Chapter Six

A review of the efficacy and acceptability of Health Promoting School interventions

Application of Stage III of the Staged Approach
Introduction

Having established a relatively clear picture of the magnitude of the problem and factors which significantly influence the target population in previous chapters, this thesis now considers the design and development of an intervention strategy to reduce smoking, unsafe alcohol use and inadequate sun protection in adolescents.

**Stage III of the Staged Approach model to health promotion**

The main question posed in the third stage of the *Staged Approach* model is – "are efficacious and acceptable intervention programs available?" This stage builds on information gathered in Stages I and II, and is concerned with evidence that interventions can produce a change in the magnitude of a health problem under ideal circumstances, known as ‘program efficacy’. Such evidence should maximise the capacity to determine if any changes in the health problem are due to the intervention, which means that rigorous research methodologies such as randomised trials are desirable. ¹ In instances when randomised trials cannot be undertaken for ethical or logistic reasons, other less rigorous methodologies are recommended. Assessment of the quality of the evidence provided in intervention studies is assisted by the application of accepted hierarchies of research evidence, such as that developed by the National Health Service Centre for Reviews and Dissemination (NHSCRD).²

Though efficacy studies in health promotion vary in size, the majority have tended to focus on single interventions in single settings, for example smokers who visit general practitioners receiving smoking-cessation advice.³ However, as health promotion practitioners are increasingly designing multi-component and multi-strategy interventions, often across different settings, the complexity of intervention research has increased. Large-scale community-based trials, such as the COMMIT trial in the
United States\textsuperscript{4} and the CART project in Australia,\textsuperscript{5} have been demonstrated to be viable and methodologically adequate. Without a clear understanding of the efficacy of health promotion interventions, decisions about which interventions are most likely to achieve health benefits will be constrained. Given the potentially large costs associated with wide-spread dissemination and adoption of interventions, the critical appraisal of the quality of efficacy research plays a crucial role in the application of evidence-based practice.\textsuperscript{3}

This chapter presents the first step in the investigation of the efficacy and acceptability of the HPS approach by reviewing the quality of evidence in existing efficacy studies in an attempt to answer the question: "What is the available evidence for the efficacy and acceptability of the HPS approach?"

**Review Method**

As briefly discussed in Chapter Two, several large reviews of health education and school-based health promotion have been conducted. To avoid duplicating these and to extend the coverage and depth of appraisal of available evidence, this investigation was conducted in two parts. In Part One, findings from only the most relevant and systematic reviews were examined and described. In Part Two, primary studies identified in those reviews which met certain inclusion criteria, described below, were extracted for a more detailed and in-depth appraisal. In addition, intervention studies identified in the publication audit (see Chapter Two) were also retrieved. A systematic search of electronic databases (MEDLINE, ERIC, APAIS, PROQUEST & Expanded Academic ASAP) was conducted to identify and retrieve any relevant publications not previously included in the reviews or publication audit.
Inclusion criteria

To be included in this review of the efficacy and acceptability of the HPS approach, primary studies had to meet seven criteria based on a number of considerations. The seven criteria are similar to those employed in previous systematic reviews of school-based programs, most notably reviews conducted by the Cochrane collaboration and the NHS Centre for Reviews and Dissemination in the United Kingdom. As such, these used generally accepted existing criteria that would allow comparisons across review. The inclusion criteria and rationale for each are described below.

1. Published in the last 12 years (ie. no earlier than 1990).

The decision to limit the review to studies published in the last 12 years was based upon prior knowledge by the candidate of the topic area and an awareness that HPS interventions are a relatively recent development in the field of school-based health interventions. It was only in the 1980s that the HPS approach was actually validated by practitioners and researchers. Findings from the 1995 publication audit conducted by the candidate found that up to March of that year, not a single intervention study could be identified which had incorporated all five principles of the Ottawa Charter (one of the definitional forms of a HPS).

2. Employed a controlled or quasi-experimental study design.

Imposing the limitation of only including those studies which employed a randomised controlled trial or quasi-experimental study design was a direct attempt to focus the review on only the most rigorous research, as specified in the accepted hierarchy of research evidence developed by the Cochrane Collaboration and the NHS Centre for Reviews and Dissemination.
3. Provided sufficient information about study participants, method of recruitment of schools, intervention strategies and evaluated outcomes.

In order for comparisons to be made and a meaningful appraisal and assessment of the efficacy of HPS interventions, sufficient information was required about these elements.

4. Targeted whole-school populations and were not confined to interventions for high-risk groups.

The philosophy of the HPS is a 'whole-school' approach and was never intended as a strategy for targeting high-risk or special groups within the school-aged population.

5. Evaluated a health promoting schools approach to school-based health promotion intervention with school-aged children.

Initial results of the search for primary evaluation trials yielded a low number of eligible studies. For this reason, the fifth inclusion criterion was broadened to include not only studies promoted explicitly as HPS interventions, but also those which appeared to adopt the HPS approach in delivering health promotion in the school setting. This allowed for comprehensive or multi-component interventions, in addition to studies that described school-based interventions as part of wider community-based trials, to be incorporated. The expansion of this criterion enabled a more thorough examination of school-based health interventions which may potentially be considered as HPS, a perspective not considered in previous reviews.
6. Written in English.

7. Readily available from university libraries, other institutions or able to be downloaded from the internet.

The last two criteria were imposed for the reason of practicality in retrieving and understanding published papers or reports.

**Data extraction and analysis**

Those studies which met all the inclusion criteria were identified and then the following information was extracted and tabulated:

- Program name and country in which the study was conducted;
- Health problem or issue targeted;
- Study population (included number of schools or students, age range, and other demographic characteristics);
- Method of recruitment (brief description of how schools were recruited into the study);
- Intervention strategies (domains addressed and specific strategies employed where provided);
- Outcomes measured (list of all outcomes measured);
- Main results;
- Presence of the components or domains of a HPS ie. curriculum (C), ethos and environment of the school (E), links with home and wider community (L), and active participation by the school (P). A tick (✓) was used to indicate sufficient evidence of intervention strategies.
addressing each of the domains as specified in definitions adopted by the UK\textsuperscript{13, 14} and Australia.\textsuperscript{15} These four components were also utilised in a previous systematic review as inclusion criteria.\textsuperscript{9}

Because of the wide variation in study designs, program strategies and outcomes measured, it was not feasible to perform a meta-analysis. The heterogeneity of HPS trials makes the calculation of an overall estimate of effect both impractical and uninterpretable. Instead, data was synthesised using a narrative, systematic review under the sub-headings described above. This method is similar to that employed by a number of Cochrane reviews in the school-based health promotion field.\textsuperscript{6-8} The results of Parts One and Two of the investigation will now be presented, followed by discussion.

**Part One: Findings of Systematic Reviews**

*Early international reviews*

An early, non-systematic review paper by the Harvard School of Public Health in 1992\textsuperscript{16} warrants a brief mention here, because it provides some insight into the status of evidence in the US which precipitated the growth in popularity of comprehensive school health programs. The paper reported on the findings of a synthesis of 25 reports from national commissions, federal and state agencies and other sources. Five themes emerged from the synthesis of reports:

- Education and health are interrelated;
• Social morbidities and health risk behaviours pose the biggest threats to health;

• A more comprehensive, integrated approach is required in addressing children's health problems;

• Schools are the most appropriate setting for health promotion efforts targeted at school-aged populations; and

• Prevention is more cost-effective.¹⁶

These five themes closely parallel the philosophy of the HPS approach as described in Chapter One, and were viewed as reflecting the growing consensus in the US over the critical issues in school-based health promotion and education.¹⁶

One of the first systematic reviews of the effectiveness of health education and health promotion in the school setting was undertaken by the Regional Office for Europe of the International Union for Health Promotion and Education (IUHPE) in 1994.¹⁷ It identified 12 school health evaluation studies, from a search of three databases between the years 1984 and 1994, which met six inclusion criteria. The health problems addressed by the studies included: smoking, drug use, obesity, dental health, AIDS and general health. Most programs were conducted in secondary schools and all involved activity in the formal curriculum through the provision of lesson plans, sometimes combined with parental involvement or community-wide interventions. A wide range of outcome measures were utilised including knowledge, attitudes, intentions and behaviour.¹⁷

Before presenting their conclusions on the effectiveness of school health interventions, the reviewers warned that such assessments were tentative due to the lack of clear description of specific intervention strategies in many studies. Overall, school health interventions were found to be effective in improving knowledge, but less successful in changing attitudes, beliefs, self-efficacy, behavioural intentions and behaviour itself.
In studies where behavioural effects were produced, they were short-term, with long-term effects either not evaluated or not detected. Programs which combined curriculum activities with parental involvement and community-wide interventions appeared to have the greatest potential for achieving long-term behaviour change.\(^{17}\)

Though these were encouraging findings, several shortcomings in this review were discernible. First, though the criteria of “sound effectiveness research” was applied to the selection process, and all of the studies did utilise a control/comparison group, only one study\(^ {18}\) used random assignment to groups. As such, the generalisability of the results is limited. Second, only programs conducted in Europe or the USA were included, narrowing the breadth of potential programs for review. Third, based on the limited description of intervention strategies, most programs could not be classified as ‘health promoting schools’. Only a few\(^ {19,20}\) appeared to address domains other than the formal curriculum. Finally, based on the reviewers, the majority of studies did not incorporate evaluation of program acceptability or other process evaluation measures. However, the few that did consider acceptability, reported that participants were satisfied with the intervention.\(^ {21,22}\) Despite these limitations, the IUHPE review is significant because it was one of the first systematic reviews to provide some empirical evidence for the effectiveness of a multi-component approach to school-based health programs.

