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The Pediatric Breathing Survey

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ABSTRACT

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To ensure culturally-sensitive assessments, the researcher designed a Pediatric Breathing Survey (PBS) to measure quality of life for African-American children. The purpose of this study was to test whether the PBS is a reliable and valid instrument. Comparisons of group differences on race, income and parent's level of education based on parent responses to the questionnaires were conducted. More specifically, differences in Health Related Quality of Life (HRQOL) between Caucasian and African-American children were examined. The researcher-designed instrument was compared to Juniper's Pediatric Asthma Quality of Life Questionnaire. The sample consisted of parents of 84 school-aged children diagnosed with asthma.

It was hypothesized that the PBS would consist of four dimensions of HRQOL: the physical and disease dimension, the psychological dimension, social dimension and the traditional health belief dimension. The traditional health belief domain was added to the PBS and consisted of 11 questions relevant to African-American cultural beliefs and traditions. A factor analysis of the PBS in this sample supported only two domains, the emotional and physical dimensions. Juniper's PAQOLQ was designed to address three domains (physical, emotional and social impairments); the factor analysis for this study

supported only one dimension. Both questionnaires (PBS and Juniper's Pediatric Asthma Quality of Life) were reliable and valid.

MANOVA and ANOVA analyses were done to determine group differences on the variables of income, race and educational level. This analysis revealed only the factor of income differed between the two instruments. There was no significant statistical difference found for educational level or race. A chi-square analysis was also done on the traditional health belief domain. The chi square analysis revealed a significant difference based on parent's educational level, race and income for the traditional health belief domain question, "I have the money for all my medicine for asthma." The difference in the two HRQOL instruments is the addition of the traditional health belief domain. This domain reveals a holistic picture of the asthmatic child's living arrangement. The total environment of the subject must be taken into account to adequately assess HRQOL (Burke et al, 1997). The addition of the traditional health belief domain enhances further asthma intervention programs because the patient's total environment is taken into account. The PBS may be a better HRQOL questionnaire for use in the United States. The questionnaire includes questions pertinent to the financial status and living arrangements of the asthmatic child's parents.

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Introduction

Asthma is a chronic inflammatory disorder of the airways characterized by variable airflow obstruction and hyper-responsiveness with prominent clinical manifestations of wheezing and shortness of breath (Center for Disease Control [CDC], 1998). It is a multifactorial disease associated with familial, infectious, allergenic, socioeconomic, psychosocial and environmental factors (CDC, 1998).

Recent research revealed that African-American children with asthma have increased morbidity due to the disease (Divine et al., 1997). This is particularly problematic since several inner city areas (Bronx, Chicago, and Detroit) have been identified as having a higher proportion of African-American children with asthma than Caucasian children (Brown et al., 1995; CDC, 1997). Socioeconomic factors have been shown to contribute to problems in the management of asthma; specifically, lower educational levels coupled with less money for pulmonary specialists and up-to-date medications are a few of the obstacles faced by African-American parents in caring for their asthmatic children (Burke et al., 1997; Oliver, Pulliam & Rupp, 1995).

The increasing diversity of the U.S. population has drawn attention to the need for evaluative tools appropriate to the target population being studied. Both language and culture are important when creating an assessment instrument. Questionnaires used to evaluate asthma management programs for quality of life concerns provide information to assess outcomes of managed care (O'Brien, 1995). Clinical, physiologic, humanistic, and economic outcomes are all currently assessed using asthma-specific instruments

(Bott, Hyland, Kenyon & Singh, 1994). Health Related Quality of Life (HRQOL) is one of the outcomes that can be assessed by using questionnaires. This form of survey solicits information about a variety of subjective experiences associated with illness. Questionnaires for health-related issues of children have been used with Caucasian children. Several studies have been done in European countries (Juniper et al., 1996; Barbarian, 1990). Other instruments such as the "Breathing Problems Questionnaire" by Hyland, Singh and Bott (1994), "Sickness Impact Profile" (Bergner, Bobbit, Carter & Gibson, 1981) and the "Quality of Well-Being Surveys" (Kaplan, Atkins & Timms, 1984) have been developed to assess HRQOL in a general population. Researchers caution extreme care in the utilization and interpretation of these instruments with patients from minority ethnic or lower socioeconomic groups (Alderman, Coupey & Lauaby, 1995; Canales, Ganz & Toscarelli, 1997; Malgady, 1996). Researchers also mention that problems may occur with definitions of words in various cultures (Canales et al., 1997).

Research substantiates the growth rate of asthma among African-American families in this country (Brown et al., 1995). African-Americans as a group are the low-income minority in this country (Weiss, Westbook & Crain, 1994). It is also a well-documented fact that there is disparity in child health due to income (Brown et al, 1995; Melton et al., 1994; Divine et al., 1997). A HRQOL questionnaire designed for the parents of African-American children as subjects should be tested. However, to date none exist.

Research Questions

Research concerning existing HRQOL questionnaires implies that there is not a reliable and valid HRQOL questionnaire for African-American parents of children with asthma. This study focused on the following questions:

1. What is the reliability and validity of the researcher-designed "Pediatric Breathing Survey (PBS)"?
2. Is there a difference, from the parents' perspective, in HRQOL between African-American and Caucasian children with asthma from a parent's perspective?

Purpose

This study was designed to test whether the PBS is a reliable and valid instrument. In addition, a comparison of group differences on race, income and parents' educational level for parents' perception of HRQOL in asthmatic children was analyzed.

Problem

HRQOL is a major concern in evaluative research; improving HRQOL is the most desirable outcome of clinical health care (Kaplan et al., 1984). Quality of life questionnaires have predominantly been tested with Caucasian populations. Based on the theoretical framework of The Health Insurance Status Model (Eisen, Donald, Ware & Brook, 1980), a questionnaire was developed to reflect the African-American parents' perspective on HRQOL for their asthmatic children. An ultimate goal for this research was to enable African-Americans to understand and accept medical interventions to improve the health-related HRQOL for their asthmatic child.

Research requires effort to bring culture into the intervention process and to enhance the outcome and design of research. This research is one of the first steps in designing healthcare protocols with the ultimate goal of improving the HRQOL for African-American children with asthma.

Review of Literature

General Information on Asthma

National statistics indicate the prevalence of asthma is increasing. Approximately 4.3% of all children in the United States suffer from asthma according to the National Health Interview Survey (NHIS). In two United States national health surveys, the National Health and Nutrition Examination Survey (NHANES) and the NHIS, African-American children were reported to have as much as a 25% greater prevalence of asthma than Caucasian children (Brown et al., 1995). In 1993, asthma accounted for an estimated 198,000 hospitalizations and 342 deaths among persons less than 25 years of age (Gautrin, Aquino, Gagnon, Malo & Cartier, 1994). The Centers for Disease Control and Prevention analyzed data from the National Hospital Discharge Survey that revealed asthma-related mortality and hospitalization rates are increasing among persons under the age of 25 (CDC, 1998). Asthma morbidity and mortality are largely preventable with improved patient education regarding the factors associated with asthma and medical management (Cooper, 1994).

According to the American Lung Association of Virginia, Southeast Region, there are approximately 64,000 patients with asthma in the Tidewater area alone, of whom 40.2% are children. The American Lung Association reported as of April 1999 the number of children with asthma in Norfolk was 4,219; in Virginia Beach 9,128; in

Chesapeake 4,011; in Hampton 2,605; in Newport News 3,723 and in Portsmouth 2,056. (American Lung Association [ALA], 1999).

Pediatric Aspects

During the past three decades, the occurrence of asthma has continued to increase until it is now one of the most prevalent pediatric diseases in the U.S. Of the estimated 14 to 15 million persons afflicted with the disease, between 3 and 5 million of them are children under the age of eighteen (Myers, Chatburn & Kercsmar, 1998).

The Centers for Disease Control and Prevention (1998) recently released the Surveillance for Asthma Report in the United States, from 1960-1995. According to this report, the prevalence rate for asthma increased 75% from 1980 to 1994; from 1993 to 1994 an estimated 13.7 million persons reported asthma during the preceding twelve months. The increase in the reported number of asthma cases was for all races, both sexes, and all age groups ($p<0.05$ for all). The data in Table 1 shows that the most substantial increase was among children 0-4 years (from 22.2 per 1,000 to 57.8 per 1,000; $p=0.05$). Between 1993-1994, the self-reported prevalence rate for asthma was slightly higher among persons less than 14 years than among persons aged more than15 years. The increase in the prevalence of asthma from 1980-1994 was evident and significant ($p=0.05$) in every region of the United States. More recent data (1996-2000) is not currently available (Personal communication with Dr. Brown, CDC, 2000).

Research by Krahn (1994) illustrates the economic importance of asthma education management. HRQOL is extremely relevant since it impacts the human issues of living a happy and productive life. There is little information available concerning the HRQOL for parents of African-American children with asthma. This lack of previous

studies is especially troublesome since research findings indicate asthma has a lifetime prevalence of more than 12% reported for African-American children (Divine et al., 1997).

Table 1 Estimated Average Annual Rate* Of Self-Reported Asthma During The Preceding 12 Months, By Race, Sex, And Age Group. United States. National Health Review Survey. 1980-1994†

Category	1980	1981-1983	1984-1986	1987-1989	1990-1992	1993-1994
Race§						
White	30.4	33.9	37.7	41.1	44.7	50.8
Black	34.0	38.0	36.4	51.7	52.2	57.8
Other	22.5¶	31.7¶	28.2¶	32.7¶	39.7	48.6
Sex§						
Male	32.0	34.3	36.8	43.0	45.3	51.1
Female	29.2	34.7	38.4	42.3	47.5	56.2
Age Group (yrs)						
0-4	22.2	32.6	34.3	33.9	46.1	57.8
5-14	42.8	44.7	51.1	60.7	65.9	74.4
15-34	27.7	30.2	35.1	40.1	41.7	51.8
35-64	28.1	33.1	32.0	36.8	42.3	44.6
≥65	30.7	34.4	38.9	42.1	36.4	44.6
Total§	30.7	34.6	37.6	42.9	46.6	53.8

* Per 1,000 population.

† All relative standard errors are <30% (i.e., relative confidence interval <59%) unless otherwise indicated.

§ Age-related to the 1970 U.S. population.

¶ Relative standard error of the estimate is 30%-50%; the estimate is unreliable.

Source: (CDC, 1998)

A recent estimate of the annual health care expenditures for asthma and asthma related-care was $6.4 billion with 43% of acute care dollars spent on emergency room visits, hospitalizations, and costs associated with death from asthma (Myers et al., 1998). Inpatient hospital services represented the largest single direct medical expenditure for this chronic condition.

Pediatric asthma accounts for billions of dollars when indirect costs from limitations on daily activities, school absenteeism, and parental workdays missed are added to the direct costs (Busse, 1993; Dzungel, Kosten & Szalai, 1995). Health care professionals, employers, managed care organizations, insurance companies and government agencies are interested in cost effective measures to manage asthma.

Since the review of literature supports that socioeconomic conditions are related to the disease of asthma (Melton et al., 1994; Divine et al., 1997), several social studies on asthma were reviewed. Pagano, Lloyd, Little, Murphy and Jellinick (1995) reviewed the psychosocial adjustment status of children with asthma. This study compared children with diabetes, cancer and healthy children and the role of functional status in psychosocial adjustment. The total sample included 100 children aged 8-16 years (mean = 11.5 years), consisting of forty-eight boys and fifty-two girls. Children with asthma scored significantly higher on measures of affective adjustment (depression and internalizing behavior), significantly lower on self-esteem, and evidenced significantly greater functional impairment. Children with cancer missed significantly more school days. After controlling for functional status, no significant differences remained in affective adjustment but school absences remained significantly higher for children with cancer.

Another study by Butz et al. (1995) described the proportion of children with behavior problems and examined which independent variables were associated with the presence of behavior problems in a group of 392 inner city children with asthma. Data on children's' asthma symptoms, medication use, health-care utilization, and school absences were obtained from parents during a structured telephone interview. The

interview included questions on behavior problems and social support. Children with a high level of asthmatic symptoms were more than twice as likely to experience a behavior problem than children classified with a low level of asthmatic symptoms ($p=0.002$). Significant variables were low level of social support and high or moderate level of asthma symptoms. A group of children at risk for behavioral problems were identified in families that lack adequate social and financial resources.

Theoretical Framework

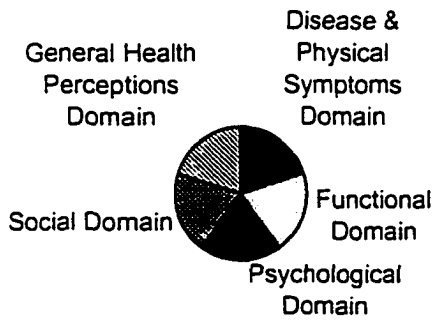
Several researchers have concluded that no universally accepted definition of HRQOL exists (Boggs, Goodwin & Pole 1994; French & Snowden, 1994; Mahler & Mackowiak, 1995; Spieth & Harris, 1996). Spieth and Harris have identified one useful definition of HRQOL as "the subjective and objective impact of dysfunction associated with an illness or injury, medical treatment, and health care policy" (p.176). In addition, Spieth and Harris (1996) define HRQOL as "the health status related to how a patient feels or how he or she functions in daily activities" (p.176).

In 1947 the World Health Organization (WHO) established three core dimensions to the concept of health. These dimensions were (1) disease and physical dimension. (2) psychological (mental functioning) and (3) social functioning. The physical domain includes the physiologic status of the physical symptomatology of the patient. Examples include the patient's degree of shortness of breath, pulse oximetry readings, wheezing and arterial blood gas measures. The psychological domain includes the mental status of the patient and includes questions on how the asthmatic child felt when presented with complications of asthma, such as decrease in activity, shortness of breath and feeling angry or mad because of their asthma. The social dimension includes questions related to

the asthmatic's ability to interact with others. Other questions such as feeling alone and not being able to keep up with others due to their problems with asthma are presented in this domain. The WHO definition became the cornerstone of a flexible HRQOL construct (Spieth & Harris, 1996).

The first widely used HRQOL measure was the Karnofsky scale of performance status (Karnofsky & Bucherd, 1949). This scale was limited by equating physical functioning with health status, creating a unidimensional definition of HRQOL.

Health Insurance Status (HIS) Model



In 1980, the Rand Corporation described HRQOL as a multi-level hierarchy consisting of five health care domains: disease state, physical functioning, mental health, social adjustment and overall health. For each health status dimension included in HIS, a battery of items was used. The result was a theoretical model with a five-level hierarchy of functioning. Their study was used to assess HRQOL in children to ascertain what types of health insurance were required by children (Eisen et al., 1980).

However, the Pediatric Breathing Survey used only three of the HIS domains: the physical or disease domain, the mental domain and the social domain. The functional

domain was not used since questions pertaining to the functional status were incorporated into the physical domain and combined with the disease state.

HIS Description of Constructs for Measurement

Physical Health and Disease State. According to HIS, physical health has been operationally defined in terms of physical symptomatology. Physical status refers to performance or capacity to perform a variety of activities that are normal for an individual in good health. In terms of physical status, measures of physical health identified five categories of activities for which performance or capacity (ability or inability to function) have been assumed to primarily reflect a child's physical, as distinct from mental or social. health. The measures quantify activities typical for an individual of a specific age and societal level, such as school and leisure activities like hobbies and sports. The correlation between physical symptoms and health is well established.

