Lack of Relationship Between Acceptance and Knowledge of Asthma in School-Age Children and Early Adolescents

Eileen Kae Kintner

ISSUES AND PURPOSE. *Early adolescents diagnosed with asthma have difficulty accepting their condition. This study is part of an ongoing program of research designed to increase understanding of the adolescent process of coming to acceptance. The purpose was to explore relationships among variables in the Acceptance of Asthma Model.*

DESIGN AND METHODS. *A cross-sectional, theory-testing design with a sample of 94 students ages 9 to 14 years.*

RESULTS. *Acceptance was dependent on psychosocial influences and disease characteristics rather than knowledge of asthma.*

PRACTICE IMPLICATIONS. *Psychosocial interventions are needed to facilitate acceptance.*

Search terms: *Asthma, psychosocial aspects of illness*

Eileen Kae Kintner, PhD, RN, is Assistant Professor, Division of Health Promotion and Risk Reduction Programs, The University of Michigan School of Nursing, Ann Arbor, MI.

School-age children and early adolescents diagnosed with asthma have verbalized and demonstrated difficulty in accepting their condition and the need for ongoing treatment and management (Kintner, 1997). Researchers have explored adult acceptance of physical disabilities and, to some degree, adult acceptance of chronic conditions (Dembo, Levinton, & Wright, 1956; Dion, 1990; Keogh & Feehally, 1999; Linkowski, 1971; McWilliam, Stewart, Brown, Desai, & Coderre, 1996; Stuifbergen & Rogers, 1997), yet few researchers have explored school-age child or early adolescent acceptance of a chronic condition (Kintner). This study is part of an ongoing program of research designed to increase understanding of the school-age child and early adolescent process of coming to accept asthma.

Healthcare professionals must strive to meet the physical, emotional, and developmental needs of school-age children/adolescents and their families. Treatment of asthma is aimed at preventing and alleviating symptoms (American Thoracic Society, 1987), as well as promoting optimal pulmonary functioning and maintenance of optimal growth, development, and wellness (Larter, Kieckhefer, & Paeth, 1993). Increasing understanding of the process by which school-age children and early adolescents come to accept their asthma will guide healthcare professionals in assisting them to develop to their fullest potential and prevent exacerbation of the condition. The purpose of this study was to explore relationships among variables in the School-age Child and Early Adolescent Acceptance of Asthma Model. The two primary research questions addressed were:

1. What is the best linear path fit of the Acceptance of Asthma Model?
2. What individual characteristics, disease characteristics, and environmental influences contribute to explaining variance in the Acceptance of Asthma Model?

Lack of Relationship Between Acceptance and Knowledge of Asthma in School-Age Children and Early Adolescents

Review of the Literature

Approximately 5 million children in the United States are diagnosed with asthma (Centers for Disease Control and Prevention, 1998). Researchers have identified a number of problem behaviors exhibited by individuals diagnosed with asthma (Birkhead, Attaway, Strunk, Townsend, & Teutsch, 1989; Creer et al., 1989). Asthma health education programs have been designed for children and their parents, with goals of increasing knowledge and self-management behaviors and decreasing morbidity (Clark et al., 1986; Taggart et al., 1991). Evaluation of these programs has revealed mixed benefits. Whereas most programs reported significant increases in level of knowledge, few reported significant long-term changes in behavior or decreases in morbidity.

In the early to mid-1970s, healthcare professionals began to consider and explore the psychosocial impact of asthma, believing tasks of child and adolescent development were made more difficult by ill health. Since that time, surprisingly few researchers have explored the psychosocial needs of children/adolescents from the emic or first-person perspective. Futcher (1988) recognized that chronically ill children and their families were at risk for psychosocial problems. Dragone (1990) questioned adolescents (11–19 years of age) diagnosed with chronic conditions, including asthma, about their healthcare needs. The adolescents identified their primary health needs as being related to uncertainty about the condition into the future, not being able to do things other kids do, worry about health, not doing well in school, difficulty breathing, and needing help with decision making. Richardson (1991) elaborated on psychosocial health problems of young adults (20–45 years of age) with asthma to include embarrassment of symptoms, having to take medication in public, and restricted socializing with others. Thirty-three percent expressed difficulty accepting the diagnosis of asthma.