**Australian reviews**

In Australia, there have been several reviews of school health programs, two of which have focused specifically on the effectiveness of the HPS approach and these are discussed here. The first of these was conducted in 1996 as part of a report prepared by NHMRC Health Advancement Standing Committee.\(^ {23}\) No specific details were provided about the review process or inclusion criteria, other than stating that “…only refereed journal
articles, books and major international and national published reports...” were included. The review identified 39 school-based health programs carried out between the mid-1970s and 1994, predominantly in the US, the UK and Australia. Of these, only 12 programs (31%) were considered as having utilised a comprehensive, integrated approach compatible with the HPS approach.23

A wide range of outcome measures and methodologies were utilised in the selected studies, with the reviewers intentionally not defining what was constituted as evidence of effect. Rather, they suggested that other than student behavioural outcomes, changes to school organisational, structural and policy conditions that are necessary for optimal school health may be more appropriate indicators by which success should be judged. Analysis of the 39 programs led to the identification of several key factors that were deemed by the reviewers as “...essential for optimal school health outcomes...”, which appear to reinforce the findings of the IUHPE review that the multi-component or HPS approach is likely to be most effective.17 These factors included:

- a comprehensive approach to addressing all aspects of health;
- development of partnerships with, and involvement of, parents, local community and health services in program planning and implementation;
- supportive school policies;
- changes to the physical and psychosocial environment; and
- several factors related to the delivery and evaluation of school curriculum, such as adequate allocation of time and training of teachers, integration with other subject areas, and relevance to school communities.23
Though comprehensive and thorough in its appraisal of the results of each study, a number of weaknesses were apparent in the review. No information was provided about inclusion or exclusion criteria, particularly in relation to minimum requirements of study design or methodology, making it difficult to assess whether the review was systematic or not. Neither study design nor methodological considerations, such as method of recruitment of schools, were considered in the appraisal of individual studies. The inclusion of programs from a wide range of countries, not just Australia, was one of several strengths of the review. In addition, each intervention was assessed to establish whether each of the components of a HPS approach was addressed. 23

The second Australian review by St Leger10 was published in 1999 and though it focused specifically on HPS programs in primary schools, it merits discussion because it also considers the question of what are the most appropriate outcomes of school-based health interventions. In addition, it was one the first reviews to raise the issue of cost-effectiveness. Though there is some indication that integrated, comprehensive school-based programs can produce favourable cost-benefit ratios,24 St Leger argues that this has only been demonstrated in studies demonstrating positive behaviour change, and only in health issues appropriate for adolescents.10

The review methodology utilised was a selective process in which programs were individually chosen by the reviewer on the basis of their frequent citations in other publications and seemingly rigorous methodology and evaluation. A total of 11 key studies were included in the review with each assessed for the presence of the components of a HPS, though it was noted that most studies did not use the HPS concept as the framework for development of intervention strategies. Assessment of the studies found that, overall, health gains were minimal with the exception of programs which were well resourced and comprehensively evaluated. For example, the Minnesota Heart Health smoking prevention project involved
substantial community-based strategies and parent involvement, in addition to a school curriculum program, and produced significantly lower smoking rates in the intervention group at long-term follow-up.\textsuperscript{20} Other conclusions drawn by St Leger were that: involvement of parents and the local community and inter-sectoral collaboration with health services increased the likelihood of program success; the most commonly used component of the HPS approach was ‘personal health skills’ or formal curriculum; few studies attempted to develop healthy school policies; and little attention was given to the professional skill development of teachers.\textsuperscript{10}

As with the NHRMC report, similar criticisms of the review methodology were apparent in the St Leger review. The decision, though justified, to purposively select studies for inclusion prohibits it from being labeled systematic. Again, little attention was directed towards study design, method of recruitment of schools and evaluation of program acceptability. Despite these shortcomings, the findings from the review appear to add further support to the emerging evidence for the potential of the HPS approach to achieve positive school health outcomes, though it remains unclear exactly what health outcomes are deemed as satisfactory indicators of efficacy.

Finally, St Leger highlights the need to consider the divergence in goals between the health and education sectors. Teachers are occupied with elevating health learning, while the health sector aims to improve health indicators and status. It appears there is still much progress to be made for the integrated and comprehensive approach of the HPS concept to be accepted and adopted by teachers by choice. Perhaps, as St Leger suggests, this is an idealistic aspiration that is not achievable.\textsuperscript{10}


Cochrane reviews

Two additional reviews were recent Cochrane reviews which, though they did not focus specifically on the HPS approach, assessed the effectiveness of school-based and community-based programs on the prevention of smoking\(^6\) and alcohol misuse\(^7\) in young people. In both of these the reviewers concluded that because a large number of studies failed to show evidence of an intervention effect, and there were only a limited number of high quality research studies on the effectiveness of multi-component programs, no definitive conclusions can be drawn until further research is conducted.\(^6,7\)

National Coordinating Centre for Health Technology Assessment (NCCHTA) reviews

Arguably the most systematic and comprehensive review to-date was that conducted by the National Coordinating Centre for Health Technology Assessment (NCCHTA) in the UK in 1999.\(^9\) Two separate reviews were undertaken as part of the one investigation. The first of these was a systematic review of primary studies of the effectiveness of the HPS approach. Of 1,067 papers identified in the search procedure, only 12 studies met the criteria for inclusion. The three criteria which studies had to meet were:

1. implemented interventions utilising the HPS approach with children and young people aged 5 to 16 years, involving active participation by the school, and providing sufficient description of program components;

2. utilised controlled studies with a comparison group, or before-and-after design with no comparisons;

3. reported on health-related outcomes including behaviour.
Only two of the 12 studies used an adequately powered randomised controlled trial study design, and none of the schools involved in the 12 studies had implemented all of the components of the HPS approach. Overall, evidence for the efficacy of the HPS approach was viewed as "limited but promising". Health-related behaviours that showed improvements included dietary intake and physical activity. There was some evidence for a positive impact on aspects of social and mental health of students, such as bullying and self-esteem, and on school environmental factors, such as staff development, school lunch provision and social climate. Due to insufficient information provided in studies, the authors were unable to undertake a cost-benefit analysis of the HPS approach. However, they did note that some financial investment in schools was regarded as important for the success of school-based interventions. One shortcoming of the NCCHTA review of primary studies was the lack of consideration given to the acceptability of HPS interventions. This is of particular interest given that most of the studies used either convenience samples of schools or purposively selected schools based upon certain criteria, such as pre-existing evidence of their commitment to health improvements. This biased selection process limits the generalisability of the results, in that, one can only make conclusions on these populations.

The second review undertaken by the NCCHTA group entailed a systematic review of existing secondary reviews of effectiveness of school-based health promotion interventions. Two hundred and fifteen (215) relevant reviews were identified in the search procedure, of which, 32 met the inclusion criteria. Health topics addressed by the reviews included: nutrition and exercise; substance use; safety and personal hygiene; sexual health; mental health; and aspects of environmental health (notably sun protection). Most reviews reported positive gains in health-related knowledge, but less of an impact on student attitudes and behaviour. Many interventions included in reviews were found to be completely ineffective, with a few even showing adverse effects. While primary studies
included in the reviews were not individually assessed for the components of the HPS, it appeared that most interventions only addressed the formal curriculum component, with a few combining classroom lessons with parent involvement or changes to the school environment.\textsuperscript{9} A synthesis of the reviews by health topics will now be discussed in relation to smoking, alcohol and sun protection.

Four reviews\textsuperscript{26-29} were included which addressed outcomes specifically related to smoking or tobacco use.\textsuperscript{9} Analysis of the reviews indicated that several school-based programs which had been evaluated in controlled trials with random allocation, were found to have significant short-term effects on smoking behaviour. Several others, using weaker study designs, also showed positive effects while an equal number were considered to have either no effect or the results were not apparent.\textsuperscript{9} Only three programs measured long-term follow-up behaviour, with the longest of these showing effects at two but not six years.\textsuperscript{30} Peer involvement, resistance skills training and parent participation were all associated with greater likelihood of success of programs.\textsuperscript{9}

Alcohol-related interventions and their associated outcomes were addressed by six reviews,\textsuperscript{8,26,28,31-33} encompassing 63 distinct school-based programs.\textsuperscript{9} Of the 63 programs, 25 reported short-term positive effects on measures of student alcohol use, 30 programs found no effects and seven appeared to have a negative effect. Of only two interventions which measured follow-up at five years, one reported a sustained positive impact.\textsuperscript{34} As with smoking interventions, alcohol programs which were most effective included: peers as facilitators, resistance skills training, norm setting and parent involvement.\textsuperscript{9}

Only one review\textsuperscript{35} of sun protection programs was included in the NCCHTA report.\textsuperscript{9} Although the four programs included in the review were all RCTS, the authors noted there were still several weaknesses apparent in methodologies, such as no pre-test or long-term follow-up and lack of control for clustering.\textsuperscript{35} Interventions were again mostly confined to the
curriculum, though some included parent newsletters and distribution of sunscreen samples. Three programs reported no changes in sun protection behaviour,\textsuperscript{36-38} and one reported mixed effects.\textsuperscript{39} Programs targeted at adolescents aged over 12 years and consisting of only a single classroom lesson, were least likely to have any impact on sun protection behaviour, knowledge and attitudes.\textsuperscript{9}

