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Jill Polmateer

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ABSTRACT

ASTHMA EDUCATION FOR THE SCHOOL-AGE CHILD

By

Jill Polmateer

Asthma is a major concern for health care providers. There are approximately 2-5 million children in the United States with asthma (Ross, 1993). Children with asthma do not always have a full understanding of their condition and may be unskilled in their ability to prevent and control symptoms. The Advanced Practice Nurse's (APN) position lends itself to patient education. The purpose of this study was to describe the effect of the Open Airways Program (OAP), an asthma education program, on emergency room visits and hospitalizations, school absenteeism, and self-management skills in children with asthma. The Health Belief Model served as a conceptual framework to illustrate the likelihood to make behavioral changes (Becker, 1977). The results of this study show decreased emergency room visits and hospitalizations after the OAP. No differences were observed in the number of school absences or self-management skills six weeks following the education. Implications for the APN on the topic of asthma education are examined. The OAP offers a practical, low-cost approach to educating children with asthma in the school and warrants further testing with a larger sample with measurement of the intervention conducted over a longer period.

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CHAPTER I

THE PROBLEM

Introduction

Asthma is a chronic lung disease afflicting 2-5 million children in the United States (Ross, 1993). Asthma is characterized by acute exacerbation of shortness of breath, wheezing, and coughing due to inflammation and constriction of the bronchial tubes in the lungs. Prevention of episodes depends on the early recognition and treatment of exacerbation. For this purpose individual management goals and therapeutic regimens are necessary (Laurenzi, 1993). Asthma is the number one reason for school absenteeism and hospitalizations in children older than one year of age (American Lung Association, 1993), accounting for lost productivity and high cost to families and society at large. Sleep and family living patterns are interrupted, and the child's school attendance and performance can be adversely affected (Laurenzi, 1993).

Sullivan, Elixhauser, Buist, Luce, Eisenberg, and Weiss (1996) estimated the average annual societal burden of asthma ranged from $326-$1315 per afflicted person. Asthma ranks third among causes of hospitalizations for children less than the age of fifteen (American Lung Association, 1993). According to the data from the American Lung

Association (1993), "asthma costs Americans $6.2 billion a year. These costs include $1.1 billion for medicines, $345 million in lost work time, $900 million in lost school time, and $295 million in emergency room visits."

Recent studies have shown that health education for childhood asthma delivered to parents and children in health care settings can improve asthma management skills, thereby improving school attendance and performance, and reducing the use of emergency health care services (Clark, Evans, Feldman, Kaplan, Levin, Levison, Mellins, Rips, & Wasilewski, 1987). Clinics in four New York City hospitals developed and implemented the Open Airways asthma education program (Kaplan, Rips, Clark, Evans, Wasilewski, & Feldman, 1986). The American Lung Association adopted the Open Airways program for a national program in 1992 to provide instruction in schools where children can be easily accessed. The program was developed for children in the third through the sixth grades to increase children's self-management skills, self-efficacy, influence parents' management decisions, reduce school absences and improve school performance (Clark et al., 1987). Parents are not expected to attend educational sessions but are sent written educational materials. The program emphasizes the child's ability to recognize early symptoms of asthma and take action to prevent further exacerbation. The educational program encourages self-management and offers opportunities to practice new skills. Topics addressed in the program are

basic asthma information and feelings, symptoms, medications, managing asthma episodes, exercise, seeking medical attention and handling problems related to asthma and school. The advanced practice nurse's position lends itself to conducting and organizing Open Airway Programs within school systems and encouraging clients to attend.

In 1994, the Munson Medical Center Patient Education Department implemented the Open Airways Program in the Traverse City, Michigan Area Public School System. In the 1996-97 school year, data were collected from parents and children before and after the program to evaluate its effects on asthma management. This thesis will use secondary data obtained from that study.

The research question to be addressed in this study is: Does the Open Airways education program decrease emergency room visits/hospitalizations and school absenteeism and increase self-management skills among children with asthma?

Statement of the Problem

The current research reveals the high cost of asthma and its effect on children and parents. Various asthma education programs and their role in cost-savings and management of asthma are described in various studies (Lawrence, 1995). The literature includes self-management strategies that improve patient adherence and outcomes (Make, 1994). Research supports the role of improving self-efficacy in achieving health behavior change (Strecher, DeVellis, Becker, & Rosenstock, 1986). There is however, a

lack of research that uses the Health Belief Model in explaining education and self-management in those with chronic illnesses, such as asthma.

Purpose

The purpose of this study is to evaluate the effect of the Open Airways education program on emergency room visits/hospitalizations, school absenteeism, and self-management skills in children with asthma. The hypotheses proposed for this study are:

Following school-based, child-centered asthma education using the Open Airways Program children with asthma will report a significant:

1. Increase in asthma management skills
2. Decrease in school absenteeism
3. Decrease in emergency visits and hospitalizations

CHAPTER II

THEORETICAL FRAMEWORK

Introduction

This study will use the Health Belief Model to examine the Open Airways Program. Three factors in the Health Belief Model have been determined to effect the likelihood of an individual adopting a behavior (Thomas, 1995). These are: a) the individual's perception of susceptibility to a health threat; b) the existence of concern or perceived susceptibility to the disease and perceived seriousness of the disease; and c) perceived benefits/barriers to reducing the perceived threat (1995, p. 248). Rosenstock, Strecher, and Becker (1988) later added the concept of self-efficacy. Self-efficacy can be viewed as a benefit or barrier. If self-efficacy is low, the individual will be less confident in their ability to complete the task. In this case self-efficacy is seen as a barrier. If self-efficacy is high, the individual will feel confident in their ability to complete the task and self-efficacy is seen as a benefit. Nurses have used the Health Belief Model to predict the relationship of health behavior to attitudes and knowledge and to explain preventative health behaviors (Thomas, 1995).

Research testing the Health Belief Model has typically been done with adults. This study's sample was children

ages 8-12 years old. Children of this age are in the stage of industry vs. isolation (Whaley & Wong, 1982). It involves an eagerness for building skills and participating in meaningful and socially useful work. The school-age child has the ability to classify, to group and sort, and in the process, is able to hold a concept and make a decision based on that concept. Children of this age progress from making judgments based on what is seen to making judgments based on what is conceptualized. Developmental theory suggests that children in this age group are able to make independent decisions based on cues in their environment (Piaget, 1967).

The Health Belief Model (see Figure 1) offers an explanation of preventative health behavior. The model analyzes an individual's motivation to act as a function of an expectancy of goal attainment in the area of health behavior (Becker, 1974). The Health Belief Model is comprised of several constructs: perceived susceptibility, perceived seriousness, perceived benefits and barriers, and cues to action. The following paragraphs will describe each of these constructs.

Becker (1974) defines susceptibility as the subjective risks of contracting a condition. An individual's perceived susceptibility is how that person views their likelihood of actually developing an illness or disease. Using the example of asthma, this would be the individual's belief that they will experience an acute asthma episode.

