

INADEQUATE IMMUNIZATION OF TODDLERS IN RURAL MONTANA:
PARENTS' PERCEPTIONS OF IMMUNIZATION BARRIERS

by

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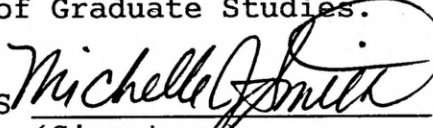
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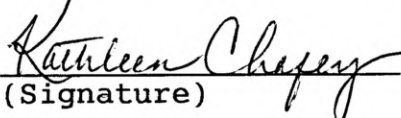
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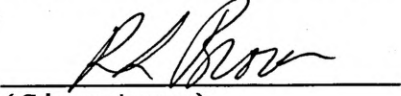
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ABSTRACT

Increasing immunization levels of two-year-olds to that of the national Healthy People 2000 goal of 90% will reduce morbidity, mortality, and cost related to risks from vaccine-preventable diseases. The nursing profession is an important component in facilitating higher immunization rates.

This project was developed using Nola J. Pender's Preventative Health Behavior Model to assess the immunization status of a population of rural two-year-olds and to assess parental perception of barriers to obtaining the basic immunization series. The aim was to also assess the potential impact of rurality on immunization status and perceived barriers.

The participants were parents of two-year-olds in rural north central Montana. They were asked to complete a survey and respond to questions about the immunization status of their two-year-old child, demographic information, statements of potential barriers to immunization, and belief statements concerning immunization.

The results of the project indicated that although the majority of children (61.5%) were completely immunized for their age, this did not meet the Healthy People 2000 goal of 90%. Many parents (nine) traveled 26 miles or greater to obtain immunizations. Most respondents (eleven) acquired health care for their child outside of the community in which they lived, at a distance of at least 45 miles. The majority of parents (ten) identified at least one barrier to obtaining immunizations. The most frequent responses were: not knowing when immunizations were due and travel distance to receive vaccinations.

The findings of this survey failed to support factors and beliefs associated with incomplete immunization and perceived barriers to immunization that have been identified in the literature. One impact of rurality, distance, was perceived as an issue for many respondents. This and other factors inherent in rurality have implications for the provision of preventative health services, such as immunizations, that must be further examined to optimize health care delivery to this unique population.

CHAPTER 1

INTRODUCTION

There have recently been extensive public campaigns in the pursuit of achieving the Healthy People 2000 goal to increase immunization levels among children under age two, to at least 90% (U.S. Department of Health and Human Services, 1991). Healthy People 2000 is a national health promotion effort comprised of 22 expert working groups, a consortium that includes nearly 300 national organizations, all state health departments, and the Institute of Medicine of the National Academy of Sciences. The Federal Government facilitated the development of the Healthy People 2000 objectives but additionally involved extensive public review and comment. Increased immunization levels are targeted with the objective of enhancing preventative services and reducing risks from vaccine-preventable diseases (U.S. Department of Health and Human Services, 1991).

In 1993, President Clinton launched the Childhood Immunization Initiative (CII) as a more inclusive national response to incomplete vaccination. The goals of CII were to eliminate endemic cases of six vaccine-preventable diseases by 1996, increase immunization levels to at least

90% among two-year-olds for each recommended vaccination (see Table 1) by 1996, and to institute a vaccination-delivery system that improves coverage levels (Centers for Disease Control & Prevention, 1994).

The Montana State Health Department identified the goal of attaining the Healthy People 2000 objective, to immunize 90% of United States children by the age of two, as a priority in the State of Montana. In 1995, an informal gathering of nurses at the Montana State Health Department discussed current priority issues. One concern identified was the immunization status of Montana's two-year-olds and the barriers to obtaining immunizations for this age group (M. Rhea, personal communication, October 4, 1995).

Therefore, the purpose of this professional project will be to determine the immunization status of two-year-olds in rural Montana and to identify parental perceptions of barriers to obtaining the basic immunization series. This information will be significant for the vast array of nurses who are key in the immunization process and are in a position to address these barriers.

By age two, a child should have received a minimum of four diphtheria-tetanus-pertussis (DTP), three live oral polio (OPV), one measles-mumps-rubella (MMR), and four *Haemophilus influenzae* (HiB) vaccinations (Centers for Disease Control and Prevention, 1994) (see Table 1).

Table 1. Recommended Schedule of Vaccination of Infants and Children.

Vaccine	Ages					
	2 mos.	4 mos.	6 mos.	12-15 mos.	15 mos.	4-6 yrs.
Diphtheria-tetanus-pertussis	X	X	X		X	X
Polio, live oral	X	X	X			X
Measles-mumps-rubella				X		X
<i>Haemophilus influenzae</i> type b conjugate	X	X	X	X		

Statement of the Problem

Many preschool children are not current on their immunizations, however, the majority (97%) of school age children are completely immunized (Kefalas, 1993). The emphasis on completion of the recommended basic vaccination series by two years of age is based on obtaining maximum vaccine effectiveness in this vulnerable population. "Efficacy is dependent on the age of the child, the immune status, appropriate administration, and booster immunizations" (Behrman & Kliegman, 1994, p. 297). Several factors influence the age at which vaccine administration is recommended: "In general, vaccines are recommended for the youngest age group at risk for developing the disease whose members are known to develop an adequate antibody response to vaccination" (Centers for Disease Control & Prevention,

1994, p. 12). Protection of toddlers is essential as their immune system has not fully matured and certain infectious diseases such as *Haemophilus influenzae* type b are more common in the under-two age group (Behrman & Kliegman, 1994). Vaccines are available to prevent eight potentially lethal or debilitating childhood diseases, however, these immunizations are currently not utilized to the fullest extent possible.

Significance of the Project

Fostering complete immunization is a critical component to ensure the health and vitality of our children, reduce morbidity and mortality of all individuals, and contain health care costs for preventable illnesses.

Montana faces the additional problems inherent in rurality. Issues characteristic to rural communities that limit access to or hinder obtainment of immunizations by parents should be identified to provide optimal delivery of preventative health care to those populations. The uniqueness of the rural culture needs to be addressed when evaluating health care factors in Montana.

Nursing plays several roles in the immunization process including that of facilitator of vaccinations and advocate for clients. The information obtained from this project will provide not only nurses but the health care community

in general with knowledge to enhance the immunization delivery system.

The role of the nurse includes promoting and providing preventative health care. Immunizations are one aspect that provides a window of opportunity to enhance health care delivery to families. Primary care nursing roles are opportune environments for integrating health promotion and disease prevention issues into interaction with clients (Pender, Barkauskas, Hayman, Rice, & Anderson, 1992). Preventative service visits are an optimal time to provide information and education, screening, risk assessment, discuss preventative health care, and to develop a plan of health care with the client.

As patient advocates, primary health care providers can be instrumental in initiating change to overcome barriers. The health care system while providing preventative services must be sensitive to parental problems and have the ability to address them. The nursing profession provides numerous contacts with children and their parents and is ideally key in the immunization process.

Objectives of the Study

The purpose of the professional project will therefore be to assess barriers to childhood immunization in a rural population based on parents' perceptions. The results will provide a base of information with which to develop

interventions that relate to the parental perceptions to increase the immunization rates in rural Montana. Specific aims of this study were to (a) identify the immunization status of a sample population, (b) identify parents' perceived barriers to immunization of their two-year-olds, and (c) assess the potential impact of rurality on immunization status and perceived barriers.

CHAPTER 2

LITERATURE REVIEW

Scope of the Problem

Immunization Status of Two-year Olds

A survey by the Centers for Disease Control (CDC) of the United States (U.S.) in 1992 determined that less than half of children in nine cities across the country had completed the primary series of immunizations by age two (Kefalas, 1993). CDC data from 1991 estimated that 37 to 56% of the 7.8 million two-year-olds in the U.S. have not been completely immunized (Shalala, 1993). Woods and Mason's survey (1992) reported rates as low as 28% in Dallas and 31% in Detroit.

