The
Adolescent Asthma
Action Program

'Triple A Program'

by

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Abstract

Asthma is a major public health problem in Australia. With up to 1 in 4 children and adolescents having symptoms of asthma, there is a high toll not only on the individual with asthma and their care-givers but also on the health care delivery system. Adolescents with asthma are particularly vulnerable to serious asthma attacks and sudden death. For many adolescents, this is a particularly risky period, as compliance with therapy may decrease and medical supervision becomes less consistent.

As behaviours and life style are primary contributers to morbidity and mortality in adolescents, education appears to be a potential way to have an impact on behaviour change. The challenge is to develop a program which will not only have a considerable impact, but is acceptable and relevant to the school community.

This treatise examines the relevant literature and psychosocial theories and models applicable to asthma health promotion and management in adolescents. It provides a health promotion model for addressing barriers to optimum asthma management and an Intervention Model to increase knowledge and improve behaviour in high school students.

The aims of this treatise are:

- To establish the impact of asthma on high school students
- To justify asthma health promotion in high schools
- To identify behavioural and psychosocial factors relevant to adolescents asthma management
- To describe an asthma health promotion intervention in a girls' high school, based on the conceptual model.

The Adolescent Asthma Action Program is an innovative asthma health promotion intervention program for high schools. The aim of the program is to promote optimum management of asthma through peer-led education and creative student presentations. Students are active in both learning and teaching and are the catalysts for behaviour change and supportive school environment. The Program is undertaken in a socially disadvantaged area, where a significant proportion of high school students come from non-English speaking backgrounds (NESB).

A common health issue in the school is addressed through positive peer modelling and social reinforcement. The models can also be applied to other health issues and have potential for a wide range of applications in schools.

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[1] The appendices are kept in a separate volume and can be made available from the author.

Chapter 1: Introduction

1.1 Asthma a public health problem

Asthma is a major public health problem in Australia (NH & MRC, 1988). It is the most common chronic illness of childhood, with as many as 1 in 4 children and adolescents in Australia having symptoms of asthma (Robertson, Bishop, Dalton, et al., 1992; Peat, Mellis, 1992; Bauman, Mitchell, Henry, et al., 1992).

Despite the availability of effective asthma treatment and increasing public awareness, asthma remains the leading cause of hospital admissions and school absences due to chronic illness in childhood (Anderson, Bailey, Cooper, et al., 1983; Ford, Dawson, Cowie, 1988). This high morbidity in children may be due to the increasing prevalence and severity of asthma in children (Peat, Mellis, 1992; Bauman, 1993). This premise is supported by a recent study undertaken at the Camperdown Children's Hospital in Sydney which described a steady rise in hospital admissions and emergency visits to the hospital in the period between 1979 and 1989 (Kun, Oates, Mellis, 1993).

There is also evidence suggesting that underrecognition and inappropriate management of asthma have led to considerable morbidity in school-aged children (Bauman, Mitchell, Henry et al., 1992; Peat, Woolcock, Leeder et al., 1980; Attaway and Strunk, 1989; Woolcock, Peat, Leeder et al., 1984). In a study of 4239 Sydney school children, 214 were found to have symptoms of asthma, yet "only 60% of these children had ever been labelled as asthma (sic), and only 20% were using appropriate asthma treatment." (Bauman, Young, Peat, et al., 1992, p. 36).

Because asthma is common amongst school-aged children, many of the problems associated with asthma impact on their education and quality of life at school. Morbidity from frequent exacerbations due to poorly controlled asthma may lead to problems such as:

- Frequent school absences (Parcel, Gilman, Nader et al., 1979)
- Poor academic performance (Bicho, Damas, De Lurdes et al., 1992)
- Limited physical activity (Buchanan, 1986)
- Social and psychological maladjustment (Richards, 1986).

These points are discussed further in Chapter 2.

1.2 What is asthma?

Asthma is a chronic inflammatory condition affecting the lungs. The inflammation in the airways produces narrowing due to:

- swelling of the lining of the airways
- excess mucous production
- spasm of the muscles that surround the airways.

In school-aged children the typical symptoms of asthma are wheezy breathing, coughing, and difficulty in breathing.

There is a broad spectrum of severity of asthma in children and adolescents. Most students with asthma have mild infrequent episodes that do not require regular "preventive" therapy. Some students may require "reliever" medications for asthma symptoms at school (Isles, Robertson, 1993). Exercise is a common trigger for asthma in children, however the symptoms can be prevented by appropriate self-management (Shield, 1992).

The natural history of asthma in individuals is also variable. Severity of asthma may vary considerably at different stages of the student's life. In a review of relevant literature, Warner established that "significant changes do occur during adolescence with some patients going into remission and others developing more severe disease" . Further, his findings suggested that "females tend to develop more persistent problems with asthma or develop more severe disease for the first time during adolescence" (1993, p.83). However, he concluded that the information available is mostly incomplete.

1.3 Barriers to asthma management in adolescents

Adolescence is defined by the World Health Organisation (1989) as being between the ages of 10 and 19 years. It is a period of transition from childhood to adulthood. In the context of this treatise the terms "adolescent / teenager / youth" refers to adolescents attending high school (11-17 years).

Teenagers with asthma are particularly vulnerable to serious asthma attacks and sudden death (Attaway, Strunk, 1989). For many adolescents, this is a particularly risky period, as compliance with therapy may decrease and medical supervision becomes less consistent (Court, 1992). Inadequate management is thought to contribute to many of the deaths (Warner, 1993). The special difficulties that adolescents experience in managing their asthma may be related

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to them having to experience the developmental changes of puberty together with the additional limitations of their illness (Court, 1992).

Behaviour and lifestyle factors are the primary contributors to barriers to adolescent asthma management (Warner, 1993). The challenge is to identify and address the relevant psychosocial factors to facilitate optimum management of asthma in young people. These risk factors are discussed in more detail in chapter 3.

Common barriers to optimum asthma management in adolescents are listed in Table 1 and are also discussed in more detail in chapter 3.

Table 1: Barriers to asthma management in adolescents
Lack of interest and understanding about asthma (Cooper Jandera,, 1991)
Denial of illness and need for treatment (Hoffman, 1976)
Non-compliance with medications (Court, 1992; Friedman, 1987)
Inadequate use of health care facilities (Blum,, 1980)
Peer pressure in risk-taking behaviours, e.g. smoking (Dielman et al., 1987).

Adolescents remain a particularly problematic group with regard to asthma management (Warner, 1993; Towns, 1992; Cooper, Jandera, 1991). Much of the morbidity and mortality associated with adolescent asthma can be prevented through more appropriate asthma management and education (Woolcock, Landau, Leeder, et al., 1988; Bauman, 1991; Bauman, Young, Peat, et al., 1992). The question is what is appropriate for adolescents?

1.4 Youth health promotion

Adolescence is a life stage with important implications for long term health. It can be argued that although adolescence is considered a relatively healthy period compared to other age groups in relation to morbidity and mortality indices, there is still a pressing need for health prevention and promotion programs for adolescents (Nutbeam, Haglund, Farley, et al., 1991). The underlying argument for this investment in health programs for young people is that many negative health behaviours are adopted in adolescence. Further, if positive health behaviours are established in youth this will have positive consequences in later life. (Parcel, Muraskin, Endert, 1988; Perry, 1991; Henderson, 1993).

Health promotion has potential to reduce health damaging behaviours and increase the practice of health enhancing behaviours in young people (Parcel, Muraskin, Endert, 1988). Health promotion as described by Green is "any combination of health education and related organisational, political, and economic interventions designed to facilitate behaviour adaptations that will improve or protect health" (1979, p. 161).

It follows from Green's definition that health promotion approaches should not be solely directed at the individual, but also at environmental, social, and other structures that will encourage, support, and reinforce the positive health behaviours. Further, it emphasises that education is only one of several strategies that can be used to facilitate behavioural change and that combinations of interventions are needed to promote health (Parcel, Muraskin, Endert, 1988).

1.4.1 Schools as a setting for health promotion

Schools offer an ideal setting for promoting health in adolescents as most attend school. Another advantage is that students can easily be accessed and a health education[2] infrastructure is already in place. It is also believed that providing health promotion in schools is a cost effective method to increase community awareness in non-English speaking communities (WHO, 1992).

Addressing students' health is integral to the education process. Lavin and Shapiro (1992) argue that education and health care are interrelated and suggests that education can contribute substantially to improvement in health. They also emphasise that a student's health status is a major determinant of their educational achievement. There is widespread agreement that health promotion at school is both effective and efficient in influencing health behaviour in adolescents (Nutbeam, Haglund, Farley, et al., 1991; Allensworth, 1993; Bremberg, 1991). The concept of a health promoting school is "a school which constantly strengthens its capacity as a healthy setting for living, learning and working" (WHO, 1993, p.6). In this definition the issue of settings is emphasised and promotes a move towards:

- health promoting environment
- health promotion for pupils
- health promotion for school staff
- working with the community

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[2] "Health education is a combination of learning experiences that affect the way students think, feel and act in relation to their well-being and that of others" (Went, 1992, p. 93)

Although students are the primary target group, the activities of health promoting schools also involve school staff, parents and the wider community, that is, the school community. The underlying principle is that students will be more motivated to learn if they can relate their learning activities to life in the larger community outside the school.

Traditionally, health education at school was concerned mainly with health services, health instructions and acquisition of facts. There is now growing support for applying the principles of health promoting schools in any approach to health education in schools, whether the focus is on a single health issue or general health. While the concept of health promoting schools generally involves multiple health issues, it can also be applied to a single health issue, such as asthma, within this framework (Young, Bauman, Forero et al., 1992; Shah, Dawson, Wachinger, 1992).

1.4.2 Effectiveness of health promotion programs

For health promotion programs in schools to be effective the education message needs to be relevant to the target population and integrated into the school curriculum. For Thompson, effectiveness means more than integration:" programs need to be accompanied by a feasible plan for implementation which ensures successful progression beyond the adoption stage" (1988, p.22). She emphasises the need for a plan to ensure that programs are able to be implemented, maintained and then disseminated.

Others maintain that effective programs must make use of strategies that both educate and change behaviour. They must impact on institutions and social structures to facilitate and support the practice of health behaviour (Parcel, Muraskin, Endert, 1988). Bremberg (1991) in his analysis of health education programs found that effective programs were

- based on sound theoretical frameworks;
- focused on skills training;
- integrated school instruction with local community efforts; and,
- combined group instruction with activities directed at individuals.

In a climate of scarce health dollars, health promotion programs promising measurable outcomes are more likely to receive funding. In his essay "Sustainability of Health Promotion Programs," Lefebvre explicitly questions the value of many programs with apparent positive outcomes: "Do they last?" asks Lefebvre (1992, p. 239). He agrees with Thompson that in order to term programs

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effective, sustainability of such programs should be integral to their process. He concludes that "...more effort is required to identify the core elements of sustainable programs, and the key strategies that enhance their development" (Lefebvre, 1992, p. 239).