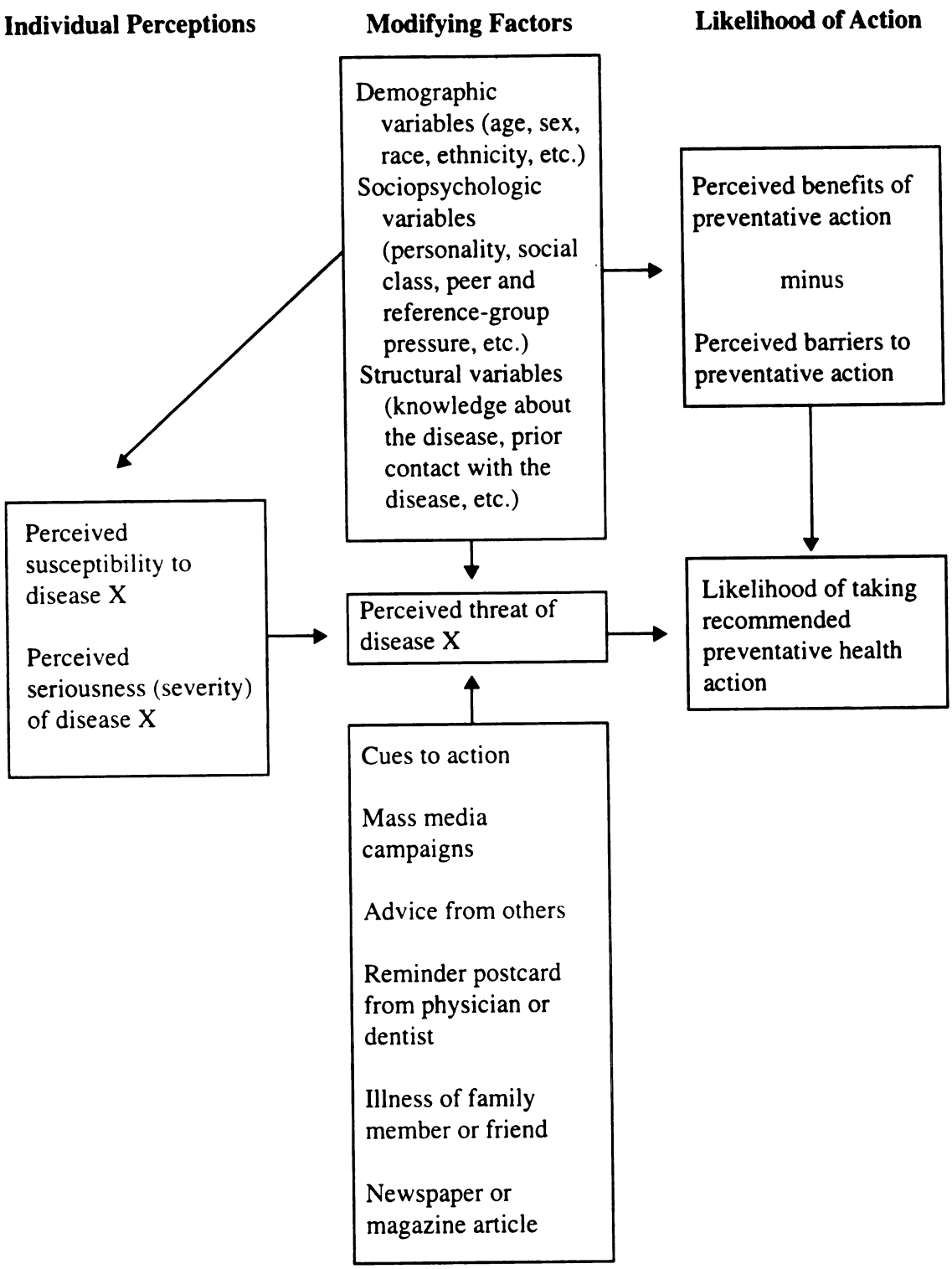

Figure 1. The Health Belief Model. (Becker, Haefner, Kasl, et al., 1977).

Perceived seriousness can be described as the degree of emotional arousal and kinds of difficulties that the disease or illness will create. In other words, it is the individual's perception of clinical or medical consequences. Again, using the example of asthma, how the asthma will affect the individual. Will the asthma episode lead to death or does it cause the individual to cough a little twice a year? The perceived seriousness and susceptibility are dependent on education and past experiences of an individual (Becker, 1974).

The perceived benefits and barriers are also referred to as the path to action. Becker (1974) describes this as the belief regarding the relative effectiveness of known available alternatives in reducing the disease threat. If taking action is likely to be effective, it relates subjectively to one's perceived susceptibility or seriousness of an illness. Beliefs are influenced by the norms and pressures of society. Barriers include those motives for avoidance of taking action. Examples of barriers include expense, inconvenience, time, and unpleasant, painful, or upsetting interventions.

Cues to action were added to the Health Belief Model. These are circumstances that set the process in motion. Cues to action can be internal or external and are dependent on the perceived susceptibility and seriousness of the illness. If the perceived susceptibility and seriousness of the illness are high, less cues to action are needed.

Rosenstock, Stretcher, and Becker (1988) discussed the inclusion of self-efficacy into the Health Belief Model. When originally formatted, the Health Belief Model was used to explain and predict simple short-term health behaviors such as vaccinations. Now, the situation is much different. Chronic illnesses have mandated the need for long-term changes. It takes confidence in one's ability to initiate and continue these lifelong behavioral changes. Thus, for the change to be implemented as the Health Belief Model proposes, people must have the incentive to take action, feel a threat if the change does not occur and perceive a benefit to taking action; a person must also feel efficacious to implement that change (1988). In the area of chronic disease management, it is important to measure health beliefs and self-efficacy. More emphasis is needed on the education to enhance self-efficacy in order to effect change. Rosenstock et al. go on to urge researchers and practitioners to incorporate self-efficacy into the Health Belief Model both as an explanatory variable but also as one that may be manipulated with positive effect (Figure 2).

Most research on the Health Belief Model has focused on predicting health behavior and not in ways to influence it. Guided by the Health Belief Model this study will evaluate the effects of the Open Airways Program on emergency room visits, hospitalizations, school absenteeism, and self-management skills. It is evident that education programs should attend to the attitude and belief dimensions of the

