators will view any questionnaire which could be directly associated with an individual participant.
2. Identifying numbers only will be used to match mothers and fathers responses (e.g., 1A, 1B).
3. Information from completed questionnaires will be released in aggregate form only.
4. Institutional/organizational names will be omitted in public presentations and/or reports.



IV. Potential Benefits of Study

Potential benefits of the individual subject participating in this study include a heightened awareness of their own perceptions/beliefs as they influence seeking specific health care for their child/children. Additionally, both women and men may benefit from an increased awareness of the shared responsibility in the health care of a child. Further, participants may develop an increased awareness of the availability of information and guidance from health care providers.

Health care providers will benefit from an increased understanding of those perceptions/beliefs which influence immunization-seeking behavior in both mothers and fathers. Counseling and education for parents may be more efficient and effective when areas of concerns and/or misconceptions are accurately identified.



V. Consent Procedure

- A. Potential participants who meet eligibility requirements of the study will be identified by staff nurses at St. Lawrence Hospital to the investigators.
- B. Eligible parents will be approached by the investigators, informed that a study concerning child health and immunizations is being conducted and inviting their participation if they so desire.
- C. To those expressing an interest, the investigators will explain the study and present the opportunity for discussion and questions. Confidentiality and anonymity will be assured and each individual will be informed that they may withdraw at any time without penalty.

VI. Study Instrument

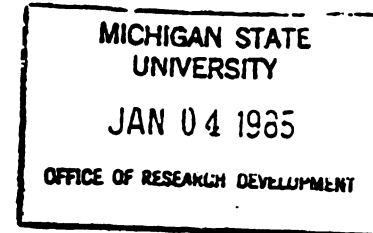
A draft of the questionnaire to be used for the measurement of those perceptions surrounding childhood illnesses and immunizations is attached. The explanation of the study will advise the individual that their answers will be anonymous and confidential and that they are free to withdraw from the study at any time without penalty.



MICHIGAN STATE UNIVERSITY

COLLEGE OF NURSING

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MEMORANDUM

January 4, 1985

TO: Henry Bredeck, UCRIHS

FROM: Barbara Given, Ph.D., R.N., F.A.A.N.
Director for the Graduate Program

A handwritten signature in cursive script, appearing to be "B Given", written over the "FROM:" line.

RE: Heidi Froemke's and Lyn O'Connor's Thesis Proposal

These students have presented their thesis proposal to their committee members. The committee has positively reviewed their proposed research project for their M.S.N. program within the College of Nursing.

/pla



Dr. Scott Swisher
Medical Chairman
Research Committee
St. Lawrence Hospital
Lansing, MI 48917

Dear Dr. Swisher:

We are graduate students in the College of Nursing at Michigan State University and are currently involved in completing our Masters thesis.

In response to the low immunization levels among preschool children in the U.S., we are interested in identifying and measuring parental (mothers and fathers) perceptions of childhood illnesses and vaccines.

It is our desire to measure these attitudes in new parents and, would, therefore, like to use the post-partum unit of St. Lawrence Hospital as the study site.

Enclosed, you will find a copy of the proposal questionnaire along with the abstract required by the Human Subjects committee at Michigan State University.

This is being sent to you for consideration and approval at the October meeting of the St. Lawrence Hospital Research Committee.

Very truly yours,

Heidi Froemke

Lyn O'Connor



APPROVAL/DISAPPROVAL STATEMENT FOR CLINICAL INVESTIGATION

85-124-5

Clinical Investigation "Identifying and Measuring Parental Perception of
Childhood Illness and Vaccines." Heidi Froenke, R.N.
Lyn O'Connor, R.N.

was approved/disapproved on January 24, 1985
date

WITH THE FOLLOWING CONDITIONS: ☒ A Medical Staff sponsor must oversee the study
and must have prior approval of patient's physician.

(Dr. Gerard Breitzer has volunteered to be the medical staff sponsor if you so desire.)