Although statistics for immunization rates of two-year-olds were low, most (83-98%) had at least one contact with immunization services prior to age two. However, these contacts for whatever reason were not maintained (Kefalas, 1993). A survey in Washington state in 1977 found that achieving one additional contact with a provider could potentially have increased the complete immunization rates of two-year-olds from 60 to 82% (Marcuse, 1979).

In 1995, an assessment of immunization status was conducted on children in Montana from 36 day-cares throughout the state. The report indicated a 56.6% completion rate of the fourth DPT, third OPV, third HiB, and first MMR doses in children at 24 months of age (Montana State Health Department, 1995).

Consequences of Inadequate Immunization

Lack of achieving full vaccination of children results in increased disease incidence and increased cost to families and the health care system in general. In the United States in 1993, there were 4940 cases of diseases preventable by routine childhood vaccination including *Haemophilus influenzae*, hepatitis, measles, mumps, and rubella. For 1995 through the month of March, there were 516 cases nationwide of vaccine-preventable diseases in all age categories (Centers for Disease Control and Prevention, 1995).

One dramatic example of the pervasive effects of incomplete immunization against a vaccine-preventable illness was the recent measles epidemic of 1989-1991. Prior to the resurgence of measles, preschoolers accounted for 40% of the measles cases in 1986. Of the preschoolers with the disease who were old enough for vaccination, 83% were unvaccinated for measles (Hutchins et al., 1989). The measles epidemic brought further light to the magnitude of

the problem of incomplete immunization of children.

This measles epidemic resulted in a total of 55,622 cases. Of these cases, nearly one-half were unimmunized children less than five years of age. The incidence of measles in children under the age of five increased by 3% during the resurgence of the disease. Thirty-five percent of the remaining cases were among school-aged children (five to nineteen years old) (Atkinson, Gantt, Mayfield, & Furphy, 1995). The primary factor in the measles outbreak was stated to be failure to vaccinate children at the ages of twelve to fifteen months (Ad Hoc Working Group for the Development of Standards for Pediatric Immunization Practices, 1993).

The epidemic of this vaccine-preventable disease had consequences in terms of not only increased morbidity and mortality but also direct and indirect increased health care costs. Complications associated with the measles virus occurred in 22% of all reported cases and ranged from diarrhea to pneumonia, encephalitis, and death. Twenty percent of cases required hospitalization for a total of approximately 44,000 hospital days. Measles-associated deaths numbered 136 of the more than 55,000 cases; of these, 49% were among children less than five years of age (Atkinson et al., 1995).

The direct medical cost for the measles epidemic was estimated at over \$100 million (Atkinson, 1995). In

contrast to the direct and indirect costs of a vaccine-preventable disease, is the relatively low charge for the basic immunization series. In the private provider setting the cost was estimated at \$300 per series in 1990 and at \$91.20 in a public health clinic setting (Zylke, 1991). Preventative maintenance not only deters disease but actually reduces costs (Shalala, 1993). "...It is estimated that for every \$1 spent now on immunization, \$10 to \$14 will be saved by preventing diseases in the future" (Shalala, 1993, p. 1845). The former First Lady Rosalynn Carter has stated: "Some parents think they can't afford to vaccinate their babies. But they can't afford not to vaccinate" (The Theresa Racicot, Carol Judge, & Carol Williams Campaign for early vaccination, n.d.).

The financial, morbidity, and mortality consequences of a disease epidemic such as those discussed as a result of the resurgence of measles are the catalyst for the current national immunization goals and for the initiation of this project.

Preventative Health Care Indicator

Another consequence of incomplete immunization is a possible corresponding lack of preventative health care, screening, and primary health care. A study by Rodewald et al. (1995) indicated that, compared with completely immunized children age twelve to thirty months, the 34% of

children who were only partially immunized were at greater risk for anemia, tuberculosis, and lead screening delays. In addition, they made only half as many preventative health visits, fewer illness visits, and missed more appointments. The researchers concluded: "Underimmunization was a powerful, independent marker for inadequate health supervision in this population" (Rodewald et al., 1995, p. 393).

Missed Opportunities

Missed opportunities to immunize children are a major cause of low immunization rates. Several reports have identified situations in which occasions to provide needed vaccinations have been missed. Unfortunately, a significant number of children do not have a primary health care provider and obtain medical care at emergency rooms or community clinics. Therefore, they may not be receiving regular physical examinations or assessment of their immunization status (Kefalas, 1993).

Opportunities are also missed to administer immunizations when health care providers misinterpret true contraindications to vaccination. This often occurs when a provider withholds vaccinations from a child with a minor illness such as a viral upper respiratory infection (Hutchins et al., 1989; Kefalas, 1993; National Vaccine Advisory Committee, 1991).

Another cause of missed opportunity is the administration of a single vaccination when others also are necessary (Kefalas, 1993). Simultaneous administration of multiple vaccinations is particularly vital for children not likely to return for subsequent immunizations (Hutchins et al., 1989).

In one private practice, a group of pediatricians conducted a study of immunization rates and procedures in their practice. Brown, Melinkovich, Gitterman, and Ricketts (1993) found that by focusing on immunization rates, they were able to achieve immunization rates of 84-88% by administering simultaneous vaccines and vaccinating during minor illnesses. However, no progress with other aspects of well-child care (WCC) were obtained. The researchers found low compliance with the American Academy of Pediatrics (AAP) recommended schedule for well-child care visits. This indicated many missed opportunities to provide nonimmunization preventative care such as blood pressure, vision, and auditory screening (Brown, Melinkovich, Gitterman, & Ricketts, 1993). So once again, the need for holistic care versus focusing on one aspect of well-child care is demonstrated.

Children at Risk

Several studies have examined risk factors correlated with the failure to attain complete immunization of children. One such study by Marks, Halpin, Irvin, Johnson,

and Keller (1979) reviewed factors associated with lack of completion of the basic immunization series by two-year-olds. Variables found to be independently associated with attaining complete immunization included increased education of mother and father, smaller family size, and higher socioeconomic status. In addition, better vaccination rates were attained by parents obtaining care from private physicians rather than health department clinics.

Similarly, Kefalas (1993) found that children not receiving regular well-child exams as well as those from low-income households were at risk for incomplete immunization.

A study (Hutchins et al., 1989) on missed opportunities by health care providers to administer the measles vaccine to preschoolers also identified factors associated with incomplete immunization. The researchers found that half of the interviewed health care providers did not administer the measles vaccine because of minor illnesses, such as upper respiratory infections, that were not true contraindications for vaccination. Unvaccinated children were more likely to receive public health care, have single mothers, or parents without sufficient knowledge about vaccines.

Finally, a profile of two-year-old children at risk for inadequate immunization was formulated from a community survey in Ohio (Salsberry, Nickel, & Mitch, 1994b). The researchers indicated that incompletely immunized children

were more likely to have been born out of wedlock, have obtained immunization through hospital clinics, and may have had a slight cold or fever at the time of the exam. Parents in the partially immunized group were more likely to be unsure of the immunization schedule and to have more children. Mothers tended to be younger, nonwhite, and less educated. Greatest risk was found to be associated with parental belief that vaccination would make their child ill.

Many children at both the national and state level are only partially immunized in part as a result of missed opportunities by providers to administer vaccinations. Thus, the consequences are increased disease incidence, increased cost and lack of preventative and primary health care.

Provider and Parental Perceptions

Provider Perceived Barriers to Immunization

Barriers that limit immunization can be categorized as either economic, policy, or resource factors. Economic contributors, such as lack of insurance coverage for immunizations and the cost of vaccination, result in incomplete immunization. Policy barriers involve requirements of appointments and primary care visits, inaccessible clinic sites, and problems with record and tracking systems. Frequently cited resource barriers as

perceived by providers are staff shortages, lack of convenient clinic hours, language barriers and lack of education materials to bridge cultural gaps (Kefalas, 1993).