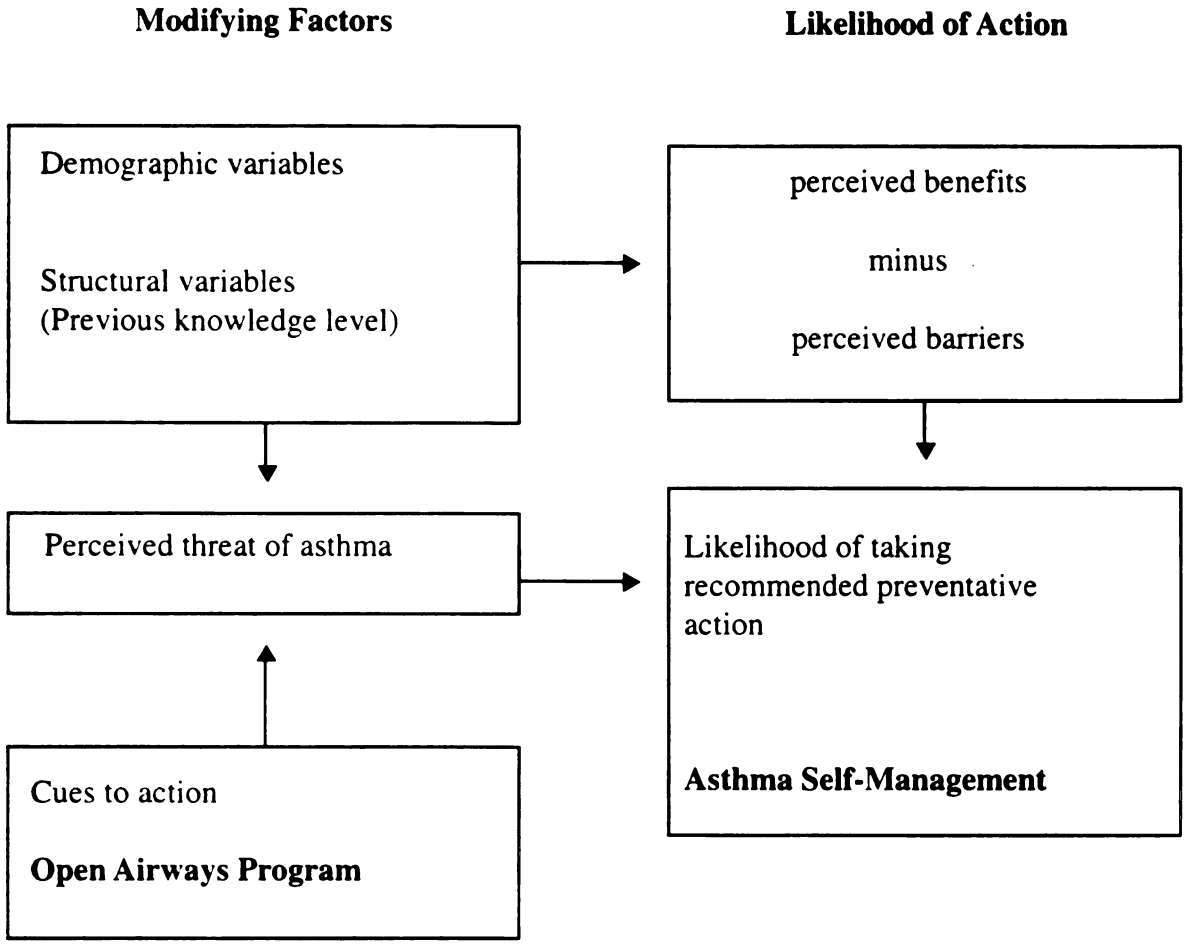

Figure 2. Adaptation of the Health Belief Model.

Health Belief Model in addition to other likely influences on health-related behaviors (Janz & Becker, 1984). Janz and Becker (1984) point out that few studies indicate any particular intervention strategy for altering attitudes and behaviors and that these deserve further investigation.

For the purposes of this study, the asthma self-management will be the likelihood of behavioral change, as the child and parent report. School absences, ER visits, and hospitalizations will also be reflected in the likelihood for behavioral change.

Conceptual Definitions

Self-Management Program

Self-management is the ability of the patient and family to carry out intervention steps to prevent or control their asthma. A self-management program can improve patients' ability to manage symptoms and thus, have an impact on their self-efficacy and symptom levels. Self-management has the advantage of on-site, early treatment of asthma symptoms that left untreated may lead to further distress (Laurenzi, 1993). Self-management is often evaluated as behaviors of performing care.

Clark (1989), discussed that most asthma self-management programs operate under three general premises: a) a partnership of care between patients and the physician (and the other health care professionals who support the asthma management plan) must be established; b) medical management must vary as the symptoms change; and c) patient compliance is strongly tied to the simplicity of the care plan and the degree to which its approach is systematic. Self-management education programs on asthma focus on the patient and family, at home, school and workplace environments, and the patient's activities (Laurenzi, 1993).

Skill information includes the use of peak flow meters, medication, and medication administration techniques.

CHAPTER III

REVIEW OF LITERATURE

Introduction

In this section, selected literature relevant to the Health Belief Model and self-management will be reviewed. The most common concepts of the model from the literature were perceived illness and severity, and perceived benefits and barriers.

Review of Literature

Health Belief Model

A study that took place at John Hopkins Hospital looked at mothers of children with asthma and compliance with drug regimen. The research focused on explaining and predicting mothers' compliance with a medical regimen based on general health motivations, perceived illness threat, and perceived benefits and barriers to compliant behavior. The findings indicated that mothers who appropriately administered medications were significantly more likely to feel that they generally controlled situations and did things according to plan (Becker, Radius, Rosenstock, Drachman, Schuberth, & Teets, 1978).

A study conducted by Szilagyi, Rodewald, Savageau, Yoos, and Doane (1992) used the Health Belief Model to evaluate the effects of a reminder letter on obtaining an

influenza vaccine for children with asthma. Of the variables investigated, two significantly correlated with the administration of the vaccine. High levels of parental worry about asthma (positively correlated: odds ratio=23.3, $P < .01$) and high levels of concern about vaccine side effects (negatively correlated: odds ratio = 0.087, $P< .025$). It was concluded that the letters had a positive influence on increasing the vaccination rate, however, many still did not respond. Limitations to this study were its small sample size and most of the children with asthma were within a high risk population.

Zimmerman, Brown, and Bowman (1996) also used the Health Belief Model in a study to determine the effects of a nurse-directed self-management program on dyspnea and self-efficacy levels in clients with chronic obstructive lung disease. This study used a single-group quasi-experimental pre-test/post-test design. The findings for the group educational approach showed no significant difference in dyspnea levels, but revealed a significant ($p< .001$) increase in the self-efficacy score. The classes were placed as a cue to action in the Health Belief Model.

Brock and Beazley (1995) used the Health Belief Model to tie together the concepts of self-efficacy and the ability to perform a skill. The study found that after the education program, parents believed that they had the skill and determination to achieve some degree of success (1995). The Health Belief Model constructs measured were perceived

susceptibility, perceived severity, perceived benefit/ barriers, and perceived self-efficacy with the cues to action, education being the intervention.

Self-Management

Many studies support the use of self-management education programs in the management of asthma. Lawrence (1995) discussed a full and partial program provided in a clinic using adults with asthma. When the total of hospital and emergency room visits were compared pre- and post-programs, a significant reduction in the requirement for hospital-based asthma care was found (X^2, $p < 0.05$). Detwiler, Boston, and Verhulst (1994) conducted an evaluation of an educational program for children ages 4-8 years and their parents on the "Huff and Puff" program. Children's and parents' self-management behavior changed significantly ($p < 0.001$) in all areas being measured except "telling an adult" and "communicating with caregiver" about asthma symptoms (1994). Make (1994) states a preferred term to self-management should be collaborative self-management. A key component to self-management is the education of the patient/family by the health care provider in a manner that is easily comprehended by the patient and family.

In a study done using primary health care providers; Mesters, Nunen, Crebolder, and Meertens (1995) showed a significant change in applied knowledge, attitude, and self-efficacy and in the report of self-management behaviors of parents after presented with an asthma education protocol

compared to a control group. Self-efficacy can positively effect health behavior in a number of ways, including an increased ability to follow a medication and treatment regimen, increased amount of effort placed on asthma management, and an increased persistence when a patient is experiencing difficulties (Wigal, Stout, Brandon, Winder, McConnaughy, Creer, & Kotses, 1993). Baily, Richards, Brooks, Windsor, and Manzella (1990) studied the effects of an educational program with adults demonstrating improved knowledge and medication skills. Other findings included a greater adherence to medication regimen, decreased asthma symptoms, and reductions in ER visits and hospitalizations. Hindi-Alexander and Cropp (1986) evaluated the effects of a six week educational program on 147 children with asthma. Unscheduled health care visits decreased by 51% and school absences decreased by 48%. Both children and their parents increased their knowledge. Results were most significant in those children with severe asthma.