Following are the names of the Human Subject Research Committee members whose
APPROVAL vote is recorded for the Clinical Investigation:

<u>[Signature]</u>	<u>[Signature]</u>
<u>[Signature]</u>	<u>[Signature]</u>
<u>[Signature]</u>	<u>[Signature]</u>
<u>[Signature]</u>	<u>[Signature]</u>

Following are the names of the Human Subject Research Committee members whose
DISAPPROVAL vote is recorded for the Clinical Investigation:

<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

The continued status of this study shall be formally reviewed by the HSRC
on or before
date

If you conclude your investigation prior to this date, please inform the
Committee.

Original - file

copy - investigator

copy - pharmacy

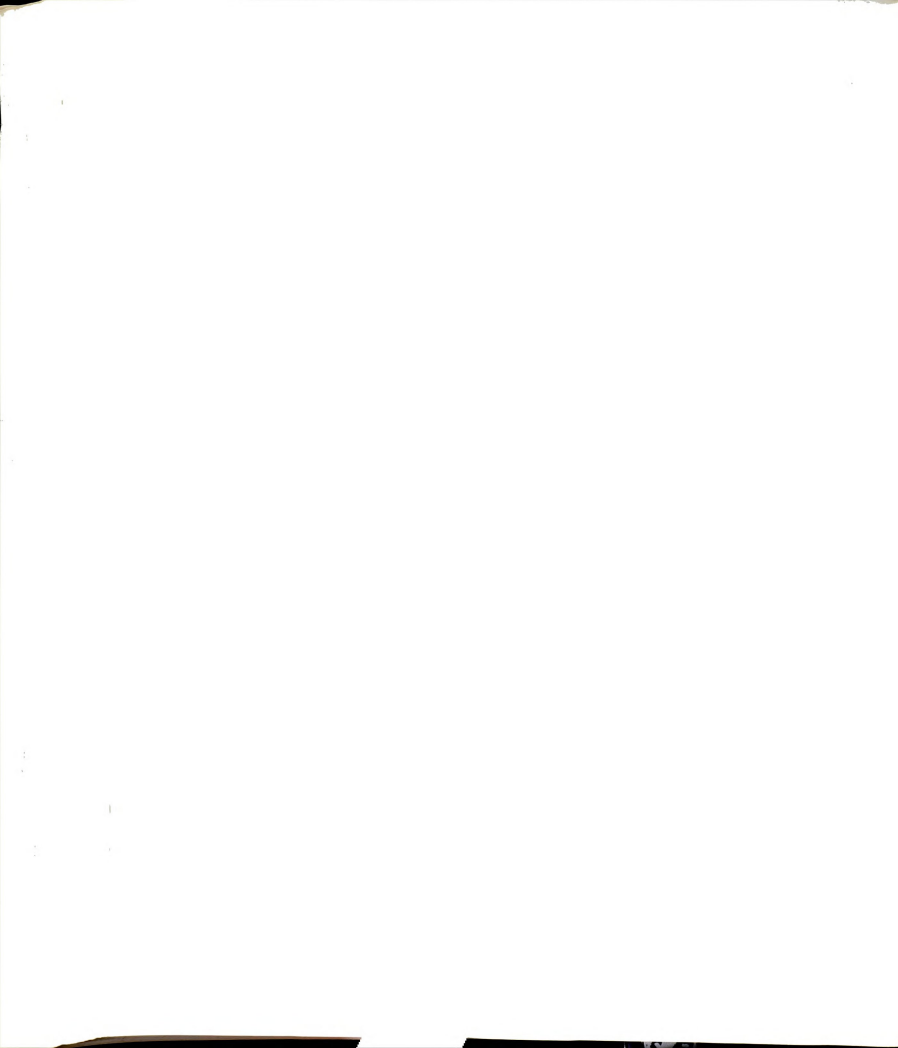


APPENDIX B

Selection Criteria Checklist

Selection Criteria Checklist

1. Both parents (the biological father and mother) agreed to complete and return the questionnaire.
2. Both parents must share the same household.
3. Both parents must be age 18 or over.
4. Both parents must be able to read and write English.
5. The newborn infant would be "normal" i.e., no genetic defects or congenital malformations.



