A PROGRAM EVALUATION:
KNOWLEDGE, ATTITUDES, SELF-EFFICACY AND QUALITY OF LIFE
IN
ADOLESCENTS WITH ASTHMA

by

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A thesis submitted to the School of Nursing
in conformity with the requirements for
the degree of Master of Science

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An Program Evaluation: Knowledge, Attitudes, Self-efficacy and Quality of Life in Adolescents with Asthma

Abstract

Asthma, the most common chronic illness in adolescence and a leading cause of school absence, limits the daily activities, and influences the physical, emotional and social health of adolescents. Whether these influences are a direct result of the condition or of non-compliance to treatment, is unknown. Knowledge, attitude, and self-efficacy are positively related to asthma self-management skills in adults who have taken education programs. To date, no such programs have been developed or evaluated specifically for adolescents.

This study examined knowledge, attitude, self-efficacy and quality of life in asthmatic teenagers before and after participating in a pilot educational program for self-management skills. Seven schools were randomly assigned to program or control. Forty eight teenagers at the program schools were tested before and after the program. Teenagers at the control schools (n=21) were tested at the same time as those in the program. Results of repeated measures ANOVA demonstrated a significant increase in knowledge and self-efficacy scores for the adolescent ‘program’ group. There was no change in attitude or quality of life scores at post-test for either group. Students reported moderate activity impairment because of their asthma. This study demonstrated that an asthma education program designed specifically for adolescents and delivered by nurses in schools, was effective in increasing knowledge and self-efficacy.
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CHAPTER 1

Introduction

Significance of the Problem

Asthma is an important cause of morbidity and mortality in adolescents. It is the most common chronic illness in this age group (Newacheck, McManus, & Fox, 1991) and a leading cause of school absence (Padur, Rapoff, & Houston, 1995). Asthma is considered a chronic inflammatory condition of the airways and despite advances in the treatment, children continue to be limited in their daily activities by asthma (Lapin & Cloutier, 1995). Many people with asthma require ongoing treatment to suppress inflammation, either on a daily basis, or for brief periods during asthma exacerbations. Behaviours involving complex decision making skills such as asthma attack recognition, symptom management, and the avoidance of known triggers are required of the adolescent with asthma. Adolescent asthmatics have difficulty managing their asthmatic symptoms, however there is little information on why this occurs. Compliance, defined as adherence to prescribed treatment regimen, has been disappointingly low in adolescents with asthma (Mawhinney, Spector, Kinsman, Siegal, & Rachalefsky, 1991). Non-compliance with a medical regimen to control asthma symptoms can be life threatening and have significant psycho-social effects that may have an impact on the adolescent’s quality of life.

Appropriate education and skills training may be important approaches to reducing the problems arising from asthma. Predisposing knowledge, attitudinal and belief factors influence the degree to which an individual is motivated to engage in asthma self-management and comply with a medical regimen (Boulet, Chapman, & Green, 1994).
Background of Research

The Ontario Lung Association through the local chapters, has been providing education programs for individuals and families with asthma for many years. The goals of asthma education programs are to increase knowledge of asthma, improve self-management skills, and enhance the individual’s compliance to treatment, which results in a reduction of symptoms and improved quality of life. The "Air Force Asthma Education Program" has been offered in settings such as the local association, community recreation halls, and day care centres. The staff however, recognized that attendance was declining at community venues and those who were seeking their services were from higher socio-economic levels, better educated and apparently more motivated. Others, who perhaps were at greater risk for asthma management problems such as teenagers, were not being seen.

In response to this accessibility problem, the Lung Association has expanded their education and support activities to schools, serving students, teachers other staff members and parent councils. The advantages of the school setting were numerous. First, teaching at school, during school hours ensured that asthmatic children of every socio-economic background could be reached; second, self-care asthma management difficulties such as medication use, and avoidance of triggers often occurred at school. Peer issues, such as embarrassment when taking medications, and a lack of understanding from teachers also contributed to the problems asthmatic children faced. The asthma experience could be demoralizing, producing physical restrictions and responses that adversely affected the adolescent. Providing an asthma education program in a familiar environment rather than
a health care setting, might help the teenager feel comfortable, and provide the added benefit of raising awareness of school personnel to the aforementioned issues.

This study is in response to personnel from the Kingston branch of the Ontario Lung Association who wished to evaluate the effectiveness of an asthma education program for adolescents being delivered in the schools. The outcome evaluation would provide further information regarding the needs of the asthmatic students which could be considered when reformulating objectives, updating age appropriate resource material, and restructuring the program for subsequent distribution province wide.

Purpose

The intent of this study was to examine the knowledge, attitudes, self-efficacy and quality of life levels as they related to a select adolescent population with asthma, and to assess the extent to which an intervention with an asthma educational program offered by the Kingston branch of the Ontario Lung Association affected these parameters.
CHAPTER II

Literature Review

The literature draws attention to many issues concerning asthma including an individual's ability to comply with an asthma treatment regimen to reduce and control symptoms as well as the extent to which asthma has an impact on the person’s everyday life. A definition of asthma, and a brief description of current medical management, studies relating to mortality, morbidity, the role of education in asthma management, and relevant quality of life issues are presented in this review.

Asthma

A group of Canadian physicians adopted the following definition of asthma:

Asthma is a disorder of the airways characterized by paroxysmal or persistent symptoms (dyspnea, chest tightness, wheeze and/or cough), with variable airflow limitation and airway hyper-responsiveness to a variety of stimuli. Airway inflammation or its consequences are important in the pathogenesis and persistence of asthma (Ernst, Fitzgerald, & Speir, 1996).

Airway hyper-responsiveness has been attributed to several causes. These include triggers such as viral respiratory infections and cold air, allergens (e.g., pollens, molds, dust mites, animal dander), irritants (e.g., tobacco smoke, air pollution), chemicals (e.g., aspirin, food additives), exercise, changes in weather, and emotional responses (e.g., laughing, crying).

Symptoms of asthma include shortness of breath, wheezing, tightness in the chest, and/or cough occurring in recurrent episodes. Asthma attacks are characteristically episodic and usually unpredictable. The extra work of breathing during an attack can
produce a direct experience of demoralization, fatigue, panic and feelings of being out of control (Janson-Bjerklie, Carrieri, & Hudes 1986).

**Medical Management**

The objective of asthma management focuses on reduction of airway inflammation in order to control symptoms and prevent attacks. Once the allergens and triggers are identified, the individual is counselled on avoidance strategies, and the benefits of compliance with medications to prevent symptoms and reduce asthma morbidity. Currently, the emphasis of treatment is on appropriate use of inhaled anti-inflammatory medications (preventers), either non-steroidal such as Intal, or steroidal such as Beclomethasone, to be taken on a daily basis in order to prevent the inflammation which results in an asthmatic episode (Lapin & Cloutier, 1995). Case controlled studies in the adult asthmatic population have shown that prolonged use of inhaled steroid can produce marked improvements in airway hyper-responsiveness, which significantly increases the control of asthmatic symptoms (Ernst, Fitzgerald, & Speir, 1996; Hargreave, Dolovich, & Newhouse, 1990; Juniper, Kline, Vanzieleghem, Ramsdale, O’Byrne, & Hargreave, 1990). Localized side effects, including thrush and hoarseness, are the most common problems encountered with inhaled corticosteroid use. The prevalence of these side effects may be minimized by rinsing the mouth after dosing and using a spacer device (Ernst, Fitzgerald & Speir, 1996). Issues of long term safety, especially with high doses of inhaled corticosteroids in children must be considered. These authors claimed that at doses of up to 1000μg/day of Beclomethasone or the equivalent in adults and 400 μcg/day in preadolescent children, the adverse effects of inhaled corticosteroids may constitute a
nuisance, but are very rarely associated with significant systemic effects such as adrenal suppression.

Adrenergic (reliever) drugs such as Ventolin (a beta-2 agonist), are the first choice in the treatment of an acute asthma episode, and are usually given by inhalation. Side effects although uncommon may include shakiness, tachycardia and nausea but are not considered dangerous (Plaut, 1988). Recently, researchers have raised the concern regarding the increased, regular use of inhaled beta-2 agonist medications as a contributing factor to the increase in asthma mortality during the 1980's (Sears, Taylor, Print, & Lake, 1990). These researchers concluded that asthmatics have been relying on these 'reliever' medications in favour of regular anti-inflammatory (preventer) medication use.

Compliance with a therapeutic regimen can be viewed as one aspect of adjustment and ability to cope with a disease. Noncompliance with recommended medical therapy for chronic illnesses is well documented in the literature. Consistent links between adolescence and poor adherence have been obtained for chronic diseases with complex treatment regimens such as asthma (La Greca, 1990). Noncompliance to an asthma management plan is alarmingly high with rates of 30% to 70% reported (Eraker, Kirscht, & Becker, 1984; Mawhinney, et al., 1991). According to Conrad (1985), noncompliance was particularly problematic when benefits of medication use are not immediately apparent, or when individuals do not believe that medication intervention will effectively change the course of their illness. This occurs with adolescents who have been prescribed anti-inflammatory drugs such as Intal or Bectol, which take up to two weeks to be effective. Compliance to the treatment regimen also involves other behavioural aspects
such as avoidance of known allergens, using peak flowmeters as an indicator of pulmonary functioning, correct inhaler use, and communicating with a physician when there are concerns regarding symptoms before asthma becomes severe.

**Mortality**

It must be emphasized that although mortality is relatively infrequent, the number of deaths from asthma has been increasing in England, Wales, Australia, Canada, France, West Germany, United States, and Denmark (Buist & Vollmer, 1990; Burney, 1987; Fitzgerald & Macklem, 1995; Jackson, Sears, & Beaglehole, 1988). Most disturbing, is the increase in asthma deaths by 6.2% per year during the 1980's in children and young adults (Weiss & Wagener, 1990). The largest increase occurred among teenagers during the years 1979 to 1991 (Sly, 1994). In 1991, there were 14 deaths in the 10 to 18 year age group in Canada (Statistics Canada, 1992).

Factors implicated in adolescent deaths from asthma include the following: inadequate recognition of asthma severity (Birkhead, Attaway, Strunk, Townsend, & Teutsch, 1989), over reliance on beta-2 adrenergic inhalant therapy leading to under use of anti-inflammatory medications (Kravis, & Kolski, 1985; Rea, Scagg, Jackson, & Beaglehole, 1986; Rubinstein, Hindi, Moss, & Blessing Moore, 1984; Strunk, 1993), and under use of prescribed asthma medications (Birkhead, et al., 1989). In addition, psychological factors including depression, disorganization, denial, and family instability may have caused adolescents and their families to ignore symptoms instead of seeking emergency medical care (Fritz, Rubinstein, & Lewiston, 1987).
Morbidity

Morbidity or the consequences of having an illness such as asthma, has physiologic, psychosocial and quality of life dimensions, all of which interact. Morbidity may be due directly to symptoms, or the degree to which treatment interferes with usual routines or activities. Hospitalizations among children under 17 years of age increased 45% per annum between 1979 to 1987 in the United States and Canada (Gergen & Weiss, 1990; Wilkins & Mao, 1993). Creer (1993) suggested that this change was related to the widespread noncompliance to the prescribed therapy. According to Leson and Gershwin (1995), the risk factors for teenagers having to be intubated included: smoking (either active or secondhand), the number of emergency room visits in the past year, underlying disease severity, and psycho-social problems, such as denial, anxiety, depression, altered self-concept and diminished social interactions.

The presence of a chronic medical condition may make teenagers feel different from their peers and lead to decreased social interactions which in turn, increases interference with normal psychosocial and developmental adjustment (Cadman & Boyle, 1987; Gortmaker, Walker, Weitzman, & Sobel, 1990; Gortmaker & Sappenfield, 1984). According to Creer, Stein, Rappaport and Lewis (1992), asthma and other chronic diseases have been found to produce physical limitations and restrictions on children's activities that adversely affect adjustment. Certain triggers, such as physical exercise and exposure to cold air and known allergens, may precipitate attacks and thus limit the activities of children and adolescents with asthma. The specific nature of the limitation of activity, such as the avoidance of sports or reduced opportunities for social and
recreational activities that are often routes to enhancing self-image, may negatively influence an adolescent's sense of self and well-being (Creer, Stein, Rappaport, & Lewis, 1992; Newacheck, McManus, & Fox, 1991; Nocon, 1991). Adolescents with asthma are not only bothered with the symptoms, they are also bothered by the physical, social, educational and emotional impairments, and are at greater risk for anxiety, depression, acting-out behaviours, and lower self-esteem (Creer, Stein, Rappaport, & Lewis, 1992; Christie, French, Sowden, & West, 1993; Kashani, Konig, & Sheppard, 1988; Nelms, 1989; Padur, Rapoff, & Houston, 1995).

In 1995, Padur, Rapoff and Houston reported that the largest number of school absences were attributed to those afflicted with arthritis, asthma and heart disease. They also noted that asthmatic children ages 8 to 16 years were at greater risk for affective, self-esteem, and functional status problems than children with cancer, diabetes or healthy children. Thus, functional impairment may be responsible, in part, for the affective problems children with asthma experience.