Chapter 2: Asthma and high schools

2.1 Introduction

As stated earlier, due to its high prevalence, frequent under-recognition and poor management, asthma poses a significant problem in high school students. This chapter will further explore the impact of asthma on students, management of asthma in schools and the case for educating high school students about asthma.

2.2 Impact of asthma on students

Several important issues relate to the impact of asthma in students. Students with asthma have significantly more school absences than other students, which may hamper students' academic and social progress (Ford, Dawson, Cowie, 1988; Freudenberg, Feldman, Clark, et al. 1980). Lower grades as well as teachers' assessments of students' psychological, social and educational achievements have been attributed to school absences (Anderson, Bailey, Cooper, 1983).

Poorly controlled asthma in students can also affect school performance. Disruption to learning has been shown to be a common problem experienced by students with asthma (Shah, Gibson, Wachinger, 1993; Henry, Gibson, et al., 1993). Reduced attention span and loss of concentration can occur, particularly if the student has asthma in the classroom or is tired after a night of lost sleep from asthma symptoms (Richards, 1986).

Another common problem at school is that students with asthma are often embarrassed about using their medications in public, not wanting to acknowledge that they have a chronic illness, which requires treatment (Warner, 1993). Moreover, students do not always carry their 'reliever' medications on them, despite the need to take medication at school in order to avoid exercise-induced asthma or to prevent severe illness.

As physical activity is a common trigger for asthma in adolescents, students with asthma may be reluctant to join in physical education classes, sports, athletic events or playground games. This reluctance may also derive from the attitudes of teachers or parents, who may mistakenly discourage students with asthma from active participation from fear of an asthma attack (Henry, Pine, Gibson, et al., 1993).

Students with asthma may be stigmatised and treated differently by their peers and teachers (Towns, 1992). Feeling left out of the group and not being good enough at sports are often serious concerns for them (Walsh, Ryan, Wengar, 1992). Evidence shows that there is no reason for students with asthma to miss out on school activities,. If their asthma is well managed, they should act "Just like anybody else" (Asthma Foundation Video, 1990), as the title of the video suggests.

2.3 Asthma and its management at schools

Schools have a potentially important role in the management of asthma, considering the high prevalence of asthma in students and the significant disruption asthma can cause at school (Henry, Pine, Gibson, et al., 1993; Hill, Britton, Tattersfield, 1987; Shah, Gibson, Wachinger, 1993). School staff need to be aware of asthma symptoms and need to encourage students to take their asthma medication if they develop symptoms at school.

However, the concern is that the level of knowledge and management of asthma is generally poor in schools. A survey conducted by the National Asthma Campaign amongst high school students found that school staff were often unable to cope with a student having an asthma attack at school. They identified that some schools did not allow their students to carry their own treatment and many students were embarrassed to use their medications in public. Their findings showed a general lack of knowledge about asthma and its management (National Asthma Campaign, 1991). Other studies have also confirmed the inappropriate management of asthma at school due to under-recognition of asthma and poor management. (Bicho, Damas, et al., 1992; Hill, Britton, Tattersfield, 1987; Henry, Pine, Gibson, et al., 1993).

In Australia, following widespread concern both from the health and the education sectors regarding management of asthma in schools, a position paper on the "National Policy on Asthma Management for Schools" was prepared by the Asthma Special Interest Group of the Thoracic Society of Australia and New Zealand (1994).

The recommendations from the paper are listed in Table 2:

Table 2: Recommendations of National Policy on Asthma Management for Schools
Improvement in education and training of school staff regarding appropriate management of students with asthma.
Improvement in asthma recognition at school through student record cards.
Encouragement for students with asthma to participate in physical education and exercise.
Students with asthma should be allowed to use asthma medications at school.
Schools should have appropriate equipment for managing asthma emergencies.
Asthma education for all students should be encouraged at school.

A few government and non-government agencies in NSW have responded to the challenge of asthma and its management in schools (Young, Bauman, Forero et al., 1992; Shah, Gibson, Wachinger, 1994; Henry, Hazell, Halliday, 1994). These interventions have targeted school staff to increase knowledge and confidence regarding emergency management of asthma at school (ibid.). The underlying argument for this investment in education is that school staff have the legal and ethical responsibility for looking after the health and safety of their students. The schools act "in loco parentis ", meaning the teachers' "duty of care" in managing students with asthma should be the same as that expected of a reasonable parent (NSW Department of School Education, 1990).

In Auburn high schools, students with asthma are given a 'Student Asthma Record Card' (see Appendix 1) to complete and return to the school. The cards, which are written action plans to manage asthma emergencies at school, are completed by the student's parents and the family doctor, and are filed in the school's Asthma First Aid Kit (Shah, Wachinger, Elliot, 1993). Data from the high schools indicated a poor return rate of these cards. The experience showed that the High School Asthma Program alone was not sufficient in improving management of asthma in high schools. More is needed. There is increasing recognition for the need to educate high school students about asthma (Asthma Special Interest Group of the Thoracic Society of Australia and New Zealand, 1994). Simply having students maintain records about their asthma does not provide that necessary education.

2.4 Asthma education for adolescent

Asthma education is perceived as "a range of activities designed to increase awareness of asthma and to promote optimal asthma assessment and management" (Bauman, 1991, p.79).

In adolescents, peers and family are major influencing factors on many health behaviours (Biddle, 1980). Therefore education of the individual does little to influence factors in the community which reinforce such behaviours (Parcel, Muraskin, Endert, 1988).

Studies of adolescent health behaviour generally agree that education specifically targeted at young people has not been effective (Bremberg, 1991). Allensworth argues that the education of the individual usually relies on awareness and knowledge change which will not necessarily modify behaviour (1992).

This lack of success of has also been examined by Court, who believes that it may be due to the difficulties in addressing problem health behaviours such as non-compliance and risk-taking, on an individual basis in adolescents (Court, 1992). Court argues that providing information and increasing knowledge will not improve compliance. This has been clearly shown by studies on the use of condoms by adolescents. The studies have shown that their use was related to beliefs and attitudes rather than knowledge (Diclemente et al. and Orr et al., 1992).

Other studies have also shown that increasing knowledge and attitude also does not always correlate with behaviour change. Holund (1990) in a review of school-based nutrition education programs, found that although these studies reported changes in knowledge and attitudes toward healthy eating patterns, most of them failed to demonstrate a change in dietary behaviour (1990).

On the other hand, research projects that have focused on behaviour change and utilised sociopsychological approaches have been shown to be effective (Parcel, Muraskin, Endert 1988). For example, Thompson in a study on drug education in schools, clearly showed that this approach was effective in "improving the nature and extent of drug education in primary schools." (1988, p.ix).

Therefore, the traditional role of asthma education usually directed to individuals with asthma does not deal with the challenge of behaviour change in

adolescents. It has been argued that programs in adolescents should not solely be directed at the individual, but also at environmental and social structures to encourage, support and reinforce health enhancing behaviours (Parcel, Muraskin, Endert, et al., 1988). Moreover, given the high numbers of adolescents with asthma, individual asthma education would seem to be an inefficient method to address this problem on the wider scale.

In recent years, asthma education for children has developed in Australia in the context of a variety of initiatives in schools, hospitals and the community. Various government and non-government agencies and organisations have responded to the challenge of asthma education (Young et al., 1991; Henry et al., 1992; Toelle et al., 1993; Van Asperen, et al., 1991; Shah, 1992; NAC, 1993). While there has been a general support for educating adolescents about asthma, few have explored and/or utilised the potential of high schools (Bauman, 1991; Towns, 1992; Warner, 1993).

Asthma health promotion for high school students

The school environment exerts a powerful influence on young people and is therefore an obvious setting for health education for adolescents (Nutbeam et al., 1993). This point is emphasised by Henderson, who points out that schools have a unique potential to affect the lives of students, staff, parents and even entire communities (1993).

Educating students about asthma has shown to improve attitudes about asthma at school. Two studies in high schools reported that increasing knowledge about asthma in students led to a more tolerant and positive attitude towards their peers with asthma (Hill et al., 1993; Brook, Kishon, 1993).

In high school students with asthma the attitude of peers and a supportive school environment are essential elements for positive behaviour change. In Australia, despite the high prevalence of asthma in high schools, this health problem has not until now been given a high priority in health promotion strategies in high schools.

To address the need of educating young people about asthma, the Asthma Foundation of NSW produced an educational video "The Real Reason" (1989) for high school students. The aim of the video was to increase awareness and knowledge about asthma among adolescent students. The video highlights the dangers of inadequate asthma management. It looks at the effects of peer group

pressure on risk-taking behaviours such as smoking and poor self care in students with asthma.

More recently, an asthma educational package;designed for Year 8 students, has been trialled in schools in the Hunter Region. The "Living With Asthma" package includes "The Real Reason" video, a teacher's manual and a teaching kit. The package is consistent with the learning principles and structure of schools' PD/Health/PE syllabus and is delivered by teachers to students. The effectiveness of the package is currently being evaluated in a controlled trial in high schools in the Hunter area (Henry, Gibson, et al., 1993).

It appears that research regarding school-based asthma health promotion programs for high school students is still largely underdeveloped. Thus, further studies in asthma health promotion in high schools can be clearly justified for the following reasons:

1 School staff have a responsibility and "duty of care" for students with asthma, but lack knowledge and confidence.

2 Many of the factors that affect the frequency and severity of asthma symptoms in high school students are preventable.

3 There is a close relationship between some aspects of school function and health problems in asthma, such as exercise-induced asthma.

4 Schools permit access to the majority of the adolescent population and provide social and environmental support for certain adolescent health behaviours.

2.5 Curriculum support and context for health education in schools

Fragmented programs in health education are failing to ensure that all students will encounter timely and effective education programs. Current models of curriculum development differ from those that were prevalent earlier. In 1992, the New South Wales Department of School Education introduced the Personal Development / Health / Physical Education syllabus for years 7 to 10 students. In the development of the peer-led workshops in the Triple A Program special attention was paid to the Key Learning Areas in the Personal Development / Health / Physical Education (Board of Studies, 1992), which was consistent with the education package 'Living with Asthma' developed by Henry and associates (1993).

To be effective school asthma programs require curriculum time, and need to be clearly identified as an essential element of the formal education in schools. There are, however, pressures for inclusion in the curriculum of many other health issues, such as nutrition, AIDS, drug and alcohol etc. As well, many teachers consider themselves ill-prepared for what they perceive as "medical matters" and do not feel equipped to teach about asthma. This issue of low priority and low competency would need to be addressed prior to including asthma education in the school curriculum.

Chapter 3: Behavioural and psychosocial factors in adolescent asthma management

3.1 Introduction

Behaviour and lifestyle factors play a significant role in adolescent morbidity and mortality (Parcel, Muraskin, Endert, 1988). As there is a close relationship between the barriers to adolescent asthma management and behaviour and lifestyle factors (Towns, 1992; Warner, 1993), an understanding of young people's beliefs and behaviours pertaining to their lifestyle is seen as fundamental to developing an effective asthma health promotion program for high school students (Franzkowiak, 1987).