Acceptance of condition, disability, and life situations have been linked to spirituality, hope, and self-transcendence (Coward, 1990). Across studies, older adolescent and adult acceptance of physical disability/chronic condition has been positively correlated with education level (Linkowski, 1971; Thomas, Davis, & Hochman, 1976), reading level (Heineman & Shontz, 1982), knowledge of disability (Brillhart, 1986), self-esteem (Starr & Heiserman, 1977), assertiveness (Joiner, Lovett, & Goodman, 1989), life satisfaction (Dion, 1990), satisfaction with social relationships (Linkowski & Dunn, 1974), increased levels of hope (Boone, Roessler, & Cooper, 1978), and decreased levels of anxiety (Bicknell, 1978). Individuals who were offered opportunities to share their knowledge with others were found to possess higher levels of acceptance (Trainor, 1981). Individuals with physical disabilities perceiving themselves or being perceived by others as "veteran" athletes also possessed higher levels of acceptance (Patrick, 1984). Individual characteristics (gender, age, race), life role (marital status, occupation), and disability/disease characteristics (severity, duration, type) indicated mixed results across studies. The focus of this study was to increase understanding of the school-age child and early adolescent process of acceptance and factors that influence the process.

Theoretical Framework

The Acceptance of Asthma Framework guiding this study evolved from a phenomenological study conducted by the author (Kintner, 1997). The study describes the process of coming to accept asthma and the essential attributes and outcomes. Findings indicate the process of acceptance begins with an initial awareness of symptoms that leads the family to seek assistance from healthcare professionals. Interaction with the healthcare community leads to acknowledgment of symptoms through a diagnosis and prescription for treatment. Children/adolescents and their families then seek information regarding the diagnosis from a variety of sources to gain knowledge. A period of resignation ensues as the children/adolescents and their families are challenged to understand the full impact of imposed limitations.

As the children/adolescents develop decision-making and reasoning abilities, they begin to explore options and choices, as well as cause-and-effect consequences. Reasoning leads to drawing conclusions about the condition that resolves their inner conflicting beliefs and turmoil of nega-

tive emotions, along with the formation of attitudes and beliefs for coming to terms with, or acceptance of, the condition. Acceptance ushers in the potential for unrestricted or full participation in life activities. A number of individual characteristics (age or grade in school, as well as one's self-perception), disease characteristics (age at onset of symptoms, duration and severity of illness), and environmental influences (parental knowledge of asthma, participation in health education and/or counseling program, perceptions of social support) have an effect on children/adolescents as they develop and grow through the process.

For purposes of theory testing, a linear path acceptance model was specified, and the following relational statements were written:

1. Acceptance of asthma is positively associated with unrestricted participation in life activities.
2. Acceptance of asthma is a mediator between knowledge of asthma and unrestricted participation in life activities.
3. Individual, disease, and environmental characteristics influence knowledge of asthma, acceptance of asthma, and unrestricted participation in life activities.

Methods

Research Design

This study followed a cross-sectional, correlational design. Human subjects approval was obtained through the University of Arizona Health Sciences Center Review Board prior to data collection. Written consent was obtained from a parent/legal guardian and assent from the child/adolescent. A network technique was used to obtain a convenience sample of school-age children and adolescents between 9 and 14 years of age, who were diagnosed with asthma and able to read and understand English. In order to increase generalizability, subjects were recruited and data collected through physicians' offices and health clinics in Arizona, California, Michigan, and Oklahoma, and through school districts in south-central Arizona. Fliers were offered to parents of children and adolescents diagnosed with asthma. Families interested in learning more about the study were encouraged to contact the author by telephone. After verbal consent was obtained, families were mailed questionnaire packets.

Instruments

This study used paper-and-pencil self-report questionnaires to measure concepts contained in the model. Reliability, validity, and age appropriateness were considered in the selection of the following instruments:

- *General Health History Survey:* A 28-item survey questionnaire developed for purposes of collecting demographic data and disease-related information (Kintner, 1996).
- *Nam-Powers Socioeconomic Scores:* A 3-item measure computed by averaging parents' occupation and education and family income scores (Nam & Powers, 1983).
- *Self-Perception Profile for Children:* A 36-item Likert-type instrument containing six subscales (Harter, 1985a). The six domains, measuring the child's perception of his/her ability, are scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, and global self-worth. Cronbach's alpha reliability of this sample ranged from .82 to .87.
- *Severity of Illness Rating Scheme (SIRS):* A multidimensional 4-item instrument designed to measure severity of asthma on a 0- to 8-point scale (Kieckhefer, 1987). The scale taps both pathophysiological aspects and responses to asthma. Cronbach's alpha reliability for this sample was .80. Concurrent validity assessed by the developer of the SIRS was supported when SIRS scores yielded significant correlations with parents' perceptions of their children's health status, school attendance records, and numbers of acute medical visits and hospitalizations.
- *Social Support Scale for Children:* A 24-item Likert-type instrument measuring a child's perceived social support from his/her parents, teachers, classmates, and close friends (Harter, 1985b). Cronbach's alpha reliability for this sample ranged from .82 to .88.

