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A Pilot Study of the Knowledge, Attitude and Self-Efficacy Asthma Questionnaire with Pediatric Revisions

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Abstract

The purpose of this paper is to describe pilot testing of the Knowledge, Attitude and Self-Efficacy Asthma Questionnaire (KASE-AQ) with pediatric revisions with nine to twelve year old children with asthma. A review of relevant literature will be provided. The adult and pediatric KASE-AQ tools will be described. The revisions to the adult tool in order to facilitate use in a pediatric population will be explained. The recruitment plan, consent and assent processes and testing methods are described. Results of pilot testing of ten subjects, ages 9 to 11 demonstrated that children were willing and able to respond to this questionnaire. There were no missing responses for any items. Overall, scoring on the knowledge domain was high, indicating that the knowledge questions were generally understood by the participating children. Cronbach's alpha for the attitude and self-efficacy domains without questions using reverse scoring is .892. Cronbach's alpha for both domains in their entirety is .800. Separate Cronbach's alpha values for the self-efficacy and attitude domains were .767 and .843 respectively. While there were limitations to this pilot project, overall findings provide evidence that further testing and evaluation of the KASE-AQ with pediatric revisions is warranted.

Introduction

Asthma is a chronic respiratory disease that is characterized by three equally causative components (Berger, 2004). The first component is chronic inflammation of the lining of the airways (Bernstein, 2000). This inflammation can develop over a period of time due to the presence of chronic stimulation by asthma triggers and untreated or under-treated bronchospasm (Bernstein). Constriction or spasm of the muscles that surround the breathing tubes, commonly called bronchospasm or bronchoconstriction, is the second component of asthma (Berger). This constriction usually occurs due to acute exposure to triggers such as allergens or cold viruses and may also occur in response to exercise (Bernstein). The third component of asthma is the tendency of the lungs of an asthmatic to produce thick, tenacious mucus when over-stimulated (Berger).

Asthma, as briefly described above, is a significant cause of morbidity and mortality among school aged children in the United States (Doull, Williams, Freezer & Holgate, 1996). Childhood asthma is a disease entity that has a significant impact on pediatric patients as young as kindergarteners in terms of limitation on activity, missed days of school and emergency medical treatment (Grant et al, 1999). Pediatric asthma also has a significant impact on society due to the demand for healthcare resources, and the impaired quality of life of children with poorly managed asthma and their families (Clayton, 2005).

Unlike some other childhood health conditions, asthma is highly treatable and its long-term sequelae highly preventable (Creer, 2001). Children with previously undiagnosed or currently under-treated asthma are being identified in vast numbers due to a plethora of in-school asthma screening programs springing up as of late. In spite of these programs, asthma remains the leading cause of pediatric hospitalization and school absenteeism in this country (Clayton, 2005). In addition to the discussion of programs for school-based screening of children for asthma that may have been previously undetected or under-treated, recent literature has also discussed many asthma education and self management programs, frequently incorporated into the regular school curriculum of asthmatic children (Velsor-Friedrich & Srof, 2000). Most pediatric asthma assessment tools published to date focus on quality of life issues or rely on partial parental input for completion.

This pilot study will test a pre and post educational intervention assessment tool designed to aid the asthma educator in gauging the effectiveness of a given intervention program. It may also be useful in an office setting to gauge the effectiveness of educational information provided during an evaluation. This will involve revision of an existing assessment tool for adults with asthma, the KASE-AQ, to be appropriate to a pediatric population. The proposed tool is intended to be completed solely by the pediatric patient with asthma. Continued efforts in the detection and management of asthma with school based programs nationwide, may significantly decrease school absentee rates, activity limitations, hospitalizations and emergency room treatment required by children as a result of asthma (Christiansen & Zuraw, 2002). These

improvements in pediatric management would contribute to meeting the objectives of Healthy People 2010 that relate to asthma and decrease the financial burden on the healthcare system that is caused by asthma related expenditures; however, a tool to assess the effectiveness of such programs is indicated. Such a tool must be developmentally appropriate in content, pertinent to the everyday life experiences of children with asthma and broad enough in scope of material covered and questions asked in order to be applicable and useful with various asthma education programs.

Review of Literature

A review of recent literature reveals varied questionnaires and surveys designed to assess assorted aspects of asthma in children. Many published pediatric asthma assessment tools to date examine only one aspect of this chronic condition, typically quality of life (QOL). While quality of life is a very important aspect of any chronic condition, assessing the knowledge of a child regarding his or her asthma is not addressed. Many asthma assessment tools rely on input from a parent or completion of the survey entirely by the parent. One might argue that a survey tool completed by the child would better determine his or her own attitude regarding his or her asthma and the level of self-efficacy of symptom management.

The Paediatric Asthma Quality of Life Questionnaire, the Feeling Thermometer (Juniper, Guyatt, Feeny, Ferrie, Griffith & Townsend, 1996) was one of the first questionnaires published in recent literature that deals primarily with evaluating asthma in children. This 23 item tool uses a Likert-type scale to assess different aspects of everyday life that a child with asthma might find troublesome. To use this

questionnaire, a trained interviewer would administer it one on one with a child at a clinic visit. The interviewer asks a question and the child responds by choosing an answer from color-coded flash cards. By incorporating changes in the questionnaire over time, coupled with objective data such as pulmonary function test results and physical assessment, the authors suggest that a more complete picture of a child's health might be evaluated. Clinical testing of this tool noted that it had valid measurement properties in children from age 7 to age 17. The limitation of the questionnaire identified by the authors at the time of original publication is the small sample size, 52 children, used to test it. Strengths, as discussed by the authors are that it "is simple and easy to use and is applicable to children as young as seven" (Juniper et al).

Bursch, Schwankovsky, Gilbert, and Zeiger (1999) reviewed four health belief measures constructed for children with asthma and their parents. The Parent Barriers to Managing Asthma scale measures perceived barriers such as lack of access to medical care, transportation difficulties, side effects of prescribed medications, cost, time constraints, child care burdens, difficulty understanding medical devices and problems getting the child to take the asthma medication. The Parent Asthma Self-Efficacy scale measures self efficacy of the parent with regard to prevention and management of asthma attacks in the child. The Parent Treatment Scale measures the parents' beliefs about whether various asthma treatments will be effective in preventing or managing asthma symptoms. The Child Asthma Self-Efficacy scale measures the self-efficacy of the child with regard to prevention and management of asthma attacks. One limitation of these assessment tools explained by the authors is that they were tested only among

families enrolled in the Kaiser Permanente Health System. Because this is a pre-paid health plan, member's perceived barriers may differ from those of families with an asthmatic child who is enrolled in other health care plans. They suggested future research with a broader population to examine the relationships between these scales.