Finally, a report on physician vaccination referral practices in New York (Cicirello et al., 1995) identified the practice of primary care physicians referral to other medical settings for vaccination as a barrier to timely vaccination of children. Primary reasons for referral were cited as financial hardship for the patient, lack of insurance coverage, discontinuation of free vaccine to physicians by health departments, and the vaccine purchase costs for the physician (Bordley, Freed, Garrett, Byrd, & Meriwether, 1994). Parents unable or unwilling to pay for immunizations not covered by insurance in the physician's office are often referred to public clinics. This practice contributes to fragmented health care and results in missed opportunities to immunize (Bordley et al., 1994). The researchers suggested the encouragement of physicians to participate in federal vaccine replacement programs.

Parental Perceived Barriers to Immunization

Many factors are common among parent and provider perception of barriers to receiving or administering immunizations. Several studies (Cicirello et al., 1995; Bordley et al., 1994; Kefalas, 1993) have assessed what providers ascertain as barriers from the health care

delivery perspective as well as what are assumed by providers to be perceived as barriers by the consumer; few have targeted the parents in data collection.

In one such study, parents and providers comparably cite cost, lack of insurance coverage, and child with a minor illness as barriers to immunization (Salsberry, Nickel, & Mitch, 1994a). Unique to the group of parents are difficulties related to lack of time, child care of other children, and inconvenient clinic hours. Socioeconomic status was not a factor in the perception of barriers to immunization. Persons in all levels of socioeconomic status identified problems with cost and lack of insurance coverage (Salsberry et al., 1994a).

Interventions and Recommendations

The National Vaccine Advisory Committee (1991) offered several recommendations to improve the immunization system. These included improved availability of immunization, improved management of the provision of immunization, and ongoing measurement of children's immunization status.

In response to the measles epidemic of 1989-1991, the National Immunization Campaign was launched in 1991 by the Children's Action Network and a coalition of business, health, government, child advocacy and community organizations to increase public awareness (Children's Action Network, 1994). The goals of National Immunization

Week as part of the National Immunization Campaign are to "increase immunization rates among preschool children while raising public awareness about the benefits of preventative health care" (Zylke, 1991, p. 1321).

Also nationally, Former First Lady Rosalynn Carter and Betty Bumpers, wife of Senator Dale Bumpers of Arkansas, formed the "Every Child By Two" campaign in response to the increase of childhood diseases such as measles, whooping cough, and rubella. Locally in Montana, a network was created by First Lady Theresa Racicot, Former First Lady Carol Judge, and Carol Williams, wife of Congressman Pat Williams, to promote vaccination by age two. Statewide they have developed a mandate to ensure that all children will be fully vaccinated by age two (The Theresa Racicot, Carol Judge & Carol Williams Campaign For Early Immunization, n.d.). According to Joyce Burgett, RN and nurse consultant to the state immunization program, this mandate entails that children attending day-cares and schools in Montana be completely vaccinated for their age (personal communication, January 29, 1996). Additional focus is on education outreach to parents and communities locally to maintain interest in immunizations. Contact has been preserved with the national "Every Child by Two" campaign to bring Montana concerns and issues to the federal level.

Other recommendations to improve vaccine administration are to simplify the process and to decrease the number of

visits or injections necessary to complete a full series. One example is the development of a combination of four vaccines (measles, mumps, rubella, and varicella) that has been under investigation (Zylke & Marwick, 1991).

The Standards for Pediatric Immunization Practices (National Vaccine Advisory Committee, 1992) were developed for health professionals to provide a guideline of immunization practices that they should endeavor to achieve. By implementing the standards, health care providers can enhance and improve their own policies and practices.

An inexpensive method proposed by Lance A. Chilton, MD (1980) to increase immunization rates was to routinely vaccinate children, both at the time of well-child visits and when presenting with minor sickness (such as a mild upper respiratory infection) at an acute care facility. He cites the Center for Disease Control's Immunization Practices Advisory Committee statement that "the presence of minor illnesses such as mild upper-respiratory infections should not preclude vaccinations" (p. 801).

A final example of one effort to increase infant immunizations was focused on changing provider behavior. The study designed and evaluated a reminder system that tracked all children and primary care visits in an inner-city clinic. An individualized immunization label was placed on the patient's chart as an indicator of immunization status and vaccine administration. The

information system resulted in a significantly higher immunization completion rate for infants (Brink, 1989).

Summary

The literature has identified low immunization rates in the nation's two-year-old population, the consequences of incomplete immunization, children at risk, provider and parental perceived barriers to immunization, and interventions and recommendations aimed at increasing immunization rates. These issues influencing the immunization status of two-year-olds can be addressed and illuminated using a model for preventive health behavior in general.

Pender's Preventative Health Behavior Model

Preventative health behavior is the focus for implementing higher immunization goals. In 1975, Nola J. Pender published a conceptual model for preventative health behavior which focused on how individuals made and took action on health care decisions within a nursing concept (Pender, 1975) (see Table 2). As reported by Tillett (1994), Pender then developed the Health Promotion Model, which was first published in 1982, to offer an explanation and predictor of individual's health promoting behaviors.

Health promoting behavior aims to enhance the well-being and self-actualization of individuals or groups. In

comparison, health protection or preventative behaviors are actions undertaken by individuals or groups and directed toward minimizing the likelihood of and protecting against illness or injury (Pender, 1987). Preventative health behaviors are generally voluntary and executed when asymptomatic. They consist of two phases: decision-making and action, with action dependent on decision-making (Pender, 1975). Several phases of Pender's model and their components can be applied to the process of decision-making and acquisition of immunizations in relation to parental behavior.

Table 2. Health Prevention Model (Pender, 1975) as interpreted by McClain.

Decision-Making Phase			Action Phase
Factors			
Personal	Interpersonal	Situational	Perceived Barriers
*importance of health	*concern of others	*cultural acceptance	
*perceived vulnerability	*family patterns	*societal norms	Likelihood of Taking Preventative Health Action
*perceived value of early detection	*expectations of friends	*nonpersonal information	Cues to Action
*perceived seriousness	*information from professionals		
*perceived efficacy			
*perceived level of control			

Decision-making Phase

The components of the decision-making phase consist of personal, interpersonal, and situational factors. They function to influence the likelihood of engagement in preventative health behaviors. Personal determinants influence an individual's perceptions and include (a) the importance of health, (b) individual vulnerability, (c) value of early detection, (d) seriousness, (e) efficacy of action, and (f) level of internal versus external control (Pender, 1975).

The personal factors include the following:

Importance of Health. Placing a high value on health results in health seeking behavior (Tillett, 1994). A parent identifying health as meaningful and perceiving health by means of immunization may tend to seek knowledge about immunizations for the child's welfare.

Perceived Vulnerability. An individual's belief in the opportunity of exposure to a health problem is another motivating factor. Another component is the present health status of the individual and of the incidence of the health problem within the general community (Pender, 1975). Many individuals have not been exposed in their lifetime to the long term devastating effects of vaccine-preventable diseases such as polio so do not discern their family to be at risk.

Perceived Value of Early Detection. Valuing early detection generally correlates with action to seek this health-protective behavior. However, this may be illness specific (Pender, 1975).

Perceived Seriousness. The perceived seriousness of a health problem is influenced by the degree of threat of discomfort or death, the visibility of the problem, the degree of interference in family and occupational roles, and the communicability of the illness (Pender, 1975). If the consequences of obtaining a vaccine-preventable disease outweigh the immediate discomforts of the immunization as perceived by an individual, it may sway the decision-making process.