3.2 Health behaviours influencing adolescents' asthma management

Health behaviour can be defined as any activity undertaken, by a person believing themselves to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic stage (Kasl and Cobb, 1986). This definition implies that individuals must believe that their actions will achieve the specific goals.

The self-management approach to asthma has been identified as an important strategy to reduce morbidity and mortality (NH & MRC Working Party, 1988; Bauman, 1991). Key self-management behaviours identified in the literature, which are applicable to optimal asthma management at school include: compliance with asthma management (Court, 1992; Friedman, 1986); self-care and preventive actions (Bauman, 1992); and avoidance of risk-taking behaviours (Young, Forero, Bauman et al., 1992).

3.2.1 Compliance with asthma management

Many of the challenges in managing adolescents with asthma are related to their compliance with the prescribed management regimen. In adolescence, failure to comply with medical advice is common (Pidgeon, 1989). Noncompliance can lead to serious consequences for the teenager. It may lead to unnecessary hospitalisations, treatment and diagnostic tests (Friedman and Litt, 1987; Pidgeon, 1989).

There is general agreement that adolescents' compliance with treatment is multifactorial. Court believes that "like children, adolescents seldom consider the long term health consequences of their actions or inaction but, unlike children, often reject the advice and guidance of parents and other adults" (1992, p. 55). He argues that developmental factors can influence compliance in adolescents. During early adolescence the teenager aspires to become independent and often resents adult supervision. In mid-adolescence, the teenager seeks approval from peers and, identifying with them, feels a need to conform to group norms. When required to adopt behaviour different from their peers they may resist that behaviour or rebel against it (Aten and McAnarney, 1981). Fear regarding side-effects of the asthma medications and denial for the need for medications are often seen as common reasons for non-compliance.

Adolescents' beliefs and attitudes about their illness may lead some teenagers with asthma to regard the regular use of 'preventer' medications as a restriction, rather than as providing freedom from incapacitating symptoms. Medications may function as a constant reminder of chronic disease and of their difference from their peers (Towns, 1992). Compliance with treatment may reinforce the feeling of being impaired and further add to the perceived stigma of the disease and disability for a young person.

Other psychosocial risk factors associated with compliance are discussed in section 4.3.

3.2.2 Self care and preventive actions.

To achieve optimum asthma management there is a need for co-management between patients and doctors. Ideally, self care and preventive actions in adolescents should be exercised in partnership with their doctor (Warner, 1993). Involving young people in decision-making regarding their management is more likely to achieve success, according to Court (1992).

However, this partnership with the doctor is often hampered as young people are often not able to utilise health services appropriately (Blum, 1980). Teenagers may resent either doctors or parents dictating their management and may not comply with appropriate management.

Self care and preventive actions in adolescents' asthma management are listed in Table 3:

Table 3: Self care and preventive actions in adolescents
Use of "preventer" medications
Avoidance of triggers
Use of medications prior to exercise, if required
Regular visits to the doctor
Use of a peak flow meter to measure asthma severity

Treatment methods have improved over the past few decades so that asthma attacks can be relieved or even prevented from occurring (Bauman, 1991).

Although management of asthma using preventive medication is effective and relatively simple, use of self care and prevention strategies in asthma management is reported to be sub-optimal in adolescents (Forero, Bauman, Young et al., 1992). In a study of high school students in Campbelltown, it was found that only, 19% used any objective measurement of their asthma, such as a peak flow meter. Similarly, lack of use of preventer medications by adolescents was another significant contributory factor found in the study.

Exercise-induced asthma is not uncommon in high school students. Over two thirds of students with asthma may develop asthma symptoms following exercise (Forero, 1993). Although these symptoms can be prevented through appropriate management and using inhaled asthma medications prior to exercise, one in three adolescents with asthma does not take regular medications before exercise (Phelan, Landau, Olinsky, 1982).

3.2.3 Risk-taking behaviours

Adolescence is a period of risk-taking. A feeling of personal invulnerability, with lack of concern for the consequences, underlies much teenage social activity. Moreover, overt risk-taking behaviours can increase during adolescence. According to Hofman (1976), the demands of chronic illness in addition to the changes in puberty, alongside the challenge of coping with negative peer pressure, can encourage 'maladaptive' coping mechanism in adolescents, such as smoking. Individuals influenced by negative peer pressure are more prone to deviant and health comprising behaviours (Jessor and Jessor, 1977).

It is during adolescence that smoking behaviour is trialled and adopted. Smoking is prevalent amongst high school students (Young, Forero, Bauman et al., 1992). A study of tobacco and alcohol use amongst high school students in
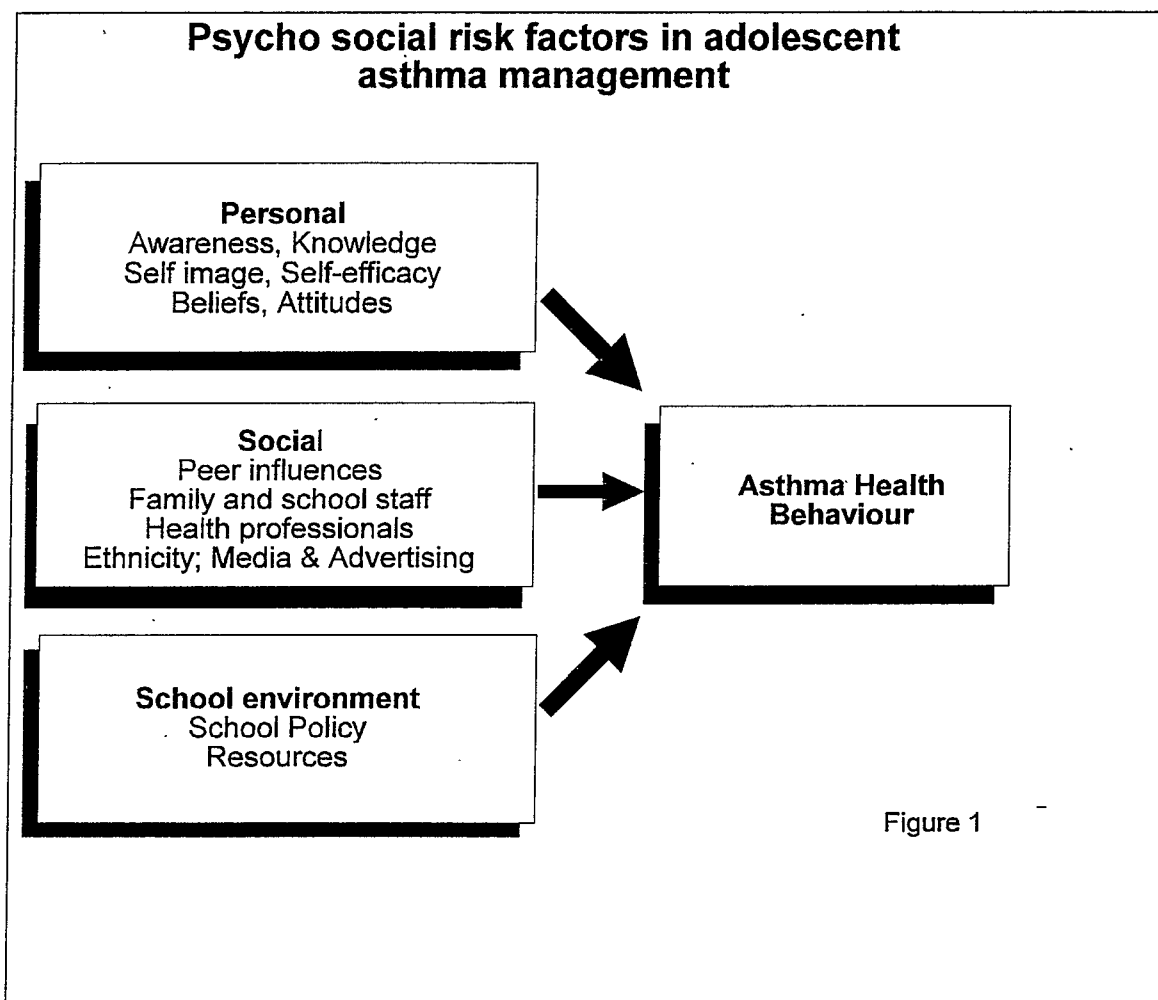
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Australia reported that 25% of 15 year olds smoke every week (Hill, White, Pain, et al., 1987). An further concern is that many asthmatics also smoke despite their awareness of the health consequences. This was clearly shown in a survey undertaken in schools in the South West of Sydney, which reported that a third of students with asthma were smokers (Young, Forero, Bauman et al., 1992)

Active and passive smoking are recognised as potent triggers of asthma symptoms (Bauman, Young, Peat, 1992) and also increases the likelihood of persistent disease (Warner, 1992). Franzkowiak holds that adolescents in Western societies tend to reject preventive health measures and take risks which flaunt conventional medical views (1989). He interprets risk-taking practices to be elements of coping with developmental problems in a socially legitimate way. He proposes that health education can only succeed in reducing risk-taking behaviours through a broader and better informed approach. Strategies that influence risk taking behaviours need to be directed not only to the individual but also to influences within the individual's home and school environment.

3.3 Psychosocial risk factors

Psychosocial risk factors are " predictive of or 'account for' particular behaviour patterns" (Perry, 1991, p.3). These factors can be broadly divided into three categories: Personal; social; and, environmental. In adolescents all three factors need to be addressed to achieve any measurable success (Nutbeam, Haglund, Farley et al., 1991). However, there are few studies specifying the psychosocial risk factors influencing adolescent health behaviours in asthma self-management (Bauman, 1991a).

Figure 1 summarises those risk factors which have been shown in the literature to determine or influence self management behaviours in adolescent asthma management.

```
+-------------------------------------------------------------+
|            Psycho social risk factors in adolescent         |
|                    asthma management                        |
|                                                             |
|   +---------------------------+                             |
|   |  Personal                 |                             |
|   |  Awareness, Knowledge     |  →                          |
|   |  Self image, Self-efficacy|     →                       |
|   |  Beliefs, Attitudes       |        +------------------+  |
|   +---------------------------+        |                  |  |
|                                        | Asthma Health    |  |
|   +---------------------------+        | Behaviour        |  |
|   |  Social                   |   →    |                  |  |
|   |  Peer influences          |        +------------------+  |
|   |  Family and school staff  |                             |
|   |  Health professionals     |     →                       |
|   | Ethnicity; Media & Adverti|  →                          |
|   +---------------------------+                             |
|                                                             |
|   +---------------------------+                             |
|   |  School environment       |                             |
|   |    School Policy          |                             |
|   |    Resources              |                             |
|   +---------------------------+           Figure 1          |
+-------------------------------------------------------------+
```

The risk-factors that influence asthma self-management behaviours in adolescents must now be considered.

3.3.1 Personal Factors

The limitations implied by asthma and its treatment "may make the teenager feel different or defective" according to Friedman and Litt (1987, p.52).

This could have consequences for their management as the adolescent's desire to be like his or her peers may lead to denial of their illness and of their need for treatment (Hofman, 1976). Denial of asthma symptoms is a known risk factor for asthma morbidity and mortality (NH & MRC, 1988). Friedman and Litt report that adolescents requiring regular medications frequently also resist treatment, as it may be a reminder of chronic disease (1987).