Bukstein, McGrath, Buchner, Landgraf and Goss (2000) described a parent-completed asthma quality of life questionnaire. For evaluation of this tool, a parent of an asthmatic child completed a general questionnaire and an asthma specific questionnaire during an office visit. Parent responses to the survey questions were compared to pulmonary function test results and physical assessment finding in order to gauge changes over time. The final result was an eight item, asthma specific questionnaire, the Integrated Therapeutics Group Child Asthma Short Form. A limitation of this tool is that the parent assesses the quality of life of the child without input from the child. Though this may be applicable and likely necessary with younger children, one might surmise that health-related quality of life of adolescents and teens might be more accurately assessed by patient completed questionnaires. One strength of the tool is that its brevity makes it practical for use in clinical and office settings.

Santanello (2001) contends that asthma medications may not be adequately tested in children because of the unique challenges inherent in pediatric clinical trials. In attempting to address these challenges, she discusses the validation of two symptom diaries, conducted by researcher in the pharmaceutical industry and used for pediatric asthma assessment specifically in clinical trials. The Pediatric Asthma Diary is a patient completed tool designed to evaluate daytime and nighttime asthma symptoms in children ages 6 to 14. The Pediatric Asthma Caregiver Diary is a parent completed

survey to assess asthma symptoms in two to five year old children. Responses to the diary questions by either the parent or child were compared with objective assessments of health and asthma symptoms made by health care professionals. Results of both diaries correlated accurately with physical findings of a health care provider over the course of the pilot project. Santanello concluded that diaries such as these can provide a reasonable assessment of pediatric participants in asthma trials but that because varied aspects of the asthma disease state are measured, accuracy increases when diaries are used in conjunction with physical examination and pulmonary function testing.

Hall, Wakefield, Rowe, Carlisle and Cloutier (2001) validated a questionnaire designed to aid primary care providers in diagnosing pediatric asthma. The Easy Breathing Survey, as it is called, was administered to all new pediatric patients seen at six primary care clinics in Hartford, Connecticut. The finished product is a four question survey that can be used in children ages 6 months to 18 years. It can be completed by parents of children who are too young to read or by the children themselves. A combination of the responses on the survey, additional verbal questioning and history from a child's medical record was used to determine if the child had asthma. Major strengths of this survey are that it can be completed rapidly and that it demonstrates high sensitivity for picking up severe levels of asthma. One weakness is that it is not as accurate in diagnosing milder asthma in patients being seen for the first time.

Redline, Larkin, Kercsmar, Berger, and Siminoff (2003) conducted a school-based asthma and allergy screening project utilizing survey instruments completed by parents and children. The Parent Symptom Questionnaire included five questions regarding

asthma symptoms, four questions that deal with allergic rhinitis symptoms and one question that pertains to symptoms of atopic dermatitis. The Student Symptom Questionnaire contained 25 questions assessing asthma, allergic rhinitis and atopic dermatitis symptoms. The authors commented that their validation sample was rather small but that the surveys were accurate in recognizing previously undiagnosed asthma and allergy type conditions in the participating children. The major drawbacks of any school based program, such as this one, are the expense involved and the need for repeated attempts to collect data due to initial low response rates.

Gorelick, Scribano, Stevens and Schultz (2003) discussed a tool designed to predict response to intervention in children treated for acute asthma. The Child Health Questionnaire was administered at the time of treatment for an acute exacerbation of asthma and then at a 14 day interval following emergency room treatment. The majority of the patients enrolled did not have regular access to health care and tended to use emergency services as primary care. While this is not an ideal situation for long term asthma management, it worked well for this project as the majority of the patients returned to the emergency department for the recommended 14 day follow up. Overall, changes in the perceptions of the children with regard to asthma symptom status correlated with objective findings. A weakness of this study is that physiologic measures, such as peak flow values or pulmonary function testing were not used as comparative measures at the follow up visit.

Varni, Burwinkle, Paroff, Kamps and Olson (2004) designed and tested a modular instrument to measure quality of life in asthmatic children ages 2 to 18. They explained the benefits of incorporating disease specific language and assessment

parameters into a generic quality of life survey. They noted that the cross information obtained from surveying both the pediatric participants and their children supported the need to measure both perspectives in order to fully understand the impact of asthma symptoms on quality of life. They also explained that the correlation between the responses of the younger children and the responses of their parents was important in that the parental perspective can be utilized at times when children are unable or unwilling to answer questions.

Chan, Mangione-Smith, Burwinkle, Rosen, and Varni (2005) used a shortened version of the same pediatric quality of life tool in a later project. For the purpose of this project, children without asthma, termed "healthy" by the authors, and asthmatic children were surveyed with the same instrument in order to determine if the instrument could distinguish between the different clinical statuses of the groups. They determined that the shorter version of the survey should be useful in assessing treatment effectiveness and quality of life changes in clinical research studies of children with asthma. One module of this survey deals with activity limitations in the form of missed school days. A weakness of this tool is that the missed school days are not qualified as pertaining to asthma symptoms or to other, un-related illnesses or reasons.

While all of the reviewed pediatric asthma assessment tools report accurate measurement of quality of life and related changes, whether completed by the pediatric asthma patient or by the parent of the patient, none assess concrete knowledge about asthma symptoms or how the child feels about his or her asthma. The KASE-AQ measures three aspects of chronic disease management that contribute to quality of life.

Attitude, the first variable of the KASE-AQ, is an important variable in the success or failure of treatment. Self-efficacy, or the confidence that a patient has in successfully implementing his or her treatment plan is a second variable measured by the KASE-AQ and not specifically addressed in a quality of life tool. Knowledge of asthma physiology and symptom recognition is the third variable specifically addressed by the KASE-AQ. If a patient exhibits a positive attitude, he or she will be more likely to be compliant with medication and to devote time and effort toward symptom management. A high level of self-efficacy, coupled with a positive attitude and a working knowledge of asthma symptoms, triggers and self-management techniques may not only increase treatment compliance and allow for recognition of early warning signs of asthma destabilization, but also increase the persistence of a patient in attaining control of symptoms during periods of symptom exacerbation.

Methods

Adult KASE-AQ

The Knowledge, Attitude and Self Efficacy Asthma Questionnaire (see Appendix A) was originally designed as a pre and post adult asthma intervention tool to aid in determining the effectiveness of a program about asthma management (Wigal, Stout, Brandon, Winder, McConnaughy, Creer & Kotses, 1993). The authors created a questionnaire designed to assess three domains: knowledge of asthma, attitude toward one's asthma and self-efficacy of asthma management. Each domain has 20 questions for a total of 60 questions that comprise the entire questionnaire. Each question is presented in a multiple choice format with a total of five possible answers supplied.