Though the results of the secondary reviews presented above appear to be promising, at least in relation to smoking and alcohol use, an important point to note is that most interventions included in the reviews only addressed the formal curriculum through the use of prepared classroom lessons.\textsuperscript{9} These programs would be more aptly described as health education interventions\textsuperscript{9} and could be not be considered as HPS programs in terms of the definitions presented in Chapter One. Several other issues pertaining to the reviews were highlighted by the NCCHTA group. First, most of the reviews were not systematic and varied in their rigour. A comparison of reviews on the same primary studies produced, in some instances, striking discrepancies in reported details such as study design and number of participants. Second, the reviews varied considerably in their assessment of the quality of programs and evidence. However, those that did assess research quality, consistently noted that methodological rigour was lacking in many primary studies.\textsuperscript{9}

Despite the shortcomings in existing evidence, and concordant with the findings of the IUHPE,\textsuperscript{17} NHMRC\textsuperscript{23} and St Leger\textsuperscript{10} reviews, the NCCHTA group concluded that "...school health promotion initiatives can have a positive impact on children's health and behaviour but do not do so consistently." \textsuperscript{9} Positive gains in health-related knowledge appear quite achievable, while changes in attitudes and behaviour are more difficult. Programs that adopt a multifaceted or multi-component approach, consistent with the HPS approach, are most likely to be effective.\textsuperscript{9} However, questions remain concerning the acceptability of the HPS
approach, appropriate study designs and methods of evaluation, and achievable outcomes or indicators of success.

IUHPE Workshop Report of HPS Evidence

In an endeavour to answer these questions, HPS experts from around the world gathered at the XVIIth World Conference on Health Promotion and Health Education in July 2001 to consider the current evidence base on HPS and identify critical gaps in knowledge. The results of their discussions are presented in the Health Promoting Schools Evidence for Effectiveness Workshops Report. No definitive conclusions were reached, however, there was wide recognition and acceptance of a range of priority issues by the participants. A list of potential indicators or criteria considered as evidence for effectiveness was generated and included:

- Positive behaviour change in the intended direction;
- Participation by significant numbers of people and the development of partnerships;
- Before and after evaluations and controlled study designs showing significant impact;
- Participation, satisfaction and empowerment of teachers;
- Supportive testimony of people involved;
- Institutionalisation and normalisation of health promotion practice;
- Efficient use of resources and time, leading to acceptance of approach by stakeholders;
- External recognition of program and continued support.
Each criterion alone would not be sufficient, but combined could be considered as evidence for effectiveness. While this initiative is an encouraging step towards the standardisation of indicators of success, much more work is required for the development of a hierarchy of evidence to evaluate the HPS approach and its universal acceptance by researchers, practitioners, and school community stakeholders. Before this can be achieved, issues pertaining to the measurement and evaluation of several of the criteria need to be resolved. For instance, how do we measure ‘partnerships’ and ‘the institutionalisation of practice’? These issues were acknowledged by the participants in the identification of several critical gaps in knowledge. Other priority gaps included:

- Measurement of school ethos and environment;
- Better understanding of the changing paradigm of HPS;
- Evidence of links between HPS and educational outcomes;
- A clear picture of the existing evidence on HPS and school-based health promotion.

Summary

In summary, there have been many reviews and reports undertaken on the effectiveness of school-based health programs, but only a few which could be considered systematic or as having used satisfactory methodological rigour. In general, programs were found to be effective in improving knowledge but less consistent in their impact on health-related attitudes and behaviour suggesting that the existing body of evidence for the efficacy of school-based programs is weak and inconclusive. However, the majority of school interventions included in reviews only addressed the formal curriculum, with a limited number incorporating strategies targeted
at the school ethos or environment and links with parents and the community. These programs would be more aptly described as health education interventions and could be not be considered as HPS programs in terms of the definitions presented in Chapter One. Therefore, there appears to be a dearth of school-based interventions that have been successful in converting the philosophy of the HPS approach into practice.

Nevertheless, the better quality and most recent reviews are unswerving in their support for the HPS and multi-component approaches as having the greatest likelihood of producing gains in health and education outcomes for school-aged populations. Efforts have been instigated into addressing gaps in knowledge relating to achievable outcomes or indicators of success, but further work is necessary to resolve this issue and others such as the acceptability of the HPS approach and appropriate study designs and methods of evaluation, before further resources are committed to its endorsement. Part Two of this review presents a more in-depth analysis of relevant primary studies of school-based programs that met the inclusion criteria listed on page 210-212.
Part Two: Review of Primary HPS Evaluation trials

Results

A total of seventeen studies were identified which met all the inclusion criteria listed on page 210-212. A summary of data extracted from each trial is presented in Table 6.1. Seven studies were conducted in the US, five in Australia, four in the UK and one in Canada. The seventeen studies will now be described under the sub-headings utilised in Table 6.1.

**Health problem targeted**

A variety of health problems were targeted by programs, including: diet and nutrition, cardiovascular disease, skin cancer, mental health, violence and aggressive behaviour, sexual health, alcohol and smoking. Some interventions addressed more than one health problem and five programs did not specify a health problem but rather allowed individual schools to identify health issues important in their school and tailor the program to their needs. For example, in the WASH project, school health committees conducted a needs assessment by surveying parents, holding discussions with staff and consultations with students to ascertain areas of focus.

**Study population**

An equal number of programs were conducted in primary and secondary schools, with some intervention programs implemented across both types and all ages of children. Several studies involved large numbers of schools, such as 96 schools in the CATCH program, while others like the Sunshine & Skin Health and the Anti-Bullying projects used only small numbers of one or two schools in each treatment group.
Method of recruitment

In the majority of interventions (n = 12), schools either actively volunteered to participate or were selectively recruited on the basis of certain criteria. For example, in the WASH project, schools were selected after submission of an application form detailing evidence of their commitment to school health promotion and their ability to meet essential criteria relating to the domains of a HPS. In the Health Promotion Schools of Excellence project, schools were competitively selected by a committee on the basis of pre-existing, defined action plans and commitment to the project. Two studies provided no information about how schools were recruited and two utilized small convenience samples of only one or two schools where the authors worked as teachers. Only one program, the Dartmouth Health Promotion Study, recruited all schools in two cities selected for the study. Not a single study used random selection from a population of schools and active recruitment of the random selection into an evaluation trial.

Study design

Due to the stringent inclusion criterion of having employed a controlled or quasi-experimental study design, all 17 programs in this review did utilise an acceptable rigorous methodology. Eight interventions used randomised controlled trials, six employed controlled trials with no random allocation, and three utilised pre- and post-test designs with no controls.

Intervention strategies and HPS domains

Most programs appeared to address the three domains of the HPS approach, that is, the curriculum, the school ethos and environment, and links between the school, home and community. The majority of programs
also attempted to instigate participation by the whole school in program planning of health promotion activities, most typically through the formation of a committee or school council involving representation from teachers, students and parents. Though a broad range of specific intervention strategies were implemented across the 17 programs, three strategies that stand out as being common to nearly all were:

- curriculum packages entailing set lesson plans and directed activities, some with peer-led sessions;

- involvement of parents via information evenings, regular parent newsletters, and/or homework tasks linked to student curriculum packages; and

- teacher and staff training sessions on health promotion, usually in the form of half-day or full-day workshops and the provision of information kits.

Other less common activities in programs entailed:

- school policy development;\(^{45-47}\)

- formulation of school health action plans;\(^{25,56}\)

- provision of small amounts of funding to schools for health promotion action;\(^{56}\)

- designation of a project coordinator to facilitate and provide support for the implementation of schools' activities;\(^{44,60,61}\)

- community strategies aimed at supply reduction, such as tobacco retailer education and surveillance, and use of local media;\(^{52,57}\)

- improvements to school environment eg. availability of foods in canteen and use of healthier food products;\(^{41,43,46}\)
• risk factor screening services (eg. CVD) for students, staff and parents. 43

Outcomes measured

Evaluation of the efficacy of programs was assessed by way of a diverse set of outcome measures. Most programs measured change in students' knowledge, behaviour, attitudes, beliefs and/or self-efficacy, but some studies only measured school teachers' or school organizational factors. 60, 62 For example, the WASH project 59, 61, 62 measured teachers' level of knowledge and practice in relation to health promotion, together with school management and other organizational factors. Similarly, the South-Western Sydney HPS Project evaluated the success of the project in terms of awareness of HPS, exposure to literature and training in HPS among teachers, and changes to health-related policies and practices in schools. 60 A few studies also measured a range of student physiological variables associated with cardiovascular disease risk factors, 25, 42, 43 such as BP, BMI and aerobic fitness, and one program 57 included impact on parents' behaviour and knowledge levels. Measurements were mainly carried out immediately post-intervention, with very few studies entailing long-term follow-up.