Student's self-esteem is an important factor in influencing compliance behaviour (Pidgeon, 1989; Dielman et al., 1987). Chronic conditions such as asthma may

contribute to feelings of inferiority (Bicho, Damas, De Lurdes Chieira, 1992). This low self-esteem may reflect on the student's confidence in his or her ability to perform a particular behaviour in a given setting, often referred to as self-efficacy (Bandura, 1986; Clark et al., 1988). In the school setting, students with asthma need to feel confident taking their asthma medication in front of their peers.

Lack of knowledge and understanding about the disease may be a contributory factor (Towns, 1992). In studying the problems of asthma in adolescence, Bicho (Bicho et al., 1992) established that a poor understanding about asthma still prevails. They found that 17% of the asthmatics did not know how to define the disease and 75% considered asthma to be curable. They concluded that there was a need for more information about asthma, both for asthmatics and the general public.

However, in adolescents, an individual's beliefs and attitude to a chronic disease is a greater influencing factor in behaviour change (Diclemente et al., 1992). The individual's perceived threat of illness and the consequences of their action will impinge on an adolescent's behaviour. The Health Belief Model is a set of attitudes to understand such behaviours (Janz and Becker, 1984). It implies that before students with asthma will adopt preventive action they must believe they are susceptible to asthma attacks and accept that the action will be beneficial or effective. In asthma education, the Health Belief Model has been applied to medication compliance in children (Becker et al., 1978). This model has also been applied to motivation in adolescents with regard to compliance in treatment (Friedman and Litt, 1987).

3.3.2 Social factors

Social factors are important determinants of the health behaviour in adolescents (Thompson, 1988). Peers and family are significant factors influencing adolescent risk-taking behaviours. For adolescents, peers play a greater role than do parents (Biddle et al., 1980). According to Millstein, Petersen and Nightingale, peers serve as "credible sources of information, role models of new social behaviours, sources of social reinforcement, and bridges to alternative lifestyles" (1993 p.77).

Peer group pressure plays a critical role in risk-behaviours in adolescents. Adolescents' initiation into use of tobacco, alcohol and drugs correlates strongly with peer group pressure (Perry, 1991). The behaviour of peers has been found also to be the strongest predictor of continuing smoking behaviour (Barratt, 1989). In studying adolescents, Headen and his associates reported that having a best friend who smokes increases the likelihood of initiating smoking (1991).

In adolescence, families also play an important role in asthma management. Parental influence may support or discourage compliance with medications, smoking, self care and prevention actions in adolescents (Pidgeon, 1991). The strong influence of parental smoking has been shown by Perry, who reported children of smoking parents are more likely to smoke than those of non-smoking parents (1991).

Compliance can also be influenced by medical advice adolescents receive and how that message is communicated by the health professional. Litt and Cuskey (1980) showed that compliance increased if the adolescent at least took some responsibility in decisions about his or her own medical management. Other psychosocial risk factors, such as access to health services and family factors, also influence compliance (Pidgeon, 1989).

The individual's relationship with health professionals and access to health services are critical factors in adolescents' self management of asthma (Pidgeon, 1991). Furthermore, "the quality of doctor-patient communication and the degree of follow-up provided will also affect the maintenance of asthma behaviours" (Bauman, 1991, p. 80). Recently the National Asthma Campaign (NAC) in Australia has emphasised the issue of doctor-patient communication, through asthma workshops, management plans and educational resources (NAC, 1993).

With regard to access to health services for asthma in the community, it is crucial to consider the demography of an area and its population as socio-economic level and ethnicity are related to asthma management (Young et al., 1992). Forero and associates found that individuals from non-English speaking backgrounds were less likely to monitor their own asthma, despite regular visits to a family doctor. However, they warn that ethnic factors may be associated with socio-economic factors, which have been shown to have a positive correlation (1992).

Another social factor that exerts a major influence on adolescents is the mass media. Current social norms are presented through the actions and appearance of popular media personalities. These norms are further reinforced by advertising. There seems no doubt that the multi-million dollar efforts of the advertising industry manage to precisely target and successfully influence children, in particular. Glynn expresses serious concern about the influence of tobacco advertising in altering children's attitudes towards tobacco and believes that it encourages children to smoke (1993). The power of advertising was clearly shown by an earlier study by Chapman and Fitzgerald which noted that Sydney

school children smoked those brands of cigarettes which were the most heavily promoted (1982).

However, the media can also have a positive effect. Information delivered by the popular press or television is often better received by adolescents than information they receive from other channels. This has been utilised by the National Asthma Campaign in Australia, which included a media campaign as one of its key strategies to improve asthma management (National Asthma Campaign, 1993).

3.3.3 School environment

Factors considered here are those aspects of the school environment that support, permit or discourage engagement in a particular behaviour. A supportive school policy in asthma management at school is likely to reinforce and encourage appropriate students' behaviours. School resources such as Asthma First Aid Kits and Student Asthma Records to manage asthma emergencies can also be considered as factors influencing a supportive school environment (Shah, Gibson, Wachinger, 1993).

In the school setting, the attitude of school staff and peers may affect a student's self management behaviour. "The perceptions of teachers' and peers' attitudes may result in under-utilisation of inhaled medications during attacks" (Bauman, 1991, p.80). Student's perception of school and the school environment can also influence health behaviours. Nutbeam and his associates examined health behaviours in high school students and showed that students' like or dislike of school was a strong indicator of future problem behaviours (1993). Today, the importance of the school environment is recognised. It is recommended that adolescent health promotion efforts include consideration of the school environment when targeting specific health behaviours (Millstein, Petersen, Nightingale, 1993).

The physical environment, including weather conditions and air quality, also plays a role in self-management in students with asthma (Bauman, Young, Peat et al., 1992). Awareness and avoidance of asthma triggers at school can be important issues for students with asthma. Passive smoking, a recognised trigger of asthma is often an issue for many adolescents, especially when their parents smoke (Landau, 1991). Recently, the issue of passive smoking has also affected areas in school, such as school toilets, according to reports from students involved with the Adolescent Asthma Action Program.

3.4 Conclusion

This chapter has dealt with some of the many complex personal, social and environmental factors associated with adolescent health behaviour.

According to Perry, There are important reasons of identifying psychosocial risk factors is twofold. It is precisely these factors that become the targets for change in any behavioural intervention programs and there is great need for further substantiation of these factors by research into adolescents. Consequently, in any health promotion intervention, psychosocial factors influencing health behaviours must be taken into account organising.

Green's PRECEDE model, described in the next chapter, provides a clear structure to illuminate the relationships of these factors and hence has implications for appropriate points for intervention.

Chapter 4: Theoretical basis of the Program

4.1 Introduction

To be effective, any health education program must stimulate and influence the process of positive behaviour change. Therefore, the program's success will largely depend on it affecting the influential factors on behaviour change. Parcel, Muraskin and Endert (1988) found that research and demonstration projects that were effective in youth health promotion have focused on behaviour change and utilised socio- psychological approaches. This finding is supported by Bremberg in his analysis of school health education programs, in which he noted that effective programs were based on theoretical frameworks (1991).

Following those findings, the Adolescent Asthma Action Program (AAAP) aims to promote behaviour change in students with asthma by increasing knowledge and creating a supportive environment.

4.2 Models and theories of behaviour change

Prior to discussing the models and theories used in the development of the Adolescent Asthma Action Program, the following terms need clarification:

A *theory* is taken here to be "... a set of interrelated propositions containing concepts that describe, explain, predict or control behaviour." (Kerlinger, 1986, cited in: Glanz Lewis and Rimer, 1990).

A *model* allows the practical application of a theory or theories by specifying the relationship between various factors as predicted by theory.

Psychosocial theories and models, describing identified factors on behaviour change and relevant to the Program, are discussed here.

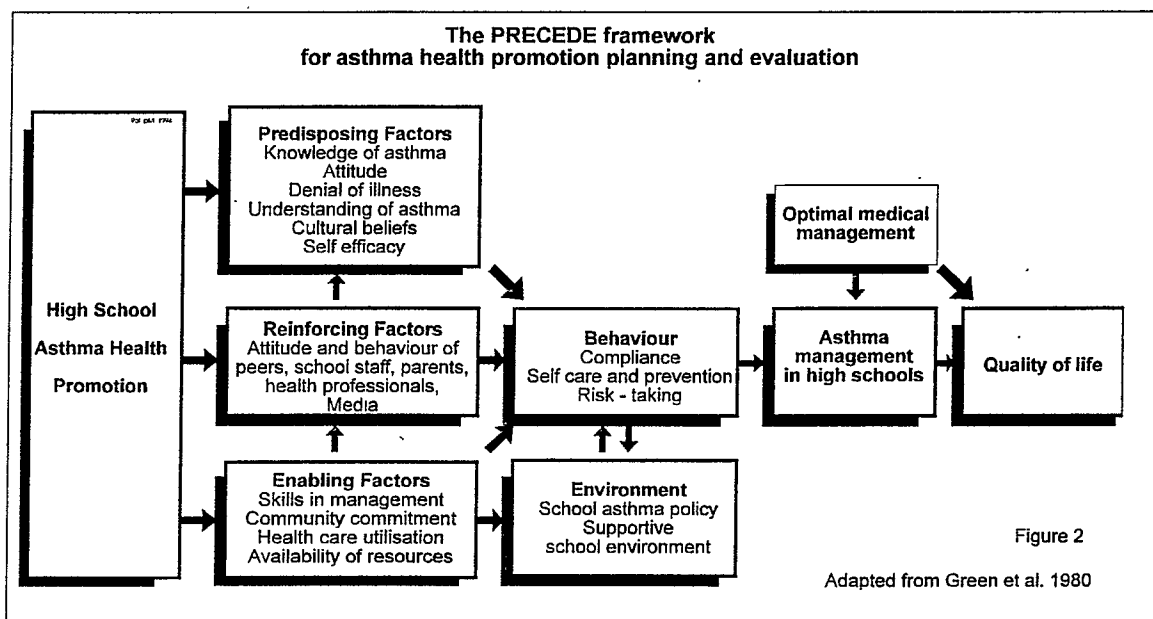### 4.2.1 Green's PRECEDE[3] model

The PRECEDE model developed by Green et al. (1980; see Figure 2) provides a framework for systematically developing the health interventions which combine . elements of environmental and behavioural change. ∙

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[3] PRECEDE is an. acronym for predisposing, reinforcing and enabling causes in educational diagnosis and evaluation.

The PRECEDE health planning model can be usefully applied when developing program objectives and identifying the personal, social and environmental factors influencing health behaviour change. The model has been applied successfully to planning comprehensive programs in many different settings (see e.g. Taggart, et al., 1989; Lazes, Kaplan, Gordan, 1990; Tones, 1990).

The PRECEDE health planning model was used to categorise the antecedents of students' health behaviour in asthma self-management behaviours in adolescents. at school which were discussed in the previous chapter. As well, it assisted in planning of the Program (see Appendix 2).