Only one answer for each of the knowledge questions is correct. Rather than a correct answer, the attitude and self-efficacy scales are used to assess the effectiveness of an intervention by demonstrating a positive shift in answers between the pre test and the post test.

The knowledge domain considers factual information that an adult may have regarding asthma. A patient, in conjunction with his or her health care provider, may work better to manage the symptoms of a chronic condition if he or she posses a working knowledge of the disorder. In the case of asthma, a patient who recognizes early warning signs of an asthma exacerbation may better manage the increased symptoms by knowing the appropriate steps to take. An example of a question from the knowledge domain would be one asking what part of the body is not a component of the respiratory system.

Which one of the following is not a component of the respiratory system?

a. *Alveoli*
b. *Larynx*
c. *Trachea*
d. *Bronchial tubes*
e. *Duodenum*

The attitude domain is the second component of the KASE-AQ. This domain is used to evaluate a patient's outlook on his or her illness or condition. If a patient exhibits a positive attitude with regard to his or her asthma, he or she will probably be more compliant with prescribed medication and other interventions suggested by the given health care provider. In the pre and post intervention test scenario, a change in attitude, ideally a shift toward the positive, would be exhibited as a result of a

successful intervention program. An example of a question dealing with a patient's attitude toward asthma would be one that uses a five point Likert-type scale, from "True" to "False" to assess the patient's attitude at that time. Since these questions deal with the patient's attitude toward his or her own asthma, there are no correct or incorrect responses. A higher score suggests a patient has a more positive attitude toward his or her asthma and would likely be more willing and eager to work in cooperation with the physician to manage asthma symptoms. A lower score is suggestive of a more pessimistic and uncooperative attitude.

My physician can handle my asthma without my having to become involved.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

The self-efficacy component of the KASE-AQ aids in assessing an individual's confidence in his or her ability to contribute to the management of his or her asthma. It has been hypothesized by asthma researchers that when a patient is non-compliant with a prescribed medication or treatment plan, health care providers frequently do not know if the subject is simply not cooperative or if he or she may lack the confidence in his or her skills with regard to asthma management (Creer & Levstek, 1996). An example of a question from the self efficacy domain would be one that is answered on a five-point Likert-type scale, from "True" to "False" and asks what a patient thinks about self-management techniques. Since these questions deal with the patient's self-efficacy regarding his or her asthma, there are no correct or incorrect responses. The

higher the score, the more confident the individual would be in his or her ability to manage and control the asthma. The lower the score, the less confident the individual would be in his or her ability to manage and control any asthma symptoms.

I can take the necessary steps to avoid or to manage an asthma attack effectively.

a. *True*
b. *Mostly true*
c. *Sometimes true and sometimes false*
d. *Mostly false*
e. *False*

Sample

In order to determine initial usefulness of the proposed tool in the pediatric population, approximately ten subjects, ages 9 to 12 inclusive, were recruited by means of flyers posted in the office of an asthma specialist. Criteria for inclusion into the pilot test group were boys and girls, ages 9 to 12 inclusive at the time of the project, who carried a diagnosis of asthma. The subjects had to be taking at least one daily controller medication to manage asthma symptoms. Subjects also needed to read and understand English. No specific exclusion criteria, other than not satisfying any of the inclusion criteria were employed. Subjects were recruited from a single asthma practice so as to produce a more homogenous knowledge base regarding asthma terminology and asthma symptom management, prior to the pilot testing project.

Instrument

The instrument tested was based upon the Knowledge, Attitude and Self-Efficacy Asthma Questionnaire (KASE-AQ). This tool was designed in the early 1990's for use as a pre-post asthma intervention assessment in adults (Wigal et al). The KASE-AQ looks at three variables, as described previously, which the authors of the adult

questionnaire explain successful medical regimens, for any disease process, are dependent upon (Wigal et al).

For the purpose of this project, the KASE-AQ was re-written in a language that might be more conducive to use in an early adolescent population (see Appendix B). All of the proposed revisions were reviewed by one of the primary authors (see Appendix C). The nature and order of the original questions was not altered in order to preserve the integrity of the scoring system. Because asthma treatment has undergone major changes since the publication of the KASE-AQ (NAEPP Expert Panel Report Guidelines for The Diagnosis and Management of Asthma - Update on Selected Topics 2002), some questions were no longer appropriate. For example, question 58 in the adult version refers for possible side effects of theophylline, a medication commonly used to treat asthma at the time the original tool was developed. Since theophylline is rarely used by asthma specialists at the present time, the population being tested has no knowledge of the side effects. This question was changed to refer to side effects of bronchodilators, the rescue medication prescribed for each of the ten participants selected and commonly used for asthma treatment today. Other changes included terminology substitutions as children in this age group think in concrete terms rather than abstractly. Question number 23 in the adult version assesses the person's confidence in managing exercise induced symptoms. For the purpose of the pediatric questionnaire, the question was altered to ask about gym class rather than exercise, thereby making an abstract idea, namely exercise into a concrete condition, that of gym class, so as to be more easily understood by children. Permission of the authors was sought prior to revision and use of the tool. The proposed questionnaire, an assent

form and a consent form, and a recruitment flyer were approved by the University of Michigan Institutional Review Board (see Appendix D).

Procedure

Flyers were posted in the office of an asthma specialist in Northwestern Ohio who is also one of the authors of the adult version of this assessment tool. Children and parents who were interested in participating in this project filled out a form and were contacted, via telephone, by the primary investigator to determine eligibility. The first ten children who satisfied the aforementioned inclusion criteria were scheduled to come to the physician's office for one appointment.

At the time of the appointment, the research project was explained to the child and his or her accompanying parent and any questions they had were answered. Each was given time to read the consent and/or assent forms and again asked if they had questions or did not understand any of the material provided. Each was asked questions, by the primary investigator, in order to determine that all of the material was understood. Informed consent was sought from each parent (see Appendix E). Assent was acquired from each child (see Appendix F).

Verbal directions consisting of "please read each question thoroughly and circle the best answer" were provided to each child by the primary investigator. The children were further instructed that in addition to assessing their ability to choose the correct answer, the project would also attempt to assess their ability to understand the language of the questions. Hence, they would not be allowed to ask questions of or request assistance from the parent who accompanied them to the appointment. The children were told that if they had a question, they would be able to ask the primary

investigator only. All of the children verbalized understanding of the directions as presented. The only questions asked were regarding clarifying a word that likely would have directed the child to the correct response. In each instance, three in total, the child was reminded that part of the project was to assess their understanding of the tool. Each was encouraged to choose the best answer as well as they could and save the question until they were finished with the project. All verbalized agreement.