Perceived Efficacy of Action. The conviction that one can successfully execute the required behavior necessary to produce a desired outcome affects the motivation to initiate a health-promoting behavior (Tillett, 1994). Also important is the perceived effectiveness of the preventative services (Pender, 1975). A parent must believe that he or she has the ability to follow through with the immunization series and that the effects will be beneficial.

Perceived Control. Those who perceive themselves to be in control view preventative health behaviors as more effective than those who see themselves as externally controlled with little influence over the environment (Pender, 1975). "The individual's perception of his own

ability to change his health can motivate his desire for health" (Tillett, 1994, p. 509). A parent may need to be involved actively in some aspect of the immunization process to feel empowered.

Interpersonal Determinants. A second influence on the decision-making process is interpersonal determinants. These include the concern of significant others, family patterns of utilization of preventative behaviors, expectations of friends, and the perceived credibility of information from professionals (Pender, 1975). The information supplied by an informal network of family and friends may be more highly valued than that of health care professionals and may have impact on all aspects of preventative behavior.

Situational Determinants. A final component of the decision-making phase is categorized as situational determinants. Preventative health behavior is affected by cultural acceptance of the actions and the social appropriateness to engage in those measures. Actions to promote health maintenance are also influenced by societal norms and pressures from society. Interpretation of health information from nonpersonal sources such as media and literature may govern perceived vulnerability to illness and perceived efficacy of preventative health actions (Pender, 1975). The situational factors may enhance or deter immunization-seeking behavior by the parents.

Action Phase

After the decision has been reached to engage in a health-protective behavior, various types of barriers may interfere with an individual initiating or carrying out the action. Barriers to health-promoting behavior may be real or imagined and may include unavailability, cost, or difficulty of the behavior (Palank, 1991). The perception of the presence of barriers may influence an individual's plan to engage in an action (Tillett, 1994). By identifying barriers to immunization that are perceived by parents, insight can be gained to factors inhibiting the action of vaccination.

Other triggers that increase the probability of preventative behavior include prior experience with illness and level of readiness to act. These affect the intensity of the cue required to encourage the recommended action (Pender, 1975). A person who has suffered the effects of an illness may seek to avoid preventable childhood diseases for their child.

Finally, cues are required to implement action. The cues may originate from internal sources such as self-awareness or fatigue. Environmental external origins such as the media or availability of health facilities may assist in putting the decision into action (Palank, 1991). Individuals may be provoked to vaccinate as a result of

prominent campaigns, such as Every Child by Two (ECBT).

Summary

In summary, a model for preventative health behavior was proposed by Nola J. Pender as an explanation of why individuals resolve to engage in health actions and identified triggers to promote response. Pender's model is an asset in evaluating motivational and inhibitory determinants of preventative health actions such as immunizations. In this study, the model will be used only to analyze certain factors of the decision-making phase: importance of health, perceived vulnerability, perceived seriousness, perceived efficacy, family patterns, information from professionals, societal norms, and nonpersonal information. All aspects of the action phase will be applied to this study.

The health care professional's role in decision-making is to provide information about realistic perceptions of vulnerability, consequences of the illnesses of high risk and to develop a plan of preventative health care with the client. The health professional must assess and promote motivators in the absence of illness. Cues to action can be provided when the individual has completed the decision-making phase by appropriately structuring the environment and addressing barriers (Pender, 1975).

The Health Prevention Model was applied in focus,

design, and will be applied to the results of the project to explain the effect of parental perceived barriers on the immunization status of children. Although all of Pender's concepts were not used in this study, the model will provide an assessment of the factors influencing this health preventative behavior. Additionally, the use of the model in evaluation of the data will guide proposed interventions and ideas for further research.

CHAPTER 3

METHODOLOGY

Project Design

This project was designed to assess immunization status and parental perception of barriers to vaccination in a rural population of two-year-old children. Participants in this study were parents or guardians of two-year-olds in Northcentral Montana. The study investigated the following: (a) current immunization status, (b) perceived barriers to immunization, and (c) potential impact of rurality on immunization status.

Data Collection

Immunization records of two-year-olds were accessed by this researcher through a county health department in a rural Montana community. The 1990 population of the county was 5,452. There were 1563 total families in the area at that time; 663 households were comprised of a married couple family with children under eighteen years of age. None of the population in the county was classified as urban in comparison to 52.5% of the total 799,065 Montana residents in 1990. The rural population was divided into 1657 rural

farm and 3795 nonfarm dwellers. Ninety-six percent were of Caucasian race; 207 individuals (four percent) were identified as American Indian, Eskimo, or Aleut; and 24 (0.4%) as Asian or Pacific Islander. The 1989 median income in the rural community was \$22,835. In that same year 61 married-couple families with children under eighteen years of age were below the poverty level; 250 families within the same category were above the poverty level (U.S. Bureau of the Census, 1990).

The 1990 census data indicated 146 children were one to two years of age in the county (U.S. Bureau of the Census, 1990). The sample was selected by compiling names from immunization files at this county health department of all parents or guardians of at least one two-year-old child. The children were ages 24 to 36 months at the time of the survey. A sample of 32 individuals was obtained from the immunization files. The sample population resided within the community in which the health department is located or in surrounding rural communities and had received at least one vaccination at the indicated health department.

The population was selected because the basic immunization series is scheduled to be completed by that age. In addition, Healthy People 2000 objectives target immunization rates of two-year-old children (U.S. Department of Health and Human Services, 1991) and the Montana State Health Department has identified the goal of achieving the

national objectives as a priority in this state (The Theresa Racicot, Carol Judge, & Carol Williams Campaign for early vaccination, n.d.).

Survey materials were mailed to parents and guardians on November 8, 1995. A letter explaining the project, assuring anonymity, and discussing potential benefits and consequences of participation was enclosed with the survey (see Appendix A). Completed questionnaires were mailed back to the researcher in a self-addressed stamped envelope with a target date of November 22, 1995.

The questionnaire employed in this project was used with permission from Pamela Salsberry RN, PhD (see Appendix D). Salsberry, Nickel, and Mitch (1993, 1994a, 1994b) conducted a Pediatric Immunization Survey in an urban population in September, 1991 using this tool. Although not analyzed for validity and reliability, the questionnaire was pilot tested in its initial use for clarity, readability, acceptability, and time for completion. The original study included 302 respondents from a sample size of 1011. The results obtained from the questionnaires were used to identify immunization status and barriers perceived by parents of varied income levels, to profile two-year-old children at risk for inadequate immunization, and to compare parents' and providers' perception of barriers to immunization. The survey was adapted in this project to include rural issues and suggestions from Pamela Salsberry

(personal communication, September 1, 1995) (see Appendices B & E).

Likert-type scales, open-ended, and multiple choice responses were included in the questionnaire. Demographic data were collected. Questions related to relationship to the child, number of children in various age groups, employment, marital status, and income. Information about the immunization status of the two-year-olds was sought. Health care access information was evaluated including distance to travel to receive immunizations, immunization provider, and community of most frequently accessed health care. Questions about the health status of the child and prior episode(s) of vaccine-preventable diseases were also asked. Final components consisted of assessment of perceived barriers to immunization and beliefs about immunizations. Approximately fifteen minutes was required to complete the questionnaire.

Methods of Analysis

A child was categorized as fully immunized if the parent reported that the two-year old had received four DTP doses, three oral polio doses, one MMR, and four HiB vaccinations. The respondent was given three choices (yes, no, or not sure) for each recommended dose. Responses of no or not sure were categorized as not immunized for that dose.

Because of the small sample size and response rate, methods of analysis were limited. Open-ended questions were categorized qualitatively. Discussion included the site at which health care was most often obtained (if not within the community of residence) and the reason health care or immunizations were (if at all) accessed in another community. A final open-ended question allowed the participants to include any comments they wished.