Mental Health. A review of the literature on mental health identified four constructs that met criteria for mental health. Ware, Johnston, Davies-Avery (1983) identified states such as affective/mood and feeling states, rather than a combination of psychological and somatic states (i.e., physical manifestations of anxiety, depression, positive well-being, or self control); both favorable and unfavorable aspects of these states were studied. However, children's mental health measurement primarily identified problems relating to behavior and conduct, such as hyperactivity, aggression, and anti-social behavior rather than anxiety and depression constructs (Eisen et al., 1980). Operational definitions of children's mental health problems focused on more intangible, overt behavior and actions (e.g., fighting, stealing) than on psychological status (e.g., depression); almost no measures of favorable aspects of a child's behavior and

psychological state (e.g., happiness, enjoyment) were measured. If asthmatic children participated in sports and were able to attend school, these measures were counted as doing well mentally in this study.

Social Health. Social status is a dimension of health status and is defined in terms of the social support systems that modify the effect of the environment and stressful life events on physical and mental health (i.e., as an intervening variable). Literature on conceptualization of social health for adults indicates less consensus on specific activity categories that reflected primarily an individual's social health than did the literature on physical health. However, there was consensus that social health could be operationally defined in terms of interpersonal interactions (e.g. visits with friends) and activities indicative of social participation (e.g. membership in clubs). There was no general consensus with respect to social health for children. Therefore, in the absence of agreed upon definitions, social health for children has been operationalized to mean the "quality of interpersonal interactions with significant persons in the child's environment" (Rand & Wise, 1984; Spieth & Harris, 1996). "Has the child been able to play with others" and "Has the child been able to attend school activities?" are examples of measures used in this study to identify the child's social health.

General Health Perceptions

General health perceptions differ from other measures of health because general perceptions do not focus on specific dimensions of health status (i.e. physical, mental). General health perceptions are measures that require parents or proxies for an assessment to rate their child's health in general. In theory, this difference in measurement makes it possible to assess both the objective information parents have concerning their children's

health and their evaluation of that information. The PBS did not utilize this domain. Pertinent health information was obtained in the physical and disease domain.

PBS Description of Care to Measure Physical and Disease Domain

Eisen's physical and disease domain in the HIS model provided the structure for the physical and disease domain in the PBS. Questions concerning the asthmatic child's physical symptomatology were reviewed in the HIS model and incorporated in the PBS. Questions relevant to the physical and disease domain in the PBS were the asthmatic's degree of shortness of breath, pulse oximetry readings, whether or not wheezing was present and the arterial blood gas measure. Nine questions in the PBS were related to the physical and disease domain (Eisen et al., 1980).

Mental Domain

The psychological health domain of the HIS focused on children's behavior and conduct. The PBS utilized the HIS focus on behavior to identify the mental health status of the asthmatic child. The psychological or mental domain of the PBS asked questions concerning feelings of anger or being mad as a result of having asthma. Six questions were used to create the psychological domain for the PBS.

Social Domain

The social domain of the HIS reviewed questions pertinent to the child's ability to interact with others their age. The HIS model further operationalized social health as "the quality of interpersonal interactions with significant others in the child's environment" (Eisen et al., 1980, p.78). The PBS structured questions concerning the asthmatic's social domain from the HIS operational explanation of social health in children. Questions asked were "How often have you felt alone because of your asthma?" and "Think about

all the activities that you did in the past week. How often did asthma interfere with your activities?" There were six questions relating to the social domain in the PBS.

Spieth and Harris' Review of Models for Pediatric HRQOL

Two primary HRQOL conceptual models emerged after the introduction of Karnofsky's scale and continued to be consistently administered in Spieth and Harris' research: The Health Status Measurement Model (HSMM) (Eisen et al., 1980) and the Utility Model (Spieth & Harris, 1996). Additionally, Spieth and Harris' Pediatric Asthma HRQOL and review of pediatric HRQOL instruments were used to design the PBS. Spieth and Harris encouraged the development of additional domains pertinent to a child's HRQOL.

Spieth and Harris (1996) reviewed and integrated the medical and current psychological literature on the assessment of health related quality of life in pediatric populations. Their review included definitions of QOL, the utility, health status, battery and modular approaches to HRQOL in asthmatic children. Additionally, their review included measures currently available for use with children with an evaluation of the psychometric properties. HRQOL measures are presented on Table 2.

Table 2 QOL Measures Available for Use with Children and Adolescents*

Measure	Domains	Respondent	Targeted age group	No. of items	Psychometric properties	Specificity
Generic Measures Play Performance Scale for Children (Lansky et al., 1985)	Functional status	Parent or physician	1-16	1	Interrater reliability Concurrent validity	Cancer
Utility Measures Quality of Well-Being Scale (Kaplan, Bush & Berry, 1978)	Physical symptoms Mobility Physical activity Functional status	Parent	All ages	Varies (23-38)	Test-retest reliability Construct validity	
Health Profiles Health Status Measure for Children (Eisen et al., 1979)	Physical health Mental health Social health General health Somatic symptoms Behavior problems	Parent	0-4, 5-13	38, 59	Internal consistency Content validity Construct validity	
Child Health and Illness Profile (Starfield et al., 1993)	Activity Comfort Satisfaction Disorders Achievement Resilience	Adolescent	11-17	275	Internal consistency Content validity Construct validity	
Disease-Specific Measures Pediatric Oncology Quality of Life Scale (Goodwin et al., 1994)	Physical status Emotional status Treatment-related adj.	Parent	4-18	21	Interrater reliability Internal consistency Concurrent validity Discriminant validity	Cancer
Diabetes Quality of Life for Youths (Ingersoll & Marrero, 1990)	Disease impact Disease worries Life satisfaction	Adolescent	11-18	53	Internal constancy	Diabetes

*All measures are administered in a questionnaire format with the exception of the QWB, which is a structured interview.

Spieth and Harris (1996) identified additional domains since a number of different areas of functioning were relevant for children and adolescents. For example, a domain such as "satisfaction with appearance" (Boggs, Goodwin & Pole, 1994) might be appropriate for pediatric oncology patients suffering from alopecia. Other possible domains for children identified were academic achievement, neuropsychological functioning, and overall satisfaction with life (Gustafsson & Kjellman, 1994). Additional research needs to be done to determine the validity of inclusion of such domains in HRQOL assessment (Bijur et al., 1994; Horowitz et al., 1995). Therefore, these domains were not included in the PBS.

Eisen's (HIS) questionnaire focused on the physician making a diagnosis of asthma and expounded on the seasonality of the asthma attacks. Other questions included what medicines the child was currently taking, pain and mental disabilities were also noted (Eisen et al., 1980). Although the HIS established a precedent in assessing HRQOL, it is no longer used since questionnaires that reflect newer medical technologies for asthma treatment are continually being developed (Spieth & Harris, 1996). A major criticism of the model from a population perspective was that health status measurement was gauged as the present functional status and was not sufficient to assess the outcomes of preventive health measures (Spieth & Harris, 1996).

Landrine and Klonoff (1994) in their study of acculturation stated, "Psychology has made an erroneous assumption that African-American culture was lost due to slavery" (p. 7). Culture was discussed in their study as "reflections of familiarity with and immersion in a group beliefs and attitudes" (p. 28). The concept of acculturation is useful because it provides psychologists with a way to conceptualize and explain ethnic

differences without resorting to racist, deficit models. "The conceptualization of ethnic differences in terms of acculturation develops the potential to decrease racist understandings of difference and encourage cultural diversity and cultural pluralism" (Landrine & Klonoff, 1994, p. 45). Therefore, for this study a traditional health belief domain was constructed consisting of questions obtained from a focus group, other questionnaires and questions pertinent to the African-American household living arrangement. Traditional health beliefs were designed to reflect certain practices and beliefs from the African-American culture regardless of education or social class (Landrine & Klonoff, 1994). Questions such as prayer can cure disease; if doctors cannot cure you, you should try going to your minister, were included in this domain (Landrine & Klonoff, 1994). Additionally, a question regarding financial status of the patient was included since research revealed that socioeconomic status is associated with asthma (Brown et al., 1995; Divine et al., 1997; Lozano, Fishman, Vonkorff & Hecht, 1997).

It was envisioned that the Pediatric Breathing Survey would consist of four domains: the physical, mental, psychological and traditional health beliefs. The Traditional Health Beliefs domain was added to the PBS in an attempt to develop a more culturally sensitive African-American HRQOL questionnaire. Research substantiates the increased prevalence of asthma in African-American children (Brown, Melton, Divine & Snowden, 1996). Yet, no HRQOL instrument for African-American parents to assess the HRQOL of their children with asthma exists.

Aspects of HRQOL Questionnaires

HRQOL for the purpose of this paper is defined as "the health status related to how a patient feels and how he or she functions in daily activities." Spieth and Harris

(1996) further defined HRQOL as the subjective and objective impact of dysfunction associated with an illness or injury. Spieth and Harris' (1996) review of HRQOL instruments separates what HRQOL is from what contributes to HRQOL. Their distinction assisted researchers and the medical professionals to use HRQOL as an outcome measure for evaluating medical interventions.

Juniper recognized the need for a disease-specific questionnaire that indicated differences in HRQOL scores for children (Juniper et al., 1996). The Pediatric Asthma Quality of Life Questionnaire developed by Juniper consists of 22 items in a seven-point likert format. The questionnaire focused on the parent's perception of how the child felt about how asthma interfered or complicated their daily lives.

The design of Dr. Juniper's study was for nine weeks, with assessments at 1, 5 and 9 weeks. The study consisted of 52 asthmatic children, 7-17 years of age, with different levels of asthma severity. An interviewer administered the HRQOL questionnaire, the Feeling Thermometer, and a clinical asthma control questionnaire as well as measured their lung function with a spirometer. For one week before each clinic visit, patients recorded in a diary their morning peak flow rates, medication use and symptoms. The Pediatric Asthma HRQOL Questionnaire measured HRQOL changes in those patients who had a change in health status either as a result of treatment or from the progression or changes in the status of their asthma ($p<0.001$). The questionnaire differentiated between patients whose status changed and those whose status remained stable ($p=0.0001$). The questionnaire was reproducible in patients who were stable (CI=0.95), which indicates the instrument's strength to discriminate between impairment levels. The questionnaire revealed good levels of both longitudinal and cross sectional correlations

with the conventional asthma indices and with general HRQOL. The results were consistent across individual domains and different age strata. The Pediatric Asthma HRQOL Questionnaire demonstrated stable measurement and validity both as an evaluative and a discriminative instrument for this sample. Juniper's study suggested that the asthma HRQOL questionnaire might also be useful for gauging outcome measures used in clinical trials conducted in the United States (Juniper et al., 1996).

Juniper, Guyatt, Ferrie and Griffith (1993) evaluated the measurement properties of an Asthma Quality of Life Questionnaire for adults. The study design was an eight-week, unblended, single cohort study, assessing patients at zero, four and eight weeks. The sample consisted of 39 adults with symptomatic asthma and a wide range of airway responsiveness. Subjects were on medication and enrolled from a previous study or through local media. Patients presenting with breathing problems were offered an inhaled steroid (Budesonide). At each visit, spirometry, volume, the Asthma Quality of Life Questionnaire, a clinical asthma questionnaire, medication requirements, methacholine tests, the Sickness Impact Profile and the Rand questionnaire were measured. The results indicated the Asthma Quality of Life Questionnaire was able to detect changes in patients that responded to treatment or who had fluctuations in their asthma ($p<0.001$) and to differentiate between patients whose condition remained stable. The questionnaire was reproducible in stable patients (interclass correlation coefficient =0.92). There were significant longitudinal and cross-sectional correlations between asthma quality of life and other measures of both clinical asthma and generic quality of life. Therefore, the Asthma Quality of Life Questionnaire had good measurement properties and was valid both as an evaluative and a discriminative instrument (Juniper et al., 1993).

Another study on the income level and asthma prevalence and care patterns by Erzen et al. (1997) revealed asthma was more severe for clients in low-income categories. Patients with a high-income had more consultation referrals than did low-income categories. This study was done in Manitoba, Canada, where there is a universally accessible health care system. This system recorded physicians' contacts and hospitalizations in such a way that they were ascribed to individuals. The prevalence of physician-diagnosed asthma, bronchitis, and airway obstruction (total respiratory morbidity [TRM]) was examined between 1988 and 1992. The place or zip code of residence was used to divide people into categories according to average family income. Physician office visits, hospitalizations, and consultation referrals were reviewed. There were three age groups studied: 0 to 14 years, 15 to 34 years, and greater than 35 years.

The prevalence of TRM was greater in low than in high-income categories. Asthma prevalence was unrelated to income in the two younger age groups; in the older group, asthma was more common in the low-income groups, but less strongly related to income than was TRM. Asthma prevalence increased over the years studied, but the increase was not related to income level. There was some evidence of income-related diagnostic bias in that low-income subjects were more likely to be labeled with a related diagnosis in addition to asthma than were high-income patients. Low-income patients had more physician contact than did high-income patients. In terms of physician office visits, care continuity did not differ among income levels. Low-income subjects had more hospitalizations than did high-income categories, and differences were larger than could be accounted for by diagnostic bias; asthma was probably more severe in low-

income categories. High-income subjects had more consultation referrals than did those with low income.

The study revealed that patients with a high school education or less had more severe asthma and a lower HRQOL across all subscales. The psychometric characteristics of the questionnaire are identified in Table 3 (Erzen et al., 1997).

The influence of socioeconomic status (SES) on asthma has been extensively studied, particularly in children (Brown, et al., 1995; Melton, et al., 1994; Divine et al., 1997). Both methods and results have differed considerably, but more recent studies tend to show that asthma prevalence is greater in individuals of relatively low

Table 3 Psychometric Characteristics of the Asthma Quality of Life Questionnaire in a U.S. Sample

Scale	Reliability		Validity		
	Cronbach's	Intraclass	FEV-1%[b]	ADSS[bc]	HUI[bc]
Activities	.93	.81[a]	.08	-.43	.60
Symptoms	.93	.93	.21	-.64	.51
Emotions	.87	.87	.11	-.52	.40
Environment	.80	.86	.12	-.51	.48
Overall HRQOL	.97	.91	.14	-.59	.55

[a] Activity scores were higher at time 2 (MD=-.32, $p<.05$). [b] Pearson Correlation [c] ADSS: Asthma Disease Severity Scale; HUI: Health Utilities Index; $p<.001$

Source: N.K. Leidy, C. Coughlin. MEDTAP International, Bethesda, MD, USA, (Erzen et al., 1997)

SES. This has been particularly true in the United States; asthma in the core area of large cities has recently emerged as a major health problem. Lack of access to care has been a possible cause of the increased asthma rate. Patterns of asthma care differed

commensurate with SES. Poor children with asthma obtained disproportionately less care than high-income level children. No HRQOL questionnaire currently exists that targets the majority of our inner-city population. The majority population of our inner cities is African-American (Kwittken & Palusci, 1995).