The only potential risk to any of the subjects that was identified by the investigator or the asthma specialist was that reading the questions of the tool might trigger some negative or undesirable feelings about asthma exacerbations or related instances that may have occurred in the past. The children and their parents were told that if any concerns or ill feeling arose as a result of reading the questions, they could feel free to speak with the primary investigator, the physician or any of the office staff regarding these matters. None of the children verbalized concern or ill feelings during the completion of the questionnaire or upon the conclusion. When each child finished the questionnaire, they were verbally asked to write those thoughts about it on the last page of the questionnaire. No mediations were administered and no changes were made to any of the participating subjects' current asthma therapy as a part of this project. Upon completion of the questionnaire, each child was given twenty dollars as a thank you for their time and participation.

Results

Sample Description

The first ten potential subjects who responded to the posted flyer each met the aforementioned inclusion criteria and completed the project. Of these ten, six

respondents were boys and four were girls. Four of the subjects were age nine, three boys and one girl. Three of the subjects were ten years old, two boys and one girl. Three of the subjects were 11 years of age, one boy and two girls.

As this project was conducted during the summer, the children were asked to provide the grade of school that they would be entering for the coming school year. Five subjects, four boys and one girl reported they would be entering the fourth grade. Two subjects, one boy and one girl, indicated they would be entering the fifth grade. Two subjects, one boy and one girl documented they would be entering the sixth grade. One subject, a girl, denoted she would be entering the seventh grade. The sample breakdown is provided in the following table. For the purposes of this pilot project, no special attention was paid to creating an even ratio among the variables of gender, age and grade in school. The following table denotes the sample breakdown.

Table 1 Sample Descriptors

Variable	Boys n= 6	Girls n=4
Age		
9	3	1
10	2	1
11	1	2
12	0	0
Grade in school	Boys n=6	Girls n=4
4th	4	1
5th	1	1
6th	1	1
7th	0	1

Item Analysis

There were no missing items on the ten questionnaires completed. It took the participants between 20 and 40 minutes each to read and respond to the entire survey. All were told prior to beginning the exercise that they could take breaks if they got tired. None of the respondent requested a break. Questions asked of the primary investigator revealed a rather large span of vocabulary knowledge, or lack thereof, among the children who participated. For example, several of the younger children were unfamiliar with the organs of the respiratory system, the words "resent" and "manage" and the meaning of the phrase "get the upper hand." The older children did not ask questions about these items.

Internal consistency coefficients were determined for the attitude and self-efficacy domains individually and in combination. A Cronbach's alpha value of .800 was demonstrated for the attitude and self-efficacy scales in combination, 40 items in the entirety. Seven of the items of these domains utilize reverse scoring, such that a response of "false" might indicate the most desired answer and "true" the least desired. These items are numbers 22, 28, 37, 40 and 50 of the attitude scale and 52 and 55 of the self-efficacy scale. Removal of the seven items of the attitude and self-efficacy scales from the analysis demonstrates a Cronbach's alpha of .892. Cronbach's alpha values for the individual scales were: attitude .843 and self-efficacy .767.

The results of the knowledge domain responses from the ten participants demonstrate a ceiling effect on one question, meaning that all of the children answered the question correctly. Ninety-percent of the children gave correct responses for one additional question. Of the remaining items pertaining to the knowledge domain, three items had eight correct responses and four had seven correct responses. The responses to the remaining ten questions were varied with no predictable pattern. There were no statistically significant correlations between correct responses and age of the child or grade in school. No statistically significant correlations were found between self-efficacy or attitude scores and age of the child and/or grade in school.

Child Responses

Each item of the knowledge domain was scored based on one point for the correct answer and zero points for any incorrect answer. There were 20 questions in the knowledge section for a total of 20 point s if all items were answered correctly. The mean response of the ten children who participated in this pilot project was 10.4 with a

range of 7 to 15 points. A ceiling effect, meaning every child gave the correct response, was noted on question number 30, a question asking about things that could make an asthma attack worse. None of the children correctly answered question number 33, which dealt with side effects of rescue medication.

The attitude domain was made up of 20 questions, each with five responses. The responses were scored on a scale of one to five with a "perfect" score being 100. The mean score of the ten participants was 80.2 with a range of 55 to 94 points noted.

The self-efficacy domain of the tool was also comprised of 20 questions using the same five point scale for scoring. The range of scores for the pilot testing was 59 to 97. The mean of the ten children's scores was 80.5.

Additionally, a final page was included with each child's questionnaire asking for feedback about the instrument. The participants were given a list of descriptors that might be pertinent and asked to circle all that they thought applied. From the list provided, three children thought the exercise was fun while four felt it was not fun. One thought it was short, versus six responding that it was long. Six children chose interesting from the list while two chose boring. Seven indicated that it was easy to read. None of the children chose hard to read as a descriptive term. Lastly, six circled easy to understand and two circled hard to understand from the list of terms provided. Comments are displayed in the following table.

Table 2 Children's Feedback on the questionnaire

Children's Comments	Number of responses
Fun	3
Not fun	4
Short	1
Long	6
Interesting	6
Boring	2
Easy to read	7
Hard to read	0
Easy to understand	6
Hard to understand	2

In addition to the list, the children were also afforded space in which to write any thoughts or comments they had about the tool. Of the ten participants, one chose not to write any thoughts about the survey in the space that was provided. The responses collected ranged from "some of the questions were strange" to different variations of it was fun and would help people. Two of the children commented that it didn't take as long as they had thought it would to complete the questionnaire. One said it seemed long because he "mostly knew most of the stuff." Actual comments given are listed in the following table.

Table 3 Subject Comments

Subject	Comment
1	"I thought that i [sic] was a little long and fun."
2	"I think it would help a lot of people."
3	"Some of the questions were strange"
4	"It was very interesting, but long. I liked some of the questions like the hard ones. The thing was also fun."
5	"The questionnaire felt long because of how many pages their [sic] were and I mostly knew most of the stuff."
6	No response given
7	"I thought this was something that taught me more about asthma."
8	"It took shorter than I thought."
9	"This questionnaire was Interesting like questions 6 and 21 I really don't know."
10	"It was long."

Discussion

Absence of missing items suggests that children of the age group employed were both willing and able to provide quality data of this nature. Most of the children indicated that the instrument was easy to read, though most said it was long. On average, it took approximately 30 minutes to complete, perhaps making it a bit lengthy to be used in its entirety during a clinic visit. In general, the instrument was

understood by these children. The questions asked by the children were few and were mainly related to a wide variation in vocabulary knowledge among this age range.