APPENDIX C
Letter of Explanation

Dear Parent:

This letter is to introduce you to a study which is being conducted by Heidi Froemke, R.N., and Lyn O'Connor, R.N., graduate students in the Michigan State University College of Nursing.

There are many things which help parents decide to acquire health care for their newborn child and/or children. This research study is being done to help health care providers better understand why parents seek this health care or not. It is the hope of the researchers that the information collected may help health care providers to give the best information to parents to help them acquire health care for their child/children.

This study will take about twenty minutes of your time. Please complete the questionnaire about your health practices and your baby's health. There are also questions about yourself, your culture, and income on the questionnaire. We do ask that mothers and fathers fill out the questionnaire independently.

This study will in no way affect the care you are now receiving. There is no physical risk or expense to you. You may feel free to ask questions. Your identity will be unknown and no information that could identify you, in any way, will be used in research data. Your answers to the questionnaire will not be revealed to any other person. The results of this study will be made available to you when the study is ended, at your request.

Completion and return of this questionnaire implies the giving of your consent to use the data for research purposes.

Thank you for your time and consideration. Please return the questionnaire in the enclosed stamped and addressed envelope.

If you have any questions or concerns, feel free to call us at 517/355-2975.

Sincerely,

Heidi Froemke, R.N.

Lyn O'Connor, R.N.