The Short-Form-36 Quality of Life Questionnaire

One of the instruments available to measure quality of life is the Short Form (SF)-36 HRQOL instrument. This instrument has been used extensively as a general HRQOL instrument primarily used with adults. The SF-36 questionnaire has been used extensively to study the quality of life in patients with emphysema, asthma and other chronic respiratory diseases (Jones & Bosh, 1997). The questionnaire assesses eight dimensions of health: physical functioning, pain, general health perceptions, social functioning, mental health, limitations due to emotional problems, limitations in usual role activities due to physical problems and a change in health status. The eight dimensions of the SF-36 are scored separately with the higher scores indicating a better health related quality of life than the lower scores. The questionnaire has been proven to be reliable with a Cronbach's alpha of .85 and .75. The questionnaire also has construct validity in terms of distinguishing between groups with expected health differences. The SF-35 HRQOL questionnaire was not used because it was designed for the adult population.

Trends of Asthma in Urban Areas

Studies support that non-Caucasians and populations of low-income communities using government health care insurance are the highest risk group of asthmatics (Melton et al., 1994). In Chicago, the trends in asthma mortality among non-Caucasians and Caucasians were studied from 1989 through 1991. The results revealed an increase in mortality in non-Caucasians that peaked at 3.63 deaths per 100,000 compared with 1.33 deaths per 100,000 in the Caucasian community (Addington, Orris, Persky & Targonski, 1994). Lang and Polansky (1994) reported that the rate of mortality from asthma has steadily increased since 1978 in Philadelphia, Pennsylvania. The researchers concluded that concentrations of major air pollutants declined, yet rates were the highest in census tracts with the highest percentages of poor people and minority residents, particularly African-Americans (Mahr, Rooney & Pearce, 1995).

Recent literature on an estimate of wheezing by inner city children in Bronx County, New York, found that the prevalence of asthma among inner city children might be substantially higher than the rates for this group estimated by a national survey (Bijur et al., 1994). The objective of the study was to estimate the prevalence of asthma and wheezing unassociated with a diagnosis of asthma among 1,285 inner city children.

Among children 0 through 11 years of age, the prevalence rate was similar for boys and girls. Among children 12 to 17 years of age, asthma was significantly more prevalent among boys. The prevalence rate of asthma differed significantly by income and race/ethnicity. The prevalence of asthma was significantly higher among children from the lower income families and for non-Caucasians. The study concluded that asthma was more prevalent in inner cities and that a large number of children with

asthma may be inadequately diagnosed and treated (Bijur et al., 1994; Sorkness, McGill & Lemanske, 1995).

Summary of Research Relating to African-Americans

There is an obvious research gap existing with respect to asthma prevention and treatment within the African-American community. Modern medications and technologies for asthma have not stopped the symptoms associated with asthma, as the increase in the mortality rate of asthma in the African-American community demonstrates (Brown et al., 1995; Weiss et al., 1994).

Office visits for asthma from 1975 to 1993-1995 more than doubled from 4.6 million to 10.4 million. Increasing rates were evident among all race strata, both sexes, and all age groups (CDC, 1998). African-Americans had higher office visits than Caucasians (CDC, 1998). Furthermore, the non-availability of well-trained physicians to treat asthma, regardless of the health insurance status of the patient, exacerbates the health care problem (Feil, Welsh & Fisher, 1993).

Between 1979-1980 and 1993-1994 hospitalization rates for asthma increased from 386,000 to 466,000, respectively. During this period, the hospitalization rates for asthma were consistently higher among African-Americans than they were among Caucasians ($p<.05$) (Centers for Disease Control, 1998).

According to age and groups of years, asthma hospitalization rates were highest among persons aged 0-4 years, lowest among persons 15-34 years, and intermediate among persons aged >35 years. The mortality rates of asthma as an underlying cause of death decreased from 1960-1962 through 1975-1977, and gradually increased again in all

race, sex, and age strata. African-Americans had consistently higher death rates than Caucasians (CDC, 1998).

Hospitalization rates for African-Americans with asthma have continued to increase since the early 1970s (French & Snowden, 1994). The increased rates have been noted to be in populations of children residing in zip codes with lower median household incomes and in the metropolitan areas (Ireys, Anderson, Shaffer & Neff, 1997). Recent studies have shown that lack of continuing primary care for asthma is associated with increased levels of morbidity in low-income minority children. Although effective preventive therapy is available, many African-American and Latino children receive episodic treatment for asthma that does not follow current guidelines for care (Melton et al., 1994). Both the growth rate of African-American families in this country and the dramatic increase in asthma for African-Americans is well documented (Brown et al., 1995). The majority of African-Americans in the low-income bracket receive inadequate health care (Burke et al., 1997). A great disparity in care exists in a child's health relative to the level of the child's family income (Divine et al., 1997).

Table 4	Estimated annual rate* of emergency room visits for asthma as the first-listed diagnosis, by race, sex, and age group			
Category	1992	1993	1994	1995
Race§				
White	46.8	50.3	46.1	48.8
Black	151.9	197.4	191.2	228.9
Other	¶28.6	¶23.7	¶21.9	¶33.1
Sex§				
Male	55.5	62.6	53.4	57.8
Female	61.4	69.7	65.9	82.3
Age group (yrs)				
0-4	143.5	164.3	145.5	120.7
5-14	77.1	82.8	80.3	81.3
15-34	52.9	59.0	62.8	69.2
35-64	39.6	50.7	41.8	64.4
65	27.7	22.6	23.5	29.5
Total§	58.8	66.6	62.9	70.7

*Per 10,000 population.
‡All relative standard errors are <30% (i.e., relative confidence interval <59%) unless otherwise indicated.
§Age-adjusted to the 1970 U.S. population.
¶Relative standard error of the estimate is 30%-50%; the estimate is unreliable
Source: United States, National Hospital Ambulatory Medical Care Survey, 1992-1995‡ (CDC, 1998).

Emergency room visits from 1992-1995 did not change significantly. In 1995 there was an estimated 1.8 million emergency room visits for asthma. The estimated annual emergency room visits for asthma by race, gender and age are presented in Table 4. African-Americans had consistently higher rates for emergency room visits than Caucasians ($p<0.05$).

HRQOL Aspects of Asthma

The impact of asthma on the United States has far-reaching consequences; only one of which is a significant decrease in HRQOL (CDC, 1996). Nationally, asthma

accounts for the loss of over 10 million school days per year in children 5 to 17 years of age (Mahr et al., 1995). The costs of asthma are reflected in the following statistics (Smith et al., 1997):

- $5.8 billion in indirect costs, i.e., lost school days, restricted activity costs
- $5.1 billion in direct costs, i.e. medications, office visits, emergency room care

Currently, HRQOL surveys have only been used with a very select portion of the entire target population, primarily Caucasian parents of children with asthma (Horwitz et al., 1995). There is no accepted standard questionnaire in use for parents of African-American children (Spieth & Harris, 1996; Scrinmgrove & Usherwood, 1990), although some HRQOL questionnaires have been adapted for other ethnic groups.

In developing a translation of the Cancer Rehabilitation Evaluation Systems (CARES) for Spanish speaking and bilingual patients with cancer, researchers encountered a number of methodological problems including the need for idiomatic translations, lack of familiarity with questionnaires, low acculturation, and low literacy rates among Hispanic cancer patients (Canales et al., 1997). Successful evaluation requires outcomes to be based on culturally sensitive reliable and valid instruments. The literature supports the validation and reliability of the Spanish version of The Asthma Quality of Life Questionnaire (AQOLQ) for adults developed at the University of Barcelona, Spain. Forward and back translation methods and pilot testing were used to obtain the Spanish version of the AQOLQ. The survey contained 32 items that covered the four health domains: activity limitation, symptoms, emotional function and environment stimuli. To test the validity and reliability of this version, 116 asthmatic

patients (80 female) with a mean age of forty-two years old were recruited from three different settings. The survey consisted of hospital outpatients (n=53), primary healthcare (n=38), and patients admitted to the hospital because of an asthma attack (n=25). Cronbach's alpha reliability coefficient was 0.96 for the overall AQOLQ, 0.95 for the symptoms, 0.83 for emotions and 0.78 for environment scores. AQOLQ overall and subscale scores had a high correlation with dyspnea (r=-0.66 for the overall scale: $p<0.001$).

The Italian version of St. George's Respiratory Questionnaire (SRQ) was also assessed for reliability and validity. The HRQOL questionnaire was developed for chronic airflow limitation. The Italian version was translated and back translated into Italian by two independent bilinguals and thereafter administered to seventy-five patients. Patients' characteristics were: mean (sd); age 66(7) years; FEV 1-35 (15%) predicted. The scores of the SRQ-Italian version had a similar pattern of correlations with other measures of disease activity. The Italian version of the questionnaire was found to have similar reliability and validity as the original questionnaire (Carone, Bertolotti, Jones & Zotti, 1997). Therefore, it was concluded that linguistically different HRQOL questionnaires have been found to be valid, reliable and comparable to Juniper's HRQOL instrument.

Other researchers have identified the need to be sensitive to the language of poor and minority cultures when examining HRQOL (Malgady, 1996). It is critical that respondents understand the language and use/or application of the questionnaire. How a questionnaire is worded and presented is important in order to account for and control for the possible presence of cultural bias that has been documented in some health studies

(Malgady, 1996). Malgady (1996) further states that professional assessment techniques need to vary in accordance with specific ethnic group identity, cultural predispositions and language of the patient.

Numerous intervention programs designed to alleviate fears and asthma attacks by educating the parent and child on self-management techniques to control asthma currently exist (Mahler & Mackowiak, 1995). As technology has advanced, diseases like asthma can now be self-managed; however, HRQOL is typically one of the last entities considered when treating an illness. In the past ten years there has been an increasing body of literature on HRQOL questionnaires for children with asthma. More effort should exist to develop objective measures for asthma intervention programs regardless of cultural differences. Testing of the reliability and validity of existing HRQOL measures has been perfunctory and greater attention, especially to validity of measures, is needed (Horowitz et al., 1995).

Despite new technological developments, understanding of pathogenic mechanisms, clinical assessment, and medical treatment of asthma, an increase of mortality and morbidity has been observed (Frankish & Green, 1994). Several studies indicate the discrepancies could be due to serious deficits among some asthmatic patients in their ability to judge the severity of their asthma, their lack of knowledge of medication and corrective actions to be taken when symptoms occur (Eisen et al., 1980). The focus of patient education should include ecological approaches that consider social, economic, and environmental factors in the treatment of asthma (Silverman, 1994).

By examining HRQOL assessments, researchers can identify acute dysfunction secondary to illness or treatment, residual dysfunction of long-term survivors and patient

sub-populations at risk for psychological or behavioral problems. Culturally sensitive HRQOL questionnaires can also improve clinical decision making, evaluation of medical care, estimation of the health care needs of a population, and consequences of differences in health (Divine et al., 1997).

Summary of Review of Literature

The cultural literacy gap in America has perpetuated misunderstanding of and non-acceptance of medical interventions that could improve the HRQOL of asthmatic children in high-risk populations. The literature is prolific on poverty and racial issues related to asthma; non-Caucasians have a history of receiving inequitable health care in the United States (Melton et al., 1996). HRQOL questionnaires have previously focused mainly on the Caucasian middle-class population in the U.S., although several studies have also been done in European countries. Valid data from a modified HRQOL questionnaire will facilitate clinical practices for non-Caucasian children with asthma, thus enhancing the medical community's awareness of cultural differences that have impeded intervention programs to date.

The research literature indicates that future research should explore ways to use and adapt instruments for specific populations, such as inner-city children (Brown et al., 1995). Attention to human diversity is clearly increasing as evidenced by the American Psychological Association's revised Standards for Educational and Psychological Testing the standards caution against using norms, item content, validity and prediction estimates with demographically, linguistically, and culturally-different populations (Malgady, 1996).

Hypothesis

1. The Pediatric Breathing Survey is a reliable and valid instrument for children with asthma as determined by parent responses to HRQOL questionnaires.
2. There will be a significant statistical difference in HRQOL between African-American and Caucasian children based on responses by parents to both HRQOL instruments.
3. a. HRQOL, as indicated by responses to both questionnaires, will increase with an increase in the educational level of the parent(s).
   b. HRQOL, as indicated by responses to both questionnaires, will increase with an increase in the income level of the parent(s).

HRQOL is an increasingly important outcome measure in health care (Kaplan, 1993). However, virtually no surveys have been developed to research the African-American perspective on HRQOL. Evidence supports the premise that differences in culture warrant different measures for low-income African-American families than the HRQOL measures used for the Caucasian middle-class population (Bieloryl, 1996; Lozano et al., 1997).

Research has concluded that it is a fundamental presumption that there is a question of cultural bias throughout the medical community in the assessment and diagnosis of ethnic minority patients (Malgady, 1996; Bielary, 1996). While psychometric criteria and clinical impressions have revealed that cultural diversity impacts mental health care services in the area of mental health (Malgady, 1996) a scarcity of research hinders understanding of the data. The importance of applying

professional assessment techniques to specific ethnic groups continues to gain recognition since the addition of the DSM-IV (e.g., "ethnic and cultural considerations," p, xxiv; glossary of culture bound syndromes) (Malgady, 1996).

Pediatric illnesses previously considered terminal are currently being treated as chronic conditions (Haloven et al., 1994). Although medical intervention often results in the improved health status of pediatric patients, there is evidence to suggest that frequent hospitalizations, intrusive medical procedures, and uncertainty of survival negatively impact childhood development and adjustment (Barbarin, 1990). Research findings conclude that HRQOL has become increasingly important as both mortality rates and survival rates have increased (Hananiaj, Kesten & Roder 1995).

Chapter II

Methodology

Procedure

Following human subjects approval by the Old Dominion University and the Norfolk Public Schools Research Department, thirty-one principals were informed of the study by telephone, with 54% responding and 45% participating. Four principals (13%) could not work out a time for the visit due to "academic requirements by the children." Prior to an on-site visit to the school, the researcher contacted each of the participating principals. When requested, the researcher faxed approval forms to the principals prior to the on-site visit. The principals advised the researcher to contact the school nurse. Two school nurses reported there were no asthmatics at their school. Nurses at participating schools were helpful and knowledgeable of the asthma management process. A total of fourteen elementary schools participated in the survey. One school was solicited two weeks later in order to allow the researcher to distribute 200 surveys.

Each school nurse was requested to supply the following information: child's name, classroom and current medications. The list was used to ensure that all asthmatic children were contacted. Parents and school nurses were advised that the lists would be kept confidential by the researcher, as explained in the consent form. A packet containing a cover letter, consent form, Dr. Juniper's HRQOLQ, the PBS and a self-addressed stamped envelope was distributed to all of the students on the list. The nurses were very helpful in giving directions to each classroom and explaining which rooms to visit first. Since several classrooms were outside of the main school building in temporary classroom structures, this information was extremely beneficial.

The researcher first informed the teacher of the reason for her visit. Several of the teachers had read the memorandum passed out by the principal explaining the visit. Upon entering the classroom the researcher explained the purpose of the study to the class. Asthmatic students were asked to gather in a different section of the classroom and the purpose of the study was reiterated. Asthmatic students were questioned regarding their diagnosis and their medication usage. Questions as to whether or not they were currently on medications were asked. Some of the asthmatic children said they had been on asthma medications previously but had been taken off the medications by their physician. These children were included in the study.