The children who participated in this project came to the situation with much the same knowledge base regarding asthma and symptom recognition or management, having all been treated by the same physician and educated by nurses with similar training. The question with the ceiling effect dealt with situations that might make an asthma attack get worse. It stands to reason that the population examined would know the correct response since they had specific and repeated education about this during clinic visits. As expected, nine of the children responded correctly to a question about peak flow meters. This can be attributed to the fact that most of them have used a peak flow meter at some time. This information is also regularly reviewed during clinic appointments. None of the children knew the answer to a question regarding exercise-induced asthma. It is likely that these children were educated about how to prevent such symptoms rather than the physiologic processes that caused it making this finding understandable. It may also indicate an area where clinicians need to put a greater emphasis.

The attitude and self-efficacy scores showed a positive skew for most of the children. Even the lowest score among the ten was above the 50th percentile. One would expect scores of this nature, given the strong educational input and clinical support these children have received as part of their care at this specialty practice. It would be useful to compare these scores to those of children who are followed for asthma in a primary care practice.

The reliabilities for the attitude and self-efficacy scales combined and as individual scales were good. According to Nunnally (1978), in early stages of development, reliabilities of .70 or higher are sufficient. If significant correlations are found, further refinement of the instrument is warranted. A Cronbach's alpha of .800 for the attitude and self-efficacy scales combined indicate high reliability. Removal of the reversely scored items strengthens the reliability further to .892. Separate reliabilities of .843 for attitude and .767 for self-efficacy were also good. This suggests that the scales could be used separately or combined depending on the purpose of the research or clinical encounter.

In examining the items utilizing reverse scoring, the responses provided by many of the children are not consistent with their responses to other items of the same nature and topic. The fact that the combined reliability improved with removal of these items calls into question the effectiveness of such questions in this population. It is possible that asking a question in negative terms that expects a positive answer is more abstract than these children were able to comprehend. Further examination is needed to determine if some items could be deleted or modified. The tool is long and the possibility of reduction of some items warrants further consideration. This may increase its practicality and usefulness.

Limitations

There are several weaknesses of the KASE-QA with pediatric revisions as demonstrated by this pilot testing. One weakness is the lack of clarity regarding the use of negatively worded questions or questions that seem to require a negative response in

the early adolescent population. Further exploration of this area may reveal that more concrete questioning would better serve the need this tool aims to meet.

Another weakness is the length of the tool if used in its entirety. Though none of the children declined to complete the questionnaire, a majority did comment that it was long. This could be a limiting factor in usefulness in a clinic setting unless the time needed to complete the survey was calculated into the appointment. The reliabilities for the individual scales suggest that it would be possible to use the individual scales separately.

Another weakness to be discussed is the small sample size used for this project. The instrument needs to be administered to a much larger sample in order to do more advance statistical testing of its psychometric properties.

A final weakness of note is the relative homogeneity of the pilot sample. The ten children who participated in this project are all treated for asthma by the same specialist hence their knowledge of asthma and attitude toward asthma is consistent with the knowledge and attitude demonstrated by the staff of this office. Testing this instrument with children who are newly diagnosed with asthma or who are followed for asthma in a primary care setting is also needed.

More diversity in the sample demographics would also be useful. A majority of the ten participants come from families that enjoy higher socioeconomic status than that of average Americans. Many of these ten children come from homes that enjoy a two-parent household with a stay-at-home mother. The majority of the children have other family members, either a parent or sibling who are also patients of he same asthma

specialist. A tool such as this might not reflect the same findings if used in a general population of asthmatic children.

Conclusion

Future work with this questionnaire should encompass a much larger sample size with special attention to an even ratio of boys and girls, ages nine, ten, eleven and twelve, and the grades in school representative of this span of ages. Testing in a population of asthmatic children from a more diverse background, both socioeconomic in nature and in the access they have had to health care professionals is also indicated to determine if the aforementioned findings hold true. Some items in the knowledge domain could be simplified to better represent the vocabulary range of the intended population. A comparison between the attitude and self-efficacy domains with and without items that utilize reverse scoring is also indicated. Consideration of this tool for use as two or three separate measures may also be of value.

Overall, the findings suggest that further testing and evaluation of the KASE-AQ with pediatric revisions is warranted and would be valuable. An instrument of this nature could be helpful to both researchers seeking to understand the mechanisms children use to cope with asthma and to clinicians working with these children in office or school based settings.

Appendix A

The Knowledge, Attitude, and Self-Efficacy
Asthma Questionnaire

This survey contains a series of statements, written in the first person, concerning your opinions about your asthma. The survey also contains questions regarding your knowledge of asthma. Please read each of the items carefully; then, circle the letter that you feel answers the question best. Remember to CHOOSE ONLY ONE RESPONSE for each item. Thank you.

1. Following a healthy diet and lifestyle will help control my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

2. Which one of the following is not a common asthma symptom?

a. Sore, dry throat
b. Coughing
c. Chest tightness
d. Wheezing
e. Shortness of breath

3. Which one of the following statements is true?

a. Asthma can be the result of an emotional illness
b. People bring asthma on themselves
c. Asthma is the result of how children are raised
d. Asthma is a physical illness
e. Both A and D

4. I can recognize the changes that occur in my lungs before an asthma attack begins.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

5. It is important for me to take my asthma medications as prescribed.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

6. Which one of the following is not a component of the respiratory system?

a. Alveoli
b. Larynx
c. Trachea
d. Bronchial tubes
e. Duodenum

7. The function of the lungs is to:

a. Bring carbon dioxide in and push oxygen out
b. Enhance cardiac output and increase stroke volume
c. Bring oxygen in and push carbon dioxide out
d. Cleanse the nasal passages and prevent keotacidosis
e. Bring oxygen in and push nitrogen out

8. I can do a great deal to solve the problems that asthma can cause.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

9. When it comes to my asthma, I feel that I can avoid having to miss work or other daily responsibilities.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

10. Oxygen is exchanged in the _____:

a. Larynx
b. Alveoli
c. Pancreas
d. Bronchial tubes
e. Trachea

11. I would like to learn as much as I can about how to manage my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

12. Air needs to be _____ before it reaches the lungs.

a. Warmed
b. Humidified
c. Cooled
d. B and C
e. A and B

13. I can prevent asthma in almost all situations.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

14. My family can help me to remain calm during my asthma episodes.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

15. I have confidence in my ability to keep my asthma under control when I am in a different city on vacation or on a business trip.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

16. Which one of the following is not a common asthma trigger?

a. Weather changes
b. Laughing
c. Aspirin
d. Exercise
e. Caffeine

17. I can help my family remain calm during my asthma episodes.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

18. Which one of these physiological changes does not occur in the respiratory system before and during an asthma attack?