Self-management in children was investigated by Clark, Feldman, Evans, Wasilewski, and Mellins (1986). The researchers randomized 310 low-income urban children with asthma to participate in a self-management or standard treatment group. The self-management group showed reduced ER visits and hospitalizations, better grades in school, and less anxiety about having asthma. A follow-up study was conducted one year after the Open Airways Program (Clark, Evans, Feldman, Kaplan, Levin, Levison, Mellins, Rips, &

Wasilewski, 1987). The study population consisted of 239 low-income, predominately Hispanic and black children from 12 elementary schools in New York City. Results of the study showed higher scores on an index of asthma management ($p < 0.05$), greater self-efficacy with respect to asthma management skills ($p < 0.05$), more influence on parents' asthma management decisions ($p < 0.05$), better grades in school ($p = 0.05$), and fewer episodes of asthma ($p < 0.01$) and of shorter average duration ($p < 0.01$).

Summary

Asthma is a chronic illness that can affect a child's school attendance and performance, cost society billions of dollars, and effect quality of life. The studies reviewed suggest that education can foster improved self-efficacy and self-management in children and parents. The Health Belief Model can be used to explain how education can act as a cue to action in improving the management of asthma.

The available research on children with asthma indicate that collaborative self-management is most effective for patients with more severe asthma, especially those requiring emergency room visits or hospitalizations. These studies do not always reflect quality of life or self-efficacy. Measures of self-efficacy or quality of life may more clearly demonstrate how asthma can effect a child on a daily basis.

Current literature supports the use of education as an intervention in the management of asthma. The Health Belief

Model is a theoretical model that can be used to understand and show how self-management of health behaviors can be influenced. However, there is limited research demonstrating the application of the Health Belief Model to school-age children.

CHAPTER IV

METHODOLOGY

Design

This study is a secondary analysis of data collected by the Munson Medical Center Patient Education Department as part of the implementation and program evaluation of the Open Airways Program. A quasi-experimental, single-group pre-test post-test design was used to examine the effects of the Open Airways Program on children with asthma and their parents. To assess the impact of the education program, data were obtained from questionnaires with parents and structured interviews with children. Data were collected prior to education at six schools and six weeks post-education. School absenteeism, ER visits, and hospitalizations were investigated from the prior year.

Hypothesis

The following hypotheses were tested in this study: Following school-based, child-centered health education using the Open Airway Program children with asthma will have:

1. A significant increase in asthma self-management skills
2. A significant decrease in school absenteeism
3. A significant decrease in emergency visits and hospitalizations

Operational Definitions

Multiple outcomes have been used to measure asthma self-management. These include mortality, morbidity, medical complications, respiratory symptoms, use of peak flows, quality of life, health-related behaviors, functional capacity, utilization of resources and other indirect costs. Uncontrolled asthma may result in increased hospitalizations, ER visits, lost time from work and school, and cost.

The dependent variables chosen for this study are asthma self-management, number of days absent, number of ER visits and number of hospitalizations. Parents reported the number of school absences, emergency room visits, and hospitalizations on a mailed questionnaire. The independent variable identified is participation in the Open Airways Education program.

School attendance was measured by using the total number of days missed in the school year. Emergency room visits and hospitalizations were those reported within the last year. This information was obtained from mailed questionnaires filled out by the parents.

Changes in children's behaviors and feelings were measured through indices derived from the interviews. Demographic data was gathered from the parent questionnaires. An index of 43 self-management activities (question #'s 1, 2, 4-7, 9-17) performed by children to prevent the occurrence of symptoms, communicate health

concerns to their parents, and to manage asthma symptoms at home and school will measure self-management.

Self-Management

Self-management is the ability of the patient and family to carry out management steps to prevent or control their asthma. This information included utilization of health care services, school attendance and occurrence of symptoms. Self-management was operationalized using questions in child interviews. Questions # 1,2,4-7,9-17 were the items operationalizing self-management in the interview with children.

Open Airways Program

Open Airways is a parent-child health education program for children with asthma to be taught in elementary schools. The program consists of six separate 40 minute sessions which incorporate self-management skills and solutions to common obstacles encountered by children with asthma (See Table 1). Children attend classes as part of their school day. Written material is sent home to parents following each session. Parents are invited to attend the last session. Students must have attended at least 66% of the program sessions for the family participating to be included in this study. Missing classes may alter the results of the study.

Table 1.

Outline of Open Airways Program

Session	Topic
1	Information about asthma/Feelings about asthma
2	Recognizing and managing asthma symptoms
3	Solving problems with medicines/Deciding how bad
4	Finding and controlling asthma triggers
5	Keeping your battery charged
6	Doing well at school

Sample

Six of eighteen elementary schools in the Traverse City Public Schools were used for this study. The schools were chosen by a voluntary method in cooperation with the school nurses. A presentation of the Open Airways Program was presented to school nurses and principals four years ago. Principals were then asked who would like to participate. Eventually all wanted to offer the program. The schools chosen the first year were the first two schools to respond. These schools may represent the more motivated parents, but more likely the more motivated school administrators. The order of the schools thus was not randomly chosen and could possibly alter the results of the study.

The sample was a convenience sample of second through sixth grade children. Children had been diagnosed with

asthma but did not need to be on any prescribed medication. Students were identified by school nurses based on their health history. In addition, the program was advertised through the school newsletter. A letter was sent to the parents of the children for permission to participate in the educational program. A description of the program was sent with the permission form. The sample consisted of those who consented to participation. A convenience sample was used due to availability, cost, and travel.

The Traverse City Public School District has eighteen elementary schools. The study includes aggregate demographic data on all of these schools. Background characteristics that may have an impact on the study were examined. Asthma prevalence in the United States was 4% in 1990 according to the National Heart, Lung, and Blood Institute (1994). This figure was compared to the number of students participating in the study. The characteristics examined were socio-economic status, parent marital status, and absenteeism of students. These were examined statistically to measure their impact on the outcome at the school level. The study includes aggregate demographic data on all of these schools.

Data Collection

Structured interviews with children were conducted at the schools by three registered nurses in Munson Medical Center's Patient Education Department pre-education and 6

weeks post-education. The Open Airways Parent Questionnaire and informed consent was sent to parents.

A structured interview format was used to measure self-management of asthma (Appendix B). The questionnaire was developed by a Columbia research team supported by Grant R18-HL-28907 from the Division of Lung Diseases, National Heart, Lung and Blood Institute. For purposes of this study, it was shortened using input from David Evan, Ph.D.(personal communication, March 1996), a Columbia research team member, using mainly self-management questions. The questionnaire is composed of closed ended questions with room for additional comments. The parent questionnaire includes demographic data.

The questionnaires were administered by three interviewers. This lessened the bias of the researcher. There may be bias of the interviewer on how much prompting the interviewer does to receive answers. The parents questionnaires were mailed. This provided for greater accessibility for the interviewer and parents. This was also more cost effective and saved on travel time and expense. Children were interviewed at school, again for easier access. Children were more likely to understand the questions in person. By offering a personal interview to children versus a mailed questionnaire, response rate was increased.

The parent questionnaire asked for recall data on missed school days, ER visits, and hospitalizations. School

attendance was measured by the total number of days missed from school in the year. ER visits and hospitalizations were those within the last year. The parent questionnaire includes demographic data.