The model shown in *Figure 2* describes the determinants of self-management behaviours in adolescents with asthma:

The PRECEDE framework for asthma health promotion planning and evaluation

Figure 2

Adapted from Green et al. 1980

The determinants, according to Green, can be grouped in three sets of factors which are:

1. Predisposing factors provide the motivation for behaviour and influence the adoption of certain behaviours

2. Enabling factors which allow the motivation to be realised . These include personal skills related to asthma management, school and community resources.

3. Reinforcing factors which influence individuals' attitude and behaviour in a positive or negative manner. Reinforcing factors provide the incentives, rewards, or punishments that maintain or stop continuation of the behaviour.

The literature supports that in order to change health behaviour, a health promotion intervention needs to address all three factors.

The epidemiological and social phase of Green's model illustrates the importance of appropriate medical management in improving quality of life for students with asthma.

4.2.2 Health Locus of Control

Locus of control is the degree to which a person feels able to control events and circumstances in his or her life (Wallston and Wallston, 1984). Individuals having an "external" locus of control are more likely to believe that their scope for action is under the control of external forces such as chance, fate, or more powerful others. On the other hand, individuals with an "internal" locus of control believe they are "masters of their own destiny" and that their decisions and actions shape outcomes. These individuals are more likely to take responsibility for their own health and avoid illness by self care and preventive actions. Students with asthma are more likely to take preventive action prior to exercise (Bauman, 1992), and comply with medical regimen if they have a strong internal Locus of Control (Friedman and Litt, 1987).

4.2.3 Social learning theory

Bandura's Social Learning Theory, a frequently used theory in health education, identifies learning to be the result of interaction of cognitive, environmental and behaviour factors (Bandura, 1977, 1986).

Bandura infers that behaviour is guided by outcome and efficacy expectations. "Outcome expectations" are an individual's estimate that a certain behaviour will lead to a particular outcome. The Social Learning Theory emphasises that before a behaviour is changed the individual considers the costs and benefits to her/himself. If the outcome is not perceived as favourable, behaviour change will not take place. In the context of asthma management, personal costs would include financial costs of medications and time factors. Personal benefits would be improving one's health, fitness and confidence.

"Efficacy expectations" describe an individual's conviction that he/she has the ability to perform the behaviour necessary to produce a given outcome in a particular situation. The concept of self-efficacy, which is the individual's level of confidence in his or her ability to perform specific tasks or behaviour in a given

setting, is central to Bandura's notion of behaviour change (Clark et al., 1988). Self-efficacy is influenced principally by one's perception of one's own performances and to a lesser extent by observing others, by the persuasion of others and by the level of emotional arousal associated with performing the behaviour.

The Adolescent Asthma Action Program has used various elements of SLT. Increasing awareness and knowledge about asthma through creative learning strategies assists cognitive development. Self efficacy is influenced through student's development and presentations of "asthma skits" by students to the school community. The Program draws on notions of modelling, environmental change and reinforcement as peers provide role models and can encourage positive behaviours. The nature of the behaviour such as compliance in asthma management is also an important factor.

It recognises fundamentally that in adolescents the most important source of social norms comes from the individual's peer group network and family influence.

4.3 Strategies for health education

Changing behaviour is a complex process. Behaviour change programs must address all the important stages in this process, employing strategies to counteract challenges which are likely to be experienced. While theories of health behaviour specify determinants and mechanisms governing a behaviour, specific strategies are needed to initiate the processes proposed by the theories (Wallack, 1981).

The way in which the information is conveyed is as important as its content (WHO, 1993). Today's approach to health education in schools is to put the emphasis on learning, rather than teaching. The active involvement of students is promoted to encourage them to learn from each other in the language which is familiar to them. Skills such as decision-making and problem-solving need to be integral to the education process (WHO, 1993).

4.3.1 Peer-led education

In health education programs the term "peer" has been used in a variety of ways (Wiist and Snider, 1991). In this treatise the term peer-led has been used in the context of older students teaching younger students.

Studies in health behaviour change have indicated that peers or "idols" are more likely to be influential on students' behaviour than parents, teachers or health educators (Biddle, 1980). Peer-led education is therefore particularly appropriate for adolescents. The task of a peer leader is to serve "as a prosocial role model and to provide social information in addition to disseminating information," (Perry, Kelder, Komro, in: Millstein, Petersen, Nightingale, 1993). Peer leaders are seen as credible sources of social information by fellow students.

In a variety of health education programs for young people peer education has been used successfully (Wiit and Snider, 1991). Research studies indicate that peer leadership is an important component of primary prevention programs. In the area of drug education peer education has been an effective strategy for behaviour change (Allensworth, 1993).

In their cross cultural study, Perry and Grant showed that peer-led teaching in smoking prevention and reducing alcohol use is superior when compared to traditional teaching methods : "Overall, the peer-led programs demonstrated significant lower alcohol use scores than the teacher-led (...). These findings were consistent for both genders.(...) Overall, students in the peer-led program had significantly higher knowledge scores at post-test than students in the control group ..." (1988, p. 325). The authors conclude that the approach is effective across economical and cultural settings.

Others have also used peer-led education in changing health behaviour in adolescents (Holund, 1990; Wallerstein and Bernstein, 1988; Broad, 1990). Holund, in her work on nutrition education for school children, successfully utilised peer education as a way to influence the health of adolescents and impact on behaviour change. The key components associated with the success of her program were a high level of student participation and teacher involvement (1990). The Triple A Program came to similar results.

In Australia, the Peer Support Program has also been used effectively to train volunteer senior students. They act as group leaders for junior students, help the juniors resist negative peer pressure, care for each other and follow a more healthy life (The Peer Support Foundation Ltd, 1990, p.A4).

Peer teaching is particularly effective in disseminating information and changing attitudes and behaviours. Students are more likely to turn to peers for advice and change is more likely to occur if someone similar to them or admired by them recommends the change. Moreover, peer instruction has been effective in

improving decision-making and problem-solving skills which are essential tools or steps for implementing behaviour change.

4.3.2 Freire's Approach

'Empowerment' of the individual in the context of this Program is taken to be "a social action process that promotes participation of people, organisations, and communities in gaining control over their lives in their community and larger society" (Wallerstein and Bernstein, 1988, p.170).

Paolo Freire's approach to education is aimed at 'empowering' people to recognise and act on their own ability to change themselves and their environments. Freire assumes that individuals will better gain knowledge through group sharing and understanding the social influences that affect their lives (1972). The role of the educator is seen as a facilitator rather than as a teacher. The facilitator guides learners in exploring the problems and relating them to their daily lives. The learners set their own priorities and decide on group action to change conditions or resolve problems. The approach he developed for literacy education has been applied in health and other adult settings (Wallerstein and Bernstein, 1988).

In a well documented case study on a drug education program involving youth from a high risk populations in the USA, Wallerstein and Bernstein (1988), demonstrated that empowerment education as developed by Freire is an effective health education and prevention model for creating personal and social change in adolescents. In their study, they adopt Freire' problem posing methodology with young people: "Instead of being preached to, youth become subjects of their own learning as they ask questions, explore the many levels of the problem, make decisions for their own choices, and share the seriousness of substance abuse with friends and their communities" (Wallerstein and Bernstein, 1988, p. 175). The emphasis is on group interaction and problem solving.

The philosophical perspective of empowerment education was drawn on in the design of the Triple A Program which targets both the individual student as well as the school community to address barriers to asthma management in young people. The use of "Freire's 3-stage methodology of listening, dialogue, and action" in the Triple A Program is modelled on the Alcohol Substance Abuse Prevention (ASAP) Program (Wallerstein and Bernstein, 1988, p.175). (See Table 4).

4.3.3 Application of theory to the Triple A Program

Table 4 summarises the theories incoporated in the conceptual model for asthma health promotion.

Application of theory to the Triple A Program			
Theory	Concept	Content	Intervention component
Freire's 'Problem Posing' as modelled in ASAP (Wallerstein, Berstein, 1988)	Environment Knowledge Attitudes	Barriers to asthma management videos group discussions problem solving	School Asthma Action Committee Peer Leader Workshop Peer-led education Student Asthma Presentations Community Consultation
Social Learning Theory (Bandura, 1977)	Awareness Knowlwdge Self-efficacy Self esteem Modelling Motivation Beliefs	Videos Asthma Information Development of skits Games Emergency management of asthma	Peer Leader Workshop Peer-led education Student Asthma Presentations
Social Learning Theory (Bandura, 1977)	Environment		School Asthma Action Committee Peer Leader Workshop Student Asthma Presentations
Health Promoting Schools (WHO, 1992)	Environment	Barriers to optimum asthma management	School Asthma Action Committee Peer Leader Workshop Peer-led education Student Asthma Presentations Community Consultation
Health Locus of Control (Wallston & Wallston, 1984)	Attitude Peer influence	Group discussions videos	Peer Leader Workshop Peer-led education Student Asthma Presentations

4.4 Conceptual model of asthma management at school

As there is no single theoretical model to address asthma management at school, selected elements from the above models, theories and strategies (see Table 4) have been utilised to develop a conceptual model of asthma health promotion at school.

Figure 3 shows the Conceptual Model of the Triple A Program:

A conceptual model of asthma health promotion

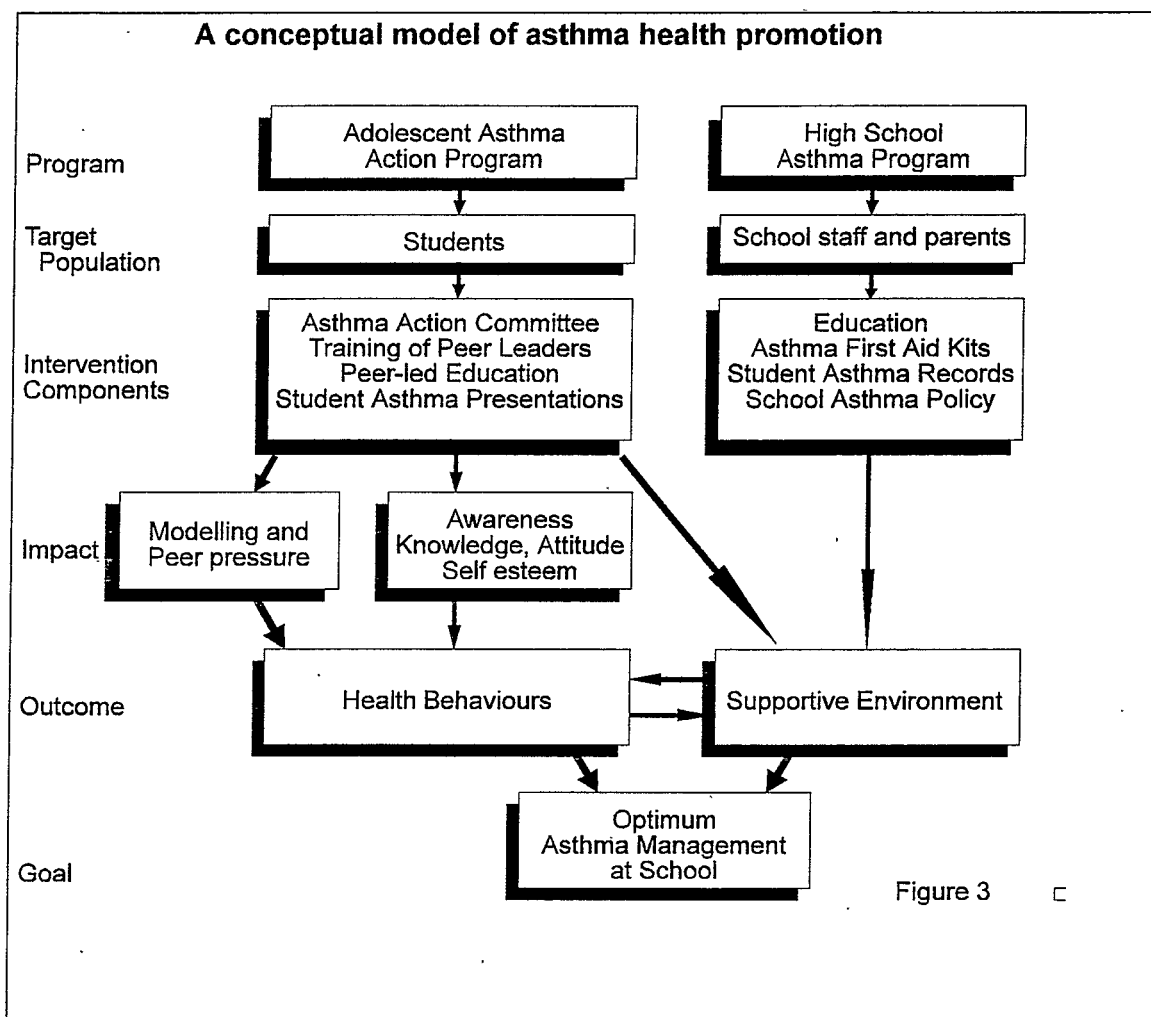|		
Program	Adolescent Asthma Action Program	High School Asthma Program
Target Population	Students	School staff and parents
Intervention Components	Asthma Action Committee Training of Peer Leaders Peer-led Education Student Asthma Presentations	Education Asthma First Aid Kits Student Asthma Records School Asthma Policy
Impact	Modelling and Peer pressure / Awareness Knowledge, Attitude Self esteem	
Outcome	Health Behaviours	Supportive Environment
Goal	Optimum Asthma Management at School	Figure 3

Figure 3 presents a conceptual of asthma health promotion in a high school setting. This is intended as a conceptual model and is to be tested further. This model provides a framework for assessing the components of optimum asthma management at school.

The goal of a school asthma health promotion program is to promote optimum asthma management at school. Outcomes sought are behaviours that are representative of optimum management and a supportive school environment.

The health behaviours related to asthma self-management at school are influenced by personal factors (beliefs, awareness, knowledge and attitudes); social factors (peer acceptance and support); and environment (supportive school environment). These psychosocial factors were the targets for the intervention and were identified by the school community and supported by the relevant psychosocial theories and models.

A multi-component intervention approach to health promotion is used to help address barriers to asthma management. This approach involves the students with asthma, their peers and the school community in the intervention. Peer leaders are the catalysts for attitude and behaviour change in the student population, alongside a supportive school community.

In the conceptual model of asthma health promotion, the Adolescent Asthma Action Program works in conjunction with the High School Asthma Program as shown in figure 3. The nature of the school environment is often established by the school policy. This emphasis on environment is shown clearly in the "conceptual model of adolescent health promotion in the 1990s" presented by Millstein, Petersen, Nightingale (1993, p.84).

Creative strategies used for different target groups of students included active student participation in planning and implementation, group discussions, brainstorming, problem solving and presentations of student's solutions to the school community. These strategies have been successfully used in school-based programs such as the Triple T program, Teenagers Teaching Teenagers in drug education (Broad 1990). Primary School Drug Education Evaluation (Thompson 1990).

Activities that Asthma Peer Leaders were responsible for included, leading small group discussion sessions, reading and giving directions, compiling their peers' responses to relevant questions, organising games and leading brainstorming sessions.

4.5 Adolescent Asthma Action Program

The Triple A (Adolescent Asthma Action) Program is an innovative approach to asthma health promotion in high schools. The aim of the Program is to promote optimum management of asthma in young people through peer-led education.

The Program provides an integrated approach to asthma health promotion at school. It involves students, school staff, parents and the community in the

planning and implementation of the program. Senior students are active participants in both learning and teaching. Students learn about asthma and the barriers to asthma management though a variety of educational strategies used through the Program. These include asthma videos, games, brainstorming sessions, group discussions, problem-solving and rehearsing of activities and presentations.

The Triple A Program was developed in 1993 by the Community Medical Officer and the Asthma Project Officer, from Auburn Community Health Services, in collaboration with students, staff and parents from Auburn Girls High School. Currently, the Program continues at that school and in 1994 the implementation process began at St Johns Regional High School for Girls in Auburn. Evaluation support has been received from Dr Peter Gibson, Staff Specialist, John Hunter Hospital, Newcastle. The Triple A Program has been maintained by grants from the Asthma Foundation of NSW and partly by public donations through the Auburn District Community Health Advisory Council.

Chapter 5: Description of the implementation of the Program

5.1 Background

Auburn, a suburb of Western Sydney, is characterised by low socio-economic status, high unemployment and a large non-English speaking background community. In response to community demand for asthma services for school children, the Auburn School Asthma Project (ASAP) was initiated in, 1989 by Auburn Community Health Services (Shah, 1992). This project is an ongoing, needs-based community and school education service for children with asthma and their care-givers in the Auburn area. (See Appendix 3 for a flow diagram of the Auburn School Asthma Project). One of the initiatives of the ASAP, was to target the high schools to promote effective management of asthma at school. The Project in high schools included introduction of Asthma First Aid Kits and Student Asthma Records[4], asthma education for school staff and parents (Shah, Gibson, Wachinger, 1993) and development of School Asthma Guidelines. Appendix 4 shows a sample of the guidelines.

5.2 Needs Assessment

In, 1992 staff from several of the high schools in Auburn communicated their concern regarding management of students with asthma to the project staff. This concern, which was supported by the current literature on adolescents and asthma, highlighted the necessity to target high school students as part of the High School Asthma Program.

The issue of a health promotion program for students with asthma was canvassed through consultation meetings held at Auburn Girls High School with school staff, student counsellors and parent representatives. (See Appendix 5 for details and minutes of the meetings.)

In the meetings, project staff consulted the groups with regard to the aim, proposed objectives and strategies for an intervention at the school. In addition specific issues that should be addressed by a health promotion program at school were identified by the participants. A summary of the issues identified are listed in table 5.

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[4] Student Asthma Records are individual crisis management plans to be used by school staff should a student have an asthma attack at school. The records are completed by the students and their doctor and are kept in the school's Asthma First Aid Kit.

Table 5: Issues identified by students, school staff and parents
Recognition of asthma
Knowledge of asthma
Negative attitudes towards asthma
Embarrassment about taking asthma medications
Students with asthma to attend a doctor when necessary
Peer support
Translated material about asthma and its management

The consensus message from the three groups was that all students need to be educated about asthma. The general recommendation was that students should receive education about asthma as part of the "Health, Personal Development and Physical Education" curriculum at school (Board of Studies, 1991). It was also judged by the participants that volunteer students should be trained to facilitate interactive learning about asthma amongst their peers. The recommendations from the consultation meetings were instrumental in the design and development of the Triple A Program for high school students. This approach meant that the school community was actively engaged in determining its own needs and priorities. Moreover, the reports from the meetings also influenced the school in adopting the program.

There was a strong correlation between the psychosocial risk factors described in the literature with those identified by the school community during consultation meetings. This correlation emphasises the value of community consultation (Hawe, Degeling, Hall, 1991) and indicates the value of Green's PRECEDE Model. The factors enumerated in the Model were those targeted for change in the program by the school community. This may encourage further research into the psychosocial risk factors in adolescent asthma management.

Green's PRECEDE Model coupled with community consultation were vital to the creation of the conceptual Model and in planning aims, objectives and evaluation of the Program.

5.3 Planning and development of the intervention

In, 1993, funding was given by the Asthma Foundation of NSW for the position of an Asthma Project Officer. A health promotion intervention, the Adolescent Asthma Action Program, was initiated by the Auburn School Asthma Project in collaboration with Auburn Girls High School. Of the 750 students enrolled at the

school, 98% were from non-English speaking backgrounds. From the start of the program the Community Medical Officer and the Asthma Project Officer (project staff) worked with school staff, students and parents in the planning and implementation of the program.

The planning of the intervention can be broadly divided into two stages:

1. Trial of the approach Stage 1: October, 1994

To assess the feasibility of peer-led asthma education at the school, a one day trial program was conducted in term 4, 1992 for Year 11 students. (A summary plan of the day is shown in Appendix 6). The trial at the school was considered successful by both students and staff as noted anecdotally and by evaluation questionnaires. It indicated that students were keen to learn about asthma through group activities and senior students were able to lead a class in asthma education and problem solving, using the video "The Real Reason" (Asthma Foundation, 1990).