a. The muscles around the bronchial tubes tighten
b. The mucus in the bronchial tubes thickens
c. The inner lining of the bronchial tubes swells
d. The blood vessels of the bronchial tubes enlarge
e. The airways narrow

19. I can take the necessary steps to avoid or to manage an asthma attack effectively.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

20. I feel comfortable taking my asthma medications when I am at work or away from home.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

21. The number of people with asthma in the United States is approximately _____:

a. 10 million
b. 5 million
c. 3 million
d. 1 million
e. 200,000

22. My asthma is not bad enough to warrant my having to learn asthma management strategies.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

23. I feel confident in my ability to exercise without having an asthma attack.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

24. Which one of the following statements is false?

a. The best time to treat an attack is before it starts.
b. The longer you wait to treat an attack after it begins, the more likely the attack is to clear.
c. Modifying your activities, drinking clear liquids, and using your inhaler will help clear an attack.
d. An attack can be treated before it begins by paying attention to your medications, the environment, your asthma triggers, your early warning signs, and your health habits.
e. For some people, menstrual periods may trigger asthma attacks.

25. My family can help me get the upper hand on my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

26. I do very well at perceiving the level of my asthma at all times, including when I am experiencing no asthma at all, when I am experiencing slight asthma, when I am experiencing moderate asthma, and when I am experiencing severe asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

27. When I have an asthma attack and have no idea what caused it, I may have _____:

a. Failed to take my asthma medications
b. Unknowingly come into contact with one of my asthma triggers
c. Been experiencing a great deal of stress lately
d. Been unaware of or ignored my early warning signs
e. All of the above

28. My physician can handle my asthma without my having to become involved.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

29. I have confidence in my ability to keep my asthma under control when problems arise in my family.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

30. Which one of the following may actually make an asthma attack worse?

a. Continuing to exercise or work once an attack begins
b. Resting instead of remaining active to clear the mucus
c. Pursed-lip breathing techniques
d. Drinking warm liquids
e. Using a bronchodilator during the attack

31. I feel as though I am well informed about my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

32. I can handle the problems that asthma may cause.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

33. The cause of exercise-induced asthma is _____:

a. Cooling and drying of the airways
b. Overheating of the airways
c. Not taking in enough oxygen
d. Not being able to rid the lungs of carbon dioxide fast enough
e. Build-up of lactic acid

34. Three “Rs” that are helpful in treating an acute asthma attack are:

a. Readjust medications, Readjust food intake, and Readjust fluid intake
b. Rest, Relaxation, and Right breathing
c. Readjust medications, Restrict fluids, and Restrict eating
d. Record symptoms, Report to physician, and Refrain from drinking liquids
e. Record triggers, Remove all stressors, and Renew commitment to take medications on time

35. I can learn to be an effective asthma self-manager.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

36. If cigarette smoke is bothering me, I feel that I can ask the person to stop smoking.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

37. My life revolves around my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

38. To prevent asthma attacks, it is important to pay attention to _____:

a. My early warning signs and my asthma triggers
b. Good health habits and medication compliance
c. The environment
d. A and B
e. A, B, and C

39. The more I know about asthma, the more I can help myself.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

40. I resent my asthma because it limits my mobility.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

41. Two early warning signs of an impending asthma attack are:

a. Emotional and attitude changes
b. Physical changes and insomnia
c. Physical and attitude/mood changes
d. Dizziness and increased sweating
e. Dysphoric mood and emotional changes

42. I feel that I can take my asthma medications as prescribed by my doctor.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

43. I feel that I have enough information about asthma to allow me to manage my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

44. I want to work in partnership with my physician in taking care of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

45. Three “ABCs” that are helpful in treating an acute asthma attack are _____:

a. Alleviate stress, Breathe rapidly, and Calm down
b. Address maladaptive behaviors, Breathe in a shallow manner, and Cough frequently to clear mucus from lungs
c. Adjust activities, use a bronchodilator, and Consume clear, lukewarm liquids
d. Ask for help, Blow into your peak flow meter, and Check your peak flow values

46. During an asthma episode, I can refrain from panicking in order to better manage the attack.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

47. I have confidence in my ability to avoid frequent trips to the emergency room because of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

48. Preventing asthma is a skill I can learn.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

49. Which one of the following instruments objectively measures lung functioning?

a. Sphygmomanometer
b. Peak flow meter
c. Auto-auscultation device
d. Stethoscope
e. Polygraph

50. There is nothing I can do to relieve an asthma attack before it gets worse.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

51. I feel OK about asking for help during asthma attacks when I need to.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

52. I don't have a lot of confidence in my ability to manage my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

53. I can generally figure out what is causing an episode of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

54. Which one of the following indicates that your inhaler is empty?

a. The inhaler stands up at the top of the water
b. The inhaler lays flat on the bottom of the water
c. The inhaler floats on its side on top of the water
d. The inhaler floats on a diagonal toward the top of the water
e. The inhaler stands up on the bottom of the water

55. Once an attack starts, I am not capable of stopping it; I just have to wait until it subsides.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

56. I want to take an active role in managing my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

57. I have a lot of confidence in my ability to detect the early warning signs of my asthma

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

58. Possible side effects of theophylline (Theo-Dur) may include:

a. Visual disturbances, sweating, and confusion
b. Memory disturbances, increased appetite, and water retention
c. Insomnia, weight gain, and depressed mood
d. Vomiting, headache, and irritability
e. Fatigue, restlessness, and slurred speech

59. I can avoid or minimize most of my asthma triggers.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

60. I can use positive self-talk to help control my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

Appendix B

KASE-AQ with pediatric revisions

This survey contains a series of statements about your opinion of your asthma. The survey also contains questions about your understanding of asthma. Please read each of the questions carefully and circle the best answer.