The literature indicated that asthma has had a serious impact on the physical, psychological, social and emotional health of adolescents. The mortality has continued to rise, and hospitalizations increased during the 1980's and 1990's. Adolescent asthmatics are at risk for psychosocial problems which may be related to limitations in their activities and these outcomes are likely related to noncompliance with their medical management plan.
Asthma Education Programs

In response to this increased morbidity and mortality caused by asthma throughout the western world, many education and self-management programs have been developed and studied. Creer, Wigal, Kotses, and Lewis (1990) reviewed 24 educational and self-management programs for childhood asthma, and described various benefits which included: increased knowledge; improved compliance behaviours which reduced asthmatic episodes; reduced emergency room visits; reduced school absenteeism; development of positive attitudes toward asthma; increased physical activity and feelings of control over asthma. Between 1990 and 1996 seventeen studies on education programs for asthma self-management were found. Nine were adult programs (Bailey, Richards, Brooks, Soong, Windsor, & Mazella, 1990; Bolton, Tilley, Kuder, Reeves, & Schultz, 1991; Boulet, Boutin, Cote, Leblanc, & Laviolette, 1995; Byrne, Drury, Mackay, Robinson, Faranda, & MacAdam, 1993; Mulhauser, Richter, Kraut, & Weke, 1991; Osman, Abdalla, & Beattie, 1994; Wilson, Scamagas, & German, 1993; Windsor, Bailey, Richards, Manzella, Soong, & Brooks, 1990); and eight were for children aged 2 to 14 years (Brazil, McLean, Abbey, & Musselman, 1997; Charlton, Charlton, Broomfield, & Campbell, 1992; Colland, 1993; Collins, 1994; Deaves, 1993; Mesters, Meertens, Crebolder, & Parcel, 1993; Moe, Eisenberg, Volmer, Wall, Stevens, & Hollis, 1992; Taggart, Zuckerman, & Sly, 1991). No programs specifically for adolescents aged 13 to 17 years were found.

The programs for adults and young children varied considerably and educational interventions were seldom described in detail. Some programs had clearly stated
objectives such as to improve patient knowledge (Collins, 1994; Deaves, 1993; Mesters, Meertens, Crebolder, & Parcel, 1993; Moe et al., 1992; Taggart, Zuckerman, & Sly, 1991), to improve technical skills (Bailey, et al., 1990; Mesters, Meertens, Crebolder, & Parcel, 1993; Moe, et. al. 1992; Yoon, McKenzie, Bauman, & Miles, 1993), to change attitudes and promote behaviour change (Boulet, et al., 1995; Colland, 1993; Mesters, Meertens, Crebolder, & Parcel, 1993; Taggart, Zuckerman, & Sly, 1991; Yoon, McKenzie, Bauman, & Miles, 1993). Teaching methods varied. Some were one-on-one and others were group sessions. Many programs were hospital based, taking place during hospitalization or in emergency rooms and clinics. Teaching aids included written materials, interactive computer programs and videotapes. Some studies used pre-test - post-test designs, however, few included a control group for comparison. Because no programs were found which specifically targeted adolescents, it is unknown whether programs that are effective with adults and young children will be effective in this population.

Individuals are predisposed to take action to handle asthma problems by virtue of internal factors such as knowledge, attitudes and beliefs and external factors such as models of behaviour, and technical advice (Clark & Starr-Schneidkraut; 1994). Thus, it is important when evaluating the results of an educational intervention that consideration is given to the process of learning.

Through processes of self-regulation for example, the ability to observe, make judgements, and react to one’s behaviour, individuals learn which management strategies such as prevention, symptom management, and medication use, work for them. If these
management strategies are effective, one would expect certain outcomes, such as improvements in physiological and psychological status, quality of life and a reduction in emergency health care use.

The long term goal of asthma education is to reduce asthma morbidity and mortality. Asthma deaths are relatively rare and, for most asthmatics, the primary aims of education are to improve the quality of life, ability to function, and control of the disease. From the health-care service perspective, reducing costs is primary. Secondary or instrumental aims for those who have asthma include the following: (1) an improvement in specific knowledge, beliefs, and attitudes to produce adequate self-management behaviour and prophylactic measures; (2) an improvement in self-assessment; (3) improved patient health-care provider relationships; (4) a reduction in delay in obtaining help when control of asthma deteriorates; and (5) increased self-confidence and self-efficacy in managing or controlling asthma symptoms (Boulet, Chapman, & Green, 1994). According to Creer, Stein, Rappaport, and Lewis (1992), the goals of asthma education programs are to promote compliance to the medical treatment which will limit the dysfunction directly attributable to asthma. This is achieved by controlling symptoms, thereby minimizing the preventable, indirect or secondary psychological and social handicaps that occur as a result of numerous factors.

**Theoretical Frameworks in Asthma Education:** Theories frequently cited in the literature which describe the complex process of human behaviour change are the social cognitive learning theory of Bandura (1986), coping theory (Gonzales, Geopinger, & Lorig, 1990), the Health Belief Model (Becker, 1974) and the PRECEDE model (Green,
Only four of the publications found used a theoretical model in their educational programs. Two of these referred to the PRECEDE model (Mesters, Meertens, Crebolder, & Parcel, 1993; Taggart, Zuckerman, & Sly, 1991) and the others to social cognitive learning theory (Colland, 1993; Wilson, Scamagas, & German, 1993). PRECEDE (Figure 1) was used as the model on which to build the educational intervention in this study. It is predicated on the predisposing (e.g., knowledge, self-efficacy, attitude), the enabling (continuity of education, convenience of program, cost) and the reinforcing factors (communication with health care provider, feedback on management attempts, peer support) that influence self-management behaviours to prevent and manage asthma attacks. Effective self-management behaviours result in improvements in the individual’s health status and quality of life. Assumptions about predisposing, enabling and reinforcing factors in adolescent asthmatics allowed the investigators and the Kingston Lung Association to set specific objectives for the educational program. The program was evaluated in terms of the predisposing factors - knowledge, attitude and self-efficacy.

Baum and Creer (1986) concluded that success of a prescribed medical regimen for a particular individual often depends, in large part, on three variables: (1) the individual's knowledge regarding the illness, which enables the individual to perform appropriate procedures to control particular symptoms; (2) the person's attitude toward the illness, including his or her willingness to work with the health care worker to manage the disorder; and (3) the degree of confidence in his or her ability to contribute to the management of the illness. These variables interact to contribute to the individual's compliance with treatment regimens to control symptoms.
Figure 1: The PRECEDE model for asthma education (Green, 1991)
If a person lacks knowledge regarding his or her asthma, the treatment regimen will fail because he or she is unaware of appropriate management steps or how to avoid triggers. A person with asthma ideally, should understand the basic pathophysiology of asthma, be aware of common asthma symptoms and triggers, know appropriate steps to take to manage asthma episodes, and be able to distinguish facts from myths about the illness. Knowledge of asthma medications, physiological mechanisms and distinction between mild, moderate and severe attacks improved significantly after an educational program (Bauman, Craig, & Dunsmore, 1989). This information was included in the program delivered by the Kingston Lung Association.

Attitudes are a second variable to be considered when planning and implementing education programs for asthmatics (Tobin, Wigal, Winder, Holroyd, & Creer, 1987). If there is a positive change in a person's attitude as a result of an education program, the person will likely exhibit increased medication compliance and will devote increased efforts to the management of his or her asthma (Charlton, Charlton, Broomfield, & Campbell, 1992). These authors demonstrated a relationship between negative attitudes and morbidity in asthma. In the program delivered by the Kingston Lung Association, the benefits of maintaining positive attitudes concerning asthma were emphasized.

Self-efficacy is another variable that is often related to treatment success or failure. Self-efficacy refers to the degree of confidence an individual has that he or she can successfully execute behaviours such as adhering to prescribed treatment regimen in order to produce certain outcomes (Bandura, 1977). Bandura postulated that peoples' perceptions of their capabilities will affect how they behave, their level of motivation, their
thought patterns, and their emotional responses to stressful situations. He claimed that one's confidence in his or her ability to do a behaviour (self-efficacy) was an important link between knowing what to do and actually doing it. Self-efficacy theory suggests a person's belief in his or her abilities to perform specific behaviours influenced their choice of behaviour, and the situations to be avoided or attempted, such as avoiding known triggers or taking Ventolin before exercise. Self-efficacy has been reported to be a powerful predictor of self-management in a variety of studies of chronic illnesses including asthma (Creer, Backial, & Burns, 1988), epilepsy (Dilorio, Faherty, & Manteuffel, 1992), cystic fibrosis (Bartholomew, Parcel, Swank, & Czyzewski, 1993), and diabetes (Hurley & Shea, 1992; Grossman, Brink, & Hauser, 1987). O'Leary (1985) suggested that patient adherence to difficult medical regimens might be more consistent and long-lasting in individuals who have strong beliefs that they have the ability to affect their health. Improving the adolescent's perceptions of self-efficacy was identified by the Kingston Lung Association as an important objective to be met in their asthma education program.

Quality of Life

Children are not only bothered by symptoms such as shortness of breath, cough, and wheeze, they are also troubled by the physical, social, educational and emotional impairments that they experience as a result of having asthma (Christie, French, Sowden, & West, 1993; Nocon, 1991; Townsend, Feeny, Guyatt, Furlong, Seip, & Dolovich, 1991). Quality of life has been conceptualized as multi-dimensional, including aspects such as physical function, psychological state, social, physical and emotional functioning (Schumaker, Anderson, & Czajkowski, 1990). Richards and Helmstreet (1994) claimed
that assessment of quality of life outcomes in asthma is beset by conceptual and methodological difficulties. Nevertheless, these authors arrive at several broad conclusions after reviewing the literature. First, they conclude that a consensus has emerged that health care research should address outcomes important to patients, especially quality of life. Second, asthma is usually well controlled if patients are moderately adherent to their recommended regimens. Measurement difficulties arise because the beneficial effects of interventions are likely to be small and large samples are required to detect them. Asthma usually is characterized by substantial periods of relative freedom from symptoms, interrupted by episodes of severe symptoms. Therefore, it is important to assess the impact of episodes on quality of life. Third, asthma specific measures should emphasize the incidence and impact of such symptoms as coughing, wheezing, sputum production, and shortness of breath. Finally, assessments of adults and children should be addressed separately. These authors also conclude that adolescents may differ in important ways from both adults and younger children and, it is important therefore, that measures be developed to reflect their unique developmental characteristics.

Recently, a number of disease specific instruments have been developed to measure quality of life in children including measures for children with asthma. There are three questionnaires which measure quality of life in asthmatic children. They are the Pediatric Asthma Quality of Life Questionnaire (PAQLQ) (Juniper, Guyatt, Feeny, Ferrie, Griffith, & Townsend, 1995); the Life Activities Questionnaire for Childhood Asthma (Creer, Wigal, & Kotses, 1993); and the Childhood Asthma Questionnaire (CAQ)
(French, Christie, & Sowden, 1994). The item content of these measures emphasized respiratory symptoms and episodes, limitations on physical activities important to the children, interference with role-related activities such as going to school, and all have reported reliability and validity. The PAQLQ was developed on a Canadian population of children between the ages of 7-17 years of age, and was most appropriate for an adolescent population.

Only one study was found which measured the impact asthma has on adolescents’ day-to-day lives. Gibson, Henry, Vimpani and Halliday (1995) considered educational needs of asthmatic teenagers in a survey of over 4000 grade 8 students and their teachers in 32 schools in New South Wales, Australia. In this sample, 23% of the students were identified as asthmatic, and over 22% indicated that they smoked. The findings indicated that the level of knowledge concerning asthma was low and specific deficits were in the areas of prevention, the treatment of exercise induced asthma, and recognition of increasing severity of symptoms. Attitudes were generally positive although students and teachers were worried about taking asthmatic students on school trips or camps. The findings showed significant quality of life impairment among the asthmatic students.

In summary, there is substantial evidence that asthma has a negative impact on the physical, emotional and social health of adolescents, which may be attributed to non-compliance to their therapeutic regimen. Asthma education is considered important in increasing compliance. Specifically, education which focused on knowledge, attitudes and beliefs has been shown to be effective in reducing morbidity by enhancing self-management abilities for asthmatic children and their families. Recently, there is an
increased interest in determining the impact that asthma has on quality of life of individuals with asthma. Presently, there is a lack of programs designed to address the specific educational needs of the adolescent asthmatics. Research that provides nurses and other health professionals with the adolescents' perspective, an understanding of factors influencing compliance to asthma therapy and the impact the asthma has on their day-to-day lives is warranted. Nurses have a major role to play in working with adolescent asthmatics to promote compliance behaviours, and improve self-management skills to control symptoms, thereby reducing secondary psychological and social morbidity.

This study was an outcome evaluation of an asthma educational program offered by the Kingston Lung Association to adolescents in a selected number of elementary and secondary schools in the area. The specific questions that guided the study were:

(1) What are the knowledge, attitude, self-efficacy and quality of life levels as they relate to asthma in an adolescent population?

(2) Is there a change in these parameters following an asthma education program?
CHAPTER III

Method

Participants

Sixty-nine students with asthma attending grades 7 through 10, at three primary and four secondary schools in two counties in Southeastern Ontario, who were participating in an asthma education program, gave assent to participate in the study. Informed, written consent (see Appendix A) was provided by their parents. Ethics approval for the study was obtained from the local University Research Ethics Board.

Schools were recruited by the Kingston Lung Association which delivered the asthma education program (see Appendix B for letters to School Boards and individual schools). Four primary (4 public) and four secondary schools (3 public, 1 separate) that declared interest in having the education program for their asthmatic students were randomized to either the program group, which received the asthma education program immediately, or the control group, which received the program after study completion. One control school withdrew shortly before the study started citing administrative conflict, leaving four urban and three rural schools in the study. Within each school, asthmatic students were identified by school secretaries from health records. Consent forms and letters of explanation inviting them to participate in the asthma education program, were sent home with these students (Appendix C).