Asthmatic children were asked to give the envelope to their parents and have them fill out both questionnaires and return them to the researcher by mail, the school nurse or the classroom teacher. Additionally, the researcher explained to the children if their parents had any questions concerning the survey they could call the researcher. The cover letter also explained this process. Several parents called the researcher to question the anonymity of the study and to ask other questions concerning the questionnaires.

The researcher returned to each school to gather the questionnaires. Thirty percent of the questionnaires were returned in the mail since a stamped addressed envelope had been enclosed. The school nurse collected seventy percent of the questionnaires either personally or the classroom teacher gave them to the school nurse. The researcher returned four times to each school to collect all of the completed questionnaires.

Parents participating in the study were required to sign a consent form (Appendix A). The consent form informed the parents of the confidentiality of the study, that there was no risk by participating in the study, and regardless of their participation in the study,

their child would still receive treatment at their health care facility. Additionally, a letter explaining the importance of the study was included (Appendix E).

Instrumentation

Two instruments were used in this study. Juniper's Pediatric Asthma Quality of Life instrument (Appendix B) is viewed as a reliable and valid instrument for the measurement of HRQOL. The researcher-designed Pediatric Breathing Survey (Appendix C) was the other instrument utilized for this study. Therefore, this study utilized Dr. Juniper's questionnaire as an external measure to gather data from parents of asthmatic children.

Juniper's Pediatric Asthma Quality of Life Questionnaire. Juniper's Pediatric Asthma Quality of Life Questionnaire is a disease-specific quality of life questionnaire that has been developed to measure the physical, emotional and social impairments experienced by children (7-17 years) with asthma. It has been rigorously tested in all age groups (7-9, 10-13, 14-17 years) to ensure that it is reproducible (repetition in stable subjects produces more or less the same results), valid (it is really measuring quality of life in asthma), and responsive to change (able to detect important changes in quality of life, even if those changes are small) (Juniper et al., 1996). Juniper's instrument consisted of 22 items in a seven-point likert format. The lower score on Juniper's questionnaire meant a decrease in HRQOL. The two items concerning activities were deleted from data analysis. The activities items were deleted because the questions in the physical domain covered the questions pertaining to activities.

The Pediatric Breathing Survey (PBS) was developed by this researcher with input from focus groups and personal experiences in a clinical setting with asthmatic

children. The PBS was structured using three of the domains of HRQOL (physical, social, psychological) from Eisen et al.'s theoretical framework and the addition of the traditional health belief domain, as Speith and Harris suggested. Weiss et al. (1995) stated that the wording of questionnaires should be simple, free of ambiguity, and encourage accurate and honest responses. Additionally, the researchers suggest that common words be used to convey the idea and that technical terms and jargon be avoided. Researchers (Boggs et al., 1996) have also suggested borrowing items from other questionnaires. Spieth and Harris (1996) suggested that HRQOL questionnaires for children have various domains such as academic achievement and domains pertinent to their HRQOL. Therefore, the researcher-designed PBS questionnaire was created not only by input from focus groups and Juniper's PAQOL questionnaire but also by thoroughly canvassing the literature on HRQOL questionnaires. The Childhood Asthma Questionnaire by French and Snowden, The Asthma Behavior Scale by Madador, the Asthma Symptom Index by Butz, the Breathing Problems Questionnaire by Hyland, The Pediatric Asthma Oncology questionnaire by Boggs, the SF-36 by Mahler and Mackowiak and Landrine's African-American acculturation scale were some of the HRQOL questionnaires reviewed before designing the PBS.

The researcher, with three-members of the dissertation committee, had four sessions of "item generation." The item generation sessions were to ascertain that only questions pertinent to the subject matter were included. The PBS questionnaire consisted of a total of 31 questions in a 5-point Likert format. Twenty questions were designed to measure the three domains: physical (n=8), mental (n=6), and social (n=6). Eight questions (1, 3, 7, 9, 13, 17,18, and 19) were related to the physical domain. Six

questions (4,8,10,16,2, and 20) assessed the social domain and six questions (5, 6, 11, 12, 14, and 15) assessed the psychological domain (refer to Appendix C).

The traditional health belief domain included questions suggested by the focus groups, which consisted of 18 parents of children with asthma and 10 asthmatic children. Questions to the focus groups held were relevant to the differences in culture and socioeconomic status of children. Eleven questions were developed to relate to the fourth domain, traditional cultural beliefs. The eleven traditional cultural belief questions were: (21) There is no cure for asthma; (22) Asthma medications cost too much money; (23) It is very difficult to manage asthma at home; (24) I can manage my child's asthma at home; (25) Prayer can cure disease; (26) Prayer can heal asthma; (27) I have the money for all my medicine for asthma; (28) If doctors can't cure you, you should try going to your minister; (29) Is your home warm in the winter and rainy seasons; (30) Is your home air conditioned in the summer; (31) Is your home free of a lot of humidity in the height of the summer months.

Content validity refers to the domains and dimensions defined by the researcher and their ability to capture all the potential concepts and restrictions perceived to be relevant to the study population (Mahler & Mackowiak, 1995). Content validity for the PBS was established by 10 practicing professionals (see Appendix H). Each participant indicated agreement with items for the PBS.

Definition of Terms

For clarification, terms used in this study are defined as follows:

Health-Related Quality of Life (HRQOL) is defined as the health status related to how a patient feels and how he or she functions in daily activities. HRQOL is "the

subjective and objective impact of dysfunction associated with an illness or injury, medical treatment, and health care policy" (Spieth & Harris, 1996). The sum score of each respondent's answers to the survey will operationally define HRQOL. The sum score of Dr. Juniper's questionnaire revealed the lower numbers as having a decreased HRQOL. The sum score of the PBS revealed the higher the number, a decrease in HRQOL.

Disease or Physical State is defined by Spieth and Harris as physical symptomatology of the patient or illness in general. The questions concerning disease state or the PBS survey will operationally define disease state.

Psychological Functioning is defined as the measurement of children's mental health which is the identification of primarily problem constructs relating to behavior and conduct, such as hyperactivity, aggression, and anti-social behavior rather than anxiety and depression constructs ((Eisen et al., 1980). Psychological functioning will be operationalized by six specific HRQOL questions on the PBS concerning the child's behavior.

Social Functioning is defined in broad terms as an individual's ability to maintain social relations (Shumaker & Czajkowski, 1993; Eisen et al., 1980). For the purposes of this study, it will be operationalized by six questions on the PBS regarding social functions.

Data Analysis

Data were analyzed in the following sequence:

1. An intrascale factor analysis (with varimax rotation) was performed on the Pediatric Breathing Survey (PBS) to identify the underlying dimensions. Only those

items related to the physical, mental, and psychological dimensions were included in the initial analyses. Questions for the fourth dimension, the traditional health belief dimension, were dichotomously scored and were, therefore, analyzed separately using non-parametric statistics. Based on factor loadings, adjustments were made to the dimensions. Cronbach's alpha was used to estimate internal reliability of the adjusted measures, and any additional adjustments were made at that time.

2. Juniper's PAQOLQ measure was also subjected to a factor analysis and estimation of internal reliability. This analysis was to confirm results reported by Juniper et al., 1996.

3. Descriptive statistics (e.g., mean) were calculated for each scale dimension.

4. Correlations were determined between all scale dimensions, relevant demographic measures (i.e., education level, household income, days with symptoms, nights with symptoms).

5. A MANOVA was performed to test for overall effects of three demographic variables (i.e., race, education level, household income). Dependent variables were all dimensions of both the PBS and the PAQOLQ. For those group differences demonstrating significant multivariate main effects and interaction effects, ANOVAs were performed to test for univariate main effects and mean comparisons were performed as needed.

6. The student t-test was used to investigate differences in mean scores on the HRQOL by race.

Chapter III

Results

The parents of 84 children with asthma completed both Juniper's Pediatric Asthma Quality of Life Questionnaire (PAQOLQ) and the Pediatric Breathing Survey (PBS) designed by this researcher. Findings from the statistical analysis are presented in this chapter. The characteristics of the study sample are presented first, followed by a factor analysis for the PBS and Juniper's PAQOL questionnaire. Results of the hypothesis testing are then reported.

Sample Description

Two hundred questionnaires were distributed via school children with a return rate of 42% (n=84). The sample consisted of 23% Caucasian parents, 47% African-American parents, 3% Latino parents and with 9% who failed to respond to the question of race.

Respondents were predominantly African American or Caucasian parents with a twelfth grade education residing in Norfolk for two to three years. The educational level of the respondents consisted of 10% with a ninth to eleventh grade education, 28% with a GED or twelfth grade education; 14% with two years of college, 7% with four years of college, 11% with more than five years of college and with 14% did not indicate a response. Demographics of the sample are reported in Table 5.

Five percent of the children were enrolled in kindergarten; 4% first grade, 11% second grade, 10% third grade, 22% fourth grade, 21% fifth grade, 1% sixth grade and 10% failed to identify their child's grade level.

Table 5	Demographic Characteristics For Parents Responding		
1.	Years of residence in Norfolk		
	Number ofYears	Number of Parents	Percentage
	1-5	20	23%
	6-10	17	20%
	11-15	6	7%
	20-25	4	4%
	30-35	8	9%
	36-39	2	2%
	42-44	4	4%
	No response	23	27%
2.	Ethnicity		
	Caucasian	23	27%
	African-American	47	56%
	Asian	2	2%
	Latino	3	3%
	No Response	9	10%
3.	Highest Grade Completed by the Parent		
	9-12th/GED	38	45%
	2 years of college or more	32	38%
	No Response	14	17%
4	Child's Gender		
	Male	36	43%
	Female	37	44%
	No Response	11	13%
5	In What Grade is your Child?		
	K	5	6%
	1st	4	5%
	2nd	11	13%
	3rd	10	12%
	4th	22	26%
	5th	21	25%
	6th	1	1%
	No Response	10	12%
6.	What is Your Household Income?		
	< $10,000	28	33%
	$10-20,000	24	29%
	$21-30,000	9	10%
	>$30,000	12	14%
	No Response	11	13%

table continues

Table 5 (continued)	Demographic Characteristics		
7.	My Child is on the Following Medications		
		Number	Percentage
	Proventil	31	37%
	Atrovent	6	7%
	Intal	9	11%
	Vanceril	10	12%
	Prednisone	9	11%
	Azmacort	8	9%
	Tilade	3	4%
	Other	15	18%
8	Are you the Child's:		
	Mother	62	73%
	Father	7	8%
	Other	6	7%
	No Response	9	11%
9.	In the Past 6 months, how much was activity limited		
	0-7 days	46	55%
	8-19 days	17	20%
	20+ days	9	10%
	No Response	12	15%
10.	In the Past 6 months, how many nights did child wake up in night with cough, wheeze or tightness in chest?		
	0-7 nights	51	60%
	8-19 nights	17	20%
	20+ nights	5	6%
	No Response	11	14%
11	Zip Code		
	23504	23	27%
	23508	9	11%
	23505	3	4%
	23518	8	9%
	23502	7	8%
	23404	1	1%
	23501	1	1%
	23503	1	1%
	23510	3	4%
	23512	1	1%
	23513	1	1%
	23514	1	1%
	23515	1	1%
	23523	1	1%
	No Response	7	8%

Respondents indicated for income levels that 33% earned less than $10,000 a year, 29% earned between $10,000-$20,000 a year, 10% earned between $21,000-$30,000 a year; 14% earned greater than $30,000 a year and 13% did not indicate an annual income.

Seventy-six percent of the respondents were mothers, 8% fathers, 7% responded . as other, with no response indicated by 9%.

The questions regarding what medication the child was receiving revealed 37% were on Proventil, 12% on Vanceril, 11% on Prednisone, 11% on Intal, 9% on Azmacort, 7% on Atrovent, 4% on Tilade and 18% not responding.

When asked how many days per month, in the past six months, did (the patient) cough, wheeze or did shortness of breath limit exercise, ability to play sports, or play with friend, 55% of the respondents indicated 0-7 days. Twenty percent indicated that the child had difficulty with exercise 8 to 20 days while 10% (8) had problems 20 or more days. Fifteen percent did not indicate any response to this question. When asked how many nights, in the past six months, did the patient wake up at night with cough, wheeze or tightness in chest, the majority (60%) stated 0 to 7 nights, with 20% of respondents identifying 8 to 19 nights and 6% of respondents indicated 20 or more nights. Fourteen percent did not answer this item.

Factor Analysis

To address hypothesis number 1, a factor analysis was calculated to provide support for construct validity. A factor analysis is a statistical tool for analyzing scores on a large number of variables to determine if the dimensions can be useful to describe the underlying traits to be identified (Munro & Page, 1993). As a first step, this research

employed factor analyses to support validity for the Pediatric Breathing Survey. The PBS Survey is a reliable and valid instrument to measure HRQOL in African-American children with asthma. The principal axis technique was used with a varimax rotation. The cutoff criterion of .5 was intended, although no loadings were actually excluded by this criterion.

Based upon the literature and design of the instrument, it was anticipated that the PBS would consist of four dimensions (the physical, mental, social and traditional health belief). The factor analysis revealed only two dimensions, an emotional and a physical/ disease dimension. The domain subscales are reported in Table 6. The Interscale Factor Analysis with eigenvalues ranged from .80889 [high] to .32250 [low] is reported in Table 7 for the PBS. Factor loadings ranged from .29445 to .80889 with all items loading clearly on one factor or the other.

Table 6 Summary of Domains Scores for PBS

Emotional Domain			
Mean	SD	Minimum	Maximum
28.41	12.13	11	49
Physical Domain			
Mean	SD	Minimum	Maximum
24.81	9.31	9	45

For example, the emotional domain item, "How often have you felt upset because you could not do the same activities others do because of your asthma during the past week?" loaded on factor 1 at .80889 and .35303. Thus, two separate subscales existed. The emotional scale of the PBS consisted of eleven items. These questions referred to displays of emotion experienced by the asthmatic as a result of asthma. Questions in the

emotional domain were concerned with the feelings of the asthmatic towards their illness, i.e., how often have you felt upset, frightened, frustrated, mad, angry, alone or worried because of your asthma, or not being able to sleep at night, feeling tired and having a disruption in daily activities were covered in this domain. The emotional domain of the PBS had a mean of 2.56 (on a five-point scale) with a standard deviation of 1.08 and Cronbach's alpha of .96 (see Table 9).