CHOOSE ONLY ONE ANSWER FOR EACH QUESTION

1. Following a healthy diet and lifestyle will help control my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

2. Which one of the following is not a common asthma symptom?

a. Sore, dry throat
b. Coughing
c. Chest tightness
d. Wheezing
e. Shortness of breath

3. Which one of the following statements is true?

a. Asthma can be the result of an emotional illness
b. People bring asthma on themselves
c. Asthma is the result of how children are raised
d. Asthma is a physical illness
e. Both A and D

4. I can recognize the changes that happen in my lungs before an asthma attack begins.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

5. It is important for me to take my asthma medications as prescribed by my doctor.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

6. Which one of the following is not a part of the respiratory system?

a. Alveoli
b. Larynx
c. Trachea
d. Bronchial tubes
e. Duodenum

7. The job of the lungs is to:

a. Bring carbon dioxide in and push oxygen out
b. Make my heart work better
c. Bring oxygen in and push carbon dioxide out
d. Clean the nasal passages
e. Bring oxygen in and push nitrogen out

8. I can do a lot to solve the problems that asthma can cause for me.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

9. When it comes to my asthma, I feel that I do not have to miss school or other activities.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

10. Oxygen is exchanged in which part of the lungs?

a. Larynx
b. Alveoli
c. Pancreas
d. Bronchial tubes
e. Trachea

11. I would like to learn as much as I can about how to manage my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

12. Air needs to be _____ before it reaches the lungs.

a. Warmed
b. Humidified
c. Cooled
d. B and C
e. A and B

13. I can prevent asthma in almost all situations.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

14. My family can help me to remain calm during my asthma episodes.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

15. I have confidence in my ability to keep my asthma under control when I am at school or on vacation.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

16. Which one of the following is not a common asthma trigger?

a. Weather changes
b. Laughing
c. Aspirin
d. Exercise
e. Caffeine

17. I can help my family remain calm during my asthma episodes.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

18. Which one of these changes does not occur in the lungs before and during an asthma attack?

a. The muscles around the air tubes get tight
b. The mucus in the air tubes gets thick
c. The inner lining of the air tubes swells
d. The blood vessels of the air tubes get bigger
e. The air tubes get smaller

19. I can take the necessary steps to avoid or to manage an asthma attack effectively.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

20. I feel comfortable taking my asthma medications when I am at school or away from home.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

21. The number of people with asthma in the United States is approximately how many?

a. 20 million
b. 5 million
c. 3 million
d. 1 million
e. 200,000

22. My asthma is not bad enough for me to need to learn how to control it.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

23. I feel confident that I can exercise or play gym without having an asthma attack.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

24. Which one of the following statements is false?

a. The best time to treat an attack is before it starts.
b. The longer you wait to treat an attack; the more likely the attack is to go away.
c. Resting, drinking clear liquids, and using your inhaler will help clear an attack.
d. An attack can be treated before it begins by paying attention to your medications, the environment, your asthma triggers, your early warning signs, and your health habits.
e. For some people, menstrual periods may trigger asthma attacks.

25. My family can help me get the upper hand on my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

26. I do very well at knowing the level of my asthma at all times, including when I am having no asthma at all, when I am having slight asthma, when I am having moderate asthma, and when I am having severe asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

27. When I have an asthma attack and have no idea what caused it, I may have _____:

a. Forgotten to take my asthma medications
b. Been around one of my asthma triggers without knowing it
c. Been very upset lately
d. Been unaware of or ignored my early warning signs
e. All of the above

28. My doctor can handle my asthma without me being involved.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

29. I have confidence that I can keep my asthma under control when problems arise in my family.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

30. Which one of the following may make an asthma attack worse?

a. Continuing to exercise or play gym once an attack begins
b. Resting instead of remaining active to clear the mucus
c. Pursed-lip breathing techniques
d. Drinking warm liquids
e. Using a rescue inhaler during the attack

31. I feel that I am well informed about my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

32. I can handle the problems that asthma may cause.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

33. What is the cause of exercise-induced asthma?

a. Cooling and drying of the airways
b. Overheating of the airways
c. Not taking in enough oxygen
d. Not being able to rid the lungs of carbon dioxide fast enough
e. Build-up of lactic acid

34. Three "Rs" that are helpful in treating an acute asthma attack is:

a. Readjust medications, Readjust food intake, and Readjust fluid intake
b. Rest, Relaxation, and Right breathing
c. Readjust medications, Restrict fluids, and Restrict eating
d. Record symptoms, Report to physician, and Refrain from drinking liquids
e. Record triggers, Remove all stressors, and Renew commitment to take medications on time

35. I can learn to be an effective asthma self-manager.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

36. If cigarette smoke is bothering my asthma, I feel that I can ask the person to stop smoking.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

37. My life revolves around my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

38. To prevent asthma attacks, it is important to pay attention to:

a. My early warning signs and my asthma triggers
b. Good health habits and medication compliance
c. The environment
d. A and B
e. A, B, and C

39. The more I know about asthma; the more I can help myself.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

40. I resent my asthma because it limits my activity.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

41. Two early warning signs of an asthma attack are:

a. Emotional and attitude changes
b. Physical changes and insomnia
c. Physical and attitude/mood changes
d. Dizziness and increased sweating
e. Depressed mood and emotional changes

42. I feel that I can take my asthma medications as prescribed by my doctor.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

43. I feel that I have enough information about asthma to allow me to manage my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

44. I want to work together with my doctor in taking care of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

45. The "ABCs" for treating an acute asthma attack are:

a. Alleviate stress, Breathe rapidly, and Calm down
b. Address behavior, take shallow Breaths, and Cough
c. Adjust activities (rest), use a Bronchodilator, and Consume clear, room temperature liquids
d. Ask for help, Blow into your peak flow meter, and Check your peak flow values
e. Alter inhaler use, Breathe loudly, and Check for triggers

46. During an asthma episode, I should not panic.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

47. I have confidence in my ability to avoid going to the emergency room because of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

48. Preventing asthma is a skill I can learn.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

49. Which one of the following instruments measures lung functioning in numbers?

a. Blood pressure cuff
b. Peak flow meter
c. Allergy skin test
d. Stethoscope
e. Scale

50. There is nothing I can do to stop an asthma attack before it gets worse.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

51. I feel OK about asking for help during asthma attacks when I need to.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

52. I don't have a lot of confidence in my ability to manage my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

53. I can generally figure out what is causing an episode of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

54. Which one of the following tells you that your inhaler is empty?

a. The taste changes.
b. The inhaler feels light when I shake it.
c. Subtracting the number of puffs I have used from the number it holds.
d. Floating it in water.
e. The expiration date.

55. Once an attack starts, I don't know how to stop it; I just have to wait until it goes away.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

56. I want to take an active role in taking care of my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

57. I have a lot of confidence in my ability to detect the early warning signs of my asthma

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

58. Possible side effects of my rescue inhaler may include:

a. Vomiting, headache, and irritability
b. Memory problems, increased appetite, and water retention
c. Not sleeping, weight gain, and depressed mood
d. Fast heart rate, shaky hands, and difficulty sitting still
e. Fatigue, restlessness, and slurred speech

59. I can avoid or minimize most of my asthma triggers.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

60. I can use positive self-talk to help control my asthma.

a. True
b. Mostly true
c. Sometimes true and sometimes false
d. Mostly false
e. False

Initials __ __ __

Birth date __ __ / __ __ / __ __ __ __

Age ___

Grade in school _____

This questionnaire was : (circle all that apply)

Fun
Not fun
Short
Long
Interesting
Boring
Easy to read
Hard to read
Easy to understand
Hard to understand

Please write us a note about what you thought of this questionnaire.