APPENDIX D
Study Questionnaire

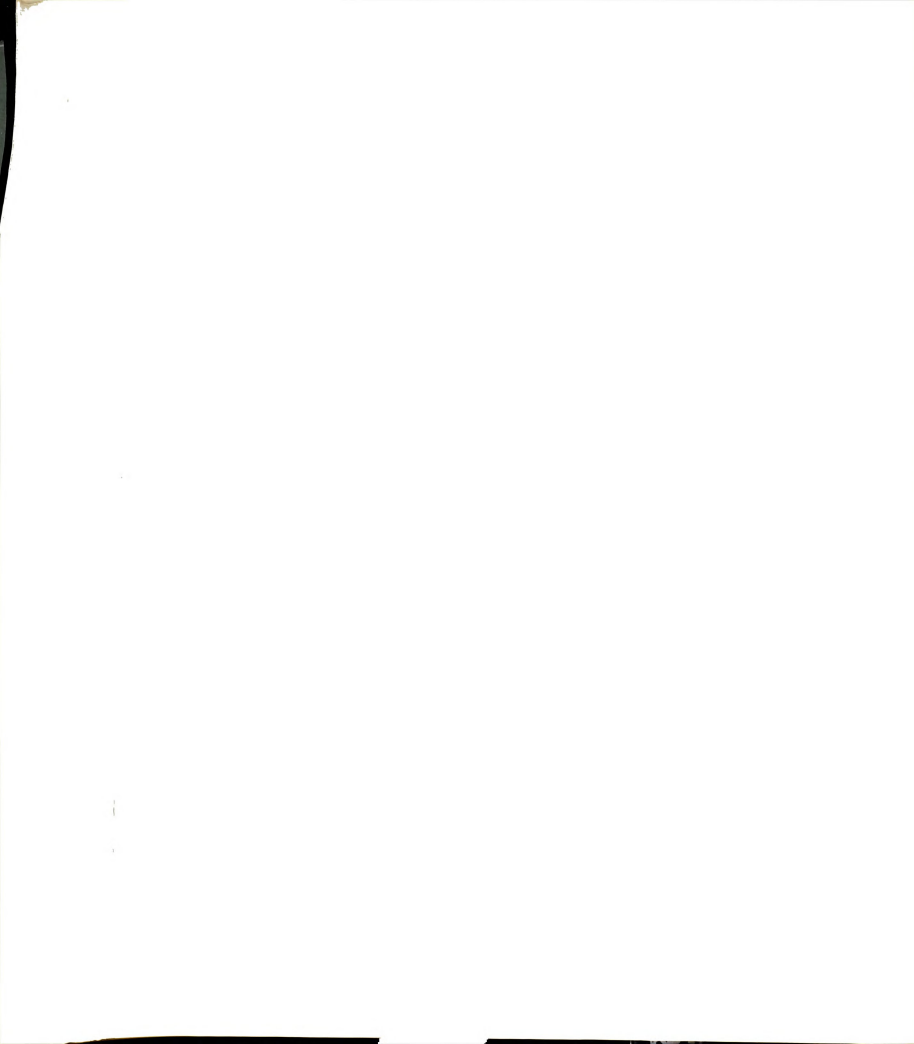


The following questions describe general things about you. Although we would appreciate your answering every question, if you should find one that is offensive to you, please feel free to leave it blank and go on to the next question. Please do not discuss your answers with each other until you have completed the questionnaire.

1. Parent filling out questionnaire (check one): (1) Mother ____ (2) Father ____
2. Age: ____
3. Ethnic background (please check only one category):
(1) White ____ (2) Black ____ (3) Mexican-American ____ (4) Oriental ____
(5) American Indian ____ (6) Other ____ (specify, _____)
4. Marital Status (check one):
(1) Married ____ (2) Separated ____ (3) Divorced ____ (4) Single ____
5. In what town do you live? _____
6. Formal education completed by each parent (check one):
Mother: (1) 8th grade or less (4) Some college
(2) Some high school (5) Completed college
(3) Completed high school (6) Post graduate work
Father: (1) 8th grade or less (4) Some college
(2) Some high school (5) Completed college
(3) completed high school (4) Post graduate work
7. Income: total combined family income for the last 12 months (check one).
(1) 0 - 4,999 ____ (5) 20,000 - 24,999 ____
(2) 5,000 - 9,999 ____ (6) 25,000 - 29,999 ____
(3) 10,000 - 14,999 ____ (7) 30,000 - 39,999 ____
(4) 15,000 - 19,999 ____ (8) 40,000 - above ____
(9) Don't know ____
8. Child's birthdate: _____
9. Sex: Male ____ Female ____ Twins ____, sex ____
10. How many other children do you have? _____

If none, go directly to question #16.

11. What are the other childrens ages? _____
12. Have these older children received any immunizations (baby shots)?
Yes _____ No _____ Don't Know _____
13. Would you check the immunizations that you remember they have had?
(1) DPT _____ (2) MMR (Measles, Mumps, Rubella) _____
(3) Oral Polio _____ (4) Other (specify, _____)
14. Where did your child get these shots (check one)?
(1) Public Health Department: _____
(2) Private Physician: _____
(3) Other (specify): _____
15. If your other child/children has not received all his or her shots, what is the reason they are lacking (circle)?
(1) Long-term illness (2) Not enough time (3) Not enough money
(4) Not old enough (5) Other, explain _____
16. Who and/or what influences the decision you make concerning the health care of your child (check all that apply)?
(1) Nurse _____ (2) Doctor _____ (3) Family & Friends _____ (4) Spouse _____
(5) Magazines, Books, Newspaper _____ (7) Myself _____ (8) Other _____
17. Check the one which most influences your decision concerning the health care of your child (check one).
(1) Nurse _____ (2) Doctor _____ (3) Family & Friends _____ (4) Spouse _____
(5) Magazines, Books, Newspaper _____ (7) Myself _____ (8) Other _____
18. Have you read recently in magazines, books or newspapers, or heard over radio or T.V., any information about immunizations (check one)?
(1) Yes _____ (2) No _____
If yes, please answer question 19, below.
19. Was the information "for" or "against" immunization?
(1) For _____ (2) Against _____



Please answer every question to the best of your ability. There is no right or wrong answer.