Several factors shown in the literature to be linked to immunization levels were assessed. The general health status of the child was included. Also, parental demographic and access variables were measured. This included number of children in various age groups, employment status, marital status, age, and income.

A Likert scale was used to investigate barriers to immunization with possible responses indicating the extent that the situation was perceived as a problem. Possible responses to the eighteen statements were none, slight, moderate, or major. Access barriers such as transportation and insurance coverage were appraised. Systems barriers were assessed such as loss of immunization records and the scheduling of immunization visits separately from regular well-child examinations. Forgetting to take the child in for immunizations or child care for other children were examples of parental barriers. Responses of slight, moderate, or major problem were categorized as concurring

with the statement.

A similar Likert scale was used to assess parental beliefs about immunizations as these factors have been linked in the literature to the immunization status of the child. Statements in this study included beliefs about childhood diseases, timing of immunizations, religious beliefs, and perceived vulnerability. Possible responses to the ten statements indicated that the participant "strongly agreed", "agreed", was "undecided", "disagreed", or "strongly disagreed" with the statement. Responses of "strongly agreed" and "agreed" were classified as affirmative. There were no "undecided" responses.

Human Subjects Review Process

The rights of human subjects were assured during conduction of this project. Procedures for data collection and the survey instrument were approved by the Montana State University College of Nursing Human Subjects Review Committee prior to data collection (see Appendix C).

A letter of introduction was included with the survey to the parent or guardian (see Appendix A). Possible risks and benefits to the participant were discussed. Completion and return of the questionnaire implied consent to participate.

Anonymity and confidentiality were assured to the subjects. The list of parents and guardians was obtained by

this researcher with permission from the health department in a rural Montana community. The list of subjects' names and addresses was destroyed upon mailing of the surveys. The questionnaires were not coded and did not require identification by the participants.

CHAPTER 4

PROJECT OUTCOME

ResultsParticipant Characteristics

Thirty-two questionnaires were mailed to parents and guardians who had obtained at least one immunization for their child at the health department in the previously mentioned rural community. Questionnaires were completed and returned by thirteen parents for a response rate of 38%. Twelve of the surveys were completed by the mother of the two-year-old in the household and one was completed by a father.

All respondents were over eighteen and married with an mean age of 30. Most (six) of the participants were not employed outside the home; five were employed full-time, two part-time, and one was a full-time student. Seven (54%) reported an annual income in 1990 of \$20,000-29,999 and four (31%) had an income of \$10,000-19,999 (see Table 3). Respondents had an average of 2.8 children with a median of two.

The distance traveled by parents to receive immunizations included two responses of 0-5 miles, five who

traveled 6-25 miles, six responses of 26-50 miles, and three responses of 51-100 miles from the site at which they received immunizations for their child (see Table 5). More than thirteen responses were a result of several parents who had obtained immunizations from more than one source.

Table 3. Demographic Data.

	Respondents (n=13)
Parental age (mean years)	30
Family income (#)	
\$10,000-19,999	4
\$20,000-29,999	7
\$30,000-39,999	1
\$40,000-49,999	0
>\$50,000	1
Number of children (mean)	2.8
Employment status (#)	
Employed full-time	4
Employed part-time	2
Student full-time	1
Not employed outside home	6

Immunization Rates

The children of eight (61.5%) of the respondents were fully immunized. One parent did not respond to this item of the survey. Of the remaining four, two were deficient in HiB vaccinations only; one was lacking the fourth DPT, fourth HiB, and the MMR vaccination; and one was delayed only with the fourth DPT and HiB doses (see Table 4).

Respondents whose children were not fully immunized were of varying income levels as were those who had received all of the recommended immunizations for two-year-olds. Of

the parents of children with partial immunization status, two traveled 26-50 miles to receive immunizations for their child, one estimated travel at 6-25 miles, and one individual traveled 51-100 miles.

Table 4. Immunization Rates.

Vaccine	Number Receiving Dose (n=12) ^a	Percentage (%)
DTP Dose		
First	12	100.0
Second	12	100.0
Third	12	100.0
Fourth	10	83.3
Polio Dose		
First	12	100.0
Second	12	100.0
Third	12	100.0
MMR	11	91.6
HiB Dose		
First	12	100.0
Second	11	91.6
Third	11	91.6
Fourth	8	66.6

^aOne parent did not respond to this item.

Child Health Status

Of the thirteen respondents, none reported that their child had acquired a vaccine-preventable illness such as measles, whooping cough, or diphtheria. Two children had contracted chickenpox for which one mother missed four days of work to care for the child.

Only one mother reported a child with a chronic illness; allergies in this case. The child was fully immunized.

Acquiring Immunizations

The majority (11) of parents obtained their child's immunizations at a health department clinic, as did three of the four with partially immunized children. A neighborhood clinic, well-child clinic, private clinic, county health nurse, and a private physician were reported once each as the site of vaccination. Three respondents indicated two sources of vaccination for their child (see Table 5).

All parents traveled by way of their own vehicle to the site from which immunizations were obtained. In addition, a friend or relative's car was also utilized by two individuals.

Many parents indicated more than one source of payment for their child's immunizations. Nine (69%) paid for some or all of the vaccinations themselves. Six reported health insurance coverage. No charge for immunizations was indicated by two parents and two had Medicaid assistance. Of those partially immunized, three paid for the cost without assistance (see Table 5).

Several statements indicated how the parent knew or remembered at what time to take the child in for immunizations. Ten had received a reminder card in the mail; one was "told at clinic when to come back" and "saw ad in local paper"; two received a phone call from the doctor's office or clinic; three of the parents had regular checkups scheduled by the health care provider when immunizations

were due; and four had copies of the recommended schedule and took the child in at the appropriate time. All of the parents of partially immunized children had received reminders in the mail and, additionally, two had received phone calls.

Table 5. Access Characteristics.

	Respondents (n=13) (frequency)
Distance to receive immunizations (miles)	
0-5	2
6-25	5
26-50	6
51-100	3
Source of payment	
Self	9
Health insurance	6
Medicaid	2
No charge	2
Source of immunizations	
Health department	11
Neighborhood clinic	1
Well-child clinic	1
Private clinic	1
County health nurse	1
Private physician	1
Source of health care	
Private physician	7
Neighborhood clinic	3
Hospital clinic	2
Health department	2

As shown in table 5, health care, other than immunizations, was most often obtained through a private physician (seven responses). Most respondents (eleven) acquired their child's health care outside the community in which they live. Responses were of a city 45 miles and an

urban area 70 miles from the identified county health department. Seven parents cited preference for a physician or pediatrician in that community. "We have had some bad experiences with a previous doctor in [my community of residence] so for medical attention we keep going to [a nearby urban area]" stated one mother. Another acknowledged, "...I had my child there and they have pediatricians [sic] their [sic], where in my county the[y] only have general family doctors and I would rather have my child see a pediatrician [sic"].

Two respondents indicated that the closest health care was available in the nearest urban area, at least 45 miles away. The remaining (two) parents cited clinic hours as the deciding factor in procuring health care in another community. "...I usually just drive to [another city] and I don't have to wait for a clinic or health fair". Also, "we work in [an urban area] and the clinic is also open on Saturday and Sunday".

Barriers to Immunization

Barriers perceived by parents to obtaining immunizations for their child were recognized by the majority (ten) of respondents (see Table 6). Systems barriers, such as requirement of advance or separate appointment (six respondents), inconvenient hours (two), loss of records (two) and lengthy office wait (two), were

cited most frequently and by three of the four parents of partially immunized children.

Transportation or distance to travel to receive immunizations was reported as a slight or moderate problem in five responses. Five individuals also identified lack of knowledge about where to obtain immunizations or when they were scheduled to be given as slight or moderate barriers.

Other parental factors such as forgetting to take the child, lack of time, and child care of other children were identified six times by those surveyed. Cost or lack of insurance coverage was reported as a slight to major problem for five (38%) parents.