Table 7 Interscale Factor Analysis of the Pediatric Breathing Survey

Factor 1: Emotional Domain of the Pediatric Breathing Survey	Factor 1	Factor 2
How often have you felt upset because you could not do the same activities others do because of your asthma during the past week?	.80889	.35303
How often did you feel frightened by an asthma attack during the past week?	.79526	.42962
How often did your asthma make you feel mad/angry during the past week?	.78800	.38723
How often did your asthma make you feel frustrated during the past week?	.76905	.49205
How often have you felt alone because of your asthma during the past week?	.76693	.32250
How often did you feel worried because of your asthma during the past week?	.74988	.38507
How often did you have trouble sleeping at night, because of your asthma, during the past week?	.68891	.55849
How often did you feel you could not keep up with others because of your asthma during the past week?	.68697	.38428
How often did your asthma wake you up during the night during the past week?	.67639	.52162
How often did your asthma make you feel tired during the past week?	.66001	.55809
How often did your asthma attacks disrupt your schedule?	.65988	.46282

table continues

Table 7 (continued) Interscale Factor Analysis of the Pediatric Breathing Survey		
Factor 2: Physical Domain of the Pediatric Breathing Survey		
How often did you have difficulties taking a deep breath in the past week?	.36015	.82594
How much did wheezing irritate you during the past week?	.41443	.82325
How often did you feel out of breath during the past week?	.29445	.80952
How often did your asthma make you feel irritable or uncomfortable during the past week?	.47529	.73356
Think about all the activities that you did in the past week. How often did asthma interfere with your activities?	.42942	.71315
How often has coughing irritated you in the last week?	.43590	.70873
How much did tightness in your chest irritate you during the past week?	.53159	.69783
How often did you feel uncomfortable because of your asthma during the past week?	.50145	.69662
How much did shortness of breath irritate you during the past week?	.49001	.68097
Determines Validity of Eigenvalue	13.87	1.03
Percentage of variance	69.40	5.10

Items on the physical dimension had a factor loading that ranged from .53159 to .29445. A typical question in this domain was "How often did you have difficulties taking a deep breath?" The items that loaded highest on physical domain in the factor analysis consisted of the nine questions concerning the physiologic status of the asthmatic. For instance, how often have you had difficulty taking a deep breath, experienced shortness of breath, wheezing, tightness of the chest or feeling uncomfortable due to your asthma were included in this domain. The mean for the physical domain of the PBS was 2.75, standard deviation of 1.03 and a Cronbach's alpha of 0.95 (see also Table 9).

The questions dichotomously scored for the traditional health belief domain were not included in the factor analysis because it would be inappropriate to use them in the

calculations required for a factor analysis. The chi square analysis is for nominal level data. These results are reported later with a separate chi-square analysis for each item.

The factor analysis for Juniper's Pediatric Asthma Quality of Life Questionnaire (PAQOLQ) is reported in Table 8. Juniper's PAQOLQ is a disease-specific instrument that the researcher expected to measure the physical, emotional and social impairments experienced by children with asthma (Juniper et al., 1996). However, for this sample, the factor analysis resulted in all items loading on only one factor (see Table 8). The mean was 3.78 (on a seven-point scale) with a standard deviation of 1.46 and a Cronbach's alpha of 0.98 (Table 9).

Juniper's Pediatric Asthma Quality of Life Questionnaire (PAQOLQ) is a disease-specific instrument and is designed to measure the emotional, physical and social impairment for children with asthma. Because of this similarity, it was expected that the dimensions of the PBS and PAQOLQ would be highly correlated. As shown in Table 9, the PAQOLQ dimension did correlate highly with both domains of the Pediatric Breathing Survey (PBS). In order to minimize errors in interpretation, the PAQOLQ was reversed scored. Juniper's questionnaire ranged from 1-7 while the PBS ranged from 105. Juniper's #1 correlated with the phrase "extremely bothered", while #1 for the PBS was "rarely bothered." Therefore, the PQAOLQ was reversed scored.

Table 8 Factor Analysis of Juniper's Pediatric Asthma HRQOL	
In general, how often during the last week did you feel irritable because of your asthma?	.94567
How bothered have you been during the last week by shortness of breath?	.94266
In general, how often during the last week did you feel out of breath because of your asthma?	.92203
How bothered have you been during the last week by wheezing?	.91874
In general, how often during the last week did you feel frustrated because of your asthma?	.91774
	(table continues)

Table 8 Factor Analysis of Juniper's Pediatric Asthma HRQOL	
In general, how often during the last week did you feel angry because of your asthma?	.91506
In general, how often during the last week did you feel worried, concerned or troubled because of your asthma?	.90149
In general, how often during the last week did you feel you couldn't keep up with others because of your asthma?	.90091
In general, how often during the last week did you feel frustrated because you couldn't keep up with others?	.89289
Think about all the activities that you did in the past week. How much were you bothered by your asthma during these activities?	.87705
In general, how often during the last week did you feel different or left out because of your asthma?	.87616
How bothered have you been during the last week by shortness of breath?	.87342
In general, how often during the last week did you wake up during the night because of your asthma?	.86212
In general, how often during the last week did you have trouble sleeping at night because of your asthma?	.85427
How bothered have you been during the last week by asthma attacks?	.85152
In general, how often during the last week did you feel tired because of your asthma?	.79438
In general, how often during the last week did you feel frightened by the asthma attack?	.75297
How bothered have you been during the last week?	.72803
How bothered by coughing have you been during the last week?	.64399
Determines Validity of Eigenvalue	15.11
Percentage of variance	75.60
Cumulative percentage of variance	75.60

The PAQOLQ and the PBS both measure quality of life in children with asthma. Therefore, it was expected that both questionnaires would correlate highly with one another. Further, both questionnaires not only correlated highly with one another but also the domains of the PBS correlated more highly with one another. That is, the two factors from the same measure were more highly correlated with each other than either dimension correlated with a similar but different measure. The relationships between measures and dimensions (see Table 9) provided evidence of convergent validity (Munro & Page, 1993). Further, both the PBS and PAQOLQ correlated in predictable ways with

the frequency of child's symptoms (i.e. "days with symptoms", "nights with symptoms"). That is, more frequent symptoms were associated with lower HRQOL, as measured by either the PBS or PAQOLQ. In conclusion, results of the factor analysis, test of inter-reliability, and correlation analysis provided support for the reliability and validity of a two-dimension PBS measure.

Table 9 Means, Standard Deviations, Reliability, Estimates, and Intercorrelations among Measures

	Variable	M	SD	1	2	3	4	5	6	7
1	PBS Emotional	2.56	1.08	(.96)						
2	PBS Physical	2.75	1.03	.86	(.95)					
3	PAQOLQ	3.78	1.46	.71	.68	(.98)				
4	Parent's educational level	--	--	-.05	-.03	-.05	--			
5	Child's educational level	--	--	-.14	-.16	-.22	*.29	--		
6	Household income level	--	--	-.16	-.08	-.08	*.52	-.06	--	
7	Days with symptoms	--	--	*.26	*.23	*.39	-.10	.01	.01	
8	Nights with symptoms	--	--	*. 38	*.36	*.49	-.10	.13	-.15	.57

Note. Values in parentheses represent coefficient alpha estimates of internal consistency.
*All intercorrelations greater than .24 are significant at $p \leq .05$.
N = 84

To address hypothesis number two, "There is a significant statistical difference in HRQOL between African-American and Caucasian children with asthma based on responses by parents to both HRQOL questionnaires." A t-test was done to measure the difference in HRQOL between the two groups for the PBS and the PAQOLQ. Latinos and Asian-Americans were combined with Caucasians for that test only. Therefore, non-African-American was used here only. The results are reported in Tables 10 and 11.

Table 10 A t-Test of the Differences in Race by PBS

Race	n	$\bar{x}$	t	p
Non African-American	28	2.5470	.26	.797
African-American	47	2.6110		

Table 11 A t-Test of the Differences in Race by PAQOLQ

Race	n	$\bar{x}$	t	p
Non-African-American	26	3.4624	1.03	.307
African-American	47	3.8394		

According to this statistical analysis, the research hypotheses of a significant statistical difference by race were not supported. There was no significant statistical difference found between the two groups for the t-test.

To address hypothesis number two for the questions in the Traditional Health Belief domain, chi-square analyses were conducted on the responses to individual questions. A chi-square was required because these responses were dichotomously scored and, therefore, could not be analyzed with the parametric statistics. The chi-square analyses revealed a significant statistical difference by race on the question, "I have the money for all my asthma medicine." The chi-square analysis by race is presented in Table 12 question, "I have the money for all my medicine for asthma". The research hypothesis of a significant statistical difference between races on health related quality of life was supported at the alpha level of .01491.

Table 12 Question #27 "I have the money for all my medicine for asthma" by Race			
	No	Yes	Row Total
White	14	7	21
	66.7	33.3	31.3
African-American	16	30	46
	34.8	65.2	68.7
Column Total	30	37	67
	44.8	55.2	100.00

To address hypotheses 3a and 3b, a MANOVA was performed to test for overall effects of three demographic variables (i.e. race, education level, household income) on the domains of the PBS and PAQOLQ. The independent variables were race, parents' educational level, and income. Dependent variables included all domains of both the PBS and the PAQOLQ. For the group differences demonstrating significant multivariate main effects, an ANOVA and a subsequent mean comparison was performed. The three research questions were examined using a 2 (race) x 2 (parents' educational level) x 4 (parents' income) design. The MANOVA and ANOVA results are presented in Table 13. As shown in the table, the only significant effect was a main effect for parents' income on Juniper's PAQOL questionnaire ($F=2.96$; $p<.05$).

Table 13 Analysis of Variance/Multivariate Analysis of Variance					
Source		Multivariate	Univariate		
	df	F	PBS Emotional Domain	PBS Physical Domain	PAQOL
Race (A)	1	1.98	1.14	0.59	0.28
Parent (B) Educational level	1	1.26	0.38	0.86	0.30
Income (C)	3	2.96*	0.46	.9763	3.48*
AxB	1	1.74	1.34	1.97	1.12
AxC	3	.99	0.13	0.39	0.65
BxC	3	2.22	0.89	1.44	1.24

* significant at a p value of .05.

The ethnicity of the sample consisted of 23 Caucasian parents of children with asthma, 47 African-Americans, 2 Asian Americans, 3 Latinos and 9 that failed to respond. For the first independent variable of race, only data for two categories--African-American parents and Caucasian parents--was used due to the small sample size of the other categories. No significant differences were found on the domains of either questionnaire by race.

The second independent variable was educational level of the parent. The frequencies for educational level consisted of 10 parents with an 11^{th}-grade education; twenty-eight with a 12^{th}-grade education or GED; fourteen with two years of college; seven with 4 years of college; eleven with 5 years of college and fourteen who failed to respond. The variable was collapsed into two categories. The two categories were '9-12 grade or GED', with 38 responses, and 'two years of college or more', with 32 responses.

No significant differences were found on the domains of either questionnaire by educational level.

For the third independent variable, income level, 28 earned less than $10,000 a year, 24 earned between $10,000-$20,000 a year, 9 earned between $21,000-$30,000 a year, 12 earned more than $30,000 a year and 11 did not respond. An ANOVA revealed a significant difference by income level on Juniper's PAQOLQ. A Tukey HSD post hoc analysis was performed to identify the source of the differences. The result of the comparison of means revealed that those parents with an income of $10-$20,000 a year (M=4.65) and those with an income in excess of $30,000 a year (M=4.94) had significantly higher health related quality of life (i.e., higher ratings on Juniper's PAQOLQ) than parents with an income of below $10,000 a year (M=4.09) or an income of $21-$30,000 a year (M=3.07). There were no other significant differences among these groups.

The discussion related to the traditional health belief dimension of the PBS was presented earlier with the chi-square analyses. A significant statistical difference was found only for the question, "I have the money for all my medicine for asthma" by parents educational level and income.

The Pediatric Breathing Survey (PBS) was designed by the researcher to attempt to assess HRQOL in children with asthma. In addition, the quality of life in African-American children was investigated. A comparison of group differences (e.g. race, income) for parents' perception of HRQOL in asthmatic children was also analyzed. The design of the survey before the factor analysis was conducted consisted of four dimensions: physical and disease dimension, psychological dimension, social dimension

and traditional health belief dimension. Other researchers in HRQOL questionnaires have previously used the physical, psychological, and social dimensions for asthmatic children. These domains have been found to be beneficial in obtaining HRQOL in asthmatic children (Juniper et al., 1996, Eisen et al., 1980). The traditional health belief domain of the questionnaire was subjected to chi-square analysis and the findings are reported here. This dimension of the Pediatric Breathing Survey made an attempt to address problems presented during focus groups. The traditional health belief domain consisted of questions relevant to cultural beliefs and traditions. The financial status of the respondents was also reviewed. As based on the literature review, socioeconomic status is a major problem with African-American children with asthma.

Table 14 Chi Square for "I have the money for all my medicine for asthma" by Educational Level

Parent's Grade		No	Yes	Row Total
9-12/GED	1	11	25	36
		30.6%	69.4%	53.7%
2 yr college	3	18	13	31
		58.1%	41.9%	46.3%
		29	38	67
		43.3%	56.7%	100.00%

Table 15 Chi Square for "I have the money for all my medicine for asthma" by Income Levels

		Not Enough Money	Yes, Have Enough Money
<$10,000	1	10	17
		37.0%	63.0%
$10,000-$20,000	2	5	17
		22.7%	22.7%
$21,000-$30,000	3	6	2
		75.0%	25.0%
>$30,000	4	10	2
		83.3%	16.7%

Chapter IV

Discussion, Summary, Conclusion, Implications and Recommendations-

This chapter discusses and summarizes findings of the study in the context of the literature and the findings. Conclusions and implications based on the findings and review of the literature are presented. Recommendations for further study are suggested.

Results

The analytical findings for hypothesis 1 was a two-dimension Pediatric Breathing Survey. The factor analysis supported a physical and an emotional dimension. The results of the factor analysis, test of interreliability, and correlation analysis provided support for the reliability and validity of a two-dimension PBS measure.

The physical dimension of the PBS is concerned with problems pertinent to the symptomatology of the patient. Questions concerning the asthmatic's shortness of breath and tightness of the chest were analyzed in the physical domain. The emotional domain is concerned with questions on how the asthmatic felt as a result of their asthma. Feelings of anger, irritation and frustration were analyzed in this domain.

Based on the review of the literature, the PBS was similar to other HRQOL instruments (Boggs, Goodwin & Pole, 1994; Bott et al., 1994; French & Snowden, 1994; Juniper et al., 1996). The PBS dimensions had high alpha correlations (.95, .96) as compared to other HRQOL instruments. Juniper's American and Italian Adult versions of the Asthma Quality of Life Questionnaire for adults had a coefficient of .96, the Childhood Asthma questionnaire by French and Snowden (1994) had a coefficient of .84, the Breathing Problems Questionnaire by Bott et al., had 13 different scales with

correlations ranging from .60-.70. The Cronbach's alpha for the PBS was .95 for the physical domain and .96 for the emotional domain.

Dr. Juniper (1996) reported a three-dimension HRQOL questionnaire; however, the review of literature did not unearth a published factor analysis. In this study, a factor analysis revealed that Juniper's questionnaire contained only one dimension. The one-dimension was identified as primarily the emotional domain of asthma. For instance, questions concerning how the patient felt about their asthma and whether or not the patient was irritable or bothered by shortness of breath were items included in this one dimension.

Hypothesis 2 was not supported as results of the t-test indicated. There was no significant statistical difference found in HRQOL between African-American and Caucasian children with asthma based on responses by parents to both questionnaires. The lack of sensitivity of the instruments may have resulted from the small sample size.

Additionally, the chi-square analysis done on the traditional health belief domain revealed a single statistical significant difference for the question, "I have the money for all my asthma medicine and race." This is question #27 in the traditional health domain, therefore, the research hypothesis of a significant statistical difference based on race was supported at the probability level of .01491 (See Appendix K). The research findings support a difference in asthma management for minority children. Based on the review of literature, asthma-related hospitalizations and mortality have risen at alarming rates in the past two decades, taking a disproportionate toll on African-American children. Adverse asthma outcomes have been attributed to inadequacies in asthma management delivered to African-American children (Brown et al., 1995; Ali & Osberg, 1997). Research has

further concluded the existence of racial disparities in primary care asthma management for African-American children (Divine et al., 1997; Melton et al., 1994).