To assess the effect of education on the number of asthma episodes, parents were asked to report the number of episodes they treated at home and the number requiring a visit to the physician. This data may not be as accurate due to parental recall especially if there is a high number of episodes, but many students with asthma have a history of mild asthma and a low number of emergency visits and hospitalizations. Multiplication of the annual number of episodes of asthma by the average duration of the episodes provided an index of the annual frequency of days with symptoms of asthma.

Reliability and Validity

Reliability and validity of the questionnaire were not addressed in the Evans article (Clark, Evans, Feldman, Kaplan, Leven, Levison, Mellins, Rips, & Wasilewski, 1987), nor in the interview information sent by David Evans. Reliability was run on the study data. The internal consistency using Cronbach's alpha measured 0.5053 on the self-management index of the child interview. When question 15a was deleted, Cronbach's alpha was increased to 0.7221. This question relates to suggesting to the teacher a need to leave class early due to asthma symptoms. This child interview tool was chosen because it most closely reflects

the educational program the Patient Education Department administered. It is important to evaluate the program with consistent tools. This is even more important because the Open Airways Program is a national program, and this information may be helpful to other educators. The more evidence that can be gathered confirming that an instrument is measuring what it is suppose to be measuring, the more confidence researchers will have in its validity (Hungler & Polit, 1995). Validity, other than content validity takes more than one study to establish.

Data Analysis

Data analysis was completed using similar testing as the Zimmerman, Brown, and Bowman (1996) which is very similar to this study in pre-test/post-test design. Chi-squared was run on the data to measure self-management before and after the program. Descriptive statistics were completed on the demographics of socio-economic status, child's age, age of asthma diagnosis, child's grade level, and medical insurance to determine their relationship to any changes in the level of self-management. This data is displayed in table form (Table 2). In order to show the relationship before and after education, chi-square was carried out on the variables of hospitalizations, emergency room visits, school absences, and self-management. The outcome of this data analysis is presented in table format for ease of interpretation.

Table 2.

Descriptive Characteristics of Study Population (N=18)

Demographic variable	Range	Sample Mean/Percentage
Age	7-12	8.74 +/-2.05 SD
Male		50%
Age diagnosis	4mo-11yr	5.19 +/-3.53 SD
Grade	2-6	3.58 +/-1.74 SD
Income mean	$20,000->$50,000	$40,000-49,999
Insurance		87.5%
Prescriptive coverage		87.5%

Note. Values represent means +/- standard deviation or percent frequency. NS= not significant.

Protection of Human Subjects

The protection of human subjects is insured by several measures. Prior to the data collection, the original proposal was presented to the Munson Medical Center Institutional Review Board for approval. This proposal for secondary analysis was also reviewed by the Munson Medical Center Institutional Review Board. In addition, this proposal was submitted to the Traverse City Area Public Schools for approval. It was reviewed by the school nurses, Assistant Superintendent for Curriculum and Instruction, and Superintendent of the Traverse City Area Public School System. Next, the interviewers coded all identifying

information so that identities of the subjects are unknown while carrying out secondary data analysis. Finally, this study proposal was presented to Michigan State University Committee on Research Involving Human Subjects (UCRIHS) for approval (IRB#98-048).

Limitations

Several limitations were cited in this study. There was a small sample size of only 18 families. The data was collected at six weeks post education not allowing a sufficient time for the integration of new asthma management skills. A previous study done with the New York City schools was unable to use ER visits or hospitalizations as a variable due to the low number of these services pre-education (Clark, Evans, Feldman, Kaplan, Levin, Levison, Mellins, Rips, & Wasilewski, 1987). This was also a problem for this study. Not only was there a small number of emergency room visits and hospitalizations, but also a minimal number of school absences. Regardless, these were measured with the advent of managed care and the concern to save health care dollars.

Interviews are not the most reliable source of information, but may be one of the only ways to measure the effect of self-management skills if ER visits and hospitalizations are low prior to education. An identified limitation was the potential for the bias of the interviewers. There was not one consistent interviewer and more prompting may have been given by one versus another.

The interviewers also taught the Open Airways Program lending itself to interviewer bias.

Some of the limitations of the study also included a small convenience sample and the study's restriction to one geographic area. A final limitation was the utilization of volunteers. The use of a convenience sample tends to result in a motivated group that is more likely to make behavioral changes.

Threats to internal validity consist of history, differential selection, and attrition (participants no longer living in the area and unable to be contacted). Threats to the external validity in this study are the interaction of selection bias and effect of external stimulus.

CHAPTER V

RESULTS

The results reported in this section are the product of the questionnaires and interviews completed by 18 families in the original study. Tables showing socio-demographic characteristics of the sample and results of hypotheses testing are included. Chi-square was used to determine if there was a significant difference pre- and post-education between variables.

Socio-Demographic Characteristics

A number of socio-demographic and illness-related variables were included in the data. These variables included the age and gender of the child, insurance status, prescriptive coverage, age of asthma diagnosis, grade and income. Table 2 reflects the descriptive characteristics of the study sample. The total sample consisted of 18 families of children with asthma in the second through sixth grades. Data describing the sample are represented either as the mean +/- standard deviation (SD) or as a percentage of responses. This population is representative of medically insured mid-income families of school-age children with mild to moderate asthma. The demographic data was collected from self-reported parent questionnaires.

Hypotheses Results

Chi-square was calculated on the variables of hospitalizations, emergency room visits, school absences, and self-management skills before and after education to test all three hypothesis. The results of the chi-square are discussed in detail below and are summarized in Table 3. Each of the hypotheses are addressed separately. Significance for the purpose of this study was established to be $p \leq 0.05$.

The first hypothesis--that following school-based, child-centered asthma education using the Open Airways Program children will report a significant increase in asthma management skills was not supported. The self-management indices scale was scored higher (M= 73.4, sd= 4.00) following the Open Airways Program than prior to education (M=66.07, sd=7.05). However, Chi-square revealed that the difference between these scores were not significant (X^2= 90.41, $p > 0.05$).

The second hypothesis--that following school-based, child-centered asthma education using the Open Airways Program children with asthma will report a significant decrease in school absences was rejected. The mean school absences prior to education were low at 1.9. Six weeks after the education, the mean annual school absences were 1.39, a slight decrease. Chi-square was not significant (X^2= 9.5, $p > 0.05$).

Table 3.

Chi-square of hospitalizations, emergency room visits, school absences, and self-management skills pre/post-education with Open Airways Program.

Variable	Pre-education Mean	Post-education Mean	X^2 value	df	*p*
Hosp/ ER	0.50	0.30	20.00	4	0.001*
School absences	1.92	1.39	9.50	9	0.39
Self-management	66.07	73.40	90.41	81	0.22

Note. * = significant finding

The final hypothesis--that following school-based, child-centered asthma education using the Open Airways Program children with asthma will report a significant decrease in emergency visits and hospitalizations was supported. A chi-square test revealed that following the Open Airways Program, children with asthma were significantly less likely to have emergency room visits or hospitalizations (X^2= 20.00, p< 0.05).

The results of this study have been presented as they apply to the three hypothesis. Two of these hypothesis were not supported, school absenteeism and self-management skills. The hypothesis dealing with health care utilization was supported. An interpretation of these findings will follow in the next section. A discussion will pursue to the pertinence of these findings to the conceptual model, methods, and current literature.