Lack of Relationship Between Acceptance and Knowledge of Asthma in School-Age Children and Early Adolescents

- *Knowledge of Asthma Survey (KAS):* An 18-item fill-in-the-blank/multiple-choice quiz measuring level of asthma knowledge (Kintner, 1996). Both parents and children/adolescents complete identical forms of the KAS. Items contain information related to anatomy and physiology, signs and symptoms, triggers, treatments, and management techniques. Kuder-Richardson-20 alpha coefficient reliability for the parents was .73 and for the children was .76.
- *Acceptance of Asthma Questionnaire:* A 24-item 5-point Likert-type questionnaire measuring level of school-aged child/adolescent acceptance of asthma (Kintner, 1996). Cronbach's alpha reliability for this sample was .77.
- *Participation in Life Activities Scale:* A 15-item Yes/No survey questionnaire designed to measure level of unrestricted involvement in chosen life activities (Kintner, 1996). Subjects are asked to list five of their most favorite activities, then answer three questions about each of the activities. The three questions seek information about whether they need to think about their asthma when planning for activities, whether asthma interferes with participating in the activity, and whether asthma prevents them from participating in the activity. Kuder-Richardson-20 alpha coefficient for internal consistency was .81.

Data Collection

School-age children/adolescents and parents willing and able to participate were mailed a questionnaire packet containing a cover letter, two booklets, and a return postage–paid envelope. One questionnaire booklet was prepared for the children/adolescents and one for the parents. The parents' booklet contained the General Health History Survey, Severity of Illness Rating Scheme, and Parental Knowledge of Asthma Survey. The children/adolescents' booklet contained the Acceptance of Asthma Questionnaire, Children's Knowledge of Asthma Survey, Participation in Life Activities Scale, Self-Perception Profile, and Social Support Scale. When questions were complete, both booklets were returned by mail to the author.

As added incentive to compensate and acknowledge subjects for their time and efforts in completing the lengthy questionnaire booklets, $5 was offered to families who returned their fully completed questionnaire packets. Personalized notes were sent to the subjects thanking them for their participation. Those who did not return the completed packet within 3 weeks were mailed a postcard reminder. One week following the postcard mailing, those who still had not returned completed packets were telephoned and asked if they had received the packet and/or had any questions or concerns about the study. A total of 125 packets were mailed to interested families. Due to time restraints, data collection was terminated on receipt of 94 questionnaire packets (74% return rate).

Data Analysis

Data gathered were interval level with normal distribution patterns, allowing for use of parametric statistics. SPSS for Windows was used to enter and recode data, and SPSS-PC was used to compute statistical data. Descriptive statistics using frequencies, means, and standard deviations were computed for analysis of the General Health History Survey. The Socioeconomic Index was computed by averaging three composite scores. The Severity of Illness Rating Scheme, Knowledge of Asthma Survey, Acceptance of Asthma Questionnaire, and Participation in Life Activities scales were summative, with higher scores reflective of higher levels of the concepts they reflect. Means were computed for the Self-Perception Profile and Social Support Scale subscales. Negatively worded items were reverse-scored. Path analysis as outlined by Pedhazur (1982) determined the accuracy of the linear path model. In addressing possible threats to validity of the model, multicollinearity (Schroeder, 1990) and linear model assumptions (Verran & Ferketich, 1987) were examined.