According to many reports, asthma is more common in African-American children than in white children. It remains unclear how much of this difference in prevalence can be explained by African-American children's greater exposure to social and environmental risk factors for asthma compared with Caucasian children. Race has remained a significant predictor of asthma after adjustment for other potential risk factors in some studies (Bijur et al., 1994) but not in others. Factors such as poverty, urban or inner city residence, and household crowding have been associated with asthma in some studies, and African-American children may have been disproportionately exposed to such risk factors.

Hypothesis 3, part a, was not supported for the researcher-designed PBS or Juniper's PAQOLQ according to the results of the MANOVA and ANOVA. There was no statistical significant difference in parent's educational level based on responses by the parents to the HRQOL questionnaires. This finding does not support the research (Erzen et al., 1997; Melton et al., 1994) that parents' educational level is related to HRQOL. One reason for the difference may have been the sample size for this study.

The chi square analysis for one item from the traditional health belief scale revealed a statistically significant difference on the question, "I have the money for all my asthma medicine," and parents' educational level. This finding supports research by Boggs et al. (1994) and Bijur et al. (1994) that having enough money for medication is associated with lower educational levels.

Hypothesis 3, part b, also revealed no significant difference in income based on responses by parents to the emotional and physical domains of the PBS. An ANOVA of analysis and the multivariate analysis revealed no significant difference in income based on responses by parents to the HRQOL instruments.

The only statistical significant effect was between Juniper's PAQOLQ, a multivariate main effect, and parent's income ($F=2.96$; $p<.05$). This difference could have been due to sample size. The analysis revealed parents (n=22) with an income of $10-20,000 a year had a higher HRQOL than parents with an income of $10,000 (n=27) or an income of $21,000-$30,000 a year (n=8). Research supports the higher the income level the less the problem of having money for asthma medications. These differences could have been a result of the small or the unequal distribution of the sample size.

Parents with two years of college or more stated that they had the money for their asthma medications. Literature supports patients in urban areas and lower-income groups with less education are less likely to have income for comprehensive treatment for their asthma (Brown et al., 1995; Divine et al., 1997).

A major limitation of this study was the small sample size. Further studies with larger and more diverse samples will enhance the reliability and validity of the instrument.

Summary

A study of 84 parents of children with asthma revealed that both versions of HRQOL questionnaires were valid instruments. From the traditional health beliefs of PBS, one item, "I have the money for all my medication for asthma," was significantly related to race, income and education level of the parent. This statement could represent a

significant finding related to the prevalence of morbidity and mortality rates of asthma for African-American children.

Conclusion

The study revealed no statistically significant difference between African-American and Caucasian children with asthma based on responses by parents to either HRQOL questionnaire. A statistically significant difference was found in parent's ability to pay for medications based on educational level for one or both questionnaires. There was a statistically significant difference between income and total score on Juniper's PAQOL questionnaire.

The findings suggest the HRQOL instrument was not sensitive enough to distinguish if the quality of life of asthmatic children was different for both races. However, HRQOL scores were significantly different based on the economic level of the parent. Research (Brown et al., 1995) supports the difference in income levels associated with medical treatment of asthmatics. Further research should aim at dissolving inequities in health care due to income level and to ensure delivery of high quality services to children with asthma regardless of income.

The addition of the traditional health belief domain to the PBS, included questions pertinent to the patient's cultural beliefs and traditions. This approach was important because in order for medical intervention treatments or programs to be effective they need to take into account the living arrangement of the patient. Based on the review of literature, there continues to be difficulties with asthma management in children. HRQOL questionnaires reveal the holistic picture of children with asthma. This research substantiates how differences in income levels (economics) parallel with a difference in

education. The literature supports the findings of the chi square analysis that parents in the income level below $10,000 do not have enough money for all their asthma medications. Parent's level of education revealed parents with two years of college or more had the money for their asthma medications while parents with 9-12th grade education or GED did not have the money for their asthma medications.

Literature supports that patients in urban areas and lower-income groups were less likely to have income for comprehensive treatment for their asthma. The traditional health belief domain was included in the PBS-HRQOL questionnaire to encompass the whole environment of the asthmatic child. Significant concerns about morbidity and mortality persist, particularly in minority, lower-income populations living in urban areas.

Further research should be done using the PBS. The PBS, together with the traditional health belief domain, may give a holistic view of the HRQOL in asthmatic children. The addition of the traditional health belief domain will enhance further asthma intervention programs because the patients' environment will be taken into account. The PBS has been shown to be a reliable and valid instrument, simple and easy to use. Further testing of the instrument is necessary to validate reliability and validity. The data generated may provide clinically relevant information to assist guardians, parents and health professionals in making informed choices among therapeutic alternatives. Additionally, such measures can assist with identifying African-American children in the low-income areas. Therefore, interventions can be targeted to the low-income group of asthmatic children. The inclusion of the PBS HRQOL questionnaire in clinical trials is an

important step in the movement toward enhancing medical intervention programs for the African-American population.

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APPENDIX A

CONSENT FORM FOR THE PEDIATRIC BREATHING SURVEY

THE PEDIATRIC BREATHING SURVEY

Investigator:	Linda Galloway, Doctoral Candidate
Chair:	Dr. Brenda Nichols
Committee Members:	Dr. J. Echternach
	Dr. D. Thomas

Description of Study: This study is designed to help refine a a Quality of Life questionnaire for parents/guardians of children with asthma. Quality of life is concerned with feelings about asthmatic children's everyday lives and their asthma. Asthma is the number one reason for children to be absent from school. The death rate for children with asthma is also increasing. Therefore, it is beneficial to know how the medical treatment given for asthma is helping the children. This questionnaire will provide the information to help children with asthma.

Exclusionary Criteria: I understand this study is only for parents/guardians of children with asthma.

Risks: There are no risks since a written questionnaire on paper is the only material to be used.

Benefits: Better treatment for children with asthma.

Costs and Payments: There is no cost or payment made for this study.

Confidentiality: I understand that any information obtained about my child from this research will be kept confidential. The questionnaires will be kept confidential and are protected within the limits of the law. Information used from this study will be presented, but I know my child will not be personally identified.

New Information: This survey takes up to 30 minutes to complete and will only be given one time.

Withdrawal Privilege: I understand that I may withdraw from this study at any time. My withdrawal from the study will NOT in any way affect my child's medical treatment.

Voluntary Consent: I AGREE TO PARTICIPATE IN THIS ASTHMA QUALITY OF LIFE STUDY ON MY CHILD.

Parent/Guardian's Signature _____ Date _____

Child's Name

Investigator's Statement: I certify I have explained to the above individual the nature and purpose of this study, potential benefits, and that there are no possible risks associated with participation in this study. I have answered any questions that have been raised and have witnessed the above signature. I have explained the above to the volunteer on the date stated on this consent form.

Signature of Investigator

Date

APPENDIX B

THE PEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE—SELF-ADMINISTERED BY JUNIPER

PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE

SELF-ADMINISTERED

McMASTER UNIVERSITY
HAMILTON, ONTARIO
CANADA

FEBRUARY 1997

Put an X in the box that best describes how bothered you have been.

HOW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK?

	Extremely Bothered	Very Bothered	Quite Bothered	Somewhat Bothered	Bothered A Bit	Hardly Bothered At All	Not Bothered	Activity Not Done
	1	2	3	4	5	6	7	
1. _____	☐	☐	☐	☐	☐	☐	☐	☐
2. _____	☐	☐	☐	☐	☐	☐	☐	☐
3. _____	☐	☐	☐	☐	☐	☐	☐	☐
4. COUGHING	☐	☐	☐	☐	☐	☐	☐	

IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
	1	2	3	4	5	6	7
5. Feel FRUSTRATED because of your asthma?	☐	☐	☐	☐	☐	☐	☐
6. Feel TIRED because of your asthma?	☐	☐	☐	☐	☐	☐	☐
7. Feel WORRIED, CONCERNED OR TROUBLED because of your asthma?	☐	☐	☐	☐	☐	☐	☐

HOW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK BY?

	Extremely Bothered	Very Bothered	Quite Bothered	Somewhat Bothered	Bothered A Bit	Hardly Bothered At All	Not Bothered
	1	2	3	4	5	6	7
8. ASTHMA ATTACKS	☐	☐	☐	☐	☐	☐	☐

IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
	1	2	3	4	5	6	7
9. Feel ANGRY because of your asthma?	☐	☐	☐	☐	☐	☐	☐

HOW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK BY?

	Extremely Bothered	Very Bothered	Quite Bothered	Somewhat Bothered	Bothered A Bit	Hardly Bothered At All	Not Bothered
	1	2	3	4	5	6	7
10. WHEEZING	☐	☐	☐	☐	☐	☐	☐

IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
	1	2	3	4	5	6	7
11. Feel IRRITABLE because of your asthma?	☐	☐	☐	☐	☐	☐	☐

OW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK BY?

	Extremely Bothered	Very Bothered	Quite Bothered	Somewhat Bothered	Bothered A Bit	Hardly Bothered At All	Not Bothered
	1	2	3	4	5	6	7
12. TIGHTNESS IN YOUR CHEST	☐	☐	☐	☐	☐	☐	☐

IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
	1	2	3	4	5	6	7
13. Feel DIFFERENT OR LEFT OUT because of your asthma?	☐	☐	☐	☐	☐	☐	☐

OW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK BY?

	Extremely Bothered	Very Bothered	Quite Bothered	Somewhat Bothered	Bothered A Bit	Hardly Bothered At All	Not Bothered
	1	2	3	4	5	6	7
14. SHORTNESS OF BREATH	☐	☐	☐	☐	☐	☐	☐

IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
	1	2	3	4	5	6	7
15. Feel FRUSTRATED BECAUSE YOU COULDN'T KEEP UP WITH OTHERS?	☐	☐	☐	☐	☐	☐	☐

IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:

	All of the Time	Most of the Time	Quite Often	Some of the Time	Once in a While	Hardly Any of the Time	None of the Time
	1	2	3	4	5	6	7
16. WAKE UP DURING THE NIGHT because of your asthma?	☐	☐	☐	☐	☐	☐	☐
17. Feel UNCOMFORTABLE because of your asthma?	☐	☐	☐	☐	☐	☐	☐
18. Feel OUT OF BREATH because of your asthma?	☐	☐	☐	☐	☐	☐	☐
19. Feel YOU COULDN'T KEEP UP WITH OTHERS because of your asthma?	☐	☐	☐	☐	☐	☐	☐
20. Have trouble SLEEPING AT NIGHT because of your asthma?	☐	☐	☐	☐	☐	☐	☐
21. Feel FRIGHTENED BY AN ASTHMA ATTACK?	☐	☐	☐	☐	☐	☐	☐

THINK ABOUT ALL THE ACTIVITIES THAT YOU DID IN THE PAST WEEK:

	Extremely Bothered	Very Bothered	Quite Bothered	Somewhat Bothered	Bothered A Bit	Hardly Bothered At All	Not Bothered
	1	2	3	4	5	6	7
22. How much were you bothered by your asthma during these activities?	☐	☐	☐	☐	☐	☐	☐

APPENDIX C

THE PEDIATRIC BREATHING SURVEY BY LINDA GALLOWAY

Directions: This part is about the child who has asthma. Please answer in terms of the child. Darken the best answer.

1. Rarely or none of the time
2. A little of the time
3. Some of the time
4. A good part of the time
5. Most or all of the time

1.	How much did shortness of breath irritate you during the past week?	①	②	③	④	⑤
2.	How much did tightness in your chest irritate you during the past week?	①	②	③	④	⑤
3.	How often did asthma attacks disrupt your schedule?	①	②	③	④	⑤
4.	How often have you felt alone because of your asthma during the past week?	①	②	③	④	⑤
5.	How often did your asthma make you feel irritable or uncomfortable during the past week?	①	②	③	④	⑤
6.	How often did you feel worried because of your asthma during the past week?	①	②	③	④	⑤
7.	How often has coughing irritated you in the last week?	①	②	③	④	⑤
8.	Think about all the activities that you did in the past week. How often did asthma interfere with your activities?	①	②	③	④	⑤
9.	How often did your asthma make you feel tired during the past week?	①	②	③	④	⑤
10.	How often did you feel uncomfortable because of your asthma during the past week?	①	②	③	④	⑤
11.	How much did wheezing irritate you during the past week?	①	②	③	④	⑤
12.	How often did your asthma make you feel mad/angry during the past week?	①	②	③	④	⑤

13.	How often did you have trouble sleeping at night, because of your asthma, during the past week?	①	②	③	④	⑤
14.	How often did your asthma make you feel frustrated during the past week?	①	②	③	④	⑤
15.	How often did you feel frightened by an asthma attack during the past week?	①	②	③	④	⑤
16.	How often have you felt upset because you could not do the same activities others do because of your asthma during the past week?	①	②	③	④	⑤
17.	How often did you feel out of breath during the past week?	①	②	③	④	⑤
18.	How often did you have difficulty taking a deep breath in the past week?	①	②	③	④	⑤
19.	How often did your asthma wake you up during the night during the past week?	①	②	③	④	⑤
20.	How often did you feel you could not keep up with others because of your asthma during the past week?	①	②	③	④	⑤

Please indicate if you agree or disagree with the following statements:

21.	There is no cure for asthma.	O	Yes	O	No
22.	Asthma medications cost too much money.	O	Yes	O	No
23.	It is very difficult to manage asthma at home.	O	Yes	O	No
24.	I can manage my child's asthma at home.	O	Yes	O	No
25.	Prayer can cure disease.	O	Yes	O	No
26.	Prayer can heal asthma.	O	Yes	O	No
27.	I have the money for all my medicine for asthma.	O	Yes	O	No

28.	If doctors can't cure you, you should try going to your minister.	O	Yes	O	No
29.	Is your home warm in the winter and rainy seasons?	O	Yes	O	No
30.	Is your home air conditioned in the summer?	O	Yes	O	No
31.	Is your home free of a lot of humidity in the height of the summer months?	O	Yes	O	No

The following questions are about the parent or guardian of the child and the child who has asthma.