CHAPTER VI

DISCUSSION AND IMPLICATIONS

The Health Belief Model

The Health Belief Model was used to describe the effect of the Open Airways Program. The Open Airways Program served as a cue to action. The findings illustrate that the Health Belief Model may be limited in helping to understand asthma education for the school-age child. The Health Belief Model does not allow for the fluctuating exacerbations of asthma. It is also not specific to the age group being studied. Despite its limited usefulness, the Health Belief Model did provide a conceptual framework for evaluating the effectiveness of this intervention. Adding the variable of self-efficacy may demonstrate more significant findings. Also a better measurement of pre- and post- perceived seriousness and severity, such as a pictorial visual analog scale (Fritz, Spirito, Yeung, Klein, & Freedman, 1994) may have linked a difference before and after the cue to action.

Hospital and emergency room visits

Following school-based, child-centered asthma education using the Open Airways Program, children with asthma will have a significant decrease in emergency room visits and hospitalizations. The results of this study did find a

significant difference in this variable following education. These variables served as the likelihood of behavioral change. This sample group had seven emergency room visits and only 1 admission prior to the educational program making it difficult to measure a change. With mild and moderate asthma, emergency room visits and hospitalizations are typically low. These variables are more useful when working with severe asthmatics.

The results in this study support the conceptual model in that the intervention had a significant effect on the emergency room/hospital visits. This has a major impact on the cost of asthma care. Health care utilization has been suggested as an important proxy measure of disease morbidity and as an independent measure of asthma outcome. Of the $3.64 billion spent on direct expenses for asthma in 1990, approximately 56% was for inpatient hospital stays, outpatient hospital visits, and emergency room visits (Sullivan, Elixhauser, Buist, Luce, Eisenberg, & Weiss, 1996). The results in this study are similar to those of previous studies, such as those reported by Mesters, Nunen, Creebolder, and Meertens (1994) which showed significant support for the hypothesis that child-centered asthma education results in decreased emergency room/hospital visits leading to decreased costs.

School absences

The results did not support the hypotheses that a school-based, child-centered education program for second

through sixth grade students with asthma can increase school attendance. Following school-based, child-centered asthma education using the Open Airways Program, children with asthma will have a significant decrease in school absenteeism. Again, this study did not demonstrate a significant relationship. Current literature has mixed findings on this outcome. This in part could be because of multiple reasons for school absenteeism including the common colds and flu often a problem in school-aged children.

The sample pre-education had a school absence mean of 1.92 making it very difficult to show a difference following intervention. This is suggestive of children with mild and moderate asthma. Children with severe asthma and more school absences initially would result in a greater likelihood for change.

Self-management

Following school-based, child-centered asthma education using the Open Airways Program, children with asthma will have a significant increase in asthma management skills. The results showed no significant change in the asthma self-management indices following education with the Open Airways Program. Although this study did not demonstrate a significant change, the current research supports the utilization of asthma education to improve asthma management. The findings in this study do not strongly support the conceptual model in that the Open Airways Program, the expressed cue to action, did not have a

significant effect on the self-management skills of children.

As noted earlier, the study failed to show any significant change in self-management skills or school attendance. The findings may be attributed to the small sample size, to the chronicity of the disease, or data-collection only six weeks post-education. Unfortunately, the short duration of data collection post-education and the small sample size limited the ability to show significant outcomes in some of the areas measured. Replication with a larger sample and one year post-education should be considered.

Current Literature

The current literature supports the effect of the Open Airways on decreased emergency room visits and hospitalizations, increased school performance and increased self-management skills. This study on secondary data was chosen to repeat a previous study done in the New York City school system (Clark, Feldman, Rips, Kaplan, Levison, Wasilewski, & Mellins, 1987), a highly populated urban area, in this rural geographic area. The current self-management literature suggests that asthma education in multiple settings has a positive impact on the self-management skills of children and their parents, health care utilization, cost of health care, and school attendance and performance (Sullivan, Elixhauser, Buist, Luce, Eisenberg, & Weiss, 1996).

Similar to the Evans, Clark, Feldman, Rips, Kaplan, Levison, Wasilewski, Levin, and Mellins (1987) study, school attendance was not significantly changed. This finding may be suggestive of the sample containing children with mild and moderate asthma who are less likely to have poor attendance. With the small sample and limited number of absences a significant change would be difficult.

Implications

The results of this study found significant differences between pre- and post- education for the variables of emergency room visits and hospitalizations. A decreased number of emergency room and hospital visits was associated with the Open Airways Program.

Because of the symptoms associated with asthma, many children with this chronic illness exhibit decreased levels of self-efficacy that results in a failure to attempt many activities, such as running and team sports. People tend to avoid activities that they think will exceed their capacity. Assessing and researching self-efficacy integrated into the Health Belief Model may provide the Advanced Practice Nurse with insight as to the best way to format education. Future research should address the integration of self-efficacy as a variable to measure both perceived benefits/barriers and likelihood of taking action.

The implications for Advanced Practice Nursing, nursing education and research are discussed in the following

sections. A general summary as it relates to these findings and implications for primary care will conclude this study.

Implications for Nursing

The implications for Advanced Practice Nursing are discussed in this section as they relate to the hypotheses. Recommendations and implications for future research and practice will follow.

The NHLBI Guidelines for the Diagnosis and Management of Asthma (NAEP, 1997) serve as a guideline in the treatment of asthma for practitioners in primary care. The guidelines discuss four components to asthma management: objective monitoring, environmental control, pharmacological management, and patient education. The Open Airways Program concentrates on one of these components, patient education.

The Advanced Practice Nurse's characteristics include that of patient educator. The Open Airways Program is a tool for the Advanced Practice Nurse to provide education to children with asthma in an environment that improves access and convenience for students and their families. The implications for nursing include the use of small group to teach self-management skills. Using small groups provides an environment conductive to learning and social support. Participation in a self-management group can increase self-management skills, although not identified by this study. Numerous studies (Zimmerman, Brown, & Bowman, 1996; Clark, 1989; Clark, Feldman, Kaplan, Levin, Levison, Mellins, Rips, & Wasilewski, 1987; Detwiler, Boston, & Verhulst, 1994) have

demonstrated increased self-management skills. The Advanced Practice Nurse can effectively foster clients and their families in asthma management by using these strategies.

The school provides an excellent setting to educate school-age children with asthma. Americans today have a very busy schedule for affording time for health education. Working couples are commonplace and children are active in a multitude of after-school activities. The Advanced Practice Nurse can help break this barrier by providing education in the school setting where children already spend a great deal of time.

Advanced Practice Nurses might further improve the management of asthma by emphasizing the value of asthma education and preventative treatment of asthma. Clarification of correct medication use and potential side effects are also important pieces of education. Utilizing an existing program, such as Open Airways, can save duplication of effort and save on the costs of materials.

Implications for Nursing Education

The Advanced Practice Nurse needs to be prepared to institute collaborative self-management with all school-aged children with asthma. Teaching asthma self-management skills requires a basic knowledge of the signs, symptoms, and treatment of the disease and may be augmented by the Open Airways Program. The National Heart, Lung, and Blood Institute Guidelines for the Diagnosis and Management of Asthma provide the material for the Advanced Practice Nurse

to gather this information. This body of knowledge should also be incorporated into college curricula.

A key point in asthma management is correct care by the primary care provider. Reliance on episodic care alone puts the child at risk for severe episodes and limits their daily lifestyle. The Advanced Practice Nurse in primary care must stay abreast on the most current asthma management. This can be accomplished by attending educational conferences, reading current research and journals, and following the most current NHLBI Guidelines for the Diagnosis and Treatment of Asthma. The Advanced Practice Nurse should also educate other primary care providers and patients in the most up to date treatment.