Results

Most studies reported mixed results with significant impact on some outcome measures, but not others. For example, the CATCH project found significant positive gains in dietary knowledge, self-reported food choices, and amount of physical activity in school PE lessons, but no significant improvements in measures of cholesterol, fitness or BMI. 42 Similarly, the South-Western Sydney HPS project reported significantly greater proportions of teachers in intervention schools who were aware of HPS.
and had read relevant literature or attended training in HPS, however, no significant changes to health-related policies and practices were detected.  

Several studies found no significant intervention effects at all.\textsuperscript{44,48,57,58} For instance, the Dartmouth Health Promotion Study\textsuperscript{44} found no consistent significant changes in the desired direction for the intervention group in any of the quantitative outcome measures of heart health and mental health. In the Students for Peace project\textsuperscript{48} no statistically significant differences between treatment groups were detected in any measure of students' aggressive behaviour or school safety. 

In the seventeen studies reviewed, outcome measures which were successfully improved by interventions included: health-related knowledge;\textsuperscript{25,39,41-43} awareness of HPS among teachers\textsuperscript{59,60} and students;\textsuperscript{44} school health management;\textsuperscript{59} staff development and training in HPS;\textsuperscript{60} coverage of health topics\textsuperscript{56} and amount of physical activity in classroom lessons;\textsuperscript{42} content of school lunches;\textsuperscript{42,43} and school health policies.\textsuperscript{45,56} Programs appeared to be less efficacious in changing students' health risk behaviour, attitudes and self-efficacy. 

\textbf{Discussion} 

One of the first and notable findings to emerge from this review, consistent with previous systematic reviews described in Part One, was the small number of primary studies which met the stipulated inclusion criteria. This may, in part, be explained by the comparatively newness of the HPS approach, which is still in its infancy stage of development.\textsuperscript{9} While there is general acceptance of the broad philosophy and principles underlying the HPS approach, there are also inconsistencies and confusion over the capacity to explicitly define what constitutes a HPS intervention.
program, and which studies qualify for review. The term ‘health promoting school’ appears to be used more commonly in Australia and Europe, than in the US where the term ‘comprehensive school health’ has been used to describe school-based interventions that involve multiple components, reflecting the same philosophy of the HPS approach. In this review, the criterion relating to HPS programs was broadened to include such multi-component approaches for the purpose of reviewing all potential existing evidence. Of the seventeen studies identified, nine had not been included in any of the previous reviews discussed in Part One. The inclusion of these programs provides a new and significant contribution to the existing body of knowledge concerning the efficacy of the HPS approach.

A second noteworthy finding to emerge from the review related to the method of recruitment of schools in programs, an issue not previously considered in other reviews (as described in Part One). Most studies included in the review used either convenience samples of schools or purposively selected schools based upon criteria, such as some pre-existing evidence of commitment to the HPS approach. It is generally well accepted in clinical research that random selection and random assignment to treatment conditions are the optimal methods for overcoming bias and potential confounding factors, ensuring comparability between groups. While most of the seventeen studies did use random allocation of schools to groups, not one study randomly selected schools. This must bring the issue of comparability of treatment groups and Type I error into question.

If schools were not randomly selected, but purposively chosen for their pre-existing commitment to and impetus for HPS, then intervention schools can not, in theory, be compared to controls, as they are already biased towards the HPS intervention approach. It has been argued that in situations such as this, it is virtually impossible to provide adequate controls. Logic would suggest that such a confounding factor would bias
the results of these programs towards a significant intervention effect, yet many of the programs did not produce positive results. This conundrum raises several questions. Perhaps a pre-existing commitment to HPS is not a confounding, but rather a pre-requisite to the successful implementation of a multi-component, whole-school health promotion program, as suggested by several experts, and in the studies reviewed this commitment was not strong enough. Some practitioners argue that health promotion interventions should be deliberately harnessing such community-driven impetus rather than trying to control for its presence. In which case, how is an adequate level of school commitment determined or measured? Is this a process or an outcome? Or both? In the case of the South-Western Sydney HPS project, intervention schools were selected on the basis of their "interest" in HPS, but outcome measures also included awareness of HPS, attendance at training and reading of HPS literature.

The issue of evaluation and the appropriateness of RCTs in health promotion has recently generated considerable discussion among leading practitioners in the field. Green and Tones raise several objections to RCTs based on both ideological and pragmatic grounds. These include: reduced external validity because of the artificiality of the situation; likely contamination, particularly in large-scale studies; difficulty discriminating the effectiveness of different components of health promotion interventions which are increasingly complex and multi-factorial; problems in demonstrating statistical significance with relatively small samples after considering clustering effects; and the ethical dilemma of striving for active involvement by participants versus ensuring compliance and adherence. These objections are supported by the WHO in a discussion paper on the evaluation of health promotion programs in school settings, and may help to explain why there have been relatively few RCTs conducted evaluating the HPS approach. Additional concerns were also raised regarding the process of delivery of interventions in the school setting and associated difficulties with standardisation across school classes and
assessment of such. Others have argued that RCTs are necessary only when the outcome is unpredictable, and that alternative evaluation methods are equally appropriate to health promotion interventions.

A broad range of health promotion strategies were utilised in the reviewed efficacy trials, consistent with the findings from the previous reviews described in Part One. Most programs appeared to address the three domains of the HPS, however this assessment was somewhat tentative given the limited information available in publications, an issue acknowledged by others. This was further complicated by the lack of clear criteria defining what is satisfactory evidence of activity within each of the three domains, and therefore what constitutes a HPS.

Evaluation of programs included a range of measurement tools and outcome measures. Overall, the seventeen school-based health programs were found to be effective in improving health-related knowledge, awareness of HPS, and several other school factors, but less successful in changing students' health risk behaviour and attitudes. This is consistent with the NCCHTA review which concluded that positive gains in health-related knowledge appear quite achievable, but changes in behaviour and attitudes are more difficult. The NCCHTA further concluded that a HPS “...can impact on the social and physical environment of the school in terms of staff development, school lunch provision, exercise programs and social atmosphere...”, a finding supported by the results of this review. The lack of clear agreement on the most appropriate outcomes or method of evaluation makes assessment of the efficacy of HPS programs difficult. Though some work has begun on identifying potential indicators of evidence of effectiveness, this is still in its infancy stage of development. The criteria generated by the IUHPE, for instance, are quite broad and lack objectivity and standardised methods of measurement.
chapter six

Possible explanations for ineffectiveness

A range of explanations were offered by authors for the lack of program success. The first and most plausible of these, referred to the possibility of little difference in the extent of exposure to the intervention components between control and intervention schools.\textsuperscript{57} For example, the impact of the program may have been weakened by difficulties in implementing various components and strategies such as poor enthusiasm for programs among teachers,\textsuperscript{48,57} which means that strategies were not implemented as intended. This is otherwise known as a Type III error.\textsuperscript{71} Another important issue acknowledged by researchers was the difficulty in isolating the contribution that each component or strategy made to the overall effectiveness.\textsuperscript{9} Because of the nature of schools and their place in real communities, there are difficulties in adhering to a strict experimental design, with a high potential for contamination effects in the control schools.\textsuperscript{9,44,48}

Second, most interventions were implemented over a relatively brief period of time. Some authors suggested that perhaps it was unreasonable to expect significant changes in school organisations and practices, and therefore student behaviour and attitudes, after only a short period, and that interventions need to be implemented and sustained for several consecutive years.\textsuperscript{57} In fact, the WHO recommends that \textit{“...no less than three consecutive years should be allocated to effectively implement school health promotion”}.\textsuperscript{72}

A third explanation offered for the lack of intervention effects related to measurement. Students could have become sensitized to the outcomes measured, leading to a response shift. Alternatively, measurement tools may not have been sensitive enough to detect any changes that may have occurred.\textsuperscript{48} While this may reasonably justify the outcomes of a particular efficacy trial, it would seem unlikely that such an explanation could account for lack of intervention effects across several programs, utilizing different outcome measures and measurement tools.
A final explanation proposed for the failure to produce significant positive gains, was that the HPS intervention, in spite of its comprehensiveness and multiple components, was simply not strong enough or efficacious.\textsuperscript{44,48,57} Perhaps the impact of the whole-school approach was weakened for those students who might be considered high-risk. Children who frequently engage in a range of health-risk behaviours may require more individual and intensive interventions targeted specifically at them.\textsuperscript{48} Some reviews\textsuperscript{9} considered that some behaviours, like substance abuse, safe sex and bullying, may be more difficult to influence than others, such as nutrition and exercise, through health promotion programs in the school setting. Others even questioned the appropriateness of the school as a setting for health promotion, suggesting that because of the additional barriers and challenges presented by school institutions in trying to implement a HPS approach, the community should act as the primary setting for child health promotion efforts.\textsuperscript{44}

Finally, consistent with previous reviews, few of the studies included in this review incorporated evaluation of program acceptability in their evaluations, although those that did generally found HPS to be an acceptable approach to school-based health interventions. For instance, the Dartmouth HP study\textsuperscript{44} reported positive feelings among participants for most components of the program, a raised awareness of health among students and higher profile of health within the school. In the WASH project,\textsuperscript{59} increased commitment by schools to fiscal, policy, staff and strategic planning measures which support health promotion were viewed as indicators of acceptability of the project. It is unclear whether raised awareness is a valid indicator of acceptability,\textsuperscript{60} or is more appropriately viewed as a process measure. Some even considered it as an outcome measure. Others\textsuperscript{44} however, argued that awareness is not a measure of efficacy, citing lessons learned from community-based interventions\textsuperscript{73-75} which have increased awareness and were found to be acceptable, yet showed no effectiveness.
In contrast to the above studies which found a high level of program acceptability, anecdotal evidence from the Students for Peace project indicated that most teachers were not involved in the decision to participate in the study. Some resented the extra burden imposed by having to teach a curriculum that was not part of the schools' mandatory syllabus. Previous research has acknowledged the existence of barriers to the successful adoption and implementation of a HPS approach. Barriers include: lack of support from education departmental staff; poor in-service training of teachers regarding health promotion; perceived lack of administrative support and commitment; competing demands on teacher time and energy; little parent involvement; and competition with other curriculum areas, timetabling and resource issues. These barriers have been viewed as contributing to teacher and administrator ambivalence toward the HPS approach to school programs.