Results

Sample

The sample consisted of 94 subjects ranging in age from 9 to 14 years ($M = 11.76$, $SD = 1.88$). The distribu-

tion of males (53.2%, $n = 50$) to females (46.8%, $n = 44$) was reflective of reported national trends. More than 75% of the subjects were recruited from south-central Arizona. Race/ethnic background figures were reflective of the English-speaking population estimates for south-central Arizona (Pima County) based on the United States Census of 1990: Anglo-Americans (73.4%, $n = 69$), Hispanic, nonwhite (16%, $n = 15$), and African-Americans (8.5%, $n = 8$). Socioeconomic scores ranged from 21 to 99 ($M = 72.6$, $SD = 20.8$). Frequency distribution of disease characteristics include: Age at onset of symptoms associated with asthma (<2–14 years, $M = 4.50$, $SD = 3.41$), age at which diagnosis of asthma was confirmed (<2–14 years, $M = 5.35$, $SD = 3.47$), time between onset of symptoms and confirmed diagnosis (<1–6 years, $M = .85$, $SD = .15$), and duration of illness (<1–14 years, $M = 7.26$, $SD = 3.41$). Parental perception of severity of illness ranged from mild (43.6%, $n = 41$) to moderate (41.5, $n = 39$) and severe (14.9%, $n = 14$). Stimuli to exacerbation of symptoms, frequency of wheezing, and types of prescribed medications, as well as frequency distribution of emergency room visits and hospitalizations for asthma symptoms, are presented in Table 1. Forty-seven percent ($n = 42$) of the subjects classified a general practitioner as the healthcare provider monitoring the asthma, 45% ($n = 44$) listed an asthma or pulmonary specialist, and 8% ($n = 8$) had no healthcare provider. Twenty-three percent ($n = 22$) of the subjects had participated in formal health education programs and 5% ($n = 5$) in formal counseling programs.

Scores including ranges, means, standard deviations, and skewness for the various instruments are given in Table 2. Visual inspection of the aggregate mean scores for this sample compared to Kieckhefer's (1987) test sample for the Severity of Illness Rating revealed gross similarities. The objective measure of severity of illness compared with the subjective measure of parental perceptions possessed a Pearson r correlation of .50 ($p<.001$), indicating that although objective and subjective measures of severity were similar, they were not identical. Visual inspection of the mean scores for the subscales of the Self-Perception Profile for this sample compared to Harter's (1985a) test

Table 1. Frequency Distribution of Disease Characteristics

	Category	Percent	*n*
Stimuli (triggers)	Allergies	87.2	83
	Exercise	71.3	67
	Infections	63.8	60
	Smoke	56.4	53
	Dust	55.3	52
	Weather changes	53.2	50
	Pollution	37.2	35
	Emotions	31.9	30
Wheezing	Never	8.5	8
	Rarely	33.0	15
	Occasionally	33.0	31
	Often	11.7	11
	Frequently	14.9	14
	Fairly constantly	16.0	15
	Total	100.0	94
Medications	Bronchodilators	87.2	82
	Oral steroids	12.8	12
	Inhaled/nasal steroids	34.0	32
	Sodium cromolyn	29.8	28
	Nedocromil	6.4	6
	Antihistamines	20.2	19
	Decongestants	10.6	10
	Antidepressants	5.3	5
Emergency Room Visits	None	33.0	31
	1–3	31.0	29
	4–9	18.0	17
	10–30	17.0	16
	Missing	1.0	1
	Total	100.0	94
Hospitalizations	None	69.0	65
	1	12.0	11
	2–5	14.0	13
	6–10	2.0	2
	11–20	2.0	2
	Missing	1.0	1
	Total	100.0	94

Lack of Relationship Between Acceptance and Knowledge of Asthma in School-Age Children and Early Adolescents

Table 2. Scores, Means, Standard Deviations, and Skewness for Instruments Used to Test the Acceptance of Asthma Model

Instruments and Subscales	Range	Mean	*SD*	Skewness	Reliability
Severity of Illness	0.00–8.00	2.08	1.16	1.162	.80
Self-Perception Profile					
■ Athletic competence	1.00–4.00	2.83	.81	−.241	.83
■ Scholastic competence	1.00–4.00	3.10	.74	−.824	.84
■ Social acceptance	1.00–4.00	2.99	.81	−.856	.86
■ Behavioral conduct	1.67–4.00	3.17	.64	−.325	.82
■ Physical appearance	1.00–4.00	2.85	.84	−.434	.86
■ Global self-worth	1.17–4.00	3.25	.72	−.895	.87
Social Support Scale					
■ Parental support	1.17–4.00	3.57	.54	−1.166	.83
■ Friend support	1.00–4.00	3.37	.74	−1.286	.88
■ Teacher support	1.00–4.00	3.27	.72	−.940	.87
■ Classmate support	1.00–4.00	3.09	.72	−.801	.82
Knowledge of Asthma					
■ Child's knowledge	4–23	13.97	4.16	−.127	.76
■ Parent's knowledge	9–25	18.66	3.55	−.266	.73
Acceptance of Asthma	67–119	95.88	11.53	−.329	.77
Participation in Life	0–15	9.27	3.66	−.645	.81

sample revealed the aggregate means on social acceptance, physical appearance, and global self-worth were fairly similar, whereas mean scores on scholastic competence and behavioral conduct were slightly higher, and mean scores on athletic competence slightly lower. This seemed reasonable, especially for those children/adolescents with exercise-induced asthma.