1. How many months and years have you lived in this city?

_____

2. What is your ethnic identity?
   a. White
   b. African-American/Black
   c. Asian
   d. Latino
   e. Other

3. What is the highest grade you have completed?
   a. 9th-11th grade
   b. 12th grade or GED
   c. 2 years of college
   d. 4 years of college
   e. 5 years or more of college

4. Child's gender
   a. Male
   b. Female

5. In what grade is your child?
   a. K5
   b. 1st grade
   c. 2nd grade
   d. 3rd grade
   e. 4th grade
   f. 5th grade
   g. 6th grade

6. What is your household income?
   a. less than $10,000
   b. $10,000 - $20,000
   c. $21,000 - $30,000
   d. greater than $30,000

7. My child is on the following medications.
   a. Proventil
   b. Atrovent
   c. Intal
   d. Vanceral
   e. Prednesone
   f. Azmacort
   g. Serevent
   h. Tilade
   I. Other

8. Are you the child's?
   a. Mother
   b. Father
   c. Other

9. What is your military pay grade?
   a. Not in Military
   b. E1-E3
   c. E4-E6
   d. E7-E9
   e. O1-O4
   f. O5-O7
   g. W2-W3

10. In the past 6 months, how many days per month did (patient) cough, wheeze or shortness of breath limit exercise, ability to play sports, or play with friends?
    a. 0-7 days a month
    b. 8-19 days a month
    c. More than 20 days

11. In the past six months, how many nights did (patient) wake up at night with cough, wheeze, or tightness in chest?
    a. 0-7 nights a month
    b. 8-19 nights a month
    c. more than 20 nights

12. What is your zip code?

_____

13. What is your father's occupation?

_____

14. What is your mother's occupation?

_____

APPENDIX D

COMPARISONS OF SURVEYS

	Questions from the PBS*	Health Insurance Survey (HIS)	Juniper's PAQOLQ	PBS
1.	How much did shortness of breath irritate you during the past week?	X	X	X
2.	How much did tightness in your chest irritate you during the past week?	X	X	X
3.	How often did asthma attacks disrupt your schedule?			X
4.	How often have you felt alone because of y our asthma during the past week?	X	X	X
5.	How often did your asthma make you feel irritable or uncomfortable during the past week?		X	X
6.	How often did you feel worried because of your asthma during the past week?	X	X	X
7.	How often has coughing irritated you in the past week?		X	X
8.	Think about all the activities that you did in the past week. How often did asthma interfere with your activities?	X	X	X
9.	How often did your asthma make you feel tired during the past week?		X	X
10.	How often did you feel uncomfortable because of your asthma during the past week?		X	X
11.	How much did wheezing irritate you during the past week?	X	X	X
12.	How often did your asthma make you feel mad/angry during the past week?		X	X
13.	How often did you have trouble sleeping at night, because of your asthma, during the past week?		X	X
14.	How often did your asthma make you feel frustrated during the past week?	X	X	X
15.	How often did you feel frightened by an asthma attack during the past week?		X	X

16.	How often have you felt upset because you could not do the same activities others do because of your asthma during the past week?		X	X
17.	How often did you feel out of breath during the past week?	X	X	X
18.	How often did you have difficulty taking a deep breath in the past week?	X	X	X
19.	How often did your asthma wake you up during the night during the past week?	X	X	X
20.	How often did you feel you could not keep up with others because of your asthma during the past week?		X	X
21.	There is no cure for asthma.			X
22.	Asthma medications cost too much money.			X
23.	It is very difficult to manage asthma at home.			X
24.	I can manage my child's asthma at home.			X
25.	Prayer can cure disease.			X
26.	Prayer can cure asthma.			X
27.	I have the money for all my medicine for asthma.			X
28.	If doctor's can cure you, you should try going to your minister.			X
29.	Is your home warm in the winter and rainy seasons?			X
30.	Is your home air conditioned in the summer?			X
31.	If your home free of a lot of humidity in the height of the summer months?			X

*See Appendix C for actual PBS questionnaire.

APPENDIX E

LETTER TO NORFOLK PUBLIC SCHOOLS

16 April 1999

Ms. Linda J. Galloway
Doctoral Candidate
Old Dominion University

Subj: THE PEDIATRIC BREATHING SURVEY

Re: Norfolk Public Schools letter dated March 31, 1999

Dear **Parents,**

I am requesting your help in completion of my dissertation which pertains to asthma in children. This survey has been approved by the Norfolk Public Schools, Department of Research, Testing & Statistics.

Attached is the consent form which thoroughly explains the study. There are no risks involved. As the parent or guardian of the child, you are only required to complete the two attached questionnaires and sign your name.

For your convience, I have enclosed a self addressed envelope to mail your completed forms to me. If you have any questions, please feel free to call me at 471-1529. Please return **both** questionnaires by 7 May 1999.

I want to express my appreciation for your time and effort in the completion of this very important task involving the health of our children.

Respectfully,

Linda J. Galloway

LINDA J. GALLOWAY

APPENDIX F

NORFOLK PUBLIC SCHOOLS INTERNAL REVIEW BOARD PERMISSION LETTER

Norfolk Public Schools

March 31, 1999

Mrs. Linda Galloway
1837 Ewing Place
Virginia Beach, VA 23456

Dear Mrs. Galloway,

You are hereby granted permission to conduct the "Pediatric Breathing Survey," in the Norfolk Public Schools. If you need any further assistance, please let me know.

Sincerely,

Dr. Pamela Y. Hoffler-Riddick
Senior Director
Department of Research, Testing & Statistics

mk

800 East City Hall Avenue, P.O. Box 1357, Norfolk, Virginia 23501-1357

APPENDIX G

CONTENT VALIDITY FOR PEDIATRIC BREATHING SURVEY

Content Validity for Pediatric Breathing Survey

Physicians, Registered Nurses and Registered Respiratory Therapists:

1. CDR Don A. Spencer, MC, USN, M.D., Critical Care Specialist
2. LT Daniel A. Rakowski, M.D.
3. CDR Gumbert, M.D., Pulmonary Specialist
4. Dave Thomas, Ph.D., Pulmonary Pediatrician
5. Hung Chikwok, M.D., Critical Care Medicine
6. Ilamni Li Brapa, R.N.
7. J.D. Odore, M.D., Pediatrics-NMCP
8. LT L. Mitchell, M.D., MC, USNR, Pediatrics
9. Jim Thomas, Certified Respiratory Therapist
10. Cynthia Brunkhard, Registered Respiratory Therapist

APPENDIX H

TEN LETTERS OF CONTENT VALIDITY

INTERNAL MEDICINE DEPARTMENT
NAVAL MEDICAL CENTER
PORTSMOUTH, VIRGINIA 23708-5100

(757) 953-5067

ALLERGY - 953-7826
CARDIOLOGY - 953-5313
ENDOCRINOLOGY - 953-5162
GASTROENTEROLOGY - 953-5371
GENERAL INTERNAL MEDICINE - 953-5019
GERIATRICS - 953-7936
HEMATOLOGY/ONCOLOGY - 953-5149
HIV DIVISION - 953-5179
INFECTIOUS DISEASE - 953-5179
NEPHROLOGY - 953-5451
NEUROLOGY - 953-5242
OCCUPATIONAL HEALTH - 953-5079
PULMONARY - 953-5202
RHEUMATOLOGY - 953-7936

ALLERGY - 953-7826
CARDIOLOGY - 953-5313
ENDOCRINOLOGY - 953-5162
GASTROENTEROLOGY - 953-5371
GENERAL INTERNAL MEDICINE - 953-5019
GERIATRICS - 953-7936
HEMATOLOGY/ONCOLOGY - 953-5149

31 Jul 98

From: Barton C. Gumpert, MD, Head, Pulmonary Division, Naval Medical Center Portsmouth
To: Dr. Nichols, Director, School of Nursing, Old Dominion University

Subj: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American population studied.

2. If you have any questions, please do not hesitate to contact me at (757) 953-5202/05.

3. Thank you.

Sincerely,

B. C. GUMPERT, M.D.
CDR, MC, USN
Head, Pulmonary Disease Division

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: CAPT John D Spencer, MC, USN
To: Dr. Nichols, Director, School of Nursing, Old Dominion University

Subj.. PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at ( )

3. Thank you.

Sincerely

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From D. Rakowski, M D.
To Dr Nichols, Director, School of Nursing, Old Dominion University

Subj PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1 I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2 If you have any questions, please do not hesitate to contact me at ( )

3 Thank you.

Sincerely

DANIEL A. RAKOWSKI
LT/MC/USNR
2AA/5205

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: Hung Chi Kwok Dept. Critical Care Medicine
To: Dr. Hung Chi Kwok MD Dept. Anesthesiology Dominion University
Subj.: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at (757) 953-5750.

3. Thank you.

Sincerely,

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From GAMIN, LINDA

To Dr Nichols, Director, School of Nursing, Old Dominion University

Subj PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at ( )

3. Thank you.

Sincerely

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: J. D. O'Dell, MD, Pediatrics NMCP.
To: Dr. Nichols, Director, School of Nursing, Old Dominion University

Subj.: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at ( )

3. Thank you.

Sincerely

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: LI L Mitchell, MC USNR (PEDIATRICS)
To: Dr. Nichols, Director, School of Nursing, Old Dominion University

Subj.: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at DSN 253-7332

3. Thank you.

Sincerely

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: _____

To: Dr. Nichols, Director, School of Nursing, Old Dominion University

Subj.: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at ( )

3. Thank you.

Sincerely

_____

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: Elijah D Brandt RT

To: Dr. Nichols, Director. School of Nursing, Old Dominion University

Subj.: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at ( )

3. Thank you.

Sincerely

Elijah D Brandt RT

CONTENT VALIDITY FOR THE PEDIATRIC BREATHING SURVEY

From: Josette Gregory, RD - Registered Dietician
To: Dr. Nichols, Director, School of Nursing, Old Dominion University

Subj.: PEDIATRIC BREATHING SURVEY CREATED BY LINDA GALLOWAY

1. I have reviewed the above questionnaire and found the design of the questions to have valid meaning and would produce results that would enable a health care provider ascertain the degree in which asthma was effecting the child at a given point in time. This Breathing survey in my estimation would have validity in the African-American and with all asthma children population studied.

2. If you have any questions, please do not hesitate to contact me at ( )

3. Thank you.

Sincerely
Josette Gregory, RD

APPENDIX I

DESCRIPTIVE STATISTICS FOR PEDIATRIC BREATHING SURVEY

Frequencies

Statistics

		X1	X10	X11	X12	X13	X14	X15
N	Valid	84	84	84	83	84	82	84
	Missing	0	0	0	1	0	2	0

Statistics

		X16	X17	X18	X19	X2	X20	X21
N	Valid	83	84	84	84	84	83	81
	Missing	1	0	0	0	0	1	3

Statistics

		X22	X23	X24	X25	X26	X27	X28
N	Valid	80	82	81	79	79	79	78
	Missing	4	2	3	5	5	5	6

Statistics

		X29	X3	X30	X31	X4	X5	X6
N	Valid	83	83	82	80	83	84	84
	Missing	1	1	2	4	1	0	0

Statistics

		X7	X8	X9
N	Valid	83	81	84
	Missing	1	3	0

Frequency Table

X1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	17	20.2	20.2	20.2
	2.00	17	20.2	20.2	40.5
	3.00	23	27.4	27.4	67.9
	4.00	24	28.6	28.6	96.4
	5.00	3	3.6	3.6	100.0
	Total	84	100.0	100.0	

X10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	15	17.9	17.9	17.9
	2.00	18	21.4	21.4	39.3
	3.00	30	35.7	35.7	75.0
	4.00	17	20.2	20.2	95.2
	5.00	4	4.8	4.8	100.0
	Total	84	100.0	100.0	

X11

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	19	22.6	22.6	22.6
	2.00	8	9.5	9.5	32.1
	3.00	26	31.0	31.0	63.1
	4.00	25	29.8	29.8	92.9
	5.00	6	7.1	7.1	100.0
	Total	84	100.0	100.0	

X12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	29	34.5	34.9	34.9
	2.00	11	13.1	13.3	48.2
	3.00	19	22.6	22.9	71.1
	4.00	18	21.4	21.7	92.8
	5.00	6	7.1	7.2	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	25	29.8	29.8	29.8
	2.00	17	20.2	20.2	50.0
	3.00	14	16.7	16.7	66.7
	4.00	19	22.6	22.6	89.3
	5.00	9	10.7	10.7	100.0
	Total	84	100.0	100.0	

X14

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	25	29.8	30.5	30.5
	2.00	15	17.9	18.3	48.8
	3.00	21	25.0	25.6	74.4
	4.00	16	19.0	19.5	93.9
	5.00	5	6.0	6.1	100.0
	Total	82	97.6	100.0	
Missing	System	2	2.4		
Total		84	100.0		

X15

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	31	36.9	36.9	36.9
	2.00	12	14.3	14.3	51.2
	3.00	22	26.2	26.2	77.4
	4.00	13	15.5	15.5	92.9
	5.00	6	7.1	7.1	100.0
	Total	84	100.0	100.0	

X16

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	21	25.0	25.3	25.3
	2.00	14	16.7	16.9	42.2
	3.00	19	22.6	22.9	65.1
	4.00	18	21.4	21.7	86.7
	5.00	11	13.1	13.3	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X17

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	15	17.9	17.9	17.9
	2.00	16	19.0	19.0	36.9
	3.00	31	36.9	36.9	73.8
	4.00	14	16.7	16.7	90.5
	5.00	8	9.5	9.5	100.0
	Total	84	100.0	100.0	

X18

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	18	21.4	21.4	21.4
	2.00	12	14.3	14.3	35.7
	3.00	29	34.5	34.5	70.2
	4.00	17	20.2	20.2	90.5
	5.00	8	9.5	9.5	100.0
	Total	84	100.0	100.0	

X19

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	29	34.5	34.5	34.5
	2.00	9	10.7	10.7	45.2
	3.00	20	23.8	23.8	69.0
	4.00	17	20.2	20.2	89.3
	5.00	9	10.7	10.7	100.0
	Total	84	100.0	100.0	

X2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	21	25.0	25.0	25.0
	2.00	21	25.0	25.0	50.0
	3.00	20	23.8	23.8	73.8
	4.00	17	20.2	20.2	94.0
	5.00	5	6.0	6.0	100.0
	Total	84	100.0	100.0	

X20

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	21	25.0	25.3	25.3
	2.00	16	19.0	19.3	44.6
	3.00	23	27.4	27.7	72.3
	4.00	18	21.4	21.7	94.0
	5.00	5	6.0	6.0	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X21

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	44	52.4	54.3	54.3
	2.00	37	44.0	45.7	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

X22

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	58	69.0	72.5	72.5
	2.00	22	26.2	27.5	100.0
	Total	80	95.2	100.0	
Missing	System	4	4.8		
Total		84	100.0		

X23

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	39	46.4	47.6	47.6
	2.00	43	51.2	52.4	100.0
	Total	82	97.6	100.0	
Missing	System	2	2.4		
Total		84	100.0		

X24

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	67	79.8	82.7	82.7
	2.00	14	16.7	17.3	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

X25

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	60	71.4	75.9	75.9
	2.00	19	22.6	24.1	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

X26

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	58	69.0	73.4	73.4
	2.00	21	25.0	26.6	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

X27

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	39	46.4	49.4	49.4
	2.00	40	47.6	50.6	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

X28

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	52	61.9	66.7	66.7
	2.00	26	31.0	33.3	100.0
	Total	78	92.9	100.0	
Missing	System	6	7.1		
Total		84	100.0		

X29

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	68	81.0	81.9	81.9
	2.00	14	16.7	16.9	98.8
	3.00	1	1.2	1.2	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	24	28.6	28.9	28.9
	2.00	15	17.9	18.1	47.0
	3.00	16	19.0	19.3	66.3
	4.00	26	31.0	31.3	97.6
	5.00	2	2.4	2.4	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X30

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	73	86.9	89.0	89.0
	2.00	8	9.5	9.8	98.8
	3.00	1	1.2	1.2	100.0
	Total	82	97.6	100.0	
Missing	System	2	2.4		
Total		84	100.0		

X31

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	68	81.0	85.0	85.0
	2.00	11	13.1	13.8	98.8
	3.00	1	1.2	1.3	100.0
	Total	80	95.2	100.0	
Missing	System	4	4.8		
Total		84	100.0		