Limitations

The reviews presented here have provided an overview of existing systematic reviews, and identified a number of new primary efficacy trials of the HPS approach to school-based health interventions. Several new issues have been raised and persisting gaps in knowledge and research challenges identified. The findings should however be viewed in consideration of a number of limitations, which are discussed presently.

First, the search methodology employed by the candidate may have lead some important studies, such as unpublished papers and reports, to go unidentified and therefore be excluded. The decision to select only published studies because they are easier to identify and retrieve, may mean that the findings are biased by the opinions and views of journal editors who make decisions about what is considered good quality research and therefore worth publishing.
Second, a number of studies identified during the search procedure were subsequently not included in the review because they failed to meet the inclusion criteria. The criterion for which the majority of studies failed to meet related to the implementation of a HPS or multi-component approach to school-based health interventions. Some programs, like the Kurri Kurri Public School Healthy Heartbeat\textsuperscript{79} and the Coalfields Healthy Heartbeat Schools Projects\textsuperscript{80} were not included because of poor study design and insufficient information provided about study participants or outcome evaluation procedures, even though they appeared to implement all of the components of the HPS approach. Others, like the Say Yes First – Drug and Alcohol Prevention Project\textsuperscript{81} were not included because they only targeted high-risk youth and not whole-school populations. Though they failed to meet the review criteria, programs such as these may potentially have provided further important insights in regard to the efficacy and acceptability of HPS programs. The review also identified several papers describing the development and process evaluation of programs that have utilised the HPS approach but results of their outcome evaluations had not yet been published, for example, the Mindmatters,\textsuperscript{82} Gatehouse\textsuperscript{83} and Mariner\textsuperscript{84} Projects. The outcomes of these studies are eagerly awaited.

Descriptions of specific intervention strategies or program components ranged from very detailed to brief, and in some instances made assessment of their inclusion of each of the HPS domains quite difficult. As this assessment could only be based upon the information provided in publications, and because there is no universally accepted criterion for the determination of what constitutes a satisfactory level of activity within each domain,\textsuperscript{63,65,85} the candidate acknowledges that this segment of the appraisal provides only the candidate’s views and conclusions.

A recent report by the WHO on evaluation in health promotion\textsuperscript{68} supported weaknesses such as these as being inherent in systematic reviews. Other limitations identified by the WHO include: biased conclusions favouring funding organisations; failing to incorporate experiential knowledge of
practitioners; discrepancies between reviews due to variations in focus or time periods; and the incompleteness of reviews.\textsuperscript{60} Demonstration of this final point was made in the NCCHTA systematic review\textsuperscript{9} which found that only 10\% of studies appeared in more than one review on the same topic.

Conclusion

This chapter has attempted to answer the question posed by Stage III of the \textit{Staged Approach} model to health promotion, that is, \textit{what is the available evidence for the efficacy and acceptability of the HPS approach to school-based health programs?} A review of the quantity and quality of evidence was presented in two parts. First, existing systematic reviews and relevant reports were described. Second, as an extension of these, an additional systematic review of relevant primary HPS efficacy trials was carried out, the results of which identified several studies not included in any other previous reviews.

Findings of the review of primary studies included in Part Two were, in the main, consistent with the conclusions of previous systematic reviews described in Part One. In general, there are a limited number of well-designed, methodological rigorous evaluation trials of the HPS or multiple-component approach to school health interventions. While a broad range of health issues and problems have been targeted, programs appear to be effective in improving student knowledge, awareness of HPS and some school organizational factors, but are less consistent in having a positive impact on health-related behaviour, attitudes and other school HP practices. Several explanations for the lack of program effects have been proposed, with little difference between treatment groups in extent of exposure to intervention components and relatively brief duration of program length being the most probable. A number of barriers to the feasibility of implementing HPS were also identified from previous
research. Few studies have evaluated the acceptability of the HPS approach, and those that have report conflicting results.

Overall, despite its growing support and endorsement, the findings from this chapter suggest that the existing body of evidence for the acceptability and efficacy of the HPS approach to school health interventions is limited, inconsistent and inconclusive. If the true potential of HPS is to be realized, then further quality research efforts need to be invested into addressing gaps in knowledge. More rigorous evaluation trials, with consideration to appropriate study design to reduce bias and potential confounders, are required. Issues pertaining to achievable outcomes and acceptable indicators of success also remain unresolved and require further investigation.
Table 6.1 Summary table of primary HPS studies which met the inclusion criteria for review