Instruments

The Knowledge, Attitude, Self-Efficacy Asthma Questionnaire (KASE-AQ) (Wigal, Stout, Brandon, Winder, McConnaughey, Creer, & Lewis, 1993) is a 60 item
instrument which measures the three dependent variables knowledge, attitudes and self-efficacy, which have been shown to have a positive relationship with asthma self-management programs (Creer, Wigal, Kotses, & Lewis, 1990; Wigal, Creer, Kotses, & Lewis, 1990). This is the only instrument presently available which measures all three variables in one questionnaire thus, it was selected to examine program effectiveness in this study (Appendix D). In a factor analysis three distinct factors — knowledge of asthma, attitude about asthma, and self-efficacy regarding asthma management items reached loadings of .40 or greater. The KASE-AQ is reliable and internally consistent. Test-retest reliability coefficients, computed independently for the three subscales were: knowledge, \( r = 0.82, p<.001 \); attitude, \( r = 0.77, p<.001 \); and self-efficacy, \( r = 0.85, p<.001 \) (Wigal, et al. 1993). Coefficient alpha was 0.88 for the knowledge subscale, 0.88 for the attitude subscale, and 0.89 for the self-efficacy subscale. Overall, the correlation coefficient was 0.88 for the first administration and 0.92 for the second administration of the KASE AQ, demonstrating test-retest reliability for the total scale. Following an asthma education and self-management training program, experimental group participants showed significant improvements in knowledge, attitude and self-efficacy from baseline to three month follow up, compared to a control group of participants (Wigal, et al. 1993).

The KASE-AQ was originally developed and tested on adults in the United States. The investigator received permission to make minor changes to a few questions in order that they would be appropriate for use with an adolescent population in Canada. For example:
Question 9. "When it comes to my asthma, I feel that I can avoid having to miss work or other daily responsibilities," became, "When it comes to my asthma, I feel that I can avoid having to miss school or other daily activities."

Question 20. "I feel comfortable taking my asthma medications when I am at work or away from home," reads, "I feel comfortable taking my asthma medications when I am at school or away from home."

Responses are presented in a five item, multiple choice format. Knowledge was recorded as correct or incorrect, and total score for this subscale was 20. Attitude scores ranged from 1 meaning an unfavourable attitude, to 5 indicating a positive attitude, with a total possible score of 100. The self-efficacy subscale scored similarly to the attitude subscale. The total score for the questionnaire was 220 points.

Readability was reported by the developers to be at a grade 5 level and to take between 15 - 25 min. to complete. The questionnaire was pilot tested with three Canadian adolescents who each took 35 minutes to complete. They stated that they did not find it difficult to understand.

The Paediatric Asthma Quality of Life Questionnaire (PAQLQ) (Juniper, et. al., 1995) included 23 questions about possible limitations, discomfort, and frequency of events influencing quality of life. The 23 items required responses on a Likert scale from 7 (no limitation, no event) to 1 (totally limited, always) for three domains: symptoms, emotions, and activities. The respondents were asked to choose activities which are especially bothersome due to asthma, from a list of 35, and then answer the first four questions of the questionnaire with these activities in mind. The participant was instructed to choose activities which they will be doing at a second testing period for comparison purposes. According to the developers, this group of questions are especially meaningful...
for the adolescent respondent and enhance the validity of the questionnaire (Appendix E).

The PAQLQ was chosen for use in the study because Juniper, et al. (1995) reported that it can detect quality of life changes in adolescents with altered health status, either as a result of treatment, or natural fluctuations in asthma ($p=.0001$), and it can differentiate these children from those who remained stable ($p=.001$). The questionnaire was developed and tested on Canadian children ages 7-17 years, which makes it applicable to the study population. In a 52 patient validation study, the questionnaire demonstrated good measurement properties as both an evaluative and a discriminative instrument. It is important that the instrument captures all areas of function considered important by the respondent so as to have a comprehensive account of the degree of impairment. This is the evaluative capability of the instrument. As well, the instrument must be able to discriminate among those who have mild, moderate and severe impairment. Evaluative instruments are required to measure longitudinal change in an individual or within a group of individuals. The essential measurement properties of quality of life evaluative instruments are responsiveness and longitudinal validity (Guyatt, Kirshner, & Jaeschke, 1992). Evaluative instruments must be responsive to small but clinically important changes that occur either spontaneously or as the result of an intervention (Harrison, Juniper, & Mitchell-DiCenso, 1997). These authors also claim that evaluative instruments require longitudinal validity. That is, that a change in score must reflect a true change in health related quality of life. The results of the validation study proved the PAQLQ to be highly responsive in all domains which ensured that studies with small sample sizes will be able to detect important changes in health-related quality of life, even if those
improvements are not large. For example, for alpha = .05 one sided, with an error set at B = .01, a sample of 25 would be required for a cross over design; and 49 for a parallel group design (Juniper, et al., 1995). The questionnaire is reported to take 15 minutes to complete and the three teenagers who pilot tested the questionnaires had no difficulty completing this instrument in this time.

The questions for the Problem Questionnaire are the investigator's and included two questions to assess asthma problem solving skills, and two to assess behaviour (e.g., medication compliance and peak flowmeter use) to manage medications (Appendix F).

A Demographic Questionnaire included information about the age, gender, child’s family living situation, asthma history, medications, emergency and hospital admissions for asthma, and school absenteeism (Appendix G).

Procedure

The asthma education program was delivered in schools on two mornings (2.5 hr. sessions) one week apart. The students were tested just prior to the educational program and six weeks after the program (see Figure 2 for the study design).

One week before the program pre-test took place, the investigator and the program instructor talked with the school officials to introduce themselves, discuss room allocations, and equipment needs (e.g., Video-cassette players), and to pick up consent forms which had been returned to the office staff. At this time, the students who were planning to participate met with the instructor and the investigator to answer any remaining questions about the program and the study. The investigator explained that the information from the questionnaires would be confidential and would benefit other
Figure 2: Study Design
Participating Schools Randomized

Control
1 primary  n=9
2 secondary  n=12

Program
2 primary  n=26
2 secondary  n=22

Pretest

Pretest
immediately
followed by 1st
teaching session

1wk

2nd Teaching Session

6wks

Post test

Post test

Receives program
at later date

6wks
asthmatic teenagers.

In the classroom prior to the start of the educational program, the questionnaires were distributed and instructions given for completion. The students were asked not to share or discuss their responses with other students. If required, either the investigator or the instructor clarified any misunderstandings or difficulties regarding the questions on an individual basis. After completion of the questionnaires, the students in the control group were thanked, provided with a pizza lunch and then dismissed. The students in the intervention group stayed for the morning educational session, were provided with a pizza lunch, thanked and then dismissed. The next week, the intervention group participated in the second educational session, were again provided with lunch, thanked and dismissed. The same procedure for completion of the questionnaires was followed at the six week testing time.

**Educational Program**

The program emphasized increasing the asthmatic student’s confidence and skills, not just knowledge, relative to the management of asthma symptoms. The PRECEDE model helped address the three key factors affecting behaviours: knowledge, self-efficacy, attitudes (predisposing factors), skills and resources (enabling factors) and support (reinforcing factors). The goals of the program as described by the Ontario Lung Association were:

1. To teach and/or review information about asthma triggers and treatment;
2. To encourage students to work with their doctors and parents to develop a plan of action for possible emergencies;
(3) To teach self-management activities such as avoidance of triggers, preventive medication use that are suitable for this age group;

(4) To promote a sense of personal control for students in managing their own asthma by increasing feelings of self-efficacy;

(5) To facilitate discussion about the social and emotional issues faced by teens with asthma.

The objectives of the educational intervention developed by the investigator in collaboration with the Kingston Lung Association for this study were:

(1) To increase the teenager’s knowledge and understanding of asthma and asthma medications and to practice correct inhaler technique;

(2) To positively influence the teenager’s attitude towards accepting the illness, the need for medication and using it as prescribed (compliance);

(3) To increase the teenager’s sense of self-efficacy concerning the management of asthma;

(4) To train the teenager in self-management activities, such as how to prevent an asthma episode at home or at school; how to communicate about asthma with important people like teacher, gym teacher, athletics coach, classmates (or people) or friends who smoke;

(5) To practice relaxation techniques to reduce anxiety.

The program was delivered by a fourth year university nursing student who had asthma, and the investigator attended the sessions as a facilitator. Group participation was encouraged throughout the program to enhance peer support and understanding of the
problems all teenagers face living with this disease. Table 1 outlines the topics covered in the two educational sessions. Handouts of the material were given to the students. A 30 minute locally made film entitled "The Asthma Zone" was included in the program. This film highlighted the coping strategies and psycho-social issues faced by teenagers with asthma. The presentation emphasized that the teen can have considerable control over asthma and presented specific methods for early treatment of asthma episodes. The benefits of prevention and management through regular medical care and adherence with the recommendations of the physicians were stressed.
## Table 1

**Outline of Asthma Education Program**

### Session 1

1. How asthma affects your lungs  
2. Myths about asthma  
3. Symptoms of asthma  
4. Value of prevention  
5. Understanding your medications  
   - relievers vs. preventers  
   - taking according to prescribed schedule (compliance)  
   - proper inhaler use - practice by student  
   - spacer device demonstration  
   - overuse of B2 agonists (relievers)  
6. Peak flow demonstration and use  
7. Environmental management and avoidance of triggers

### Session 2

1. Attack management strategies  
2. Recognizing when asthma episode requires medical assistance  
3. Importance of communicating changes in asthma control to physician  
4. Exercise and asthma - prevention strategies  
5. Film - The Asthma Zone and group discussion  
6. Summary and wrap-up
CHAPTER IV

Results

Sample Characteristics

The final sample consisted of a total of 69 adolescents; 48 from the four program schools where children received the intervention program, and 21 from the three control schools where children will receive the program following the study. Three urban and one rural school comprised the program group, and two rural and one urban school comprised the control group. See Table 2 for gender, age, and grade for the program and comparison groups.

Most of the students (70%) lived with both parents, 25% with their mother and 5% with their father. Seventy-four percent of the mothers and 82% of the fathers were employed outside the home. Most of the students (75%) had been diagnosed with asthma by a doctor before the age of six years. The remainder were diagnosed between the ages of 6 and 12 years.

Asthma Characteristics

Prevalence of asthma was determined from school health records to be 12.4%. A description of asthma in terms of seasonal variations, triggers, perceived severity, and frequency of symptoms, is useful for an understanding of the disease in an adolescent group. Seasonal variations in asthma were reported, with most students having difficulty in the winter (75%), followed by fall (61%), spring (58%) and summer (51%). Exercise was the most common asthma trigger reported by 80% of the students. Weather changes were reported by 68%, viral infections by 64%, allergies such as animals, pollen, dust, and
Table 2

Gender, age and grade characteristics of program and control schools

<table>
<thead>
<tr>
<th>School</th>
<th>Grade</th>
<th>Number of Schools</th>
<th>Number of Subjects</th>
<th>Gender</th>
<th>Mean Age (years ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program</td>
<td>7-8</td>
<td>2</td>
<td>26</td>
<td>females n=14 males n=12</td>
<td>12.9(2.0)</td>
</tr>
<tr>
<td></td>
<td>9-10</td>
<td>2</td>
<td>22</td>
<td>females n=9 males n=13</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>7-8</td>
<td>1</td>
<td>9</td>
<td>females n=1 males n=8</td>
<td>13.5(1.2)</td>
</tr>
<tr>
<td></td>
<td>9-10</td>
<td>2</td>
<td>12</td>
<td>females n=7 males n=5</td>
<td></td>
</tr>
</tbody>
</table>
food sensitivities were reported by 61% and finally, cigarette smoke triggered asthma symptoms in 59% of the students.

A Chi-squared test showed that there was no difference between groups with regard to perceived severity of asthma or asthma symptoms (wheeze, cough, shortness of breath). It can be seen from Figure 3 that most of the students reported that their asthma was either mild or moderate. Asthma symptoms were reported to occur twice per week or more by 34% of the students (Figure 4). Nocturnal asthma however, was significantly different between groups using the Chi-square test of proportions, $\chi^2(4) = p < .05$. Figure 5 shows the program group reporting more asthma symptoms at night than the control group. It was noted that 48% of the total group of students had nocturnal asthma ranging from once per month to more than twice per week, indicating poor asthma control.

A question was asked about days of school missed in the past month because of asthma symptoms. This information is important in order to ascertain the impact of asthma on the daily activities of the students. The learning and social opportunities provided in the school environment are a source of self-esteem in this adolescent group, and missing school would compromise this important aspect of their lives. Twenty-four percent of the students missed from 1 to 10 days of school in the past month because of asthma. There was no significant difference in proportions between program and control groups.

Information was collected from the group to identify the impact of asthma on the health care system. Forty-one percent of the students had obtained emergency services
**Figure 3:** Percentage of students' perceived asthma severity as a function of school group
Figure 4: Frequency of asthma symptoms reported by school group
Figure 5: Reported nocturnal asthma by school group
from the hospital emergency department or their family doctor for asthma symptoms
(Figure 6) and 10% had been admitted to hospital for their asthma in the past year. Most
of the students were being treated for their asthma, indicating current disease. All but one
of the students in the study had active asthma. Family doctors were treating 77% of the
students for their asthma, and 23% were being followed by specialists.

Medical Management

To identify medication use in this group, the students were asked for information
regarding their prescribed asthma medications, including how often they were taking these
drugs. Broncho-dilators (relievers e.g., Ventolin) were prescribed for 97% of the
adolescents. Fifty-seven percent were taking these on a PRN basis and 20% were taking
their Ventolin regularly four times a day. Anti-inflammatories, either steroid and non-
steroid (preventers e.g., Beclomethasone, Intal) were prescribed to 44% of the students.
However, only 20% claimed they were taking them on a regular daily basis. Sixty-four
percent were taking their anti-inflammatory medication “whenever they felt they needed
it.” Sixteen percent of the students had been prescribed Prednisone from one to four times
in the past year, indicating a severe asthma exacerbation. Only three students indicated
that they use a peakflow meter to help them decide when to adjust their medications.