_____

_____

_____

_____

Appendix C

Appendix D

Appendix E

Parent Consent

Parent/Guardian Consent for Participation in a Research Project

A single-site research project to determine the ability of 9-12 year old subjects with asthma to read and understand the Knowledge, Attitude and Self-Efficacy Asthma Questionnaire (copyright 1994 – ICKE) with proposed pediatric revisions.

The University of Michigan
ANONYMIZED
Family Nurse Practitioner Student

Research project supervised by ANONYMIZED

Instructions: Please read each page of this form carefully. If you do not understand any of the words or information contained in this form, please ask the study coordinator to explain them to you.

INTRODUCTION

You are being asked to give your permission for your child to participate in a research project. The following information will describe the nature and risks of the project in which your child is being asked to participate. The study coordinator will ask you questions to determine that you understand the information contained in this form. The study coordinator will also answer any questions that you might have about the project. You will be given a signed copy of this form if you decide to allow your child to participate.

BACKGROUND

The Knowledge, Attitude and Self-Efficacy Asthma Questionnaire (KASE-AQ) is a reliable and valid questionnaire that can be used to assess the effectiveness of an asthma education program for adults. Though there are many asthma education programs being developed to address the needs of children with asthma, there are not very many tools available with which to assess the effectiveness of these programs for children. Approximately fifteen to twenty children, ages nine to twelve, who have asthma, will participate in this project

PURPOSE

Before you decide to allow your child to participate in this project it is important that you understand the purpose of the research being done. The purpose of this research project is to determine whether the proposed pediatric revisions to the Knowledge, Attitude and Self-Efficacy Asthma Questionnaire are easily read and understood by your child.

YOUR RESPONSIBILITIES

We ask that you bring your child to one appointment at ANONYMIZED office.

STUDY MEDICATION

There will be no medication involved with this research project. No changes will be made to your child's current asthma treatment as a result of participation in this project.

STUDY PROCEDURES

During one appointment, that will take place at ANONYMIZED office, your child will be asked to complete a copy the KASE-AQ with pediatric revisions. The KASE-AQ consists of sixty questions and may take as long as 30-45 minutes for your child to read and complete. Your child will need to do this without any assistance from you. He or she will be seated in an area within your sight but you will be asked not to speak with him or her about the questionnaire while he or she is completing it. Any questions your child may have while working on the questionnaire will be answered by ANONYMIZED. You will be able to read a blank copy of the questionnaire if you so desire. You will not be able to keep a blank questionnaire or a copy of the questionnaire that has been completed by your child.

STUDY PARTICIPATION AND WITHDRAWAL

Participation in this research project is voluntary. You or your child may choose not to participate at any time prior to the completion of the questionnaire. Choosing not to participate, withdrawal from the project or not completing the questionnaire will not affect your child's ongoing medical care from ANONYMIZED.

POSSIBLE RISKS OF PARTICIPATION

There are no known risks to your child associated with participation in this research project. If your child has concerns as a result of reading and completing the study questionnaire, staff members will be available to address those concerns and answer any questions that may arise.

POTENTIAL BENEFITS

Your child will not benefit directly from participation in this project. The information gathered in this project may benefit other children with asthma in the future.

ALTERNATIVE TREAMENTS

No standard treatment is being withheld because your child is participating in this project. There are no costs to you for your child's participation.

CONFIDENTIALITY

All of the information gathered from this project will remain confidential. The data will be available only to the people conducting and supervising the research project. If the results of this project are published, your child will not be identified in any way. The data may also be subject to review by the institutional review board of The University of Michigan. If you have questions please feel free to ask them. If questions should arise after your child has completed his or her participation in the project, please contact ANONYMIZED. Should you have questions regarding your child's rights as a research participant, please contact the Institutional Review Board, ANONYMIZED, 540 E. Liberty Street, Suite 202, Ann Arbor, MI 48104-2210.

COMPENSATION

Following completion of the questionnaire, your child will be given a gift certificate for $20.00. If you and/or your child choose not to participate in the project, no compensation will be provided.

SIGNATURES

Your signature below indicates that you have decided to allow your child to participate in this project and that you have read this form and understand it and the information explained to you.

Printed Name of Parent _____

Signature _____ Date _____

Name of Person Obtaining Informed Consent _____

Signature _____ Date _____

Appendix F

Subject Assent

Assent for Participation in a Research Project

A single-site research project to determine the ability of 9-12 year old subjects with asthma to read and understand the Knowledge, Attitude and Self-Efficacy Asthma Questionnaire (copyright 1994 – ICKE) with proposed pediatric revisions.

The University of Michigan
ANONYMIZED
Family Nurse Practitioner Student

Research project supervised by ANONYMIZED

Directions: Please read each page of this form. If you do not understand any of the words on any of these pages, please ask the study coordinator to explain them to you.

You are being asked to participate in a research project. These pages tell you about the project and what might happen if you do it. The study coordinator will ask you questions to make sure you understand what you have read and what you will be doing. The study coordinator will also answer any questions that you might have. If you do the project, your parent or guardian will be given a signed copy of this form.

Before you decide to participate in this project it is important that you understand the reason why it is being done. The purpose to this research project is to find out if you understand the asthma questionnaire that you will be filling out.

Your parent or guardian will bring you to ANONYMIZED office for one appointment. While you are here, you will be asked to fill out a questionnaire about your asthma. It

is a long questionnaire and you may take breaks if you get tired. You will need to answer the questions without any help. If you do not understand any of the words, ANONYMIZED will explain them to you. You will not be able to keep a copy of the questionnaire when you are done.

You are allowed to say that you do not want to participate in this project. If you decide not to participate, no one will be angry with you and ANONYMIZED will still be your asthma doctor.

Nothing bad will happen to you if you fill out this questionnaire for this project. We will not be doing any tests or giving you any different medicine at this appointment. If you are bothered by any of the questions or want to talk about feelings you might have, let us know.

The information we get from you may help other children with asthma in the future.

It will not cost you or your parent/guardian anything for you to fill out this questionnaire.

All of this information you give to us will be kept secret. If we write a report about this project, we will not tell anyone your name or that you filled out a questionnaire.

After you fill out the questionnaire, you will be given a gift certificate for $20.00.

Your signature below says that you have decided to participate in this project and that you have read this form and understand it and the information that was explained to you.

Printed name of pediatric subject _____

Signature of subject _____

Date of signature _____

Printed Name of Parent _____

Signature _____ Date _____

Name of Person Obtaining Informed Consent _____

Signature _____ Date _____

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