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Health Problem</th>
<th>Study Population</th>
<th>Method of recruitment</th>
<th>Study Design</th>
<th>Intervention strategies</th>
<th>Outcomes measured</th>
<th>Results</th>
<th>HPS Domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEA/ENHPS (UK)55</td>
<td>Several.</td>
<td>18 primary</td>
<td>21,000 schools invited to participate.</td>
<td>Schools matched in triads and randomised to intervention or reference groups. (intervention = 16, reference = 32)</td>
<td>Funding &amp; support provided to schools to assist with individually tailored development of plans for activities in each of 3 domains of HPS.</td>
<td>Attitudes; Knowledge; Self-esteem; Behaviour; Perceptions; Changes to school.</td>
<td>No statistical analysis, but reports lower rates of smoking &amp; drinking in intervention secondary schools at pre- and post-test surveys. Increased coverage of health topics &amp; use of outside agencies. Some environmental changes &amp; development of school policies.</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Wessex Healthy Schools (UK)58</td>
<td>None specified.</td>
<td>16 secondary schools</td>
<td>11 schools volunteered to start scheme (intervention); 5 control schools selected from matched areas.</td>
<td>Quasi-experimental. No random allocation.</td>
<td>Varied between schools. Schools required to take action on curriculum &amp; 2 of 8 other key areas (community; smoke-free school; healthy eating, physical activity; taking responsibility for one's own health; access to health; environment; and workplace) BUT no information on what was carried out in schools.</td>
<td>Student knowledge &amp; behaviour; School audit; Staff attitudes; Curriculum &amp; policy review.</td>
<td>No significant effects on student knowledge, substance use or exercise. Intervention schools had better audit scores, but difference was not significant.</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Health Promotion Schools of Excellence (USA)25</td>
<td>Cancer, CVD, Injury, Physical fitness.</td>
<td>9 elementary + 3 middle + 3 high schools in 1st yr. 16 elementary + 3 middle + 3 high schools in 3rd year. (n = 16,000)</td>
<td>All schools in County were eligible. Schools competitively selected by committee on basis of defined plans &amp; commitment.</td>
<td>Pre- and post-test. No controls.</td>
<td>Each school had committee who developed action plans involving the whole-school. Common strategies were: health fairs, food awareness &amp; walking projects, first aid training. No information on specific actions in each school.</td>
<td>Health risk appraisal + fitness test for staff. Fitness test + health knowledge, attitudes &amp; behaviour of students.</td>
<td>Staff showed improvements in diet, motor vehicle safety, &amp; frequency of some health screenings, but no change in weight, drug use or exercise. Students showed gains in fitness measures, health attitudes &amp; knowledge. No changes to behaviour.</td>
<td>? ? ✓ ✓</td>
</tr>
<tr>
<td>Healthy eating policy (UK)41</td>
<td>Diet &amp; nutrition.</td>
<td>Students in 2nd year of high school in 3 schools in Scotland. (n = 158)</td>
<td>Intervention school selected because of pre-existing healthy eating policy.</td>
<td>Controlled, but no randomization. No pre-test, only post-test. (intervention = 1, control = 2)</td>
<td>Changes to availability of foods &amp; drinks in schools; healthier ingredients use in school meals; parents involved in program development; relevant topics incorporated into curriculum but no details provided.</td>
<td>Student dietary behaviour at school &amp; outside of school. Nutrition knowledge.</td>
<td>Students in intervention school reported significantly fewer &amp; healthier snacks. No differences in other dietary behaviour. Significant difference in knowledge favouring one of the control schools.</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Program Name</td>
<td>Health Problem</td>
<td>Study Population</td>
<td>Method of recruitment</td>
<td>Study Design</td>
<td>Intervention strategies</td>
<td>Outcomes measured</td>
<td>Results</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td>------------------------</td>
<td>-------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>CATCH (USA)42</strong></td>
<td>Cardiovascular health.</td>
<td>3rd grade students in 96 elementary schools in 4 USA states. (n = 5,106)</td>
<td>Schools selected based on distance from field centers, their food service’s potential for intervention &amp; commitment to the program.</td>
<td>RCT (intervention = 56, control = 40)</td>
<td>Intervention schools further randomized into 2 groups (school vs family-based program).</td>
<td>Fat content in schools lunches &amp; amount of PE activity, BP, BMI, fitness, eating &amp; exercise habits of students, knowledge &amp; intentions.</td>
<td>Significant gains in dietary knowledge, intentions &amp; self-reported food choices. No significant differences in cholesterol, aerobic fitness or BMI. Fat content of school lunches significantly reduced &amp; amount of physical activity in PE lessons significantly increased.</td>
<td></td>
</tr>
<tr>
<td><strong>Heart Smart (USA)43</strong></td>
<td>Cardiovascular health.</td>
<td>4th &amp; 5th grade students in 4 elementary schools in New Orleans (USA). (n = 870)</td>
<td>Area selected on basis of ethnic &amp; SES distribution. No information provided on how schools selected.</td>
<td>RCT (intervention = 2, control = 2)</td>
<td>CVD curriculum of 15-35 hrs per year per grade. Risk factor screening &amp; after school nutrition &amp; exercise sessions for staff. School lunches modified &amp; school fun runs. Health advisory committee involving parents &amp; parent newsletters. Staff training.</td>
<td>CVD risk factors, school lunches, Physical fitness, CVD knowledge.</td>
<td>Knowledge gains, but not significant. School lunches successfully modified &amp; some reduction in student cholesterol. Significant improvement in physical fitness in boys, but not girls. Significant increases in HDL levels.</td>
<td></td>
</tr>
<tr>
<td><strong>Sunshine &amp; Skin Health (USA)39</strong></td>
<td>Skin cancer.</td>
<td>4th to 6th grade students in 2 schools in Arizona, US USA. (n = 139)</td>
<td>Convenience sample based on teacher interest &amp; similarity of schools.</td>
<td>RCT (but only 1 school in each condition)</td>
<td>5 curriculum units. Take-home activities &amp; parent newsletters. Teacher training.</td>
<td>Sun protection Knowledge, attitudes &amp; behaviour.</td>
<td>Significant increase in knowledge, but less favourable attitudes in intervention students. Some significant changes in behaviour - sunscreen use &amp; clothing.</td>
<td></td>
</tr>
<tr>
<td><strong>Anti-bullying Program (UK)47</strong></td>
<td>Mental health &amp; safety.</td>
<td>Students in 1 secondary school in UK.</td>
<td>School selected on basis of author working there.</td>
<td>Pre- and post-test. No controls.</td>
<td>Whole-school anti-bullying policy which included: Increased supervision during breaks, non-punitive sanctions, staff development, pastoral care curriculum. Liaison with parents &amp; links with support services.</td>
<td>Bullying &amp; aggressive behaviour.</td>
<td>Significant reduction in reported bullying &amp; aggression.</td>
<td></td>
</tr>
<tr>
<td><strong>Dartmouth Health Promotion Study (Canada)44</strong></td>
<td>Mental health &amp; Heart health</td>
<td>2 cohorts of 28 primary schools (Grades 4 to 6)</td>
<td>All schools in 2 cities selected for study.</td>
<td>Longitudinal, quasi-experimental. Schools stratified on SES &amp; randomly allocated to trial or comparison group.</td>
<td>A coordinated approach to health instruction, health services, &amp; environment facilitated by a coordinator and committees.</td>
<td>Quantitative measures of heart &amp; mental health, plus Qualitative interviews, focus groups/ surveys of participants.</td>
<td>No consistent significant changes in desired direction for intervention group on quantitative measures. Qualitative evidence indicated high level of program acceptability; increased student awareness of health; &amp; raised profile of health in school system.</td>
<td></td>
</tr>
<tr>
<td>Program Name</td>
<td>Health Problem</td>
<td>Study Population</td>
<td>Method of recruitment</td>
<td>Study Design</td>
<td>Intervention strategies</td>
<td>Outcomes measured</td>
<td>Results</td>
<td>HPS Domains</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>------------------</td>
<td>-----------------------</td>
<td>--------------</td>
<td>------------------------</td>
<td>-------------------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>WASH Project (Australia)59, 61, 62</td>
<td>None targeted. Varied between schools.</td>
<td>Staff from 59 schools (incl. primary, secondary, rural &amp; urban)</td>
<td>All schools invited &amp; intervention schools selected on basis of evidence of their commitment to school health promotion.</td>
<td>Quasi-experimental. Pre- and post-tests. No random allocation. <em>(intervention = 40, comparison = 19)</em></td>
<td>School health committee set up in each school, provided with 2 days training + series of 4 x ½ day meetings + trained coordinator to facilitate planned HP actions.</td>
<td>Knowledge &amp; behaviour of staff. 12 Management &amp; 12 school HP Factors. No measures of student behaviour.</td>
<td>Increased HP knowledge &amp; activity in participants. Significant impact on several school health management factors. Significant impact on 3 school HP factors (links with local community; accessing health services; provision of staff HP)</td>
<td>C E L P</td>
</tr>
<tr>
<td>Safer Choices Project (USA)49-51</td>
<td>Sexual health (HIV, STD, unintended pregnancy)</td>
<td>9th grade students in 20 schools across 2 US states. <em>(n = 3,677)</em></td>
<td>NA</td>
<td>RCT <em>(intervention = 10, control = 10)</em></td>
<td>School HP Council established. 20 lessons in curriculum + peer team clubs. Parent education in form of newsletters &amp; homework tasks. Students identifying local health services &amp; provided with list of services.</td>
<td>3 behaviours:- initiation of sexual intercourse; condom use; &amp; no. of sexual partners. 13 psychosocial variables</td>
<td>No significant impact on sexual initiation or no. of sexual partners. Significant increase in use of condoms at last intercourse. Significant difference in 9 out of 13 psycho-social variables favouring intervention group.</td>
<td>C - L P</td>
</tr>
<tr>
<td>South-Western Sydney HPS Project (Australia)60</td>
<td>None targeted. Varied between schools.</td>
<td>Staff from 38 schools (incl. primary &amp; secondary government schools in south-western Sydney).</td>
<td>Schools which were &quot;known&quot; to be interested in becoming HPS approached to participate.</td>
<td>RCT <em>(intervention = 20, control = 18)</em></td>
<td>Workshop to raise awareness. Provision of resource kit. Quarterly network meetings. Support provided for school-based HP activities (on request).</td>
<td>Awareness of HPS &amp; exposure to literature &amp; training on HPS. Health-related policies &amp; practices of schools.</td>
<td>Significantly greater proportion of staff in intervention schools who had heard of HPS, had read literature &amp; attended training. No significant changes to health-related policies &amp; practices, except in sending health reading materials to parents.</td>
<td>C - L P</td>
</tr>
<tr>
<td>Project Northland (USA)52-55</td>
<td>Alcohol use.</td>
<td>Cohort of 6th grade students in 20 schools followed to 12th grade in Minnesota. <em>(n = 1901 at 8th gde) (Phase I)</em></td>
<td>School districts were systematically recruited, blocked by size &amp; randomly allocated to intervention or control.</td>
<td>RCT <em>(intervention = 10, control = 10) (Phases I &amp; II)</em></td>
<td>Parent involvement /education programs. Curriculum – lesson plans. Community organization. Peer-led activities – safe alcohol environments. Community-wide media campaigns.</td>
<td>Alcohol, tobacco &amp; other drug use; Peer influence &amp; perceived accessibility; Self-efficacy; perceived norms; parent communication.</td>
<td>At end of Phase I (3yrs of intervention) - Significant reductions in onset &amp; prevalence of alcohol use. No significant differences in smoking, other drug use, self-efficacy or perceived access. Favourable changes to perceived norms &amp; peer influence. BUT at 2yrs follow-up there were no significant differences between intervention &amp; control groups.</td>
<td>C - L P</td>
</tr>
<tr>
<td>Program Name</td>
<td>Health Problem</td>
<td>Study Population</td>
<td>Method of recruitment</td>
<td>Study Design</td>
<td>Intervention strategies</td>
<td>Outcomes measured</td>
<td>Results</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Students for Peace project.</td>
<td>Violence &amp; aggressive</td>
<td>6th - 8th grade students in 8 middle schools in Texas, USA. (cohort n = 2246)</td>
<td>Schools selected on basis of non-participation in other violence programs. Of 21 eligible schools, 8 agreed to participate.</td>
<td>RCT</td>
<td>School HP Council set up to plan program activities. Curriculum program. Peer mediation &amp; Peers helping Peers programs. Parent education through newsletters.</td>
<td>3 measures of students' aggressive behaviour &amp; 2 measures of safety in school environment.</td>
<td>No statistically significant differences between intervention and control schools in any of the outcome measures. Although not statistically significant, a slight increase in aggressive behaviours in intervention schools compared to control.</td>
<td></td>
</tr>
<tr>
<td>(USA) 48</td>
<td>behaviours.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Cool School Initiative</td>
<td>Skin cancer.</td>
<td>15 primary schools in South-East Sydney, Australia.</td>
<td>51 Schools invited to participate on basis of agreeing to develop sun policy &amp; to undertake interviews.</td>
<td>Pre- and post-test. No controls.</td>
<td>Competition involving 3 awards (bronze, silver &amp; gold) &amp; prize money for development of a written sun protection policy. Workshops for staff &amp; parents, information kit &amp; other support offered by project officer.</td>
<td>No. of schools which developed or reviewed sun protection policies. Changes in practice.</td>
<td>Proportion of schools with written policy increased from 61% to 84% (out of 51 schools). All participating schools showed improvements in sun protection practices (eg. increased amount of shade, rescheduled activities to limit time outdoors during peak UVR.)</td>
<td></td>
</tr>
<tr>
<td>(Australia) 45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidskin project.</td>
<td>Skin cancer.</td>
<td>Parents of children aged 5-6 years at 33 schools in Western Australia.</td>
<td>Schools selected on basis of distance from center of Perth &amp; allocated to treatment groups on basis of this also.</td>
<td>Non-randomised controlled trial. ('Moderate' intervention = 11, 'high' intervention = 8, control = 14)</td>
<td>Sun protection curriculum at school &amp; materials sent home. Offered low cost sun protective swimwear. Guidelines on sun protection policy development &amp; changes to school environment.</td>
<td>Amount of time exposed to sun. Types of clothing, swimwear, hats &amp; sunscreen worn.</td>
<td>Children in intervention groups reported less sun exposure, by spending less time outdoors in peak UVR &amp; wearing more protective clothing. No difference between groups in use of sunscreen or hats.</td>
<td></td>
</tr>
<tr>
<td>(Australia) 46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kickbutts Project</td>
<td>Smoking.</td>
<td>Parents &amp; students in Yrs 7 &amp; 8 in 27 high schools in Sydney.</td>
<td>All schools in one LGA (n = 20) invited to participate, those able to comply with protocol recruited. Controls selected from other LGAs.</td>
<td>Non-randomised controlled trial. (intervention = 13, control = 14)</td>
<td>Curriculum package (5-8 wks). Parent information kits &amp; parent information evenings. Community strategies aimed at supply &amp; distribution of resources to parents.</td>
<td>Student smoking behaviour &amp; attitudes. Parent &amp; sibling smoking behaviour &amp; attitudes.</td>
<td>No significant differences in post-intervention smoking behavior or attitudes.</td>
<td></td>
</tr>
<tr>
<td>(Australia) 57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HPS Domains: C – Curriculum, E – School ethos & environment, L – Links with parents, home & community, P – Active participation by the whole school.