Knowledge, attitude, self-efficacy asthma questionnaire (KASE-AQ)

To determine the effectiveness of the intervention program, a repeated measures
ANOVA with 3 between factors (Gender- male vs. female; Grade - 7 and 8 vs. 9 and 10;
and Intervention- program vs. control), and 1 within factor (Time- pre vs. post
intervention) was performed on the full scale KASE score. The scores on the analysis
Figure 6: Emergency visits for asthma symptoms reported by all students.
revealed a significant main effect of Time, $F(1, 54) = 13.899$, $p < .01$, which was qualified by a Time x School interaction, $F(1, 54) = 8.453$, $p < .01$. Simple effects analysis revealed that mean scores for the program school post-intervention were greater than all scores pre-intervention and the control group post-intervention. See Appendix H for the ANOVA summary table. Figure 7 displays the mean pre-test and post-test full scale KASE scores for the program and control groups.

To determine whether the differences in the full-scale score reflected differences in each of the subscales, knowledge, attitude and self-efficacy were examined separately.

**Knowledge:** Table 3 displays the means of the subscale scores pre and post intervention for the program and the control groups. Here it can be seen that prior to the intervention program, knowledge about asthma was similar in both the program and control groups. Table 3 shows that following the intervention, at post-test, there were significant differences between the groups, which was confirmed by a one-way ANOVA. The analysis revealed that there was a significant increase in knowledge for those in the program group but not the control group $F(1, 68) = 18.024$, $p < .01$.

**Attitude:** Table 3 shows that pre-test scores for the program and control group were similar prior to the intervention. Although attitude increased in the program schools from pre to post-tests, the increase was not statistically significant.

**Self-Efficacy:** It can be seen in Table 3 that self-efficacy scores were similar in both groups at pre-test. However, mean scores in the program group at post-test, were found to be statistically higher using a One-Way ANOVA procedure $F(1, 68) = 8.4$, $p < .01$. 
Figure 7: Mean full scale knowledge, attitude and self-efficacy scores for program and control schools at pre-test and post-test.
Table 3

Mean pre-test and post-test KASE subscale scores for program and control schools

<table>
<thead>
<tr>
<th></th>
<th>Knowledge Mean (± SD)</th>
<th>Attitude Mean (± SD)</th>
<th>Self-Efficacy Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>8.5 (3.2)</td>
<td>75.3 (8.2)</td>
<td>75.1 (10.7)</td>
</tr>
<tr>
<td>Post-test</td>
<td>12.5 (3.0)</td>
<td>83.7 (9.5)</td>
<td>81.3 (10.7)</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>8.1 (2.6)</td>
<td>73.0 (7.7)</td>
<td>76.7 (11.1)</td>
</tr>
<tr>
<td>Post-test</td>
<td>8.2 (3.2)</td>
<td>77.5 (10.7)</td>
<td>75.1 (11.0)</td>
</tr>
</tbody>
</table>
Pediatric Asthma Quality of Life Questionnaire (PAQLQ)

A repeated measures ANOVA revealed Time to be a significant factor in the variability in the PAQLQ scores $F(1), p < .05$, however there were no differences in Time x School $F(1), p > .05$ (Appendix 1, page 5, for ANOVA).

Raw scores for the subscales in the PAQLQ questionnaire were converted to standard scores with a total of seven, in accordance with the developers guidelines. Scores from 1 to 3.5 represent a severe impairment, those from 3.6 to 5.0 represent moderate impairment and finally, all scores from 5.1 to 7 represent a mild impairment. Students were moderately limited in their activities as indicated by a mean score of 3.9. moderately impaired by symptoms with a mean score of 4.5 and mildly impaired by emotional problems as a result of their asthma. The total mean score and the subscale mean scores of the PAQLQ are shown in Table 4. Almost a third of the students reported that they were quite to extremely bothered by their asthma in the past week (Figure 8).

Relationship Between KASE and PAQLQ

To determine if there was a relationship between the scores on the KASE and PAQLQ questionnaires, a Pearson Product Moment correlation was performed. It can be seen on Table 5 that the total KASE and PAQLQ scores were positively correlated at pre-test ($r = .40, p < .01$), and at post-test ($r = .37, p < .05$). When the relationship between the subscales were examined, (see Correlation Table 6) attitude and self-efficacy were moderately correlated with activity, symptoms and emotions. Knowledge however, did not correlate with any of the PAQLQ subscales.
Table 4

Mean PAQOL subscale scores pre and post intervention for program and control schools

<table>
<thead>
<tr>
<th></th>
<th>Activity (±SD)</th>
<th>Emotions (±SD)</th>
<th>Symptoms (±SD)</th>
<th>Total (±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>3.9 (1.2)</td>
<td>5.4 (1.4)</td>
<td>4.5 (1.2)</td>
<td>4.6 (1.5)</td>
</tr>
<tr>
<td>Post-test</td>
<td>4.1 (1.4)</td>
<td>5.3 (1.5)</td>
<td>4.8 (1.4)</td>
<td>4.7 (1.5)</td>
</tr>
</tbody>
</table>
Figure 8: Activity Limitation in the Past Week Due to Asthma Symptoms (All Students)
'Amount of Impairment by Asthma in Past Week?'
Table 5

Pre-test and post-test correlation coefficients for full KASE and PAOLO scales

<table>
<thead>
<tr>
<th></th>
<th>KASE PRE</th>
<th>KASE POST</th>
<th>QOL PRE</th>
<th>QOL POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>KASE PRE</td>
<td>1.00</td>
<td>.53**</td>
<td>.40**</td>
<td>.32*</td>
</tr>
<tr>
<td>KASE POST</td>
<td></td>
<td>1.00</td>
<td>.35**</td>
<td>.33*</td>
</tr>
<tr>
<td>QOL PRE</td>
<td></td>
<td></td>
<td>1.00</td>
<td>.88**</td>
</tr>
<tr>
<td>QOL POST</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

* p < 0.05  ** p < 0.01
Table 6

Correlation coefficients for pre and post tests between KASE and PAQLQ subscales

<table>
<thead>
<tr>
<th></th>
<th>Activity Pre</th>
<th>Activity Post</th>
<th>Symptoms Pre</th>
<th>Symptoms Post</th>
<th>Emotions Pre</th>
<th>Emotions Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Pre</td>
<td>.01</td>
<td>.00</td>
<td>.04</td>
<td>.07</td>
<td>.06</td>
<td>.22</td>
</tr>
<tr>
<td>Knowledge Post</td>
<td>.07</td>
<td>.16</td>
<td>.17</td>
<td>.11</td>
<td>.19</td>
<td>.16</td>
</tr>
<tr>
<td>Attitude Pre</td>
<td>.43**</td>
<td>.47**</td>
<td>.43**</td>
<td>.34**</td>
<td>.40**</td>
<td>.41**</td>
</tr>
<tr>
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* $p<0.05$  ** $p<0.01$
Problem Questions

To determine if the students could assimilate the information gleaned from the program and apply it to hypothetical situations, two questions were asked following completion of the KASE and PAQLQ questionnaires. The first was, “During an attack of asthma, you require Ventolin every two hours. You are gaining benefit but you are very breathless after two hours. Provided that you don’t get any worse, it is fine to continue with two hourly treatments.” Only 20% of the students at pretest and 22% of the students at post-test responded correctly, indicating that it was not fine (false) to continue with two hourly treatments because this meant that their asthma symptoms were becoming severe. It was therefore important to see a doctor immediately about their deteriorating asthma control. The second question, asked the student about ways to prevent attacks of asthma during exercise. Only 5% of the students answered correctly identifying pretreatment with broncho-dilator 20 minutes before exercise, and two of the following: 15 minute warm-up exercises; maintaining good overall asthma control; exercising in humidified environment; drinking clear fluids; and avoidance of outdoor exercise during high pollen times if pollen is a trigger.

In summary, a repeated measures ANOVA revealed a significant increase in the full scale KASE-AQ following an asthma education intervention, for those in the program group. Specifically, significant increases in knowledge and self-efficacy scores accounted for the variability in the scores. There were no significant differences between groups in either the attitude or the quality of life scores. There was a significant positive correlation between the KASE-AQ and the PAQLQ.
CHAPTER V

Discussion

The purpose of this study was to evaluate an asthma education program offered by the Kingston Lung Association to adolescents in grades seven to ten in terms of knowledge, attitudes, self-efficacy and quality of life. The results of this study will be discussed in relation to this purpose and the educational objectives formulated for the program.

The asthma educational intervention was effective in increasing knowledge, and self-efficacy in adolescents who took part in the program. Attitude and quality of life however, were not altered as a result of the program.

Prior to the educational program, knowledge about asthma was, in general, low. The students who participated in the educational program however, showed significant increases in knowledge six weeks following the program. Knowledge deficits were in the areas of management of exercise induced asthma, medication use, and strategies to prevent asthma. Knowledge in these areas is critical to successful control of asthma symptoms, and for the prevention of symptoms when there is potential for contact with known triggers. The students were asked to demonstrate correct inhaler use using their own inhalers during the first session. Some students were using roto-disks for their asthma medication and therefore, did not know how to use the inhalers properly. Many students who were prescribed asthma medications with this delivery system, were using their inhalers incorrectly. Only two students indicated that they used a spacer device with their inhalers and in fact, many students claimed that they had never seen a spacer device
before. It was clear from the findings, however, that an asthma education program
designed specifically for teenagers and delivered in the schools increased knowledge which
is a prerequisite for asthma management behaviours to control symptoms.

Although this study was not designed to explore myths about asthma, it is
interesting to note that these emerged during the program sessions. For example, at pre-
test, 42% of the students believed that asthma was a result of an emotional illness, and
73% believed that anti-inflammatory medications can be addicting. There was little
change in these findings at post-test. Health professionals will need to identify and dispel
these and other myths about asthma which interfere with symptom prevention and
treatment to facilitate effective self-management practices.

Although 80% of the entire sample indicated that exercise triggered asthma, not
one student was able to identify ways to prevent symptoms during exercise. Many said,
they take their puffer before, they did not however, specify how long before exercise this
should happen (20 minutes). Other measures which are helpful in preventing exercise
induced asthma which the group were unable to identify are: a 15 minute warm-up,
improving overall control of asthma, selecting exercise in humid environment, and
breathing through the nose. Preventing and controlling exercise induced asthma is
particularly important for the adolescent in physical education classes at school.

Teenagers with asthma who do poorly in physical education classes may do so because
asthma symptoms prevent them from performing well and enjoying sports. Consequently,
this may lead ultimately to a sedentary lifestyle, and be a threat to their self-esteem. There
is some support for this notion, as many adolescents in the program group stated that gym
teachers do not understand why they can not keep up with other students in their class. It was clear, that those who work with children with asthma need to be educated about the condition and its effects on the child. This is necessary, if teenagers are to have the support they need to enjoy and to perform to the best of their ability in sports. Continued emphasis on life-style, behavioural and environmental factors influencing asthma self-management in this population must be a concern of asthma education efforts of nurses.

The students’ attitudes were generally positive regarding asthma as indicated by high scores in this subscale, and there were no differences between groups either at pre-test or post-test. Many of the students complained at the second testing time which was done in early December, that their asthma was bothering them. Therefore, the seasonal variation of asthma may have influenced attitude during the completion of the questionnaire. Attitudes also may have been influenced by the mood of the students.

There were several attitude questions on the KASE-AQ that were related to quality of life issues. For example, it was noteworthy, that over one third of the students felt that their life revolved around their asthma, and over half resented their asthma because it limited their mobility. The scores on these two questions did not change from pre-test to post-test in either of the groups. For a number of the adolescents in this study, asthma did have a negative effect on their activities of daily life. This was similar to the findings of Creer, Stein, Rappaport, and Lewis (1992) that the physical limitations and social impairments may negatively influence the adolescent’s self-esteem and feelings of self worth. Having an illness such as asthma was problematic for many of the students in this study.
Although most of the adolescents indicated that they felt it was important to work together with their physician to control their asthma, and to take their asthma medications as prescribed, it is necessary to recognize that what they say and what they do may not be the same. Many of the students in this study reported that they took their medication "whenever they felt they needed it" which was not the way they reported their physician had prescribed the medication. Discrepancies between physician and the adolescents perceptions, understandings and expectations have been shown to influence compliance, and the motivation to engage in self-management (Boulet, Chapman, & Green, 1994). The results also indicated that they felt comfortable taking their asthma medications at school or away from home, however, this is contradicted by what the students stated during the educational sessions.

Family support was reported by most of the students to be helpful in getting control of asthma symptoms. There is support in the literature for the finding that children with asthma need to receive rewards for their self-care efforts from family members and other caregivers (Jerrett & Costello, 1996). Parents of teenagers with asthma not only must provide support, but also need to collaborate with the physician in their child’s treatment regimen. One student for example, said that his mother had not found another doctor to take care of his asthma since their physician left the city three months ago. He stated that this was a problem because his asthma was really bad. The investigator, in fact, was very concerned about this student’s asthma because of the symptoms he had during the educational sessions. Appropriate medical supervision plays an important role in the teenager’s self-management behaviours as the physician controls the treatment plan.
The students reported high levels of self-efficacy and indicated that they felt quite confident in their ability to manage their asthma. Those participating in the program group did however, score significantly higher at post-test. Contrary to the perceptions of student confidence, a lack of confidence in rather fundamental concepts of asthma management was evident in the answers to several questions. Forty percent of the students did not feel confident recognizing changes in their lungs before an asthma attack begins. The same number did not feel confident in their ability to exercise without having an asthma episode. Almost half of the teenagers felt there was nothing they could do to relieve an asthma attack before it got worse. It is clear from these results that increasing adolescents’ perceptions of confidence in the areas of: symptom recognition; attack management skills; and prevention of exercise induced asthma, are important areas to focus on in future self-management programs. According to Green and Frankish (1994) small incremental behaviour changes should be encouraged by asthma educators rather than all or nothing efforts.