2. Planning of the Program Stage 2: Feb., 1993- June, 1993

A School Asthma Action Committee was formed in February, 1993, to assist in the design and the implementation of the Program in the school. The members included:
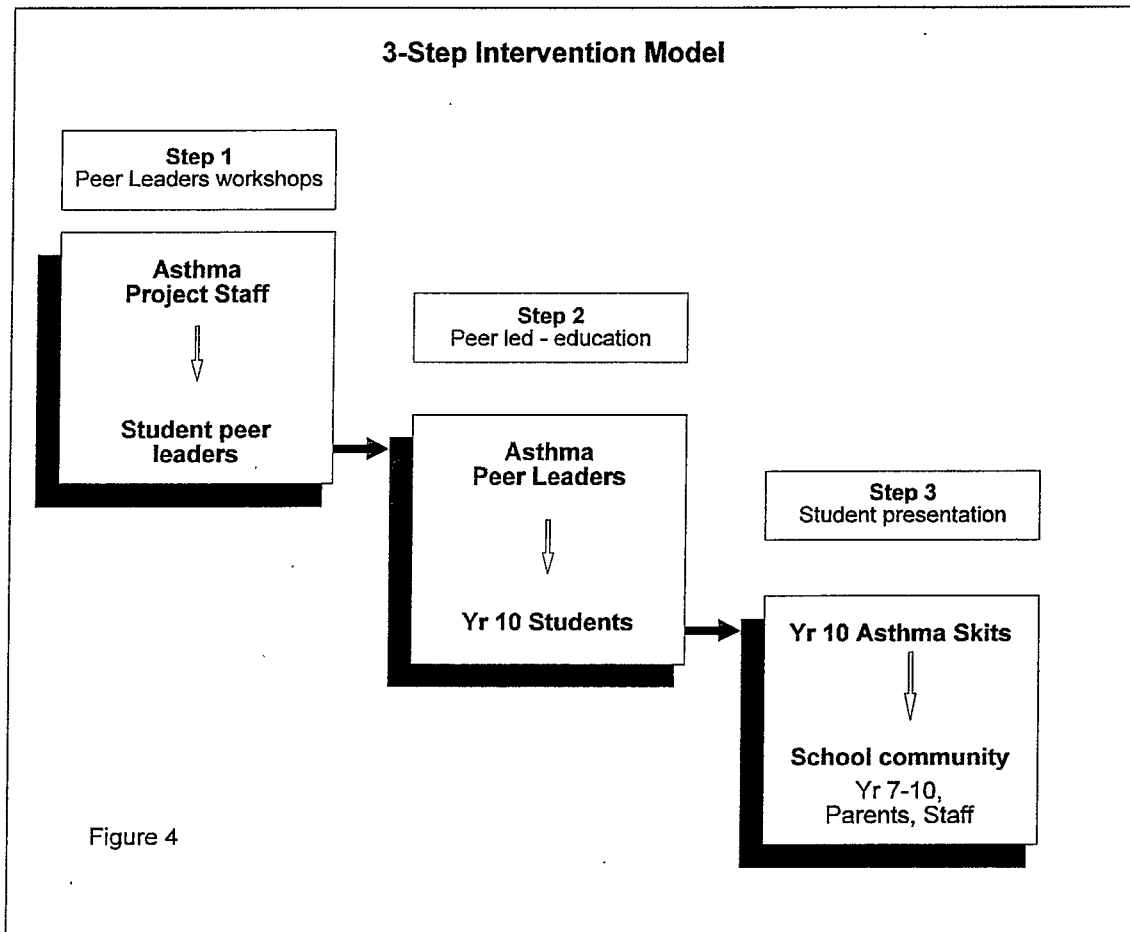
Table 6: Members of the School Asthma Action Committee	
School staff:	The Principal, the Deputy (Year 10 Health teacher), the Head teacher of Welfare(Co-ordinator of Peer Support Program*), Year 7 adviser and ancillary staff member in charge of school clinic.
Students:	Twelve Volunteers from the Year 11 Peer Support Program and two Year 10 students with asthma. The students were from all ethnic backgrounds.
Parents:	2 parents from the parents groups at the school
Project staff:	Community Medical Officer (Elected Chairperson) and Asthma Project Officer
Honorary patron:	Vice-president of the Asthma Foundation, Mrs J.R. Hayes.

The committee members were actively encouraged to participate in planning, discussions and problem solving with regard to any issues arising from the

implementation of the program. The group met on five occasions in the first half of the year to discuss the implementation and evaluation of the program. Collaborative decisionmaking was central to this planning process. Decisions were made on the basis of majority rule. As a result of these meetings a flow diagram, (see Appendix 7) was designed to outline the process of implementation of the program in the school.

The student's time-table, staffing issues, school structures and the need to ensure that the program could be sustained in future years were key points considered by the committee in selecting both the target population and methodology. As a result, year 10 students were considered the most appropriate as the target group for the Asthma Peer Leaders intervention, and years 7-10 as the target group for the presentations. However, the size of the venue and the school timetable determined the participation of the students. The Program was integrated in the health component of the Personal Development/ Health/ Physical Education syllabus. From these discussions a 3-Step Intervention Model was designed to promote knowledge and behaviour change in the school community with an emphasis on year 10 students (see Figure 4).

Figure 4: The 3-Step Intervention Model: To increase knowledge and improve behaviour in high school students.

3-Step Intervention Model

Step 1
Peer Leaders workshops

Asthma
Project Staff

⇩

Student peer
leaders

Step 2
Peer led - education

Asthma
Peer Leaders

⇩

Yr 10 Students

Step 3
Student presentation

Yr 10 Asthma Skits

⇩

School community
Yr 7-10,
Parents, Staff

Figure 4

- **Step 1**: Volunteer senior students from the school's leadership programs to be trained by project staff from community health to become Asthma Peer Leaders.

- **Step 2**: Year 10 students to learn about asthma and identify barriers to asthma management in three health lessons led by at least two Asthma Peer Leaders per class. As a result of the education, each class to produce a short presentation, labelled "asthma skit", to promote optimum management of asthma with some assistance from their health teacher.

- **Step 3**: These "asthma skits" of the Year 10 students to be presented to Year 7-10 students*, staff and families at a special 'Student Asthma Day' (Appendix 8).

The 3-step Intervention Model is proposed to increase knowledge and improve behaviour in high school students. The steps are described in more detail in section 5.4.

5.4 Implementation of the Triple A program

A flow diagram of the implementation of the Program is shown in Appendix 7.

5.4.1 Negotiation with the school

Preliminary meetings with the school principal and interested staff were essential to raise interest and gain support for the Program. A further meeting was held to arrange the details of the implementation of the Program in the school. Issues to be discussed with the staff are summarised in Appendix 11. Prior to Program implementation, it was important to establish the key components of the Program in the school curriculum, encourage staff support and allocate time for the events (see: Appendix 12)

5.4.2 School Asthma Action Committee

The planning and implementation of the Program was overseen by a School Asthma Action Committee held at the school. The meeting time was used to clarify questions about the project, to outline the function of the workshops and to explain the evaluation process. An essential requirement was that the students involved were volunteers, not been coerced to participate by the school staff, and had earlier completed some leadership or group skills training in the school, such as the Peer Support Program or other appropriate structures. The roles of the committee members are documented in Appendix 13.

5.4.3 Training workshops for Asthma Peer Leaders

The peer-leader training workshops were held in the afternoon during school hours or immediately after school at the community health centre. Three one and a half hour sessions, were conducted on the same afternoon, one week apart, by the Project staff. The Session outlines and workshop plans can be found in Appendix 14.

In the workshops, the peer leaders learned about asthma and its management; and identified barriers to asthma management in young people, with an emphasis on risk-taking behaviours. Working in small groups, students had the opportunity to acquire skills in the use of asthma devices, problem-solving and group leadership skills.

The educational strategies, described in the Session Outlines (see Appendix 14), were used to demonstrate and model group interaction and collaborative decision-making skills. Throughout the program every opportunity was used to make the program memorable and enjoyable for the students. This was evidenced not only by the fact that we had no drop outs, but also that in the course of the Program other students asked to be included. On completion of the workshops, certificates were presented to the Asthma Peer Leaders at a special presentation ceremony and the event was publicised in the local media.

5.4.4 Peer-led education

Trained Asthma Peer Leaders in groups of two to three per class (depending on the number of trained volunteers) conducted three health lessons with Year 10 students. The Asthma Peer Leaders were each given an attractive yellow folder with the relevant information required for the lessons (See Appendix 15). The educational aids such as videos and asthma devices were kept with the health teacher. In the lessons the students learned about asthma and its management and developed a class message (Asthma Skit) to promote optimum asthma management in young people.

Two follow-up meetings were held with the Asthma Peer Leaders after the first and third peer-led lessons. The meetings provided an opportunity for students to discuss their sessions, resolve any problems and to give feedback to the project staff.

5.4.5 Student Asthma Day

Presentations of creative "asthma skits" by year 10 students to year 7 students, staff and parents were the focus of an annual asthma related event in the school. (See Appendix 8). The skits,created by the students with some assistance from the staff, promoted strategies to overcome barriers to asthma management through song, dance, debate, signs or short plays. The skits were about three to five minutes long and involved the entire class. That the Triple A Program was well received by students was evidenced by the presentations of the asthma skits and feedback from both students and staff.

The students and school staff were involved in the planning and organisation of the day, with project staff facilitating the process. Media publicity in the local and national papers, visits by sporting celebrities, presentation of certificates and support from the Asthma Foundation of NSW were additional strategies employed

to make the program 'special' to the school community. Among these the local and ethnic press were utilised regularly. (See attached press releases, Appendix 10)

The Triple A Program described in this treatise is currently being realised in two girls high schools in Auburn in, 1994.

5.5 Evaluation[5]

Evaluation was planned as an integral part of the program.

5.5.1 Process Evaluation

To assess the effectiveness of the implementation process the formative evaluation[6] design, used to assess the implementation of the Triple A Program, is based on Partlett and Hamilton's "Illuminative Model" (1972). This model is designed to provide immediate feedback about program implementation and quality, and relies exclusively on qualitative data collection (Green, 1986). An essential requirement for this process is that it requires the evaluator to be very familiar with the implementation of the program.

The purpose of the formative evaluation is to:

1 Establish whether the program plan was achieved

2 Assess the quality of teaching material and approaches

3 Justify continuation of the program as part of the school curriculum

4 Assess the practicality of the teaching approaches

5 Describe the program to the wider community

6 Assist with impact and outcome evaluation

To assess the implementation of the program participating students, Asthma Peer Leaders and key staff members were surveyed using individual and group questionnaires (See Appendix 9). Evaluation data were collected from the areas outlined in Appendix 16.

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[5] The Program plan in this treatise focuses on the implementation of the Program and therefore details of the evaluation are not provided here.

[6] Formative evaluation is concerned with program improvement and looks at how the program was conducted and what outcomes can be determined. Items looked at include the level of satisfaction of program participants, how the program fits into the existing schedules and the way it was conducted (Henderson, 1993).

5.5.2 Impact and outcome evaluation

The impact evaluation measured knowledge and attitudes in all students and quality of life[7] in all students with asthma using validated pre- and post questionnaires in high schools. The questionnaire used in the study is attached as Appendix 9.

The results of the formative and impact evaluation are being analysed. These preliminary results will determine the choice of appropriate outcome measuring instruments for behaviour change in students with asthma.

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[7]   A self report on perceived physical, mental and social well-being in relation to asthma.

Chapter 6: Discussion

6.1 Introduction

The development of health-enhancing behaviour patterns is a major goal for health prevention and promotion in youth. Self-management behaviours in students with asthma can be influenced by many factors as has been detailed in chapter 3. These psychosocial factors are interconnected and need to be taken into account prior to any health promotion intervention in asthma management. Among them the environment and peer influence are the key components when working with adolescents.

The school therefore provides an excellent setting for health promotion for adolescents with asthma, who may not have easy access to any other type of program through the health care system (Evans, Clark, Feldman et al., 1987). However, although health education programs at school to prevent the occurrence of illness are usual, education programs for chronic illness, such as asthma are rare. Cooperation of health and education sectors is therefore essential to minimise the morbidity related to asthma in the school environment.

6.2 Significance of the program

The Triple A Program is a health promotion intervention for high schools, based on sound theoretical principles utilising psychosocial approaches. Optimum management of asthma in young people is promoted through peer-led education and student presentations ('asthma skits'). This is particularly relevant for communities with a high proportion of NESB, in which individuals are more likely to have special difficulties in accessing sources of reliable health information (Forero, Young and Bauman, 1992). Promotion of positive health behaviours and educating young people about asthma has important long-term benefits not only for the individual, but also for their family and the wider community.

The involvement and recruitment of parents has always been a concern for health promotion programs in school. This is particularly relevant in NESB communities where parents may experience a "... distrust of school, fear of embarrassing students and language barrier" according to Millstein, Petersen and Nightingale (1993, p.83). The Triple A Program involves parents in: assessing the needs; in the School Asthma Action Committee; and invites them to the Student Presentations. It therefore gives many opportunities for parents to be involved, even when they do not speak English.