NA – Information not available; LGA – Local Government Area; BMI – Body Mass Index; PE – Physical Education; CVD – Cardiovascular disease; HP – Health Promotion; BP – Blood Pressure; HDL – High Density Lipoproteins; RCT – Randomised Controlled Trial; HPS = health promoting school; UVR – Ultra-violet radiation.
References for Chapter Six


42. Leupker R, Perry C, McKinlay S. Outcomes of a field trial to improve children's dietary patterns and physical activity: the Child and Adolescent Field Trial for Cardiovascular Health (CATCH). *JAMA* 1996; **275:**768-76.


44. McIntyre L, Belzer EG, Manchester L, Blanchard W, Officer S, Simpson AC. The Dartmouth Health Promotion Study: A failed quest for synergy in school health promotion. *Journal of School Health* 1996; **66:**132-137.


Chapter Seven

Evaluation of a Health Promoting Schools Program

Part One: Study design, program development and process evaluation

Parts of this chapter have been published in the following paper:

Introduction

The Hunter Region Health Promoting Schools Program was developed, implemented and evaluated following the recognition of several important findings that emerged from the current evidence base. First, while a number of health risk behaviours are important to the health of school-aged children, smoking, unsafe alcohol use and inadequate sun protection are major contributors to the burden of illness in Australia\textsuperscript{1,2} and remain at unacceptable levels in secondary-school age students in the Hunter Region of New South Wales. Second, schools have been universally acknowledged as an appropriate setting for interventions targeted at health risk behaviours such as these,\textsuperscript{3,4} consistent with the 'settings based' approach to health promotion endorsed by the WHO and other internationally recognised organisations.\textsuperscript{5,6} Third, despite increasing interest in, and activity related to, the HPS approach to school-based health interventions, there appears to be few well-designed, rigorous research trials which have evaluated the efficacy of a health promoting schools program. Those that have been conducted, as described in Chapter Five, provide limited and inconsistent evidence of its effectiveness across a range of indicators and outcomes.

Fourth, the majority of evaluation studies have used either convenience samples or purposively selected schools based upon pre-existing commitment to the HPS approach. Of the seventeen studies included in the review described in Chapter Five, not one had randomly selected schools into an evaluation trial. Finally, few studies included process evaluation or consideration of the acceptability of the HPS approach to school health programs. There remains an important need for a well-designed, rigorous efficacy and acceptability trial of the HPS approach which addresses the deficits in the current knowledge base, and seeks to more definitively answer...
the question posed by Stage III of the Staged Approach, that is, "is the HPS approach efficacious and acceptable?"

Evaluation has been broadly defined by the WHO in its recent 'Evaluation in Health Promotion. Principles and Perspectives' report as "the systematic examination and assessment of features of a program or other intervention in order to produce knowledge that different stakeholders can use of a variety of purposes." Traditionally, evaluation has been categorised into 'process' and 'impact/outcome' evaluation types, though it has been acknowledged that particularly in complex, multi-component and multi-site health promotion interventions, the separation between different types of evaluation is difficult, and in some instances, non-productive. However, for the purpose of this thesis, it was decided to differentiate between the two types of evaluation as firstly, one logically precedes the other and secondly, for ease of understanding and interpretation of findings from the evaluation trial.

As outcome evaluation is the focus of the next chapter (Chapter Eight), it is briefly described here as the extent to which any intended changes were produced by the program, therefore concerned with cause-and-effect relationships. Process evaluation has been defined as "the extent, fidelity and quality of intervention implementation" and serves a number of important purposes. These include: determination of coverage or the extent to which the targeted population were reached; documentation of actual activities so that any discrepancies between the planned and actual program can be identified; measurement of factors external to the program which may confound program effects; identification and description of key participants, their roles and responsibilities; elucidation of the internal mechanics of managing the program; barriers, acceptability and satisfaction from the perspective of all involved; and feasibility. The main foci in process evaluation is on how and why outcomes were or were not achieved. It
chapter seven

highlights strengths and weaknesses in the program, and in the case of programs which are found to be effective, assists in attributing causality, and provides useful information for dissemination and adoption of programs on a wider-scale.

One example of a comprehensive process evaluation that was undertaken in school-based interventions was the CATCH program which involved multiple data collection methods (eg. interviews, surveys, observations, records) to assess a broad range of measures associated with various groups (eg. teacher, students, program staff). The few studies identified in the review (described in Chapter Six) which included program acceptability in their evaluations also used a range of measures, and generally found most components of the HPS to be acceptable. However, as previously noted, few systematic reviews and HPS efficacy trials have even considered process evaluation. This oversight has made it impossible to ascertain whether the limited and inconsistent evidence of outcomes is due to poor implementation of the HPS approach or its ineffectiveness.

A number of experts and key organisations in health promotion and the HPS arena have recently highlighted the lack of attention given to process evaluation and have called for greater efforts to be invested in this type of evaluation. In the views of Green and Lewis, process evaluation is important for the control and guarantee of quality of health promotion practice. Recognising the lengthy time delay often associated with the measurement of outcomes in health promotion, the WHO advocate for greater efforts devoted to process, while acknowledging that both process and outcome evaluations are equally important. Others have even expressed the opinion that “well-done process evaluation is much more desirable than poorly done outcome evaluation.” Driven by the philosophy and vision of the HPS, evaluation of the European Network of Health Promoting Schools has focused heavily on
both context and process, rather than specific outcomes.\textsuperscript{19-21} At the First Workshop on Practice of Evaluation of the Health Promoting School, held in Switzerland in 1998, Pattendong argued that proof of effectiveness and evaluation are about “process as well as health related behaviour outcomes.”\textsuperscript{22} One of five guidelines proposed by St Leger for the selection of indicators of effectiveness, explicitly refers to consideration of the process of how interventions are implemented.\textsuperscript{23} Finally, both the recent HPS Evidence for Effectiveness Workshops\textsuperscript{24} and Health Technology Assessment systematic reviews\textsuperscript{25} reports make strong recommendations that “process evaluation which describes the way in which programs have been implemented is undertaken and reported in all studies of health promotion in schools.”\textsuperscript{25}

As with other stages in the development and implementation of health promotion interventions, process evaluation should be driven and informed by relevant theory or a working framework.\textsuperscript{9, 12} Evaluation of both process and outcomes for this study was undertaken using the recently developed framework for evaluation of health promotion initiatives outlined in the WHO’s Evaluation in health promotion: Principles and Perspectives report.\textsuperscript{9} The framework, based on previous work by Springett et al\textsuperscript{26} and Patton,\textsuperscript{27} provides six broad principles for evaluation which are intended as a general guide, not as a practical handbook for evaluation. These principles require that evaluation:

1. Utilises the most appropriate methods for the program being evaluated;
2. Conforms to general health promotion principles, in particular the empowerment of, and participation by, individuals and communities;
3. Considers both collective and individual accountability;
4. Is flexible and adaptable to changing circumstances and new challenges;
5. Addresses all stages of the intervention; and

6. Applies to all levels of evaluation.\(^8\)

The WHO framework\(^8\) developed from the viewpoint that evaluation is a feedback system between the health promotion initiative and its environment, and while no evaluation is comprehensive enough to address all relevant questions, an important purpose of the system is to build and improve knowledge about health problems and how health promotion works. The current trend towards community- or settings-based programs is acknowledged as presenting particular challenges for the evaluator due to their complexity, social and political context, evolving nature, and broad range of desired outcomes. Therefore, evaluation of such programs must also be complex, involve multiple strategies at multiple levels, and be flexible and adaptable to changing circumstances.\(^8\)

Community participation is considered an essential characteristic of community-based programs, and so it follows that evaluation should also be participatory. Involving communities and key stakeholders in all stages of the evaluation process not only empowers people, but increases their understanding and acceptance of the evaluation findings, and their commitment to further pursue the program goals.\(^8\)

Based on the six principles as outlined, the WHO framework proposes that all evaluations should include the following eight steps:

1. Describe the proposed intervention program, its aims, key stakeholders and management groups;

2. Identify the issues and questions of concern;

3. Design the data collection process;
4. Collect data;

5. Analyse and interpret the data;

6. Make recommendations based on the findings;

7. Disseminate the findings;

8. Take action.  

A second and complementary framework used to guide the evaluation process in this study is the *eco-holistic* paradigm of health promotion evaluation that considers the principles of the Ottawa Charter, emphasising collaboration, participatory action and is focused more on process of interventions. This new paradigm of evaluation contrasts with the *biomedical* paradigm and has been touted as 'the way forward' for a more practical and "health centred approach" to evaluation of HPS.