Self-efficacy is based on four sources of information: performance accomplishments, vicarious experiences, verbal persuasion, and emotional/physical arousal (Bandura, 1977). Programs for adolescent asthmatics can be designed to increase self-efficacy by incorporating these constructs. For example, to increase teenagers self-efficacy in managing exercise induced asthma, performance accomplishments, vicarious experiences and verbal persuasion can be used. Pre-treating with Ventolin (with proper inhaler technique), abdominal breathing, doing warm-ups before exercise and exercising in humid environments could be taught and then practised by the student to increase mastery
of these skills. Efficacy expectations increased in patients with COPD following an educational program on managing breathing difficulty (Scherer, & Schmieder, 1996).

The scores on the Pediatric Asthma Quality of Life Questionnaire changed significantly over time, however results indicated that the intervention did not account for significant differences in scores. The entire sample had moderate quality of life impairments before and after the asthma educational program indicating that their asthma symptoms were troublesome. There are two possible explanations for this result. First, it may be that the students' asthma was not adequately controlled. Only 44% of the entire sample had been prescribed an anti-inflammatory medication. Many students admitted that they took this medication "whenever they felt they needed it," other than every day as it would have been prescribed. If asthma symptoms are not being controlled with appropriate medications, then there are negative effects to quality of life. Second, it may be that some students chose different activities at post-test which resulted in missing data. In order to compare results, the activities chosen at pre and post-test must be the same. Although this was explained to the students, some students did not choose the same activities at pre and post-test. Some students wrote on their questionnaires that "the activity they chose at pretest didn't bother them any more" or "they didn't do this activity any more" and so they chose a different one. Had they chosen the same one, they may have scored higher (less bothered), and the results may have been different.

The most frequently identified activities on the PAQLQ that were limited by asthma were running (77%), basketball (26%), and hockey (29%). The question, "How bothered have you been in all activities this past week because of your asthma?" identified
extreme limitation in a third of the students which indicated that asthma symptoms are being poorly controlled in many students, resulting in a limitation in activities of everyday life. Furthermore, the attitude questions from the KASE-AQ related to quality of life issues supports the finding that asthma is having a negative effect on the activities of the adolescents in this study. Twenty four percent of the students missed from 1 to 10 days of school in the past month because of their asthma which adds to the burden adolescents experience as a result of this condition. A few of the comments the students made during the educational sessions when asked what was the worst thing about having asthma, were "not being able to do stuff," "it sucks having asthma because my friends can do things like camping and I can’t," and "I used to compete in swimming and now I can’t because the chlorine makes my asthma bad."

In the symptoms domain, severe limitation from asthma attacks was reported by 22% of the students at pre-test. Nocturnal asthma occurring at least quite often in the last week was reported by 28% of the students indicating that asthma was not being controlled. Minor fluctuations from these results were reported at post-test. The group as a whole, were moderately impaired by their symptoms indicating that they could benefit from better management of their asthma. Continued efforts by educators to develop strategies to improve symptom management in asthma sufferers in order to provide better control and reduce morbidity is of paramount importance.

In contrast to the high degree of impairment reported in both the activity and symptom domains of the PAQLQ, the students were only mildly bothered in the emotion domain. Have these teenagers become complacent to the way asthma symptoms were
affecting their lives? If they have ever felt the benefits of good asthma control, one might expect that their expectations in terms of activities might be perceived differently. Assuming that an individual has been properly assessed and prescribed appropriate treatment to control symptoms, one then, could attribute changes in an individual’s quality of life to his or her self-management practices.

Although the investigator did not intend to explore the relationship between knowledge, attitude, self-efficacy and quality of life, it was an interesting, yet not surprising, ad hoc finding. A significant positive correlation was found between the two scales which supports the theoretical background of this study. The PRECEDE model is predicated on predisposing factors such as knowledge, attitude and self-efficacy, enabling factors such as education and reinforcing factors such as peer support. These variables are positively correlated with asthma self-management behaviours to reduce and control symptoms which ultimately improves the individual’s quality of life. This lends support for the consideration of the principles within the model when planning educational interventions for adolescents with asthma.

As far as the educational objectives are concerned, the program was successful in increasing knowledge and understanding of asthma and asthma medications. The findings highlighted specific issues such as prevention of exercise induced asthma, myths regarding asthma medications, which require more time and attention from the educator in future programs. Self-efficacy was significantly increased. It is suggested that future educational programs focus on areas where the students in this study lacked confidence such as, symptom discrimination and prevention of exercise induced asthma. Scores in the attitude
scale increased slightly, however, the findings indicated that the students resented their asthma. Efforts to improve attitudes are important in educational programs.

Prevention of asthma episodes and recognition of acute asthma episodes which require medical attention were discussed during the education program. Role-playing may be beneficial to help the students through situations where they are required to make decisions about behaviours to prevent asthma episodes. Research suggests that children are quite competent to participate in programs that teach decision making skills, related to health matters such as asthma management (Lewis & Lewis, 1990). Communication strategies to use with doctors, teachers, and peers was an area the teenagers indicated they needed help and practice, and is an appropriate objective for future programs. Relaxation techniques were briefly discussed, however, there was not enough time for elaboration and practice by the students of this or other alternative educational approaches, which is a limitation of the educational intervention offered in this study.

Smoking in this adolescent sample was an activity reported by 23% of the students which is similar to the Gibson, Henry, Vimpani, and Halliday (1995) study but lower than the Lung Association statistics which report smoking in this age group to be 30% (Health Canada, 1996). Asthma educators need to warn adolescent asthmatics about the dangers of smoking. Brook, and Shiloh (1993) reported that adolescents who had asthma were at greater risk for developing smoking habits than healthy counterparts. One may ask whether smoking is a risk taking activity which asthmatic teenagers engage in to deny that they have asthma or to prove they are no different from others.

In general, from the comments the students made, and the fact that there was a
100% response rate for both testing times, it was apparent that the asthma education program captured their interest. Students appeared to especially value and benefit from the opportunity for peer support and interaction. The instructor and the investigator perceived the group interaction as valuable in eliciting fears and concerns of the students, and through this shared experience with other adolescent asthmatics, the instructor was able to address the students' concerns in a non-threatening manner.
CHAPTER VI

Summary, Recommendations and Conclusion

Summary of Design and Results

The literature has drawn attention to the fact that non-compliance to therapeutic regimes is common in the adolescent age group. The behaviours required to control symptoms however, compete with the developmental struggle for independence and the influence of peers.

This randomized control group pre and post-test study determined that an asthma educational program delivered by the Kingston Lung Association, for adolescent asthmatics in a select number of schools, was effective in increasing knowledge and self-efficacy, which was measured by the KASE-AQ. Attitude and quality of life were not altered as a result of the program. Scores on the PAQLQ indicated that the students were moderately impaired as a consequence of their asthma, indicating that asthma was not in good control. The educational program was based on the PRECEDE model, and the predisposing factors knowledge, attitude and self-efficacy were outcomes for the study.

Recommendations

The focus of this study was the evaluation of an asthma educational program given to adolescents in a select number of schools. Therefore, the recommendations from the findings of the research described here, are considered in terms of the deficits identified in the program, and implications for future research. Although there were statistically significant improvements in knowledge and self-efficacy, if the program is to be developed beyond the pilot stage, it is necessary for the specific educational needs of this age group,
as identified in the study, be incorporated into a revised program.

First, more specific information on the prevention of exercise induced asthma is recommended. This means giving more attention to strategies for prevention, such as premedicating 20 minutes before, and 15 minutes of warm-up exercises. Second, as well as information, future programs should provide opportunities for increasing mastery by including practice and demonstration by the student of proper inhaler use, relaxation techniques, and role playing to increase the teenager's confidence in social situations which put them at risk for asthma attacks. Third, the inclusion of concerns regarding medication compliance, especially the neglect of anti-inflammatory therapy and over use of short acting beta-2 agonists is of paramount importance for future programs. Educators also must dispel the myths that are associated with asthma and the therapy. Finally, asthma education needs to be ongoing to reinforce self-management behaviours and update teenagers on current asthma therapy.

Asthma education programs aim to enhance compliance behaviours to control asthma symptoms, thereby reducing morbidity which ultimately improves the quality of life of the adolescent. A most interesting aspect of the study were the findings from the exploratory questions in the demographic survey. These results indicated that for this group of teenagers, their asthma control was often sub-optimal. This has implications for the design of the asthma education program in the future. Assessment of asthma control should be a primary objective of asthma education programs for adolescents.
Future Research

These recommendations have implications for the design of a more effective educational program for adolescents in the future, and outcome studies to test the effectiveness of these programs. The KASE-AQ was a valuable tool to measure knowledge, attitude, and self-efficacy in a general sense, however, the investigator recommends that in future studies, more specific information is required especially in the areas of knowledge and self-efficacy. This information would help clinicians and educators pinpoint areas in which teenagers are having difficulties. Exercise induced asthma prevention, myths regarding asthma, avoidance of triggers in social situations and symptom recognition and discrimination, have emerged as troublesome areas for asthma management for the adolescents in this study. More specific outcome measures are required in future studies to identify specific educational needs of this group in these areas.

The investigator found that quality of life also emerged as an important outcome to document in this age group because of the degree impairment they are experiencing as a result of their asthma. A long term study is recommended to capture any improvements in quality of life that can be attributed to changes in their self-management behaviour as a result of an asthma education program. With the present social climate and increased interest in empowering clients to be active participants in their own health care, future research that focus on teaching decision making skills and empowering children and adolescents with self-care skills is recommended. A study of how parents and physicians share responsibilities for asthma management with the adolescent, and strategies to transfer increasing control to the adolescent is recommended.
It is important that future research incorporate clinical assessment such as symptoms, and peak flows in both pre and post-test situations. This would provide some evidence of behaviour change to control symptoms, which could be attributed to the asthma education program. The relationship between behaviour change and better symptom control may also reinforce future asthma self-management decisions for the adolescent.

Conclusion

Adolescents are at risk for the physical, social and social morbidity which is associated with non-compliance to their therapeutic regimens. Nurses have an important role in developing, teaching, and evaluating educational programs for teenagers with asthma, in order to enhance compliance behaviours which reduce unnecessary physical and psychological morbidity. This study has contributed important information about the educational needs of adolescents with asthma and the impact that this disease has on their quality of life. The asthma education program offered to students in grades 7 through 10, focused on knowledge, attitudes and self-efficacy beliefs, three factors which are positively correlated with asthma self-management skills and compliance behaviours. The program was effective in increasing all three variables, with significant gains in knowledge and self-efficacy as a key finding, and smaller non-significant gains in attitude.

Determining the burden that a disease has on an individual's quality of life is an important outcome to measure for researchers evaluating asthma education programs. Although there were no differences on the PAQLQ between the program and control
groups in this study, the investigator was able to document the impact this disease has on the lives of this group of adolescents.
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Appendix A: Consent
Consent Form

I agree to participate having understood the explanation and having had all my questions answered to my satisfaction. I understand that one of the purposes of this study is to provide an evaluation of the educational program given by The Lung Association in Kingston, Ontario. I understand that participation in this study is voluntary and I am free to withdraw at any time for any reason. I understand that there may be some benefit to me in terms of learning more about my asthma, and that other teenagers may be helped through the results obtained in this study.

I understand that all information obtained during this study is confidential and that my identity will be protected at all times. I understand that all information obtained, including my identity, will be stored separately in locked filing cabinets in the School of Nursing, Queen's University, and will be available only to the student investigator and the study supervisor. I understand that my identity will not be disclosed in any published findings of the study. I understand that I will receive a copy of the consent form for my records. Findings will be used for educational purposes and will be published.

I have read and understand the consent form for this study. By signing this consent form, I am indicating that I agree to participate in the study.

________________________________________  ____________________________
Student Signature                              Date

________________________________________  ____________________________
Parent/Guardian Signature                      Date

________________________________________  ____________________________
Student Investigator                           Date

Statement of Investigator:

I have carefully explained to the subject the nature of the above research study. I certify that, to the best of my knowledge, the subject understands clearly the nature of the study and demands, benefits, and risks involved to participants in this study.

________________________________________  ____________________________
Signature of Student Investigator              Date

If at any time you have further questions or concerns about the study, you may contact Deborah Pichora (Student Investigator) at (613) 548-7716, Dr. Mary Jerrett (Thesis Advisor) at (613) 545-2668, or Dr. Alice Baumgart, Dean of the School of Nursing, at (613) 545-2669.
Appendix B: Correspondence
October 18, 1996.

Sharon Jessup,
Director, Eastern Region
Lung Association
979 Princess Street, Ste. 105
Kingston, Ontario
K7L 1G1

Dear Sharon:

I have reviewed the material which you submitted to me in support of your request to expand your asthma education program to secondary schools in Frontenac County.

Approval is granted for you to approach principals, about participating in this research, using this letter as an introduction.

May I emphasize that in accordance with our Board Policy S-22: External Research, it is understood that for this program, the names of schools and students will not be identified in any report, and schools and students have the right to opt out of this program at any time.

Best wishes for success with the expansion of your valuable asthma education program.

Sincerely,

H.F. Wohlgemut
Superintendent of Curriculum and
Office of Accountability

cc: Barry O'Connor, Director of Education
Linda MacKinnon, Superintendent of Education
Issam Massouh, Superintendent of Education
Susan Everitt, Superintendent of Human Resources
All Principals

"Building Bridges to the Future"
September 20, 1996

Danny Lalonde
Student Services
Bayridge Secondary School
1059 Taylor-Kidd Boulevard
Kingston, Ontario
K7M 6J9

Dear Danny:

Thanks for taking the time to speak with me today about The Lung Association's new program for teens with asthma. As promised, enclosed is more information on the program. We would appreciate an opportunity to offer the program at Bayridge. I hope the limited lost class time will be sufficiently appealing to administration, and the free lunches and gift packs will be adequate to draw in the students! (I gave Irene your message about the changed dates in November for her program.)