The Health Belief Model continues to lend itself to the advance practice nurse curriculum. The advanced practice nurse focuses on preventative health and health promotion which can be easily applied to the Health Belief Model. The Health Belief Model has a multitude of studies that give examples for future research. Education of nursing theories must include examples of practical application so that nursing theories will be chosen for future research. Educators must foster this transition to make nursing theories more useful.

Implications for Research

Research should focus on follow-up one to five years after education with the Open Airways Program. Asthma costs

should be included in the data collection as managed care focuses on providing cost-effective quality care.

Lawrence (1995) states future research must address the need for a standardized method to measure asthma outcomes that will not only demonstrate decreased cost of care after intervention, but also serve to quantify the emotional cost of uncontrolled asthma that must be recognized and addressed by policy-makers and those who are paying for asthma care. A socio-demographic characteristic to be considered in this equation is working versus non-working parents and the likelihood of attending an asthma education program. Economic evaluation of the intervention of asthma education focusing on direct and indirect costs will be necessary with the managed care environment. The National Asthma Education and Prevention Program Working Group Report on the Cost Effectiveness of Asthma Care (Sullivan, Elixhauser, Buist, Luce, Eisenberg, & Weiss, 1994) recommend correlating asthma severity, who educated, amount of education, and how long the effects of education last.

Several factors limit the ability to generalize the results of this study. The first factor is the voluntary participation of the sample population. Voluntary participants tend to be highly motivated and more likely to take action in self-management skills. Another factor is the lack of a control group. A control group would have been useful in quantifying and testing the effects of the Open Airways Program. Asthma symptoms and management often

change with the seasons and weather and would be reflected in the control group. Lastly, a more long-term evaluation needs to be completed to investigate the intervention over time. Asthma is a chronic illness often affected by seasons and weather changes that are better measured as a full year to reflect these changes.

Another area of research needed is self-efficacy. Although difficult to measure, self-efficacy can be manipulated through education and provides more than just knowledge in integrating health care behaviors. Self-efficacy has been shown to have a positive effect on multiple behavior changes including smoking cessation, weight management, use of contraception, alcohol use, exercise, and nutrition (O'Leary, 1985; Strecher, 1986; Bandura, 1977, 1982; Yalow & Collins, 1989). Rosenstock, Stretcher, and Becker (1988) encouraged researchers to use the Health Belief Model incorporating self-efficacy as an explanatory variable and as one that may be manipulated in good effect. Perceived severity and seriousness should be evaluated to measure these variables effects. The severity of asthma impacts the number of asthma episodes and how the disease impacts lifestyle. In addition to perceived severity, an actual diagnosis of severity should be included.

In summary, it is recommended that further research be conducted using a quasi-experimental design that includes a control group to more clearly understand the correlation

between variables. A likert scale could be used to measure self-management allowing parametric testing. A larger sample studied over a longer duration of at least one year post-education is suggested. Another recommendation for research is the inclusion of self-efficacy into the Health Belief Model. It would be beneficial to assess perceived severity and seriousness pre- and post-education. Again, cost should must also be collected to evaluate the cost effectiveness of asthma education.

Summary

In summary, by seeking knowledge directed towards asthma education, communication skills, asthma management, and working with small groups, the nurse can understand the proper nursing care of patients and families with the chronic disease of asthma. It is imperative that the Advanced Practice Nurse become educated in patient education in the topic of asthma.

The Health Belief Model has been useful in identifying health-related risk behaviors and predicting the frequency at which health behaviors are practiced. Advanced Practice Nurses can link the key concepts of the Health Belief Model to their actions to administer the Open Airways Program. The Advanced Practice Nurse can also demonstrate these actions to their fellow practitioners in primary care.

Although this study only demonstrated one significant finding, it provides a launching point for the Advanced Practice Nurse to conduct future research on this subject

with a control group using a larger population. The outcomes and cost-effectiveness should be demonstrated over time. The Advanced Practice Nurse can play a key role as educator, practitioner, and researcher to have a significant impact on the asthma self-management of children with this chronic illness.

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Appendix A

Appendix A

MICHIGAN STATE
UNIVERSITY

February 19, 1998

TO: Linda Spence
A230 Life Sciences

RE: IRB#: 98-048
TITLE: ASTHMA EDUCATION FOR THE SCHOOL-AGE CHILD
REVISION REQUESTED: N/A
CATEGORY: 1-C
APPROVAL DATE: 02/17/98

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

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

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

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

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:bed

cc: Jill Polmateer

OFFICE OF
RESEARCH
AND
GRADUATE
STUDIES

University Committee on Research Involving Human Subjects (UCRIHS)

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

517/355-2180
FAX: 517/432-1171

Appendix B

Appendix B

Code sheet

OPEN AIRWAYS
CHILD QUESTIONNAIRE (INTERVIEW)

1. How often do you cough or wheeze from your asthma?
(4) 1-2 times per day (3)1-2 times per week
(2) 1-2 times per month (1) 1-2 times per year
2. Can you ever tell if you are going to wheeze or cough before you start? Yes (2) No(1)
3. (If yes) How do you know that you are going to wheeze or cough? RECORD SIGNS
4. Do you remember the last time you wheezed or coughed from asthma? When was that?
(4) Today (3) In the last week (2) In the last month
(1) In the last year
5. Now, I'd like you to think about the last time you wheezed or coughed. Do you do any of the following things to take care of your asthma?
Circle all that apply.(Code 2=yes, 1=no)
Stop playing/rest
Tell mother/other adult
Take asthma medicine
Drink some water or juice
Relax (massage, meditate, relaxation exercise)
Cough to clear mucus or phlegm from lungs
Go to doctor or hospital
Are there other actions not listed? List_____
6. Do you ever tell your mother or caretaker things about how you feel so that she will know what to do for your wheezing?
(2) Yes (1) No
7. Do you ever ask your mother or other caretaker to do things to help stop the wheezing or coughing? (2) Yes (1) No
8. (If yes) What do you ask them to do? List

_____

_____

9. Who decides when to give you your medicine?
(list all that apply)(Code 2=yes, 1=no)
Mother Father Self Other _____
10. Have you ever told your parents that you needed to go to the doctor, hospital, or emergency room for your asthma?
(2) Yes (1) No
11. When you are wheezing or coughing, do you tell your mother or other caregiver whether you think you should go to school or not?
If so, do you do this (3)Most of the time,(2) some of the time, or (1) hardly ever?