Research Question 1: What Is the Best Linear Path Fit of the Acceptance of Asthma Model?

The model specified three constructs and predicted the direction of paths that link the constructs: Child's knowledge of asthma, child's acceptance of asthma, and child's participation in life activities. It was expected that child's knowledge of asthma would be linked to participation in life activities through the mediating variable, acceptance of asthma.

A requirement of path analysis is that the variables in the path must be at least moderately correlated with each other (correlations from .30–.70 are expected), although extremely high correlations ($\geq$.85) constitute multicollinearity. A review of the bivariate correlation matrix revealed that the requisite moderate correlations among the path variables did not exist (Table 3). Indeed, the path analysis itself produced no significant direct links between any of the three constructs. However, an indirect link was found between participation in life activities and acceptance of asthma.

**Table 3. Correlation Matrix for Acceptance,
Knowledge, and Participation Variables**

|	Acceptance	Knowledge	Participation
Acceptance	1.00		
Knowledge	.10[a]	1.00	
Participation	.08[b]	.02[c]	1.00

[a]$p = .35$ [b]$p = .44$ [c]$p = .82$

Research Question 2: What Individual Characteristics, Disease Characteristics, and Environmental Influences Contribute to Explaining Variance in the Acceptance of Asthma Model?

Although the Specified Linear Path Acceptance of Asthma Model did not fit the data, information of interest and worth exploring included what individual characteristics, disease characteristics, and environmental influences contributed to explaining variance in a child's knowledge of asthma, acceptance of asthma, and participation in life activities. The Specified Linear Path Acceptance of Asthma Model served as a guide in addressing Research Question 2. Two models were specified for testing: the Knowledge of Asthma Model and the Acceptance of Asthma/Participation in Life Activities Model.

Knowledge of Asthma Model. Child's knowledge of asthma served as the dependent variable. Environmental influences theorized to affect child's knowledge of asthma included parent's knowledge of asthma, participation in an asthma education program, classification of healthcare provider as general practitioner versus asthma or pulmonary specialist, parent's perception of severity, and socioeconomic status of the family. Current age of the child/adolescent was an individual characteristic theorized to affect child's knowledge of asthma. Path coefficients were calculated for each of the independent variables, indicating their effects on the dependent variables. Direct and indirect effect coefficients were computed for each dependent variable. In preparation for testing the goodness-of-fit between the theory and

Figure 1. Knowledge of Asthma Model
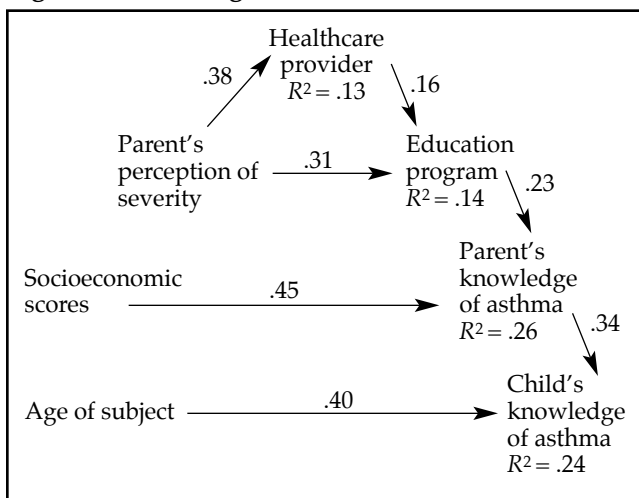
data, the squared multiple correlation (R^2m) was calculated to be .578. Consideration of theory-trimming methods revealed identical just- and over-identified models with no difference between the models noted ($Q = 1$). Path coefficients for the respecified model are presented in Figure 1. The following relational statement accounted for 58% of the explained variance for the Knowledge of Asthma Model: A child's level of knowledge of asthma is directly influenced by his/her parent's knowledge of asthma and his/her current age in years, and indirectly influenced by his/her participation in an asthma health education program, the classification of healthcare provider monitoring the condition, the parent's perception of severity of illness, and the family's socioeconomic status.