We would like to begin offering Welcome to The Asthma Zone in participating schools the week of October 7. Because we are conducting a concurrent evaluation of the program, it is possible that your school would be in the control group, which means that your students will get the program beginning in the first week of February, instead of in October. We will definitely provide Welcome to The Asthma Zone to all schools that request it, but in order to conform to a proper evaluation technique, we have to randomize the schools (in other words, we'll be pulling the names of four schools out of a hat for the October program and four out of a hat for the February program). If more than eight schools want the program, we will make arrangements to offer it in April.

We are excited about both our new activities -- No Ifs, Ands or Butts is a revised version of a smoking awareness/cessation program that has been very well received throughout Ontario, and The Asthma Zone is an opportunity for your students to participate in the further development of education and support for themselves and other adolescents with asthma.

As the week of October 7 is fast approaching, I would be very grateful if you could let me know as soon as possible about whether we may offer Welcome to The Asthma Zone at Bayridge this year. Bill Allen told me I could mention that exercise-induced asthma is a significant problem for a lot of adolescents with asthma, and we can help with that!

Yours very truly,

Sharon Jessup
Executive Director

When You Can't Breathe, Nothing Else Matters.
Welcome to The Asthma Zone
Teen Asthma Education and Support Program

"The trouble with having asthma is that on TV and in books and movies, asthma is like some kind of short form for geek. You know, if a character has asthma or bad allergies, then the audience knows right away that they’re a geek. I hate having the geek disease."
- David, aged 15

"I saw about a million doctors when I was a kid, and they all said I’d outgrow my asthma, or probably I’d outgrow my asthma, when I was nine or ten or something like that....They made me think I just had to wait and then I wouldn’t need to take drugs and have trouble breathing and have to avoid all kinds of stuff. But they were wrong. I guess they lied. I think my asthma is for life."
- Colleen, aged 16

"Before I knew I had asthma, I was healthy. Even if I coughed or felt like it was hard to breathe sometimes, who cares? Everyone feels like that sometimes, like when they have a cold or whatever. But once they told me it was asthma, all of a sudden I was sick. I had this disease. I was the same person and I felt the same, but before I was healthy, and now I’m sick. They shouldn’t have told me."
- Lisa, aged 13

These comments came from teenagers with asthma who live and go to high school in the Kingston area. The kids participated in a research questionnaire and two focus groups conducted by The Lung Association in the summer of 1994, as part of the research for the production of a video about teenagers’ first-hand experiences with asthma. The finished video, The Asthma Zone, was released in 1995. It is now part of a developing program for asthmatic adolescents that will be offered to students in grades 7 to 10.

We are asking your school to give us an opportunity to provide a pilot program, Welcome to The Asthma Zone, for grades 9 and 10 students. The program includes a built-in evaluation component, and an opportunity for your students to play a role in curriculum development. The program is being developed, tested and evaluated in the Frontenac and Lennox and Addington area. It will then be revised as necessary and rolled out across Eastern Ontario, and later made available to Lung Association offices across the province.

Program Goals:
To teach and/or review information about asthma triggers and treatment;
To encourage students to work with their doctors and parents to develop a plan of action for possible asthma emergencies;
To facilitate discussion about the social and emotional issues faced by teens with a chronic disease (specifically asthma);
To promote a sense of personal control for students in managing their own asthma.

Time Commitment from the Student:
The program consists of three sessions (all three to be held on either Tuesdays or
Wednesdays), as follows:

Week One: A 90-minute session consisting of most of lunchtime plus half of either period two or period three;
Week Two: A 90-minute session consisting of most of lunchtime plus half of either period two or period three;
Week Six: A 50-minute session consisting of lunchtime.

Cost:
There is no fee charged, either to the student or to the school. The program is made possible by donations from individuals and businesses to The Lung Association.

Benefits to the Student:

Aside from the obvious learning and support opportunities, The Lung Association will provide lunch (pizza, drinks and dessert) for all three sessions to the students who participate in the program.
Take-home materials will be supplied for the student to share with his/her parent(s).
Take-home summaries of key points will be provided for the student to keep.
A "gift pack," containing items and gift certificates appealing to high school students will be provided to each student who attends all three sessions.
Students have a chance to be in at the creation stage of a program for their peers.

Benefits to the School:

For teens with asthma, moving from the relatively protected environment of elementary school to more independence in high school may be rather frightening or discouraging, at least from the perspective of having asthma. In Lung Association focus groups, several teens suggested that the staff members in their high schools "don't care about whether you are having trouble with your asthma." Their comments elicited general agreement that having asthma in high school could be a lonely experience. Allowing The Lung Association to provide Welcome to The Asthma Zone is a chance for school staff to acknowledge some of the special issues faced by students with asthma.

The Lung Association is prepared to provide an inservice on Asthma and Anaphylaxis (life-threatening allergy) to staff and to parents. The inservice would be offered after the completion of the Welcome to The Asthma Zone program. There would be no charge for this service.

Size of Group:

Ten to 12 is the ideal size. We will run the program with a minimum of 6 students and a maximum of 15.
No Ifs, Ands or Butts
Teen Smoking Awareness/Cessation Program

NO IFS, ANDS OR BUTTS...was developed at the request of young people who were seeking help to quit smoking. Qualified Lung Association staff and trained volunteers have worked in community-based and school based smoking cessation and awareness programs for many years.

Student input has been vital to Lung Association staff in the development of this program. Components of this program are consistent with the ideals expressed in Ministry of Education, Physical and Health Education and Ministry of Health Mandatory Health Programs and Services guidelines.

We are asking your school to give us an opportunity to provide NO IFS, ANDS OR BUTTS to students in your school wishing to quit smoking, cut down or those seeking information regarding quitting smoking.

Program Goals:
To reduce and eliminate smoking behaviour in young people;
To show young people that non-smoking is part of a desirable image;
To demonstrate that non-smoking is the norm;
To encourage and help to develop positive self-image and self-esteem in young people; and
To help young people develop coping skills to resist pressures to smoke.

Time Commitment from the Student:
This program consists of six sessions over a 4-week interval, with the option of adding two more sessions as support meetings. Our experience conducting teen programs indicates they be offered during class time, as student compliance is usually very good (before or after classes or during lunch hour are usually smoking breaks for the students.) The sessions will be offered on the following days:
October 15 & 16, 23, 29, 30 and November 6.

We will be able to offer 2 programs in October/November and 2 programs in January/February to local high schools. There is no fee charged, to either student or school. We encourage you to call Irene Morton as soon as possible to book NO IFS, ANDS OR BUTTS or for more information regarding this program.

Size of Group:
Minimum of 5 students, maximum of 15 students.
Appendix C: Explanation
Knowledge, Attitudes, Self-Efficacy, and Quality of Life in Adolescents With Asthma

Queen's University
School of Nursing
Study Information Sheet

Explanation of the Study

You are invited to participate in a research study to learn more about teenagers' feelings about asthma management and how asthma affects their activities. The study is being conducted by Mrs. Deborah Pichora, a Registered Nurse and a Master of Science student in the School of Nursing at Queen's University. Professor Mary Jerrett, School of Nursing, will supervise the study. The purpose of the study is to increase the amount of information available about factors which help teenagers manage their asthma better and how asthma affects them in their daily lives.

If you decide to participate in this study, you will be asked to fill out 2 questionnaires which will take approximately 40 minutes to complete, three times during the course of the study.

The benefit for the students involved in this study could possibly be a better understanding of asthma and methods to control symptoms. Findings from the study will provide information for future asthma education programs to help other teenagers manage their asthma. There are no risks to participants, however, students would miss some school classes as a result of participating in the study.

You understand that your participation in the study is voluntary. Students may participate in the asthma program at school and elect not to participate in the study. Also, you may withdraw from the study at any time.
Appendix D: Knowledge, Attitude and Self-efficacy Questionnaire (KASE)
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 ketoacidosis
   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 school or other daily activities.
   
   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 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 away from home for extended periods, i.e., at friends for sleepovers, on trips, summer camp.

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 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 Canada is approximately ________.
   
   a) 5 million  
   b) 2 million  
   c) 1 million  
   d) 500,000  
   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 habit  
   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 change

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 behaviours, 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) Adjust medication, Breathe only through the nose, and Call the physician
   e) 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 devise
   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 makes a squeaking sound when you shake it next to your ear
   b) The inhaler floats on a diagonal half-way down in a sink full of water
   c) The inhaler has a sound of liquid sloshing around inside when you shake it next to your ear
   d) The inhaler stands up at the bottom of a sink full of water
   e) The inhaler makes no sound when you shake it next to your ear
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. I know one of these is not true of oral inhaled steroids:

a) They produce better overall asthma control
b) They reduce nighttime cough episodes
c) They can become addicting
d) Poor inhalation technique is responsible for side effects such as fungal infections, hoarseness, cough, and wheeze
e) They take up to 2 weeks to become effective

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 up to help control my asthma.

a) True
b) Mostly true
c) Sometimes true and sometimes false
d) Mostly false
e) False
Appendix E: Paediatric Asthma Quality of Life Questionnaire (PAQLQ)
PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE

SELF-ADMINISTERED

ACTIVITIES

Because you have asthma, you may have found some of the things you like doing difficult or not much fun.

We want you to think about all the things that you do in which you have been bothered by your asthma.

Some people are bothered by asthma when doing some of the following activities. Please read through the list. Think about how your asthma has bothered you during the last week.

On the next page, write down the three (3) things in which you have been bothered most by your asthma during the last week. These things must be activities that you will be doing regularly during the study. The three activities you choose can be from this list or you can think of other activities as long as you do them regularly.

<table>
<thead>
<tr>
<th>1. Ball Hockey</th>
<th>19. Walking Upstairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Baseball</td>
<td>20. Laughing</td>
</tr>
<tr>
<td>4. Dancing (ballet/jazz)</td>
<td>22. Doing Household Chores</td>
</tr>
<tr>
<td>5. Football</td>
<td>23. Singing</td>
</tr>
<tr>
<td>6. Playing at Recess</td>
<td>24. Doing Crafts or Hobbies</td>
</tr>
<tr>
<td>9. Riding a Bicycle</td>
<td>27. Rollerblading/Rollerskating</td>
</tr>
<tr>
<td>10. Running</td>
<td>28. Skateboarding</td>
</tr>
<tr>
<td>11. Skipping Rope</td>
<td>29. Track and Field</td>
</tr>
<tr>
<td>12. Shopping</td>
<td>30. Tobogganing</td>
</tr>
<tr>
<td>13. Sleeping</td>
<td>31. Skiing</td>
</tr>
<tr>
<td>14. Soccer</td>
<td>32. Ice Skating</td>
</tr>
<tr>
<td>15. Swimming</td>
<td>33. Climbing</td>
</tr>
<tr>
<td>16. Volleyball</td>
<td>34. Getting up in the Morning</td>
</tr>
<tr>
<td>17. Walking</td>
<td>35. Talking</td>
</tr>
<tr>
<td>18. Walking Uphill</td>
<td></td>
</tr>
</tbody>
</table>
**PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE**

**SELF-ADMINISTERED**

On the lines below, please write down the 3 activities in which you have been bothered most by your asthma. We then want you to tell us how much you have been bothered doing these things during the last week because of your asthma.

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

**HOW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK?**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Extremely Bothered</th>
<th>Very Bothered</th>
<th>Quite Bothered</th>
<th>Somewhat Bothered</th>
<th>Bothered A Bit</th>
<th>Hardly Bothered At All</th>
<th>Not Bothered</th>
<th>Activity Not Done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<td>3</td>
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<td>3.</td>
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<tr>
<td>4. COUGHING</td>
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</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Feeling</th>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>Quite Often</th>
<th>Some of the Time</th>
<th>Once in a While</th>
<th>Hardly Any of the Time</th>
<th>None of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Feel FRUSTRATED because of your asthma?</td>
<td></td>
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<td>6. Feel TIRED because of your asthma?</td>
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</tr>
<tr>
<td>7. Feel WORRIED, CONCERNED OR TROUBLED because of your asthma?</td>
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</tbody>
</table>
PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE
SELF-ADMINISTERED

**HOW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK BY?**

<table>
<thead>
<tr>
<th></th>
<th>Extremely Bothered</th>
<th>Very Bothered</th>
<th>Quite Bothered</th>
<th>Somewhat Bothered</th>
<th>Bothered A Bit</th>
<th>Hardly Bothered At All</th>
<th>Not Bothered</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. ASTHMA ATTACKS</td>
<td>☐</td>
<td>☐</td>
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**IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:**

<table>
<thead>
<tr>
<th></th>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>Quite Often</th>
<th>Some of the Time</th>
<th>Once in a While</th>
<th>Hardly Any of the Time</th>
<th>None of the Time</th>
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<tbody>
<tr>
<td>9. Feel ANGRY because of your asthma?</td>
<td>☐</td>
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<tbody>
<tr>
<td>10. WHEEZING</td>
<td>☐</td>
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**IN GENERAL, HOW OFTEN DURING THE LAST WEEK DID YOU:**

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<tbody>
<tr>
<td>11. Feel IRRITABLE because of your asthma?</td>
<td>☐</td>
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PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE

SELF-ADMINISTERED

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<td>6</td>
<td>7</td>
</tr>
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</table>

12. TIGHTNESS IN YOUR CHEST

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

<table>
<thead>
<tr>
<th>All of the Time</th>
<th>Most of the Time</th>
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<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

13. Feel DIFFERENT OR LEFT OUT because of your asthma?

HOW BOTHERED HAVE YOU BEEN DURING THE LAST WEEK BY?