Please circle one response for each question.

20. It is possible my child could get a bad cold.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
21. It is possible my child could get mumps.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
22. My child could be paralyzed if he/she developed polio.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
23. I am concerned about my own health.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
24. I am concerned about the chance of getting sick.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
25. I plan to give my child/children vitamins regularly.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
26. If my child developed asthma I would worry.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
27. My child could get an infection if he/she had a bad cut on the arm.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
28. It is possible my child could develop anemia or low blood.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
29. It is possible my child could accidentally drink something poisonous.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
30. It is possible my child could get polio.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree



31. It is possible my child could develop whooping cough (pertussis).
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
32. It is possible my child could get asthma (wheezy breathing).
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
33. My child could get pneumonia if he/she developed a bad cold.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
34. I would worry if my child developed mumps.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
35. A health care provider (doctor or nurse) could cure/prevent chicken pox.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
36. I would worry if my child developed measles
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
37. I would worry if my child developed anemia or low blood.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
38. I would worry if my child accidentally drank something poisonous.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
39. A health care provider (doctor or nurse) could cure/prevent polio.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
40. A health care provider (doctor or nurse) could cure/prevent asthma (wheezy breathing).
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
41. I would worry if my child developed whooping cough (pertussis).
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
42. It is possible my child could get a bad cut on the arm.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree



43. It is possible my child could get measles.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
44. A health care provider (doctor or nurse) could cure/prevent a bad cold.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
45. A health care provider (doctor or nurse) could cure/prevent mumps.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
46. Immunizing my child will be expensive.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
47. Obtaining immunizations for my child/children will take a lot of time.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
48. I would worry if my child developed chicken pox.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
49. A health care provider (doctor or nurse) could cure/prevent a bad cut on the arm.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
50. A health care provider (doctor or nurse) could cure/prevent measles.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
51. A health care provider (doctor or nurse) could very likely prevent drinking something poisonous accidentally.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
52. A health care provider (doctor or nurse) could cure/prevent whooping cough (pertussis).
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
53. It is possible my child could develop strep throat.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
54. It is possible my child could get chicken pox.
(1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree

55. There isn't much anyone can do about common childhood illnesses.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
56. A health care provider (doctor or nurse) could cure/prevent anemia or low blood.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
57. A health care provider (doctor or nurse) could cure/prevent strep throat.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
58. If my child developed strep throat I would worry.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
59. Immunizing my child/children will make them sick.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
60. If you answer "strongly agree" or "agree" to question #59, in what way do you think your child will be sick (check all that apply)?
- (1) sore arm/leg _____ (4) throw up _____
 (2) fever _____ (5) convulsions _____
 (3) irritable _____ (6) other (explain) _____
61. It will be difficult for me to find transportation to take my child to the doctor/clinic.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
62. I find it easy to call the doctors office/clinic to make appointments.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
63. I know where to get immunizations for my child.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
64. Having an immunization will interfere with my baby's normal activity.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree
65. I plan to buy special foods to improve or protect my family's health.
- (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree

66. During this hospitalization, have you been given any information regarding immunizations (check one)?

Yes ____ No ____

67. Do you plan to have your baby immunized?

Yes ____ No ____ Undecided ____

68. If so, at what age? _____

Why? _____

69. If there is any reason why you don't want your baby to get immunizations (baby shots), please list.

70. Do you have any suggestions as to how we could help more parents to get immunizations (baby shots) for their children?

Thank you for your time and consideration in completing this questionnaire.



APPENDIX E

Telephone Consent

Dear Parent(s):

If you would be willing to accept a five-minute telephone call from us in two to six months for follow-up on this study, we would appreciate having your name and telephone number. Again, all information you provide is strictly confidential.

Name

Telephone Number

Sincerely,

Heidi Froemke, R.N.

Lyn O'Connor

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