Acceptance of Asthma/Participation in Life Activities Model. Acceptance of asthma served as the dependent variable. Participation in life activities served as a mediating variable. Environmental influences theorized to affect acceptance included perceived parental support, teacher support, and classmate support. Severity of illness was one disease characteristic, and athletic competence was one individual characteristic theorized to affect acceptance. Path

Lack of Relationship Between Acceptance and Knowledge of Asthma in School-Age Children and Early Adolescents

coefficients were calculated for each of the independent variables, indicating their effects. Direct and indirect effect coefficients were computed for each dependent variable. In preparation for testing the goodness-of-fit between the theory and data, the squared multiple correlation (R^2m) was calculated to be .703. One path was deleted from the just-identified model using theory-trimming methods. The path coefficient between severity of illness and parental social support did not meet criteria of statistical significance or meaningfulness, therefore, it was deleted. The overidentified model was then tested for significance. Path coefficients for the respecified model are presented in Figure 2. In preparation for testing the goodness of fit between the theory and data, the squared multiple correlation was calculated to be .690. With a $Q = .958$, no difference was noted between the just-identified and over-identified models ($\chi^2 = 3.647$, with 9 degrees of freedom). From the tabled values, a $\chi^2 = 4.168$ possesses a probability of .90. It was concluded that the model fit the data.

The following relational statement accounted for 70% of the explained variance for the Acceptance of Asthma/Participation in Life Activities Model: A child's acceptance of asthma is directly influenced by his/her perceived classmate and teacher support, and indirectly influenced by his/her self-perception of athletic competence, level of unrestricted participation in chosen life activities, perceived parental support, and severity of illness rating.

Discussion

This study was part of an ongoing program of research to increase understanding of the school-age child and adolescent process of coming to accept a chronic condition. Understanding the process will guide health-care professionals in assisting children to develop to their fullest potential. The Acceptance of Asthma Framework directed the specification of a linear path Acceptance of Asthma Model. The model proposed knowledge and acceptance of asthma influenced one's unrestricted participation in chosen life activities. That was not the case for this sample. Whereas adult acceptance and knowledge of disability were correlated (Heineman & Shontz, 1982), school-age child and adolescent acceptance and knowledge of asthma were not correlated. In fact, there were no shared variables between knowledge and acceptance models, implying these are two completely separate concepts. Results revealed that knowledge of asthma was dependent on the age of the child and parent's knowledge of asthma, whereas acceptance was dependent on schoolteacher and classmate support.

Results confirmed findings of previous acceptance research and offered support for findings of numerous asthma health education studies. Adult acceptance of disability and school-age child/adolescent acceptance of asthma both appear to be directly dependent on one's social support or satisfaction with social rela-

Figure 2. Acceptance of Asthma/Participation in Life Activities Model
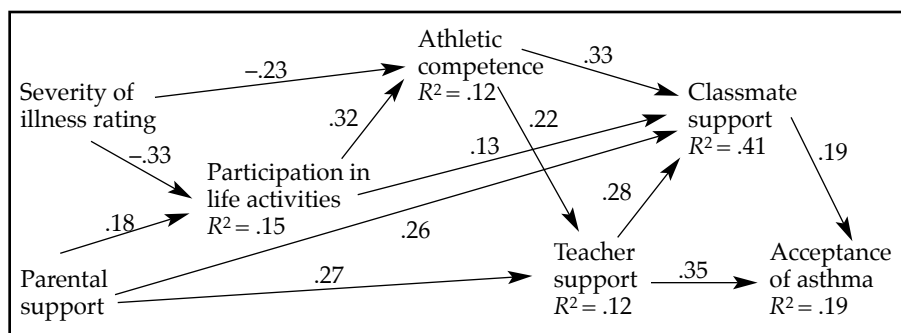
tionships (Linkowski & Dunn, 1974) and perceived athletic competence (Trainor, 1981). School-age child/adolescent knowledge of asthma historically has been, and as demonstrated with this study, continues to be influenced by parental knowledge of asthma, current age of the child/adolescent, participation in an asthma education program, and family's socioeconomic status.

The logical next step would be to examine current interventions or develop and test school interventions designed to increase teacher and classmate knowledge of asthma and to foster empathy, understanding, and support for the child diagnosed with this condition.