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<tr>
<th>Extremely Bothered</th>
<th>Very Bothered</th>
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<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

14. SHORTNESS OF BREATH

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

<table>
<thead>
<tr>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>Quite Often</th>
<th>Some of the Time</th>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

15. Feel FRUSTRATED BECAUSE YOU COULDN'T KEEP UP WITH OTHERS?
**PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE**

**SELF-ADMINISTERED**

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>All of the Time</th>
<th>Most of the Time</th>
<th>Quite Often</th>
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<tbody>
<tr>
<td>16. WAKE UP DURING THE NIGHT because of your asthma?</td>
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<td>17. Feel UNCOMFORTABLE because of your asthma?</td>
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<td>18. Feel OUT OF BREATH because of your asthma?</td>
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<td>19. Feel YOU COULDN'T KEEP UP WITH OTHERS because of your asthma?</td>
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<td>20. Have trouble SLEEPING AT NIGHT because of your asthma?</td>
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<td>21. Feel FRIGHTENED BY AN ASTHMA ATTACK?</td>
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**THINK ABOUT ALL THE ACTIVITIES THAT YOU DID IN THE PAST WEEK:**

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<th>Very Boothered</th>
<th>Quite Boothered</th>
<th>Somewhat Boothered</th>
<th>Boothered A Bit</th>
<th>Hardly Boothered At All</th>
<th>Not Boothered</th>
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<td>22. How much were you bothered by your asthma during these activities?</td>
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## PAEDIATRIC ASTHMA QUALITY OF LIFE QUESTIONNAIRE

**SELF-ADMINISTERED**

**DATE**

**ID**

---

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

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23. Have difficulty taking a DEEP BREATH?  

- [ ] 1  
- [ ] 2  
- [ ] 3  
- [ ] 4  
- [ ] 5  
- [ ] 6  
- [ ] 7
Appendix F: Problem Questionnaire
PROBLEM BEHAVIOUR QUESTIONNAIRE

1. During an attack of asthma, you require Ventolin every 2 hours. You are gaining benefit but you are very breathless after 2 hours. Provided that you don’t get any worse, it is fine to continue with 2 hourly treatments.
   a. True
   b. False
   c. Unsure

2. Write down ways you help to prevent attacks of asthma during exercise.

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

3. Do you ever take less medication than required?
   a. Never
   b. Rarely
   c. Sometimes
   d. Usually
   e. Always

4. Do you use a peak flow meter to help you decide when to adjust your medications?
   a. Never
   b. Rarely
   c. Sometimes
   d. Usually
   e. Always
Appendix G: Demographics
General Information

All answers will be kept confidential. Please provide the following information about you and your family.

1. Age _______ Male _______ Female _______ Grade _______

2. Ages of brothers and sisters.
   a) __________________________
   b) __________________________
   c) __________________________
   d) __________________________

3. Check if you live with: Both Parents _______ Mother _______ Father _______  

4. Mother’s occupation: ______________________________________________________
   Father’s occupation: ______________________________________________________

5. Age when diagnosed with asthma: __________________________

6. Is your asthma a problem in the: Spring _____ Summer _____ Fall _____ Winter _____

7. Do any of the following bring on your asthma?
   Weather _______ Infection _______ Emotions _______
   Allergies _______ Exercise _______ Dust _______
   Pollution _______ Smoke _______ Other _______

8. How severe is your asthma? Mild _______ Moderate _______ Severe _______

9. Do you smoke? Yes _______ No _______ How much? _______

10. Do you have asthma symptoms (wheeze, cough, shortness of breath):
    Once per month or less _______
    Once per week _______
    Twice per week _______
    More often _______
11. Do you sometimes have nighttime attacks?

   Never  ___________
   Once per month  ___________
   Once per week  ___________
   Twice per week  ___________
   More often  ___________

12. How many days of school have you missed, in the past month, to asthma? ________________

13. How many times, in the past year, have you visited the hospital emergency department or your doctor for an asthma attack? ________________

14. Have you been admitted to hospital for asthma in the past year?

   No  ___________   Yes  ___________   How often?  ________________

15. List medications you are presently taking:

   How much?  How often?

   _________________  _______________  ________________
   _________________  _______________  ________________
   _________________  _______________  ________________

16. Are there medications you take on a regular basis?  ________________

   ________________  ________________  ________________  ________________

17. Are there medications you only take at certain times or as needed?  ________________

   ________________  ________________  ________________  ________________

18. How many times have you had to take Prednisone in the past year? ________________
Appendix H: KASE ANOVA
KASE-AQ Summary Table Linear Measures Anova

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GET
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 /METHOD = SSTYPE(3)
 /PLOT = RESIDUALS
 /CRITERIA = ALPHA(.05)
 /WSDESIGN
 /DESIGN.

Notes

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 Comments Created 15 May 97 12:28:45
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 in Working Data File
 Missing Value Handling
 Definition of Missing Cases Used
 User-defined missing values are treated as missing.
 Statistics are based on all cases with valid data for all variables in the model.
 Syntax
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 /METHOD = SSTYPE(3)
 /PLOT = RESIDUALS
 /CRITERIA = ALPHA(.05)
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Within-Subjects Factors
Measure: MEASURE_1

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*Noncent. Parameter and Observed Power values.*
Multivariate Tests

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a. Computed using alpha = .05
b. Exact statistic
c. Design: Intercept+GENDER+GRADE+SCHOOL+GENDER * GRADE+GENDER * SCHOOL+GRADE + GRADE * SCHOOL + GRADE * SCHOOL + GRADE * SCHOOL
Within Subjects Design: TIME

Mauchly's Test of Sphericity

Measure: MEASURE_1

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<th>Within Subjects Effect</th>
<th>Mauchly's W</th>
<th>Approx. Chi-Square</th>
<th>df</th>
<th>Sig.</th>
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Mauchly's Test of Sphericity

Measure: MEASURE_1

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<tr>
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<th>Greenhouse-Geisser</th>
<th>Epsilon&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Huynh-Feldt</th>
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Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

da. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the layers (by default) of the Tests of Within Subjects Effects table.
b. Design: Intercept+GENDER+GRADE+SCHOOL+GENDER * GRADE+GENDER * SCHOOL+GRADE + GRADE * SCHOOL + GRADE * SCHOOL + GRADE * SCHOOL
Within Subjects Design: TIME
## Tests of Within-Subjects Effects

Measure: MEASURE_1  
Sphericity Assumed

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<th>Sig.</th>
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<td>.301</td>
<td>1.093</td>
<td>.177</td>
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<tr>
<td>TIME * GRADE</td>
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<td>3</td>
<td>68.516</td>
<td>.378</td>
<td>.769</td>
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<td>.120</td>
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<tr>
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<td>140.980</td>
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<td>23.347</td>
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a. Computed using alpha = .05

## Tests of Within-Subjects Contrasts

Measure: MEASURE_1

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<td>TIME * GRADE</td>
<td>TIME_1</td>
<td>205.547</td>
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Tests of Within-Subjects Contrasts

Measure: MEASURE_1

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^a. Computed using alpha = .05

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

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^a. Computed using alpha = .05

Observed * Predicted * Std. Residual Plots
Dependent Variable: total kase pre score

Model: intercept + GENDER + GRADE + SCHOOL + GENDER*GRADE

Dependent Variable: total post KASE sc

Model: intercept + GENDER + GRADE + SCHOOL + GENDER*GRADE
### ONE WAY

**Variable** KNOW_PRE  knowledge pretest score (TL)

**By Variable** SCHOOL  school program

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
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<td>1.4539</td>
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<td>619.9420</td>
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**Group**

<table>
<thead>
<tr>
<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 0</td>
<td>21</td>
<td>8.1429</td>
<td>2.5746</td>
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<tr>
<td>Grp 1</td>
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**GROUP**

<table>
<thead>
<tr>
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<th>MAXIMUM</th>
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<td>Grp 1</td>
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<td>TOTAL</td>
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**Levene Test for Homogeneity of Variances**

<table>
<thead>
<tr>
<th>Statistic</th>
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<th>df2</th>
<th>2-tail Sig.</th>
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25 Mar 97 SPSS for MS WINDOWS Release 6.0

--- ONE WAY ---

Variable KNOW_PST knowledge post test score (T2)
By Variable SCHOOL school program

Analysis of Variance

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<th>F Ratio</th>
<th>Prob.</th>
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Group Count Mean Standard Deviation Standard Error 95 Pct Conf Int for Mean
Grp 0 21 8.2381 3.1766 .6932 6.7921 TO 9.6840
Grp 1 48 12.5000 3.0317 .4376 11.6197 TO 13.3803
Total 69 11.2029 3.6363 .4378 10.3294 TO 12.0764

GROUP MINIMUM MAXIMUM
Grp 0 3.0000 17.0000
Grp 1 5.0000 18.0000
TOTAL 3.0000 18.0000

Levene Test for Homogeneity of Variances

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<tr>
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Variable KNOW_DIF COMPUTE know_dif = know_pst - know_pre
By Variable SCHOOL school program

Analysis of Variance

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<th>Prob.</th>
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Levene Test for Homogeneity of Variances

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Analysis of Variance

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<th>Mean Squares</th>
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<table>
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<tr>
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<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
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</thead>
<tbody>
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Levene Test for Homogeneity of Variances

<table>
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**ONE WAY**

**Variable**  ATTITUDE  
**By Variable**  SCHOOL

**Analysis of Variance**

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<th>Mean Squares</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
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<td>567.3960</td>
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**Group**  
**Count**  **Mean**  **Standard Deviation**  **Standard Error**  **95 Pct Conf Int for Mean**

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<th>Group</th>
<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
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<tbody>
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<td>81.8116</td>
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**GROUP**  **MINIMUM**  **MAXIMUM**

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<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
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**Levene Test for Homogeneity of Variances**

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**ONE WAY**

Variable ATT_DIF
By Variable SCHOOL

Computations:

```
COMPUTE att_dif = atti_pst - atti_pre.
```

Analysis of Variance

<table>
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<tr>
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<th>Mean Squares</th>
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Grp 0 Count: 21
Mean: 4.5238
SD: 7.2844
Std Error: 1.5896
95 Pct Conf Int for Mean: 1.2090 TO 7.8396

Grp 1 Count: 48
Mean: 8.4167
SD: 10.1684
Std Error: 1.4677
95 Pct Conf Int for Mean: 5.4641 TO 11.3693

Total Count: 69
Mean: 7.2319
SD: 9.5041
Std Error: 1.1442
95 Pct Conf Int for Mean: 4.9488 TO 9.5150

GROUP MINIMUM MAXIMUM
Grp 0 -7.0000 17.0000
Grp 1 -20.0000 37.0000
Total -20.0000 37.0000

Levene Test for Homogeneity of Variances

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--- ONE WAY ---

Variable EFFC_PRE  self-efficacy pre test(T1)
By Variable SCHOOL  school program

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Group Count Mean Standard Deviation Standard Error 95 Pct Conf Int for Mean
Grp 0 21 76.6667 11.0650 2.4146 71.6300 TO 81.7034
Grp 1 48 75.1667 10.7473 1.5512 72.0460 TO 78.2873
Total 69 75.6232 10.7855 1.2984 73.0322 TO 78.2141

GROUP MINIMUM MAXIMUM
Grp 0 55.0000 93.0000
Grp 1 49.0000 90.0000
TOTAL 49.0000 93.0000

Levene Test for Homogeneity of Variances

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**O N E W A Y**

Variable **EFFC_PST**  self-efficacy post test (T2)
By Variable **SCHOOL**  school program

**Analysis of Variance**

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**Group**  **Count**  **Mean**  **Standard Deviation**  **Standard Error**  **95 % Conf Int for Mean**

| Grp 0 | 21  | 75.1429 | 11.0104 | 2.4027 | 70.1110 TO 80.1547 |
| Grp 1 | 48  | 81.2500 | 10.6920 | 1.5433 | 78.1454 TO 84.3546 |
| Total | 69  | 79.3913 | 11.0762 | 1.3334 | 76.7305 TO 82.0521 |

**GROUP**  **MINIMUM**  **MAXIMUM**

| Grp 0 | 61.0000 | 100.0000 |
| Grp 1 | 56.0000 | 100.0000 |
| TOTAL | 56.0000 | 100.0000 |

**Levene Test for Homogeneity of Variances**

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25 Mar 97 SPSS for MS WINDOWS Release 6.0

---- ONE WAY ----

Variable EFFC_DIF
By Variable SCHOOL

**Analysis of Variance**

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Grp 1 -14.0000 33.0000
TOTAL -29.0000 33.0000

Levene Test for Homogeneity of Variances

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COMPUTE effc_dif = effc_pst - effc_pre
By Variable SCHOOL
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Appendix I: PAQLQ ANOVA
General Linear Model