Table 6. Parental Perceptions of Barriers to Immunization.

Barrier	Respondents (n=13)	Percentage (%)
Don't know when due	5	38.5
Travel distance	4	30.8
Insurance doesn't cover	3	23.0
Advance appointment required	3	23.0
Forgot	3	23.0
Immunizations separate from checkups	3	23.0
Cost	2	15.4
Office wait too long	2	15.4
Hours inconvenient	2	15.4
Child care of other children	2	15.4
Transportation	2	15.4
Records lost/missing	2	15.4
Immunizations not given because of cold or fever	1	7.7
Lack of time	1	7.7
Health of other family	1	7.7
Don't know where to go	1	7.7
Child in poor health	0	0.0
Allergies	0	0.0

Partially immunized children. Of the four parents whose children were lacking some of the immunizations recommended by two years of age, one cited six distinct statements as problems on the eighteen item Likert scale, two referred to five problems, and one specified only one problem--insurance. Cost or lack of insurance coverage was identified by parents of three of those partially immunized.

Transportation or distance to travel to receive immunizations was cited as a slight to moderate problem for two of the four partially immunized families. Also two parents indicated not knowing when immunizations were due as an obstacle.

Several additional statements were identified by a "slight" response with a frequency of one. These items included: "forgot to take my child", "lack of time", "health of another family member", "doctor or clinic hours are inconvenient", "office wait is too long", "child care for other children", "immunization visits scheduled separately from regular check-ups", "advance appointment is required", and "immunizations were not given by the doctor or nurse if my child had a slight cold or low grade fever".

Beliefs About Immunizations

Statements of parental beliefs about immunizations may potentially reveal perceptions influencing the decision not to immunize a child. However, this segment of the

questionnaire revealed agreement by only one parent (a father) with only one statement. The statement indicated lack of knowledge about vaccine-preventable diseases. Therefore, the remaining twelve respondents judged their knowledge about vaccine-preventable diseases to be adequate.

Summary

The results of this survey may help to explain delays in immunizations of two-year-olds. The Healthy People 2000 goal to achieve full immunization of 90% of United States two-year-olds was not reflected in this sample population. Only eight (67%) of the children in this project were fully immunized. Although lower than the national goal of 90%, this rate is above those reported in Woods and Mason's (1992) survey of 28%-48%; the 1991 CDC data estimated 37% to 56%; and the Montana State Health Department survey indicating a completion rate of 56.8% (in receiving DPT4, OPV3, HiB3, and MMR1). The low percentage in this survey was primarily due to failure to receive the fourth DTP and fourth HiB doses.

Although the literature cites missed opportunities to immunize children as a major cause of low immunization rates, this was not supported by the results of this survey. Only one parent reported a child with a minor illness as a barrier to receiving vaccinations. However, opportunities missed related to lack of assessment of immunization status

was not evaluated in this study.

One study (Salsberry et al., 1994b) identified the greatest risk of incomplete immunization to be linked to parental belief that vaccination would cause harm to the child. In contrast, none of the parents of either completely or partially immunized children in this study identified this belief.

Also associated in the literature with inadequate immunization rates were larger family size, lower socioeconomic status, obtaining immunizations from health departments or hospital clinics, and younger maternal age. In this study, the parents of partially immunized children were 24 to 31 years of age similar to that of the average respondents of this questionnaire. Family income varied considerably in both the fully and partially immunized groups. Site of immunization was also insignificant as most had obtained some or all vaccinations at a health department. Finally, although the literature links larger family size with incomplete immunization, the number of children in the families of those inadequately immunized in this study ranged from two to four with a mean of three.

Parents in this study did not consistently perceive factors identified in the literature as barriers to immunization of their children. Participants classified not knowing when immunizations were due most frequently as a barrier although ten (78%) had received reminders in the

mail. Distance to travel was perceived second most frequently as a barrier to immunization. This may be accounted for by the rural nature of the population and by those obtaining immunizations in a community other than that of residence.

Cost, socioeconomic status, and lack of insurance coverage have invariably been identified in other studies as barriers to immunization. This project did not support those findings. However, Nola Pender's Preventative Health Behavior Model can be applied to the results of this survey. Responses to the immunization belief statements were interpreted as revealing a sense of vulnerability to vaccine-preventable diseases, seriousness of the consequences of those diseases, perceived efficacy of vaccinations, and parental perception of importance of immunizing their child. These compose some of the personal determinants of Pender's model and have an affirmative effect on the decision-making phase of seeking this form of preventative health care.

Interpersonal determinants were assessed in the family pattern of health care acquisition which varied considerably. Although most immunizations were obtained at clinics or health departments, other aspects of sick or well-child care were acquired from private physicians. Most individuals revealed adequate knowledge about the immunization process, however, it was not assessed as to

whether this information was acquired through formal or informal networks.

The effects of situational determinants on the decision-making phase such as socioeconomic status and access characteristics were also considered. As discussed earlier, family income was not a significant factor in seeking childhood immunizations, whereas, access components, such as distance and knowledge of where vaccinations were available, did have some impact in this phase. These aspects of the questionnaire can be related to the societal norms and nonpersonal information of Pender's model.

The action phase is dependent on cues and the presence of barriers to action. External cues identified by this population as promoting vaccination included a high response of receiving reminders through mail or phone contact. In spite of these cues, there was a contrasting perception of lack of knowledge about when immunizations were expected. Barriers, such as distance in this rural sample, may have influenced the parent's ability to engage in the action--immunization--for the child. The likelihood of the parent taking future preventative health action in behalf of the child can not be implicated from this study of one aspect of well-child care.

Limitations

Limitations of this study should be considered in

evaluation of the results. The fully immunized rate of children in this population should be considered with the small sample size and response rate in perspective. Also, the population that was accessed had received at least one vaccination at the county health department which may have influenced the data in favor of higher immunization rates compared to individuals never having contact with this facility.

Limitations of the tool must be considered in appraising the outcome of this study. The original tool was developed for and piloted in an urban population and may therefore have restricted application. Neither the original or adapted questionnaire were tested for reliability or validity. In view of these limitations, this project may be considered as a pilot use of the revised tool in a rural population.

Implications

Despite the limitations, this project has implications for the delivery of immunization services to rural Montana. Although community immunization clinics are provided in this small town and surrounding counties, many parents are limited in their ability to access these services as a result of distance, inconvenient clinic hours, lack of knowledge about the immunization schedule, or by the presence of other barriers. The provision of flexible

clinic schedules with enhanced community awareness and improved reminder systems need to be explored by individual providers and preventative health care delivery systems.

Health care providers must achieve assessment of immunization status at each contact with children. Missed opportunities, although not evident in all of the four partially immunized families, remains an important concept. Attention should be given to the fourth DTP and HiB doses. This may require coordination with diverse systems as many parents access immunizations at sites other than those utilized for sick and well-child care. The parent may need to assume responsibility for retaining a record of the child's immunization status to assist in this collaboration of care.

Lack of full immunization in this rural population may have future impact on the incidence of vaccine-preventable illness in rural Montana with an associated increased cost to the state's health care system. As indicated in the literature, failure to immunize may be correlated with a lack of utilization of other aspects of well-child and preventative health care services.

This study also has significance for the nursing profession. Nurses can enhance the delivery of immunizations by addressing barriers identified by this project in the settings in which they practice. Missed opportunities can be minimized by advocating for the client

and administering vaccinations in all situations for which there is not a true contraindication. Also, identifying barriers to immunization as perceived by parents can be accomplished on an individual case basis. Health care providers who recognize children to be incompletely immunized may then intervene to assist in overcoming parental perceived barriers.