Limitations

Sample size was limited due to cost and time factors. Efforts were made through use of the General Health History Survey to obtain extensive demographic information on all subjects choosing to participate. The information was compared to general populations and reported when describing the sample. Only one method of measurement was used to measure each of the variables in the model. In reporting results, reliability and validity of instruments were considered. All measures used were paper and pencil self-report scales. Self-report measures have been found to contain inherent limitations, including distortion in recall, lack of objectivity, and social desirability (Burns & Grove, 1987). However, self-report measures have value and are of interest in capturing personal dynamics and conveying perceptions of experiences. In completion of the instruments, subjects were reassured there were no right or wrong answers.

How Do I Apply These Findings to Nursing Practice?

Treatment of asthma is aimed at promoting optimal pulmonary function by minimizing exacerbation of the condition through preventive care with consistent follow-up, as well as ensuring the child possesses age-appropriate knowledge about asthma and its management, and assumes increasing responsibility for self-care (Larter et al., 1993). If the goal of the clinician is to increase a child/adolescent's knowledge of asthma, the clinician would want to optimize parental knowledge beginning with an initial assessment before offering age-appropriate educational materials to the family.

If the goal of the clinician is to increase a child/adolescent's acceptance of asthma, the clinician would want to consider interventions to foster, promote, and/or optimize the child/adolescent's perception of classmate and teacher support. Beginning with an initial assessment, the clinician would need to explore current perceptions of classmate and teacher support. If a problem is identified in this area, there are programs available for schools designed to promote empathy and understanding among classmates and teachers for children with asthma. In addition, the clinician would want to focus on decreasing the child/adolescent's severity of illness, thus facilitating his/her participation in life activities and enhancing his/her self-perception of athletic competence. This may in turn affect the child/adolescent's relationship with his/her classmates and teachers. Finally, encouraging parents to be supportive of their child/adolescent's participation in life activities and to openly communicate with their child/adolescent's teachers about the asthma may foster support within the school system.

Author contact: ekintner@umich.edu; with a copy to the Editor, roxie.foster@uchsc.edu

References

American Thoracic Society. (1987). Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease (COPD) and asthma. *American Review of Respiratory Disease, 136,* 225–244.

Lack of Relationship Between Acceptance and Knowledge of Asthma in School-Age Children and Early Adolescents

Bicknell, J.H. (1978). The relationship of manifest anxiety and the rank order of values of late adolescents to acceptance of disability. Doctoral thesis, University of Arkansas. *Education, Guidance and Counseling, 1271-A.*

Birkhead, G., Attaway, N.J., Strunk, R.C., Townsend, M.C., & Teutsch, S. (1989). Investigation of a cluster of deaths of adolescents from asthma: Evidence implicating inadequate treatment and poor patient adherence with medications. *Journal of Allergy and Clinical Immunology, 4,* 484–491.

Boone, S.E., Roessler, R.T., & Cooper, P.G. (1978). Hope and manifest anxiety: Motivational dynamics of acceptance of disability. *Journal of Counseling and Psychology, 25,* 551–556.

Brillhart, B. (1986). Predictors of self-acceptance. *Rehabilitation Nursing, 11*(2), 8–12.

Burns, N., & Grove, S.K. (1987). *The practice of nursing research: Conduct, critique and utilization.* Philadelphia: Saunders.

Centers for Disease Control and Prevention. (1998). Surveillance for Asthma-United States, 1960–1995. *Morbidity and Mortality Weekly Reports, 47*(SS-1).

Clark, N.M., Feldman, C.H., Evans, D., Levison, M.J., Wasilewski, Y., & Mellins, R.B. (1986). The impact of health education on frequency and cost of health care use by low-income children with asthma. *Journal of Allergy and Clinical Immunology, 78*(1, Pt. 1), 108–115.

Coward, D.D. (1990). The lived experience of self-transcendence in women with advanced breast cancer. *Nursing Science Quarterly, 3,* 162–169.

Creer, T.L., Wigal, J.K., Tobin, D.L., Kotes, H., Snyder, S.E., & Winder, J.A. (1989). The Revised Asthma Problem Behavior Checklist. *Journal of Asthma, 26,* 17–29.

Dembo, T., Levinton, G.L., & Wright, B.A. (1956). Adjustment to misfortune—A problem of social-psychological rehabilitation. *Artificial Limbs, 3,* 4–61.