12. Do you do the following things on your own,without the help of your parents, to keep yourself from starting to wheeze? (Circle all that apply)

Take medicine regularly (Code 2=yes, 1=no)
Take medicine to avoid wheezing
Practice breathing/ relaxation exercise
Keep from getting too tired
Keep from getting out of breath
Get rid of wheezing triggers/ avoid triggers
Clean house/room/desk to control triggers
Cough out phlegm to clear lungs
Keep relaxed in stressful situations
Other things not mentioned _____

13. Do you remember the last time you had wheezing or coughing in school? When was that?

(3)In last week (2) In last month (1) In last year

14. Did you do any of the following things? Circle all that apply. (Code 2=yes,1=no)

Stop playing/rest
Told teacher/staff
Took/asked for medicine
Drank water or juice
Relaxed
Coughed to clear mucus
Went home
Went to doctor or hospital
Other_____

15. Have you ever suggested to your teacher or someone else at school that you should:

Leave class early because of asthma
(2) Yes (1)No
Stay in class and see if wheezing stops
(2) Yes (1) No
Take your medicine
(2) Yes (1) No
Call you mother or care taker or go home
(2) Yes (1) No
Go to the doctor or emergency room
(2) Yes (1)No

16. Do you ever ask your teacher about making up schoolwork you missed because of asthma?

(2) Yes (1)No

17. Do you ever choose not to play games in gym or outdoors because of asthma?

(2) Yes (1)No
If yes, in what situations?_____

18. Now I'd like to ask you to tell me if you can do these things.

(3) I CAN DO IT (2) I MIGHT BE ABLE TO DO IT
(1) I CANNOT DO IT

___ a. Tell how much medicine to take
___ b. Choose (decide) when to take your medicine (the as needed medications)

___ c. Tell ahead of time that you are going to start wheezing or coughing
___ d. Tell your mother or care taker how bad your wheezing or coughing is
___ e. Cough to clear phlegm from your lungs
___ f. Relax and keep calm when you are wheezing
___ g. Remember what you are suppose to do when you start wheezing
___ h. Stop playing a game with other children and sit down to rest when wheezing starts
___ i. Talk to your teacher about asthma
___ j. Know if you should go to school or not when wheezing in the morning
___ k. Tell your parents why you should or should not go to school
___ l. Know when you have to go to the doctor or hospital for help
___ m. Tell your parents why you need to go to the doctor or hospital

Appendix C

Original Study

Appendix C

Original Study

INFORMED CONSENT
OPEN AIRWAYS EVALUATION

In signing this document, I am giving my consent for myself and child (Open Airways participant) to be interviewed by an employee of Munson Medical Center's Patient Education Department of Traverse City, MI. I understand that my child and I will be part of a research study that will focus on asthma education and its effect on asthma management.

I understand that my child and I will be interviewed by mail or at an agreed upon location at a time convenient to me. I will be asked questions regarding how my child and I manage the participant's asthma, confidence in our ability to do so, and seeking of health care services. The interview will take 1/4 - 1 hour to complete.

I understand that my family has been selected to participate in this study because was child was involved or will be involved in Open Airways, and asthma education program within the last 3 years.

This interview was granted freely. I have been informed that the interview is entirely voluntary, and that even after the interview begins, I may refuse to answer any question or decide to terminate the interview process. I have been told that my answers to questions will not be given to anyone else and no reports of this study will identify my child or I in any way. I have also been informed that my participation or non-participation or my refusal to answer any questions will have no effect on services that I or any member of my family may receive from health or school providers.

I understand that the results of this research will be given to me if I ask for them and that Jill Polmateer, RN,C, BSN is the person to contact if I have any questions about the study. Jill Polmateer can be reached at (616) 935-8208.

UCRIHS APPROVAL FOR
THIS project EXPIRES:

FEB 17 1999

SUBMIT RENEWAL APPLICATION
ONE MONTH PRIOR TO
ABOVE DATE TO CONTINUE

Date

Respondent's Signature

Interviewer's Signature

MUNSON
MEDICAL
CENTER
A MUNSON HEALTHCARE FACILITY

October 15, 1996

Jill Polmateer, R.N., B.S.N.
Patient Education Department
Munson Medical Center
1105 Sixth Street
Traverse City, Michigan 49684

Dear Jill:

This letter is to formally confirm for you that the Munson Medical Center Institutional Review Board has approved the study which you presented to the Committee in conjunction with the Patient Education Department. It is our understanding that your study pertains to the analysis of the "open airways" program, which is an effort to educate pediatric patients and their families in self-help techniques to avoid complications of asthma.

We wish you success in your research project.

Sincerely,

Ralph J. Cerny
President

RJC/sb

1105 Sixth Street
Traverse City, Michigan 49684-2386
(616) 935-5000

TRAVERSE CITY AREA PUBLIC SCHOOLS

Jayne H. Mohr, Ed.D.
Assistant Superintendent for Curriculum & Instruction

P.O. Box 32
Traverse City, Michigan 49685-0032

Telephone (616) 922-6453
FAX (616) 922-6420

C R E A T I N G A C U L T U R E O F E X C E L L E N C E

Jill Cook
Executive Assistant

November 6, 1996

Ms. Jill Polmateer, R.N.
Munson Medical Center
1105 Sixth Street
Traverse City, MI 49684-2386

Dear Ms. Polmateer:

Thank you for your summary of the Patient Education's Research Proposal. The nurses and I have reviewed the materials and have shared our recommendation with the superintendent. He supports this proposal and we expect written documentation of the results upon completion.

Thank you for your interest in following up with our students who have participated in the Open Airways Program. Please feel free to contact me if I may offer further assistance. Renee Dean (922-6472) is also available to provide additional information if necessary.

Sincerely,

Jayne H. Mohr

Jayne H. Mohr, Ed.D.
Assistant Superintendent

JHM:jkc
PC: Peter Wharton
Renee Dean

Note 933-5610

OPEN AIRWAYS
PARENT QUESTIONNAIRE

1. Age of child _____

2. Sex of child (circle) M F

3. Current grade of child_____

4. Age of asthma diagnosis_____

5. Parent's marital status: __ Married __ Single

6. Family income before taxes (circle)

   $ 0-9,999 $10,000-19,999 $20,000-29,999
   $30,000-39,999 $40,000-49,999 $50,000 & up

7. Does your child have medical insurance covering office visits? Yes No

8. Does your child have prescription coverage for his/her medications?
   Yes No

9. How many hospital admissions has your child had in the last year for asthma related illnesses (i.e. asthma, bronchitis, pneumonia, asthmatic-bronchitis)?
   _____

10. How many emergency room or walk-in clinic visits has your child had in the last year due to asthma related illness? _____

11. How many physician visits has your child had in the last year for asthma related illnesses? _____

12 When your child wheezes or has other symptoms of asthma, what do you usually do?
   _____

13. Does your child do anything to stop the wheezing or symptoms by his/herself? Yes No

14. What medications does your child currently take?

	Name	Dose	Times per Day
1.			
2.			
3.			
4.			
5.			

15. Does your child take medications as prescribed?
Yes No

16. Does your child use a spacer with inhalers?
Yes No

17. Does your child use a peak flow meter?
Yes No
If yes, what is their target? _____

18. How many days has your child missed from school in the past year?
0 1-3 4-6 7-9 10-12 >12

19. How often does your child experience symptoms from asthma?
__ 1-2 times per day __ 1-2 times per week
__ 1-2 times per month __ 1-2 times per year

MUNSON
MEDICAL
CENTER

Dear Parents of Open Airway Participants;

Thank-you for participating in the Open Airways program and research study. I hope that you enjoyed the classes and written material. It has been a pleasure to work with your children. Asthma education is a vital piece to its management.

You will find included a questionnaire. This is the same as previously. We will be measuring the difference before and after the classes. We will be interviewing your children one last time also. Please fill out the questionnaire and return it in the self-addressed stamped envelop by **April 30, 1997.**

It is critical to the study to receive follow-up data. Thank-you for your response. For any questions about asthma or this program, please call Jill Polmateer, RN, C, BSN at (616) 935-8208.

Sincerely;

Jill Polmateer, RN,C, BSN Debbie Gray, RN Tina Soyring, RN, BSN

1105 Sixth Street
Traverse City, Michigan 49684-2386
(616) 935-5000