Recommendations

Several recommendations are suggested for further study. To achieve more relevant data, this project should be replicated on a larger scale with a sample from a varied rural population. Also, a detailed look at individual rural health providers' immunization reminder systems and immunization rates of their clients may contribute to the knowledge base of successful techniques. An assessment of rural providers' perceptions of barriers to immunization delivery to this population may be useful as a comparison.

Coordination of public and private health care systems is integral to the provision of superior immunization services to preschool children. The information obtained from this study can contribute to the existing base of knowledge and be used to develop interventions to overcome barriers to immunization of preschool children. However, further research of the barriers inherent in this process is required to facilitate optimal health preventative behavior.

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APPENDICES

APPENDIX A

Letter of Introduction to Parent

Dear parent or guardian:

I am interested in your perceptions of barriers you may have encountered in obtaining immunizations for your child. The enclosed questionnaire will provide you with the opportunity to identify barriers that may be unique to a rural community such as your own. This study will provide information about the immunization status of two-year-olds in your community and may be used to understand the immunization delivery system in your area.

Your participation is voluntary. If you choose to participate, the completion and return of the questionnaire will indicate your consent to participate in the study. If you choose not to participate in this study, it will not affect your ability to obtain immunizations or health care in your community. Minimal risk is involved in completion of the survey. Some questions may have the potential for stimulating guilt. If you have any concerns about this please contact me.

Only one questionnaire is required to be completed in this study. Please fill out the information based on the two-year-old child in your home. If you have more than one two-year-old child, please select one child with which to base your responses on. Completion of the questionnaire should take you about 15 minutes. Upon completion of the questionnaire no further involvement is required. The questionnaires will not require names or identification.

Results of this study will be reported as grouped data. Individual data will not be revealed. There will not be any financial reimbursement or direct benefit for participation in this study.

Your participation is greatly appreciated. Please return the questionnaire in the enclosed envelope by November 22. If you have any questions regarding the study during or after completion of the questionnaire, please feel free to call me at 452-7648. Thank you.

Sincerely,

Kathleen McClain RN, BSN
Graduate Student
Faculty: Michelle Smith MN, RNCS
Assistant Professor
Montana State University-Bozeman
College of Nursing
Great Falls Campus 455-5610/5614

APPENDIX B
Questionnaire

PEDIATRIC IMMUNIZATION STUDY

(Approximate time to complete
is 15 minutes)

CONDUCTED BY:

Kathleen McClain RN
Family Nurse Practitioner Student
Montana State University
College of Nursing

Permission to use and adapt survey: Pamela J. Salsberry PhD, RN,
Associate Professor

Adapted by: Kathleen McClain RN

Please remember to complete this questionnaire for the one child you have chosen.

Has your doctor ever told you your child had any of the following diseases?

(circle number of all of the below that apply)

- 1 MEASLES (10 DAY)
- 2 MUMPS
- 3 RUBELLA (3 DAY OR GERMAN MEASLES)
- 4 POLIO
- 5 WHOOPING COUGH
- 6 DIPHTHERIA
- 7 TETANUS (LOCK JAW)
- 8 CHICKEN POX
- 9 NONE OF THE ABOVE

If you did NOT circle any of the above diseases, please go to the next page.

For EACH disease circled above indicate below whether your child was hospitalized for the disease.*

Name of the disease (write out) _____

Did child require hospitalization YES _____
NO _____

Name of the disease (write out) _____

Did child require hospitalization YES _____
NO _____

Name of the disease (write out) _____

Did child require hospitalization YES _____
NO _____

*If you need to write about more than 3 diseases, please add an additional sheet of paper.

For EACH disease circled above that your child has had, please indicate whether you had to miss work because of your child's disease.

Name of disease (write in name) _____

I had to miss work: YES _____ (fill in number of days missed)

NO
NOT WORKING OUTSIDE THE HOME

Name of disease (write in name) _____

I had to miss work: YES _____ (fill in number of days missed)

NO
NOT WORKING OUTSIDE THE HOME

Immunizations are available for many diseases. I have listed some of the available immunizations and the usual number given to young children. Please circle either Yes or No or Not Sure for each shot or dose listed. You may want to look at your child's immunization record when answering this question.

Immunization	(circle)		
DPT			
1st shot	Yes	No	Not Sure
2nd shot	Yes	No	Not Sure
3rd shot	Yes	No	Not Sure
Booster	Yes	No	Not Sure
Polio			
1st dose	Yes	No	Not Sure
2nd dose	Yes	No	Not Sure
3rd dose	Yes	No	Not Sure
MMR			
One shot	Yes	No	Not Sure
Hib			
1st shot	Yes	No	Not Sure
2nd shot	Yes	No	Not Sure
3rd shot	Yes	No	Not Sure
4th shot	Yes	No	Not Sure

Where did your child receive his/her immunizations? Circle all that apply.

- 1 PRIVATE PHYSICIAN
- 2 NEIGHBORHOOD CLINIC
- 3 HOSPITAL CLINIC
- 4 HMO CLINIC
- 5 HEALTH DEPARTMENT CLINIC
- 6 EMERGENCY ROOM
- 7 URGENT CARE CENTER
- 8 OTHER (PLEASE WRITE IN NAME) _____
- 9 DID NOT RECEIVE IMMUNIZATIONS

I am interested in how you take your child to the place that gives the immunizations. Please circle the number of all the ways you have taken your child in for immunizations.

- 1 OWN VEHICLE
- 2 FRIEND OR RELATIVE'S CAR
- 3 VEHICLE SENT FROM CLINIC
- 4 WALK
- 5 OTHER (PLEASE SPECIFY) _____
- 6 DID NOT RECEIVE IMMUNIZATIONS

How were your child's immunizations paid for? (circle all that apply)

- 1 HEALTH INSURANCE
- 2 MEDICAID
- 3 I PAID FOR THEM MYSELF
- 4 THERE WAS NO CHARGE
- 5 OTHER (PLEASE SPECIFY) _____
- 6 DID NOT RECEIVE IMMUNIZATIONS

How did you know or remember when to take your child in for immunizations? (circle all that apply)

- 1 REGULAR CHECK UPS WERE SCHEDULED BY THE DOCTOR WHEN IMMUNIZATIONS WERE DUE
- 2 I RECEIVED A REMINDER CARD IN THE MAIL
- 3 I HAD A COPY OF THE RECOMMENDED SCHEDULE AND TOOK MY CHILD IN WHEN IMMUNIZATIONS WERE DUE
- 4 I RECEIVED A PHONE CALL FROM THE DOCTOR'S OFFICE OR CLINIC REMINDING ME TO BRING MY CHILD IN
- 5 OTHER (PLEASE SPECIFY) _____
- 6 DID NOT RECEIVE IMMUNIZATIONS

Where do you normally take your child for health care (other than immunizations)?

- 1 PRIVATE DOCTOR
- 2 NEIGHBORHOOD CLINIC
- 3 HOSPITAL CLINIC
- 4 HEALTH DEPARTMENT CLINIC
- 5 HMO CLINIC
- 6 EMERGENCY ROOM
- 7 URGENT CARE CENTER
- 8 OTHER (PLEASE SPECIFY) _____

If you take your child to another community for health care, where do you go? _____

If you take your child to another community for health care or immunizations, could you share the reason? _____

Please indicate the extent to which you agree or disagree with the following statements. Possible answers:

SA means you strongly agree with statement
 A means you agree with statement
 U means you are undecided
 D means you disagree with statement
 SD means you strongly disagree with statement

Statement

Extent of Agreement
 (circle)

1	I did not know my child needed immunizations	SA	A	U	D	SD
2	I do not know much about the disease immunizations can prevent	SA	A	U	D	SD
3	I do not think the diseases immunizations can prevent are a danger to my child	SA	A	U	D	SD
4	I do not think it is important to get immunizations	SA	A	U	D	SD
5	I think immunizations will make my child sick	SA	A	U	D	SD
6	I do not think immunizations are needed until my child starts school	SA	A	U	D	SD
7	My religion advises against immunization	SA	A	U	D	SD
8	I have other problems which are more important than getting immunizations	SA	A	U	D	SD
9	I take my child to many different doctors or clinics and they don't know which immunizations he or she has had	SA	A	U	D	SD
10	I was advised by my doctor or clinic not to have my child immunized	SA	A	U	D	SD

Getting immunizations for children may be hard for various reasons. Please indicate below those reasons which were a problem for you in getting immunizations for your child. Please circle the response that best describes your situation.