Dion, G.A. (1990). *Testing of an Instrument to Measure Acceptance of Diabetes "Ideas about Diabetes–Revised" (IAD-R).* New Orleans, LA: Louisiana State University Medical Center School of Nursing.

Dragone, M.A. (1990). Perspectives of chronically ill adolescents and parents on health care needs. *Pediatric Nursing, 16*(1), 45–50.

Futcher, J.A. (1988). Chronic illness and family dynamics. *Pediatric Nursing, 14,* 381–385.

Harter, S. (1985a). *Manual for the self-perception profile for children.* Denver, CO: University of Denver.

Harter, S. (1985b). *Manual for the social support scale for children.* Denver, CO: University of Denver.

Heineman, A.W., & Shontz, F.C. (1982). Acceptance of disability, self-esteem, sex role identity and reading aptitude in deaf adolescents. *Rehabilitation Counseling Bulletin, 25,* 197–203.

Joiner, J.G., Lovett, P.S., & Goodwin, L.K. (1989). Positive assertion and acceptance among persons with disabilities. *Journal of Rehabilitation, 55*(3), 22–29.

Kieckhefer, G.M. (1987). Testing self-perception of health theory to predict health promotion and illness management behavior in children with asthma. *Journal of Pediatric Nursing, 2,* 381–391.

Kintner, E.K. (1996). Testing of the school-aged child and adolescent Acceptance of Asthma Model (Doctoral dissertation, The University of Arizona, 1996). *Dissertation Abstracts International, 58*(2B).

Kintner, E.K. (1997). Adolescent process of coming to accept asthma: A phenomenological study. *Journal of Asthma, 34,* 547–561.

Keogh, A.M., & Feehally, J. (1999). A quantitative study comparing adjustment and acceptance of illness in adults on renal replacement therapy. *ANNA Journal, 26,* 471–478.

Larter, N.L., Kieckhefer, G., & Paeth, S.T. (1993). Content validation of standards of nursing care for the child with asthma. *Journal of Pediatric Nursing, 8,* 15–21.

Linkowski, D.C. (1971). A scale to measure acceptance of disability. *Rehabilitation Counseling Bulletin, 14,* 236–244.

Linkowski, D.C., & Dunn, M.A. (1974). Self-concept and acceptance of disability. *Rehabilitation Counseling Bulletin, 18,* 28–32.

McWilliam, C.L., Stewart, M., Brown, J.B., Desai, K., & Coderre, P. (1996). Creating health with chronic illness. *Advances in Nursing Science, 18*(3), 1–15.

Nam, C.B., & Powers, M.G. (1983). *The socioeconomic approach to status measurement.* Houston, TX: Cap & Gown Press.

Patrick, G.D. (1984). Comparison of novice and veteran wheelchair athletes' self-concept and acceptance of disability. *Rehabilitation Counseling Bulletin, 27,* 186–188.

Pedhazur, E.J. (1982). *Multiple regression in behavioral research.* Fort Worth, TX: Harcourt Brace Jovanovich.

Richardson, H.M. (1991). The perceptions of Canadian young adults with asthma of their health teaching/learning needs. *Journal of Advanced Nursing, 16,* 447–454.

Schroeder, M.A. (1990). Diagnosing and dealing with multicollinearity. *Western Journal of Nursing Research, 12,* 175–184.

Starr, P., & Heiserman, K. (1977). Acceptance of disability by teenagers with oral-facial clefts. *Rehabilitation Counseling Bulletin, 20,* 198–201.

Stuifbergen, A.K., & Rogers, S. (1997). Health promotion: An essential component of rehabilitation for persons with chronic disabling conditions. *Advances in Nursing Science, 19*(4), 1–20.

Taggart, V.S., Zuckerman, A.E., Sly, R.M., Steinmueller, C. Newman, G., O'Brien, R.W., et al. (1991). You can control asthma: Evaluation of an asthma education program for hospitalized inner-city children. *Patient Education and Counseling, 17,* 35–47.

Thomas, K.R., Davis, R.A., & Hochman, M.E. (1976). Correlates of disability acceptance in amputees. *Rehabilitation Counseling Bulletin, 19,* 506–511.

Trainor, M.A. (1981). Acceptance of ostomy and the visitor role in a self-help group for ostomy patients. *Nursing Research, 31,* 102–106.

Verran, J.A., & Ferketich, S.L. (1987). Testing linear model assumptions: Residual analysis. *Nursing Research, 36,* 127–130.