X4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	35	41.7	42.2	42.2
	2.00	6	7.1	7.2	49.4
	3.00	22	26.2	26.5	75.9
	4.00	15	17.9	18.1	94.0
	5.00	5	6.0	6.0	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	20	23.8	23.8	23.8
	2.00	17	20.2	20.2	44.0
	3.00	24	28.6	28.6	72.6
	4.00	17	20.2	20.2	92.9
	5.00	6	7.1	7.1	100.0
	Total	84	100.0	100.0	

X6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	25	29.8	29.8	29.8
	2.00	14	16.7	16.7	46.4
	3.00	30	35.7	35.7	82.1
	4.00	12	14.3	14.3	96.4
	5.00	3	3.6	3.6	100.0
	Total	84	100.0	100.0	

X7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	18	21.4	21.7	21.7
	2.00	13	15.5	15.7	37.3
	3.00	26	31.0	31.3	68.7
	4.00	18	21.4	21.7	90.4
	5.00	8	9.5	9.6	100.0
	Total	83	98.8	100.0	
Missing	System	1	1.2		
Total		84	100.0		

X8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	19	22.6	23.5	23.5
	2.00	17	20.2	21.0	44.4
	3.00	21	25.0	25.9	70.4
	4.00	19	22.6	23.5	93.8
	5.00	5	6.0	6.2	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

X9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	17	20.2	20.2	20.2
	2.00	18	21.4	21.4	41.7
	3.00	33	39.3	39.3	81.0
	4.00	14	16.7	16.7	97.6
	5.00	2	2.4	2.4	100.0
	Total	84	100.0	100.0	

APPENDIX J

DESCRIPTIVE STATISTICS FOR DR. JUNIPER'S PEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE

Frequencies PAQOLQ

Statistics

		Z1	Z10	Z11	Z12	Z13	Z14	Z15
N	Valid	45	81	81	79	78	79	79
	Missing	39	3	3	5	6	5	5

Statistics

		Z16	Z17	Z18	Z19	Z2	Z20	Z21
N	Valid	79	78	78	77	15	78	79
	Missing	5	6	6	7	69	6	5

Statistics

		Z22	Z3	Z4	Z5	Z6	Z7
N	Valid	80	14	69	80	80	81
	Missing	4	70	15	4	4	3

Statistics

		Z8	Z9
N	Valid	81	81
	Missing	3	3

Frequency Table

Z1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	2.4	4.4	4.4
	2.00	6	7.1	13.3	17.8
	3.00	5	6.0	11.1	28.9
	4.00	7	8.3	15.6	44.4
	5.00	10	11.9	22.2	66.7
	6.00	6	7.1	13.3	80.0
	7.00	9	10.7	20.0	100.0
	Total	45	53.6	100.0	
Missing	System	39	46.4		
Total		84	100.0		

Z10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	4	4.8	4.9	4.9
	2.00	15	17.9	18.5	23.5
	3.00	21	25.0	25.9	49.4
	4.00	11	13.1	13.6	63.0
	5.00	13	15.5	16.0	79.0
	6.00	7	8.3	8.6	87.7
	7.00	10	11.9	12.3	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

Z11

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	1.2	1.2	1.2
	2.00	14	16.7	17.3	18.5
	3.00	12	14.3	14.8	33.3
	4.00	16	19.0	19.8	53.1
	5.00	13	15.5	16.0	69.1
	6.00	10	11.9	12.3	81.5
	7.00	15	17.9	18.5	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

Z12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	6	7.1	7.6	7.6
	2.00	10	11.9	12.7	20.3
	3.00	13	15.5	16.5	36.7
	4.00	21	25.0	26.6	63.3
	5.00	12	14.3	15.2	78.5
	6.00	8	9.5	10.1	88.6
	7.00	9	10.7	11.4	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

Z13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	3.6	3.8	3.8
	2.00	12	14.3	15.4	19.2
	3.00	13	15.5	16.7	35.9
	4.00	13	15.5	16.7	52.6
	5.00	12	14.3	15.4	67.9
	6.00	7	8.3	9.0	76.9
	7.00	18	21.4	23.1	100.0
	Total	78	92.9	100.0	
Missing	System	6	7.1		
Total		84	100.0		

Z14

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	5	6.0	6.3	6.3
	2.00	18	21.4	22.8	29.1
	3.00	15	17.9	19.0	48.1
	4.00	13	15.5	16.5	64.6
	5.00	13	15.5	16.5	81.0
	6.00	7	8.3	8.9	89.9
	7.00	8	9.5	10.1	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

Z15

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	4	4.8	5.1	5.1
	2.00	13	15.5	16.5	21.5
	3.00	14	16.7	17.7	39.2
	4.00	14	16.7	17.7	57.0
	5.00	14	16.7	17.7	74.7
	6.00	8	9.5	10.1	84.8
	7.00	12	14.3	15.2	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

Z16

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	3.6	3.8	3.8
	2.00	14	16.7	17.7	21.5
	3.00	5	6.0	6.3	27.8
	4.00	24	28.6	30.4	58.2
	5.00	9	10.7	11.4	69.6
	6.00	8	9.5	10.1	79.7
	7.00	16	19.0	20.3	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

Z17

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	3.6	3.8	3.8
	2.00	11	13.1	14.1	17.9
	3.00	15	17.9	19.2	37.2
	4.00	17	20.2	21.8	59.0
	5.00	16	19.0	20.5	79.5
	6.00	7	8.3	9.0	88.5
	7.00	9	10.7	11.5	100.0
	Total	78	92.9	100.0	
Missing	System	6	7.1		
Total		84	100.0		

Z18

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	4	4.8	5.1	5.1
	2.00	12	14.3	15.4	20.5
	3.00	22	26.2	28.2	48.7
	4.00	14	16.7	17.9	66.7
	5.00	16	19.0	20.5	87.2
	6.00	3	3.6	3.8	91.0
	7.00	7	8.3	9.0	100.0
	Total	78	92.9	100.0	
Missing	System	6	7.1		
Total		84	100.0		

Z19

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	6	7.1	7.8	7.8
	2.00	8	9.5	10.4	18.2
	3.00	17	20.2	22.1	40.3
	4.00	18	21.4	23.4	63.6
	5.00	11	13.1	14.3	77.9
	6.00	8	9.5	10.4	88.3
	7.00	9	10.7	11.7	100.0
	Total	77	91.7	100.0	
Missing	System	7	8.3		
Total		84	100.0		

Z2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	1.2	6.7	6.7
	2.00	3	3.6	20.0	26.7
	3.00	2	2.4	13.3	40.0
	4.00	3	3.6	20.0	60.0
	5.00	2	2.4	13.3	73.3
	6.00	1	1.2	6.7	80.0
	7.00	3	3.6	20.0	100.0
	Total	15	17.9	100.0	
Missing	System	69	82.1		
Total		84	100.0		

Z20

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	4	4.8	5.1	5.1
	2.00	11	13.1	14.1	19.2
	3.00	9	10.7	11.5	30.8
	4.00	22	26.2	28.2	59.0
	5.00	12	14.3	15.4	74.4
	6.00	6	7.1	7.7	82.1
	7.00	14	16.7	17.9	100.0
	Total	78	92.9	100.0	
Missing	System	6	7.1		
Total		84	100.0		

Z21

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	4	4.8	5.1	5.1
	2.00	13	15.5	16.5	21.5
	3.00	14	16.7	17.7	39.2
	4.00	15	17.9	19.0	58.2
	5.00	11	13.1	13.9	72.2
	6.00	5	6.0	6.3	78.5
	7.00	17	20.2	21.5	100.0
	Total	79	94.0	100.0	
Missing	System	5	6.0		
Total		84	100.0		

Z22

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	3.6	3.8	3.8
	2.00	13	15.5	16.3	20.0
	3.00	17	20.2	21.3	41.3
	4.00	18	21.4	22.5	63.8
	5.00	12	14.3	15.0	78.8
	6.00	10	11.9	12.5	91.3
	7.00	7	8.3	8.8	100.0
	Total	80	95.2	100.0	
Missing	System	4	4.8		
Total		84	100.0		

Z3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	2	2.4	14.3	14.3
	3.00	1	1.2	7.1	21.4
	4.00	4	4.8	28.6	50.0
	5.00	3	3.6	21.4	71.4
	6.00	1	1.2	7.1	78.6
	7.00	3	3.6	21.4	100.0
	Total	14	16.7	100.0	
Missing	System	70	83.3		
Total		84	100.0		

Z4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	2.4	2.9	2.9
	2.00	7	8.3	10.1	13.0
	3.00	16	19.0	23.2	36.2
	4.00	11	13.1	15.9	52.2
	5.00	14	16.7	20.3	72.5
	6.00	8	9.5	11.6	84.1
	7.00	11	13.1	15.9	100.0
	Total	69	82.1	100.0	
Missing	System	15	17.9		
Total		84	100.0		

Z5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	1.2	1.3	1.3
	2.00	11	13.1	13.8	15.0
	3.00	15	17.9	18.8	33.8
	4.00	19	22.6	23.8	57.5
	5.00	15	17.9	18.8	76.3
	6.00	8	9.5	10.0	86.3
	7.00	11	13.1	13.8	100.0
	Total	80	95.2	100.0	
Missing	System	4	4.8		
Total		84	100.0		

Z6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	2.4	2.5	2.5
	2.00	12	14.3	15.0	17.5
	3.00	16	19.0	20.0	37.5
	4.00	21	25.0	26.3	63.8
	5.00	12	14.3	15.0	78.8
	6.00	6	7.1	7.5	86.3
	7.00	11	13.1	13.8	100.0
	Total	80	95.2	100.0	
Missing	System	4	4.8		
Total		84	100.0		

Z7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	3.6	3.7	3.7
	2.00	10	11.9	12.3	16.0
	3.00	16	19.0	19.8	35.8
	4.00	15	17.9	18.5	54.3
	5.00	18	21.4	22.2	76.5
	6.00	6	7.1	7.4	84.0
	7.00	13	15.5	16.0	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

Z8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	2.4	2.5	2.5
	2.00	9	10.7	11.1	13.6
	3.00	20	23.8	24.7	38.3
	4.00	11	13.1	13.6	51.9
	5.00	12	14.3	14.8	66.7
	6.00	10	11.9	12.3	79.0
	7.00	17	20.2	21.0	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

Z9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	2.4	2.5	2.5
	2.00	17	20.2	21.0	23.5
	3.00	10	11.9	12.3	35.8
	4.00	13	15.5	16.0	51.9
	5.00	10	11.9	12.3	64.2
	6.00	9	10.7	11.1	75.3
	7.00	20	23.8	24.7	100.0
	Total	81	96.4	100.0	
Missing	System	3	3.6		
Total		84	100.0		

APPENDIX K

CHI-SQUARE ANALYSIS OF TRADITIONAL HEALTH BELIEF DOMAIN

APPENDIX K — Chi-Square Analysis of Traditional Health Belief Domain

	RACE--Percent Responding YES			PARENT'S GRADE LEVEL			INCOME				
	Caucasian	African-American	p-value	9-12/ GED	>2 yrs college	p-value	>10K	11-20K	21-30K	>30K	p-value
There is no cure for asthma	56.5%	52.3%	.74050	52.8%	50.0%	.81905	56.0%	41.7%	55.6%	66.7%	.52219
Asthma medications cost too much	69.6%	68.2%	.90773	72.2%	74.2%	.85597	70.4%	72.7%	77.8%	66.7%	.95153
It is very difficult to manage asthma at home	39.1%	45.7%	.60644	48.6%	43.8%	.68407	50.0%	39.1%	66.7%	33.3%	.40086
I can manage my child's asthma at home	78.3%	88.9%	.24170	83.3%	81.3%	.82203	81.5%	87.0%	66.7%	91.7%	.44854
Prayer can cure disease	71.4%	77.3%	.60899	77.1%	73.3%	.72226	80.8%	73.9%	100.0%	59.5%	.12437
Prayer can heal asthma	61.9%	75.0%	.27768	74.3%	70.0%	.70028	77.8%	68.2%	100.0%	54.5%	.13922
I have the money for all my medicine for asthma	*66.7%	*34.8%	.01491*	*30.6%	*58.1%	.02345*	[a]37.0%	[a]22.7%	[b]75.0%	[b]83.3%	.00170*
If doctors cannot cure you, you should try going to your minister	50.0%	70.5%	.10343	68.6%	61.3%	.533554	63.0%	72.7%	87.5%	41.7%	.15159
Is your home warm in the winter and rainy seasons?	82.6%	78.7%	.26763	76.3%	84.4%	.28671	75.0%	87.5%	66.7%	91.7%	.13995
Is your home air-conditioned in the summer?	87.0%	89.4%	.34787	84.2%	90%.6	.26544	89.3%	79.2%	88.9%	100.0%	.06275
Is your home free of a lot of humidity in the height of the summer months?	87.0%	80.0%	.19708	83.3%	81.3%	.56403	84.6%	83.3%	77.8%	83.3%	.31436

*significantly different at p05
a,b columns with different letters indicate a significant difference at p05

APPENDIX L

LETTER OF PERMISSION FROM DR. ELIZABETH JUNIPER

McMASTER UNIVERSITY
Department of Clinical Epidemiology & Biostatistics
1200 Main Street West, Hamilton, Ontario, Canada L8N 3Z5
Telephone: Area Code 905 525-9140
Fax: Area Code 905 577-0017

Telephone Extension: 22153
E-Mail: juniper@fhs.csu.mcmaster.ca

February 3, 1998

Linda Galloway
Old Dominion University
1837 Ewing Place
Virginia Beach, VA 23456
U.S.A.

Dear Ms. Galloway:

This is to confirm that you have permission to use the Paediatric Asthma Quality of Life Questionnaires in your research project.

Please note that there is no licensing fee required for use of the Questionnaires by non-profit academic institutions.

Good luck with your research project!

Yours sincerely,

Elizabeth Juniper MCSP, MSc.
Associate Clinical Professor

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APPENDIX M

CURRICULUM VITAE

LINDA B. GALLOWAY

EXPERIENCE

Social Security Administration, Claims Representative
Responsible for intake of retirement, disability, Social Security Supplement claims and widow's claims.

Portsmouth Naval Hospital, Registered Respiratory Therapist.
Familiar with all life support equipment.
Worked extensively in the Intensive Care Unit.
Performed pulmonary function studies and asthma education.
Constructed Policy and Procedure Manual for Pediatric Asthma Clinic.

Old Dominion University, Doctoral Candidate
Researched asthma management and quality of life.
Performed quantitative and qualitative statistical analysis.
Provided program evaluation and design.
Worked as a research assistant/teacher assistant.

Norfolk State University, Assistant Professor
Coordinated health services management program.
Taught undergraduate purchasing finance, research and management.
Established the masters degree program in hospital administration.

Newport News General Hospital, Manager/Supervisor
Director of respiratory therapy and vascular departments.
Responsible for budget, management and in-service education to medical staff.
Served on the safety, quality assurance and educational committees.

Norfolk General Hospital, Staff Therapist
Worked as a staff and respiratory care practitioner.
Served on the quality assurance/continuous quality improvement committees.
Taught blood borne pathogens to hospital staff.