Possible answers: **NONE** means not at all a problem
SLIGHT means it was a slight problem
MODERATE means it was a moderate problem
MAJOR means it was a major problem

Problem		Extent of Problem (circle one)			
1	Cost of immunizations	NONE	SLIGHT	MODERATE	MAJOR
2	Transportation	NONE	SLIGHT	MODERATE	MAJOR
3	Insurance doesn't cover	NONE	SLIGHT	MODERATE	MAJOR
4	Don't know where to get immunizations	NONE	SLIGHT	MODERATE	MAJOR
5	Immunization records were misplaced or lost	NONE	SLIGHT	MODERATE	MAJOR
6	Don't know when immunizations are due	NONE	SLIGHT	MODERATE	MAJOR
7	Forgot to take my child	NONE	SLIGHT	MODERATE	MAJOR
8	My child is in poor general health	NONE	SLIGHT	MODERATE	MAJOR
9	My child is allergic to immunizations	NONE	SLIGHT	MODERATE	MAJOR
10	Lack of time	NONE	SLIGHT	MODERATE	MAJOR
11	Health of another family member	NONE	SLIGHT	MODERATE	MAJOR
12	Doctor or clinic hours are inconvenient	NONE	SLIGHT	MODERATE	MAJOR
13	Office wait is too long	NONE	SLIGHT	MODERATE	MAJOR
14	Child care for other children	NONE	SLIGHT	MODERATE	MAJOR
15	Immunization visits scheduled separately from regular check-ups	NONE	SLIGHT	MODERATE	MAJOR
16	Advance appointment is required	NONE	SLIGHT	MODERATE	MAJOR
17	Immunizations were not given by the doctor or nurse if my child had a slight cold or low grade fever	NONE	SLIGHT	MODERATE	MAJOR
18	Distance to travel to receive immunizations too far	NONE	SLIGHT	MODERATE	MAJOR

I am interested in the general health status of your child. Below is a list of some chronic (ongoing or continuing) illnesses some children may have. Please circle the number of all the illnesses your child has now or has had in the past

- 1 ALLERGIES
- 2 ASTHMA
- 3 DIABETES (SUGAR)
- 4 EPILEPSY (SEIZURES)
- 5 ANEMIA (LOW BLOOD)
- 6 HEPATITIS (YELLOW JAUNDICE)
- 7 CANCER
- 8 MENINGITIS
- 9 TUBERCULOSIS
- 10 OTHER (PLEASE WRITE OUT) _____
- 11 NONE OF THE ABOVE

Finally, I would like to ask a few questions about yourself for statistical purposes:

What is your relationship to the child I have been asking about?
(circle number)

- 1 MOTHER
- 2 FATHER
- 3 GRANDPARENT
- 4 STEP PARENT
- 5 FOSTER PARENT
- 6 OTHER RELATIVE (PLEASE SPECIFY) _____
- 7 OTHER (NON RELATIVE) (PLEASE SPECIFY) _____

Number of children you have in each age group (if none, write "0")

- | | |
|-------|-----------------------|
| _____ | UNDER 1 YEAR OF AGE |
| _____ | 1 TO 5 YEARS OF AGE |
| _____ | 6 TO 12 YEARS OF AGE |
| _____ | 13 TO 18 YEARS OF AGE |
| _____ | OVER 18 YEARS OF AGE |

Are you presently: (circle number)

- 1 EMPLOYED--FULL TIME
- 2 EMPLOYED--PART TIME
- 3 STUDENT--FULL TIME
- 4 STUDENT--PART TIME
- 5 NOT EMPLOYED OUTSIDE THE HOME

Your present marital status: (circle number)

- 1 NEVER MARRIED
- 2 MARRIED
- 3 DIVORCED
- 4 SEPARATED
- 5 WIDOWED

Your present age: _____ YEARS

What was your approximate total family income in 1990?
(circle number)

- 1 LESS THAN \$5,000
- 2 \$5,000 TO \$9,999
- 3 \$10,000 TO \$19,999
- 4 \$20,000 TO \$29,999
- 5 \$30,000 TO \$39,999
- 6 \$40,000 TO \$49,999
- 7 \$50,000 OR ABOVE

What is the approximate distance in miles that you travel to
receive immunizations? (circle number)

- 1 0 TO 5
- 2 6 TO 25
- 3 26 TO 50
- 4 51 TO 100
- 5 OVER 100

What is today's date? (please write in date)_____

Thank you for sharing this information with me. Please write any
comments in the blank space below.

If you would like to receive a copy of the results of this study,
indicate this by providing your name and address below.

Name: _____
Address: _____
City: _____
Zip Code: _____

If you would like to talk with me about the study please phone
Kathleen McClain at (406) 452-7648.
MSU Faculty: Michelle Smith

APPENDIX C

Human Subjects Approval Letter



College of Nursing

Main Campus

Sherrick Hall
MSU • Bozeman
Bozeman, MT 59717
Phone (406) 994-3783
Fax (406) 994-6020

Billings Campus

Campus Box 574
MSU • Billings
Billings, MT 59101
Phone (406) 657-2912
Fax (406) 657-1715

Great Falls Campus

2800 11th Ave. South
Suite 4
Great Falls, MT 59405
Phone (406) 455-5610
Fax (406) 454-2526

Missoula Campus

UM North Corbin Hall
Missoula, MT 59812
Phone (406) 243-6515
Fax (406) 243-5745

October 30, 1995

To: Kathleen McClain

Fr: Marty Rhea, PhD, RNCS *Marty Rhea*
Interim Human Subjects Chair
College of Nursing

Re: Proposal

The College of Nursing Human Subjects Committee met on October 30, 1995 and reviewed your proposal. The Committee asks that you include a statement of risk in your introductory letter to parents. You may submit a revised letter to me for approval.

Please do not begin data collection until your revision has received approval.

cc: Michelle Smith

APPENDIX D

Permission Letter for Survey Use



College of Nursing
Department of Community,
Parent-Child and Psychiatric Nursing

1585 Neil Avenue
Columbus, OH 43210-1289
Phone: (614) 292-4800
Fax: (614) 292-4948

July 18, 1995

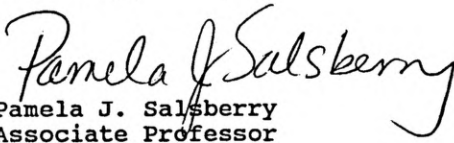
Kathleen McClain, RN
P.O. Box 66
Black Eagle, MT 59414

Dear Ms. McClain:

Enclosed is a copy of the parent survey that we used in the study. You have our permission to use the tool, provided that you share your results with us. The tool was pilot tested for readability but there is no validity or reliability information.

Good Luck!

Sincerely,


Pamela J. Salsberry
Associate Professor

The most comprehensive health sciences center in America

College of Dentistry / College of Medicine / College of Nursing / College of Optometry / College of Pharmacy /
College of Veterinary Medicine / School of Allied Medical Professions / The Ohio State University Hospitals /

APPENDIX E

Permission Letter to Adapt Survey

To whom it may concern:

Kathleen McClain has my permission to revise the parent survey developed by myself and my colleagues to include rural issues and minor changes in terminology.

Sincerely,

Pam Salsberry
Pamela J. Salsberry

Good luck —