Within-Subjects Factors

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Between-Subjects Factors

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Descriptive Statistics

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|         | 7.00 control program | 124.7500 | 16.6007         | 4  |
|         | Total              | 112.5714 | 25.2973         | 7  |
|         | 8.00 control program | 137.5000 | 26.6521         | 4  |
|         | Total              | 137.5000 | 26.6521         | 4  |
|         | 9.00 control program | 97.0000 | 15.7162         | 3  |
|         | 9.00 control program | 110.0000 | 42.3989         | 7  |
|         | Total              | 106.1000 | 35.9551         | 10 |
|         | 10.00 control program | 113.0000 | 33.9411         | 2  |
|         | 10.00 control program | 112.5000 | 3.5355          | 2  |
|         | Total              | 112.7500 | 19.7041         | 4  |
|         | Total control program | 113.0000 | 29.2450         | 12 |
|         | Total control program | 114.9231 | 31.8760         | 13 |
|         | Total              | 114.0000 | 30.0167         | 25 |

|         | female | program | 102.5000 | 24.6069         | 8  |
|         |        | Total    | 102.5000 | 24.6069         | 6  |
|         | 8.00 control program | 141.0000 | 8.4853      | 2  |
|         | 8.00 control program | 150.0000 | 8.4853      | 2  |
|         | Total    | 147.0000 | 7.9373      | 3  |
|         | 9.00 control program | 92.0000 | 61.9919      | 3  |
|         | 9.00 control program | 125.4000 | 14.5877     | 5  |
|         | Total    | 112.8750 | 38.9668     | 8  |
|         | 10.00 control program | 76.0000 | 28.8701     | 2  |
|         | 10.00 control program | 108.6667 | 35.6417     | 3  |
|         | Total    | 95.6000 | 33.7016     | 5  |
|         | Total control program | 94.8333 | 47.4823     | 6  |
|         | Total control program | 116.7500 | 26.4462     | 16 |
|         | Total    | 110.7727 | 33.7073     | 22 |

| Total | 7.00 control program | 96.3333 | 28.5365         | 3  |
|       | 7.00 control program | 111.4000 | 23.6700         | 10 |
|       | Total              | 107.9231 | 24.4863         | 13 |
|       | 8.00 control program | 138.2000 | 23.1344         | 5  |
|       | 8.00 control program | 150.0000 | 8.4853          | 2  |
|       | Total              | 141.5714 | 20.0488         | 7  |
|       | 9.00 control program | 94.5000 | 40.5401         | 6  |
|       | 9.00 control program | 116.4167 | 33.4785         | 12 |
|       | Total              | 109.1111 | 36.3543         | 18 |
|       | 10.00 control program | 94.5000 | 32.8786         | 4  |
|       | 10.00 control program | 110.2000 | 25.3515         | 5  |
|       | Total              | 103.2222 | 28.1992         | 9  |
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a. Computed using alpha = .05
b. Exact statistic
c. Design: Intercept+GENDER+GRADE+SCHOOL+GENDER ** GRADE+GENDER * SCHOOL+GRADE ** SCHOOL+GENDER * GRADE ** SCHOOL

Within Subjects Design: TIME

---

### Mauchly's Test of Sphericity

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Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the layers (by default) of the Tests of Within Subjects Effects table.
b. Design: Intercept+GENDER+GRADE+SCHOOL+GENDER ** GRADE+GENDER ** SCHOOL+GENDER ** GRADE ** SCHOOL

Within Subjects Design: TIME
Tests of Within-Subjects Effects

Measure: MEASURE_1
Sphericity Assumed

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a. Computed using alpha = .05

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

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a. Computed using alpha = .05

Tests of Between-Subjects Effects

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Transformed Variable: Average

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a. Computed using alpha = .05

Observed * Predicted * Std. Residual Plots
**Dependent Variable: QOL_PRE**

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Model: intercept + GENDER + GRADE + SCHOOL + GENDER*GRADE

**Dependent Variable: QOL_PST**

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Model: intercept + GENDER + GRADE + SCHOOL + GENDER*GRADE

**Descriptives**
Descriptive Statistics

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PAIRS= qol_pre WITH qol_pst (PAIRED)
/Criteria=CIN(.95)
/Missing=ANALYSIS.

T-Test

Paired Samples Statistics

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Paired Samples Correlations

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Paired Samples Test

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Paired Samples Test

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### Oneway Analysis of Variance

**Variable** ACTV PRE QOL-activity subscale pre test(T1)

By Variable SCHOOL school program

Analysis of Variance

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<th>Prob.</th>
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Group Count Mean Standard Deviation Standard Error 95 Pct Conf Int for Mean
Grp 0 21 18.5714 6.2815 1.3707 19.7121 TO 21.4307
Grp 1 48 20.2708 6.5192 .9410 18.3779 TO 22.1638
Total 69 19.7536 6.4498 .7765 18.2042 TO 21.3030

GROUP MINIMUM MAXIMUM
Grp 0 7.0000 32.0000
Grp 1 5.0000 34.0000
TOTAL 5.0000 34.0000

Levene Test for Homogeneity of Variances

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<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 0</td>
<td>18</td>
<td>19.9444</td>
<td>7.4318</td>
<td>1.7517</td>
<td>16.2497 TO 23.6402</td>
</tr>
<tr>
<td>Grp 1</td>
<td>30</td>
<td>21.3333</td>
<td>6.8598</td>
<td>1.2524</td>
<td>18.7718 TO 23.8948</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>20.8125</td>
<td>7.0338</td>
<td>1.0152</td>
<td>18.7701 TO 22.8549</td>
</tr>
</tbody>
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**GROUP** | **MINIMUM** | **MAXIMUM**
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Grp 0</td>
<td>5.0000</td>
<td>35.0000</td>
</tr>
<tr>
<td>Grp 1</td>
<td>8.0000</td>
<td>34.0000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5.0000</td>
<td>35.0000</td>
</tr>
</tbody>
</table>

**Levene Test for Homogeneity of Variances**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>2-tail Sig.</th>
</tr>
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<tbody>
<tr>
<td>.0147</td>
<td>1</td>
<td>46</td>
<td>.904</td>
</tr>
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</table>
**Oneway**

Variable ACTV_DIF

By Variable SCHOOL

Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
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<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
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<td>1.8000</td>
<td>1.8000</td>
<td>.1270</td>
<td>.7232</td>
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<tr>
<td>Within Groups</td>
<td>46</td>
<td>651.8667</td>
<td>14.1710</td>
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<tr>
<td>Total</td>
<td>47</td>
<td>653.6667</td>
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</tr>
</tbody>
</table>

Group | Count | Mean   | Standard Deviation | Standard Error | 95 Pct Conf Int for Mean

<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 0</td>
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<td>-.2425 TO 2.5758</td>
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<tr>
<td>Grp 1</td>
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<td>.7667</td>
<td>4.2156</td>
<td>.7697</td>
<td>-.8075 TO 2.3408</td>
</tr>
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<td>Total</td>
<td>48</td>
<td>.9167</td>
<td>3.7293</td>
<td>.5383</td>
<td>-.1662 TO 1.9995</td>
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GROUP  | MINIMUM | MAXIMUM
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
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<tr>
<td>Grp 1</td>
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<td>8.0000</td>
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<td>0.0000</td>
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</table>

Levene Test for Homogeneity of Variances

<table>
<thead>
<tr>
<th>Statistic</th>
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<th>2-tail Sig.</th>
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--- O N E W A Y ---

Variable SYM_PRE QOL-pre symptoms subscale (T1)
By Variable SCHOOL school program

Analysis of Variance

<table>
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<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>435.2428</td>
<td>435.2428</td>
<td>2.6836</td>
<td>.1061</td>
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<tr>
<td>Within Groups</td>
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<td>10866.5831</td>
<td>162.1878</td>
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<td>Total</td>
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<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp O</td>
<td>21</td>
<td>41.3333</td>
<td>13.9080</td>
<td>3.0350</td>
<td>35.0025 TO 47.6642</td>
</tr>
<tr>
<td>Grp 1</td>
<td>40</td>
<td>46.7917</td>
<td>12.2021</td>
<td>1.7612</td>
<td>43.2485 TO 50.3348</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>45.1304</td>
<td>12.8920</td>
<td>1.5520</td>
<td>42.0334 TO 48.2274</td>
</tr>
</tbody>
</table>

GROUP MINIMUM MAXIMUM
| Grp O | 11.0000 | 67.0000 |
| Grp 1 | 11.0000 | 65.0000 |
| TOTAL | 11.0000 | 67.0000 |

Levene Test for Homogeneity of Variances

<table>
<thead>
<tr>
<th>Statistic</th>
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<th>df2</th>
<th>2-tail Sig.</th>
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<tr>
<td>.1786</td>
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<td>.674</td>
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Variable SYM_PST QOL-symptom subscale (post-T2)
By Variable SCHOOL school program

Analysis of Variance

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<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>284.0417</td>
<td>284.0417</td>
<td>1.3716</td>
<td>.2459</td>
</tr>
<tr>
<td>Within Groups</td>
<td>64</td>
<td>13253.5492</td>
<td>207.0867</td>
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</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>13537.5909</td>
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</tr>
</tbody>
</table>

Group Count Mean Standard Deviation Standard Error 95 Pct Conf Int for Mean
Grp 0 21 45.1905 15.8228 3.4528 37.9880 TO 52.3929
Grp 1 45 49.6444 13.6900 2.0408 45.5315 TO 53.7574
Total 66 48.2273 14.4316 1.7764 44.6795 TO 51.7750

GROUP MINIMUM MAXIMUM
Grp 0 10.0000 70.0000
Grp 1 13.0000 70.0000
TOTAL 10.0000 70.0000

Levene Test for Homogeneity of Variances

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>2-tail Sig.</th>
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<tbody>
<tr>
<td>.7294</td>
<td>1</td>
<td>64</td>
<td>.396</td>
</tr>
</tbody>
</table>
- - - - O N E W A Y - - - - - 

Variable SYM_DIF  COMPUTE sym_dif = sym_dst - sym_pre (CO
By Variable SCHOOL  school program

Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
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<tbody>
<tr>
<td>Between Groups</td>
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<td>9.4569</td>
<td>9.4569</td>
<td>.0983</td>
<td>.7549</td>
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<tr>
<td>Within Groups</td>
<td>64</td>
<td>6156.4825</td>
<td>96.1950</td>
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<td>Total</td>
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<td>6165.9394</td>
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</tr>
</tbody>
</table>

Group  Count  Mean  Standard Deviation  Standard Error  %5 Pct Conf Int for Mean
Grp 0     21    3.8571  9.0735          1.9800             - .2731 TO 7.9874
Grp 1     45    3.0444 10.1241         1.5092             0.0028 TO 6.0861
Total     66    3.3030  9.7396         1.1989             .9087 TO 5.6973

GROUP  MINIMUM  MAXIMUM
Grp 0    -11.0000 31.0000
Grp 1    -19.0000 26.0000
TOTAL    -19.0000 31.0000

Levene Test for Homogeneity of Variances

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>2-tail Sig.</th>
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<tbody>
<tr>
<td>.6394</td>
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<td>64</td>
<td>.427</td>
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</tbody>
</table>
**ONE WAY**

**Variable**
- EMO PRE
- QOL-emotional subscale-pre(T1)

**By Variable**
- SCHOOL
  - school program

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
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<tbody>
<tr>
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<td>536.9266</td>
<td>4.2015</td>
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<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 0</td>
<td>21</td>
<td>38.6667</td>
<td>11.2665</td>
<td>2.4585</td>
<td>33.5382 TO 43.7951</td>
</tr>
<tr>
<td>Grp 1</td>
<td>48</td>
<td>44.7292</td>
<td>11.3207</td>
<td>1.6340</td>
<td>41.4420 TO 48.0164</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>42.8841</td>
<td>11.5676</td>
<td>1.3926</td>
<td>40.1052 TO 45.6629</td>
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**GROUP**
- MINIMUM
  - Grp 0 14.0000
  - Grp 1 13.0000
  - TOTAL 13.0000
- MAXIMUM
  - Grp 0 56.0000
  - Grp 1 56.0000
  - TOTAL 56.0000

**Levene Test for Homogeneity of Variances**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>2-tail Sig.</th>
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<tbody>
<tr>
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<td>.993</td>
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</tbody>
</table>
### ONE WAY

**Variable**  |  EM0 PST  | QoL-emotional subscale-post(T2)  
---|---|---
**By Variable**  |  SCHOOL  | school program  

#### Analysis of Variance

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<thead>
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<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
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<td>217.6771</td>
<td>1.4290</td>
<td>.2361</td>
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#### Group Count Mean Standard Deviation Standard Error 95 Pct Conf Int for Mean

<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>95 Pct Conf Int for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 0</td>
<td>21</td>
<td>39.9524</td>
<td>14.0658</td>
<td>3.0694</td>
<td>33.5497 TO 46.3551</td>
</tr>
<tr>
<td>Grp 1</td>
<td>48</td>
<td>43.8125</td>
<td>11.5310</td>
<td>1.6644</td>
<td>40.4642 TO 47.1608</td>
</tr>
<tr>
<td>Total</td>
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<td>42.6377</td>
<td>12.3812</td>
<td>1.4905</td>
<td>39.6634 TO 45.6120</td>
</tr>
</tbody>
</table>

#### Group Minimum Maximum

<table>
<thead>
<tr>
<th>Group</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>Grp 0</td>
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<td>56.0000</td>
</tr>
<tr>
<td>Grp 1</td>
<td>10.0000</td>
<td>56.0000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>8.0000</td>
<td>56.0000</td>
</tr>
</tbody>
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#### Levene Test for Homogeneity of Variances

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>2-tail Sig.</th>
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<td>1.3018</td>
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</table>
25 Mar 97 SPSS for MS WINDOWS Release 6.0

--- O N E W A Y ---

Variable EMO_DIF
By Variable SCHOOL

Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>Prob.</th>
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<tbody>
<tr>
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<td>70.8592</td>
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Group Count Mean Standard Deviation Standard Error 95 Pct Conf Int for Mean
Grp 0 21 1.2857 9.0451 1.9738 -2.8316 TO 5.4030
Grp 1 48 -.9167 8.2355 1.1887 -3.3080 TO 1.4747
Total 69 -.2464 8.4843 1.0214 -2.2845 TO 1.7918

GROUP MINIMUM MAXIMUM
Grp 0 -12.0000 22.0000
Grp 1 -25.0000 19.0000
TOTAL -25.0000 22.0000

Levene Test for Homogeneity of Variances

<table>
<thead>
<tr>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>2-tail Sig.</th>
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</thead>
<tbody>
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<td>.621</td>
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