The Program also addressed the problem that the health concerns of young people are not always those which health providers see as a priority by involving the students in the decision making process (Blum, 1980). The asthma skits are developed by the students following group problem solving, making them responsible for the messages delivered to their peers.

The Triple A Program focuses on the ability of young people to be educators and agents of change. "Compared to school-based programs in which the teacher alone manages the class-room activities, peer-leaders enhance the program's capacity by modelling health behaviour outside school" (Millstein, Petersen, Nightingale, 1993, p.87). Barriers to asthma management are not confined to school settings. Therefore school, families and community as well as the student with asthma benefit from collaborative efforts. Anecdotal evidence from the Asthma Peer Leaders during the feedback meetings indicated that some students were even able to influence smoking behaviours in friends and family members, and decrease exposure to passive smoking.

The Program's predication upon the greater acceptability of teaching by peers was unlike 'top-down' methods of education, and thereby had a greater chance of success. The advantages of this approach are that messages otherwise 'unacceptable', become more acceptable when coming from their peers (Biddle, 1980). Peer leaders also experience a self-directed process of learning and understanding issues, thereby enhancing their own cognitive skills. Peers can have a positive or negative effect on adolescent behaviour (Millstein, Petersen, Nightingale, 1993). However, since the Program's objectives are specific and focus on health enhancing behaviours, any untoward effects have not yet been seen.

Intersectoral collaboration, one of the principal components of primary health care, can be achieved between the health and education sectors (Nutbeam, Haglund, Farley et al., 1991). This became evident when involving students, staff and parents in the planning and implementation of the Program, which increased the likelihood that the messages provided were appropriate and acceptable.

6.3 Benefits of the education process for schools and students

The cornerstone of the program is the 3-Step Intervention Model promoting knowledge and behaviour change in high school students. This education model is directed at the individual, group and the school community and has the potential to be easily adaptable to address other health issues at schools, such as

smoking, nutrition and drug education. Further, it addresses the issue of how adolescent values change with age (Prokhorov, Perry, Kelder et al., 1993). The model can be implemented easily in schools and therefore has potential for a wide range of applications.

The advantages for health advancement in schools that emerge from this model are many. Primarily, it gives the opportunity for the students at different stages of their school career to have exposure to the health message. This message is reinforced during their time at school through the different channels of student presentations, peer-led workshops, and ultimately by becoming Asthma Peer Leaders. Maintenance of positive health behaviours is thereby encouraged.

A range of educational strategies are used to meet program objectives and increase motivation and participation among the students (Friedman and Litt, 1987). One such strategy is the use of the asthma videos in the education workshops. Both videos address self-management behaviours in asthma relevant to young people, including exercise-induced asthma, smoking and compliance with medications, using credible role models: sporting personalities and young people. The information was further reinforced by peer-led teaching, problem solving and student presentations. Therefore this strategy not only has the potential to increase awareness and knowledge, but has the potential of changing attitudes and behaviour, on the part of the classmate, teacher or the student themselves (Shea, Basch, 1988).

The videos' emphasis on prevention and role modelling also has the potential of positive effects in students with mild asthma. Students increase their self-esteem through their role as Asthma Peer Leaders or by participating in the skits. It also reduces the chance of the students with asthma being stigmatised by their peers.

Asthma and its management are given a high visibility in the school and the community, particularly through the Student Asthma Day. The publicity resulting from articles in the local media, assists in strengthening the motivation and commitment of the students and staff members. Frequent articles with photographs of the participants, also helped raise the profile of the program in the school and the community and reflected the value of their involvement. Student feedback following the implementation of the Program, indicated that awareness of asthma and its management appears to have spread across the school community. They also reported that many of their families were "very proud" and supportive of their daughters' involvement with the Adolescent Asthma Action Program.

The Program provides innovative ways to increase understanding about the illness and to decrease any sense of isolation for individual students with asthma by involving the whole class in group exercises and the development of creative strategies. This process also encourages the involvement of students that may be experiencing feelings of "alienation" [8] at school and who are not generally accessible to regular health promotion activities at school (Nutbeam et al., 1993).

The Triple A Program also had certain hidden benefits for example some members of the staff became interested in maintaining and improving their own health and their students'. A lunch time aerobics class for students and staff was initiated following the Student Asthma Day Presentation. Peer leaders also became more sympathetic to difficulties that teaching staff have in dealing with disruptive students. It created a special relationship between senior school staff and the senior students.

6.4 Costs of the Program

The effectiveness of this program depends on funding. To date, it has been developed and implemented using resources of Auburn Community Health Services and participating schools, except for funding for the Asthma Project Officer, which has been met by the Asthma Foundation of NSW. The Program has proved particularly cost-effective, giving significant results for a small outlay. Other costs have been kept to a minimum by using videos and materials for the Program which were either donated or produced by project staff. These costs have been supported primarily by public donations. However, the cost of this Program's implementation in other areas will depend on factors that cannot be predicted.

6.5 Enabling factors contributing to ease of intervention

Several lessons can be learnt from the implementation of the Program, particularly in relation to factors that must be considered when initiating an asthma health promotion program in a high school. These findings are important in relation to planning and communication to establish the program in the school and are detailed in Thompson's review of Primary School Drug Education (1988, p.68).

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[8] 'Alienation' has been defined as "an emotional state characterised by feelings of powerlessness, and lack of purpose in life. Such feelings are often accompanied by responses ranging from a complete rejection of social values to a low level of interest in school and education" (Nutbeam et al.,, 1993)

Among these factors included: involvement and support of the principal of the school and key members of staff; a committed group of individuals involved in planning and implementation; relevant training for all participants; feedback meetings with participants; promotion of the program through special events and media. These findings substantiate other studies, which have examined effective health education and promotion programs in schools (Parcel et al., 1988; The Peer Support Program Ltd, 1990; Went, 1992).

It is important to note that any successful intervention within schools requires the agreement of not only the principal and key staff members, but also the support of students and parents. On the organisational side, the program requires the commitment and time of the volunteer students and key staff members, especially in the beginning, who may already be overburdened with routine work. Although there was a committee who assisted in overseeing the Program, staff members coordinating the Program played a vital role in keeping it going.

Approaching schools and getting their active involvement is a very delicate and time consuming procedure in the first year of the program. The health professionals who are implementing the program need to be familiar with the routine of the school, known to the staff and command the respect of the school community.

6.6 Reflections and scope for future agenda

Asthma can exact a high toll on students with this condition, their care-givers and the health care delivery system. It is the most common chronic illness in high school students and its prevalence and severity are increasing in childhood. Therefore, it would be pragmatic to include asthma in any health promotion strategies within schools.

As the program was a pilot program, it was considered appropriate to initially focus on implementation of the program and learn as much as possible about the process. To measure the impact of the program, an existing questionnaire developed by the Greater Newcastle Asthma in Schools Project in the Hunter schools was used (Henry, Gibson, Hazell et al., 1993). For outcome measures an experimental design which evaluates self management behaviour in asthma may be appropriate in the future.

Further trials in a co-educational school environment are also required prior to general dissemination. The question of whether the program will be able to achieve the desired effect in a co-educational school is still to be addressed. To

date there is no evidence as to what differences, if any, would result if the program was implemented in other than a girls' school.

The raw data of the evaluation indicated that to enhance quality of life in students with asthma there is a need to improve co-management of asthma, as shown in Figure 2. The importance of collaborative asthma management between individual patients and health care providers has been emphasised by the Asthma Management Plan (National Asthma Campaign, 1991).

The need for co-management has been further emphasised by Bauman, who warns that health professional must remain aware, that no amount of asthma knowledge or self management skills will obliviate the need for effective medical care (Bauman, 1991). Asthma education for adolescents, although vital for effective management of their illness, should only be an adjunct to adequate medical care.

Although students were encouraged by their peers to visit their doctor for asthma management, their medical management was not specifically targeted. Individual students with frequent attacks of asthma at school were often referred to the community health centre for assessment and education. These students were then referred to their general practitioner with a proposed asthma management plan.

The cost of asthma is estimated to be over $500 million annually in Australia (NSW Health Department, 1992). With the reorientation of health services towards prevention as opposed to treatment, there is also a need to focus on community involvement in health care. Recently, a few projects have evolved from School Medical Services in the community which have introduced innovative and cost effective ways of asthma education in schools (Young et al., 1992; Shah, Gibson, Wachinger, 1993). Further assessment of potential asthma education and health promotion programs in schools, for both sustainability and achievable outcomes, is essential for future research. There is a need for the State Health Departments and Department of Education to assist in the funding, coordination and evaluation of requisite health programs and services delineated by school needs (Resnicow, Cherry, Cross, 1993).

Schools are ideal settings for health promotion programs because they already have the facilities and professional resources required to develop and implement the program, including school health services. Although teachers usually take professional responsibility for the teaching of health education, school health services can provide a vital resource for the planning and support of programs in

health (WHO, 1993). The traditional role of school health services is evolving to better reflect changes in the health status of young people, and to provide services which are more relevant to the health concerns of young people (Nutbeam, Haglund, Farley et al., 1991; Nossar, 1994).

Nossar, in discussing the practice of community paediatrics, emphasises the principles of participation, rationality and integration to ensure the attainment of its goals, which include the development and implementation of effective health promotion and protective programs (1994). A challenge that remains is how more supportive and positive environments can be promoted at school (Millenstein, Petersen, Nightingale, 1993).

6.7 Conclusion

Peer-led education has considerable potential for adolescent health promotion in Australia. This treatise has shown an effective way to address the personal, social and environmental factors which determine behaviours pertaining to barriers in asthma management in young people. It provides a conceptual model to improve asthma management in high schools and has contributed to development of the theoretical basis for the conceptual model. However, further research is required to assess the long term effects of the Program.

The Triple A Program offers an innovative approach to asthma eduction for adolescents. The emphasis is on the process, whereby students take control of the educational messages for their peers. The program model is based on sound theoretical principles and provides an integrated and sustainable approach to asthma education in high schools. It demonstrates that a collaborative approach to asthma education is an effective way to ensure its integration into the school curriculum.

The design of the Triple A Program permits elements of the program to be modified to suit individual school settings. Adolescents with poor access to health services are particularly likely to benefit from this approach. The Triple A Program has shown that working with adolescents, parents and school staff is possible, and that a common health problem provides useful entry into high schools. The conceptual model demonstrated also that work needs to be done on several aspects of any given health issue concurrently.

The key challenge in developing the Triple A Program has been well summarised by Parcel, Muraskin and Endert who state that "for any program to be effective, it must take place in an institution where that program is valued, where it

is seen as important to the work of the institution, and where success in the program builds the stature of the institution" (1988, p. 43S).

Our experience with the peer leaders and the school community proved to be very rewarding for both the participants as well as the Project staff. This has given the impetus and encouragement to all involved, to share this experience with others and in the words of the Auburn Peerleaders "... this program should be made available in every school in Australia".

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