This chapter describes the study design, development of the Hunter Region HPS Program, its planned model of intervention, and evaluation of the process of its implementation, within the context of the WHO framework and *eco-holistic paradigm* outlined above.

**Study Design**

The design of the evaluation study was a RCT over a two-year period as shown in Figure 7.1. In 1994, eight (8) schools were initially randomly selected from all state secondary schools (38) in the Hunter Region of New South Wales for inclusion in the project. (The Hunter Region was previously described in Chapter Four.) Schools that were already participating in, or had
been earmarked for future, health promotion projects were excluded from the study. Financial and practical constraints restricted the number of selected schools to eight. Each school was then randomly allocated to intervention or control group prior to recruitment. Of the four (4) schools allocated to the intervention group, one school did not consent to participate. A replacement school was randomly selected from the original list of all schools and assigned to the intervention group. This school also declined to participate. With the intervention group comprising three (3) schools, it was decided to eliminate one of the control schools thereby leaving an equivalent number of control and intervention schools.

There are several difficulties and constraints associated with the implementation of RCTs and experimental study designs for evaluating school health promotion as acknowledged by others\(^8,19,25\) and described in Chapter Six. Nevertheless, as it is widely accepted that these study designs are the most rigorous for overcoming bias, potential confounders and ensuring comparability between study groups. Also, RCTs have been viewed as justified for policy and political, statistical, and ethical reasons,\(^29\) and were therefore considered as the optimal study design for this thesis. In addition, the RCT has been shown to be viable in other large-scale community health promotion trials.\(^30,31\)

Cluster randomisation, in which schools are the unit of randomisation, is viewed as the most practical and statistically the most appropriate design for evaluation of school based studies.\(^25,32\) The underlying rationale of the HPS approach also focuses on schools as the immediate target for action, not individuals. Ethical reasons also dictate that schools are randomly allocated, as it would be unacceptable and less desirable to randomly assign individuals within schools. One potential methodological limitation noted by the Cochrane group\(^33\) concerns the difference between the unit of allocation (the school)
and the unit of analysis (the individual), however, this is accounted for in this thesis by controlling for intra-school clustering in the statistical analysis of intervention outcomes.

**Figure 7.1. Study design of the Hunter Region Health Promoting Schools Program**

- State secondary schools in Hunter Region of NSW (n = 38)
- Eight schools randomly selected (n = 8)
- One (1) school declined
  - One (1) replacement school selected but also declined
  - One (1) school eliminated
- Six schools consented to participate (n = 6)
- Random allocation
  - Intervention Schools (n = 3)
  - Control Schools (n = 3)

**Background to the development of the program**

The Hunter Region Health Promoting Schools Program was developed by the candidate in collaboration with The Hunter Centre for Health Advancement (HCHA) and the New South Wales Department of School Education – Hunter regional office. (The HCHA is a collaborative centre between the Hunter Area Health Service and the Faculty of Medicine and Health Sciences at The University of Newcastle established in 1992 to make improvements to the
health status of the people of the Hunter region.) Support for the program was received by both organisations, and financial assistance provided by the HCHA to cover program intervention costs. In addition, the candidate was awarded a small research grant from the University of Newcastle. Ethical clearance was obtained from the relevant ethics committees associated with the University, the Hunter Area Health Service and the NSW Department of Education.

The Hunter Region Health Promoting Schools Program

The program was based upon the philosophies and definitions underlying the HPS approach as described in Chapter One. Specifically, the program was designed to address each of the three components or domains in definitions adopted in both the United Kingdom, and Australia. These domains are:

1. The formal curriculum;
2. The school ethos and environment;
3. Links with the home and wider community.

In addition, a fourth component was included, reflecting the domains addressed in the review in Chapter Five and those used in other previous reviews:

4. Active participation by the school.

In keeping with the philosophy of the HPS, participating school communities were encouraged to adopt and own the program to enhance their commitment to the program and caring for school community members. The program was not prescriptive, but rather aimed to skill and resource school
communities to enable them to address important health issues in an appropriate manner. Implementation of the HPS program resulted in different planned activities and strategies for each of the three schools. Emphasis was placed on the establishment of strong links between the health and education sectors and the development of strategies and resource materials for future HPS initiatives.

The program focused on three health risk behaviours of smoking, unsafe alcohol use and inadequate sun protection among young adolescents because of their contribution to the burden of illness in Australia and unacceptable levels of prevalence (as described in Chapter Three). Strategies within each of the domains of the HPS approach were designed to target each of the health risk behaviours, in addition to targeting their associated factors, as identified in the descriptive study described in Chapters Four and Five. Because it was recognised that school communities have different needs and may wish to address other health issues, an agreement was reached with participating schools that efforts would focus on these three health risk behaviours at least for the two-year duration of the program with an assurance of addressing other health issues which may be identified as important by the school community either during or after the completion of the program time-frame. All intervention school communities were encouraged to target smoking, unsafe alcohol use and inadequate sun protection, and some schools may have also addressed additional health issues (eg. nutrition).

**Aims of the Hunter Region Health Promoting Schools Program**

The aims of the program evaluated in this chapter were:

1. To encourage and empower three secondary school communities to adopt the Health Promoting Schools approach;
2. To develop strategies and resource materials for use by schools which adopt the Health Promoting Schools program;

3. To increase the number of health promotion actions implemented in schools targeted at smoking, unsafe alcohol use and inadequate sun protection.

Program management and functional teams

Due to its intrinsic nature, a HPS program would not have been possible without the formation of a number of management and collaborative groups: a Working Party, Advisory Group, School Facilitators, School-based Coordinator and School HPS committees, which were all important to facilitate the planning and implementation process. This 'team' approach has been identified as critical for the successful adoption and maintenance of programs in school communities by a number of practitioners, and has been utilised in other community and school-based projects, such as the North Karelia, COMMIT, Western Australia School Health (WASH) and the European Network of Health Promoting Schools programs. The membership and roles of each of the program teams are outlined below:

The Working Party

The Working Party contained the candidate, a small number of staff from the HCHA and the Department of School Education who met frequently, usually once a fortnight, to plan and manage the week-to-week health promotion activities and devise strategies for encouraging schools to adopt the program.
The Advisory Group

The Advisory Group met less frequently, usually every six months, and contained members of the Working Party and additional staff from the health and education sectors including health promotion program managers, Department of Education District Coordinators and Curriculum Consultants. Its role was to act as a critical reference group for feedback on the plans and progress of the Working Party. The Advisory Group also played an important role in facilitating collaboration between the health and education sectors at a higher structural level of administration.

School Liaisons

There were two School Liaisons, of whom one was the candidate assigned to two of the intervention schools and the other being a trained health promotion officer who was assigned to the third school. The main role of the School Liaison was to facilitate the process of encouraging schools to adopt the HPS program by moving the school through the stages of the program model (see Figure 7.2). School Liaisons also acted as a link between school communities and the larger project team. Their role entailed ongoing liaison with school communities, attendance at school committee meetings, provision of resources and the recording and monitoring of school health promotion activities that were implemented. As both Liaisons were also members of the Working Party, strategies and motivation of their role were maintained through regular meetings with the Working Party. It was originally envisaged that School Liaisons would play a greater role during the initial stages of the program in terms of required activity and effort, but that this would decrease as members of the school community took on greater responsibilities and control over their school's program.
School-based Coordinators

From each of the three intervention schools, a person (usually a teacher) was identified by the School Liaison as someone who was interested in and supportive of the HPS program, and who would be willing to co-ordinate activities from within the school community. The role of the School-based Coordinator included such tasks as in-school organisation of meetings, notification of up-coming events in school newsletters, and identification of other appropriate persons within the school community for involvement in program activities.

Health Promoting School Committees

Each school was encouraged to form a HPS Committee or interest group with membership comprising representatives from staff, students, parents, school executive, welfare, school liaisons and local community members. The HPS Committee was encouraged to own the program and be responsible for planning and implementing health promotion strategies and activities within the school community.
In Chapter Six, a review of existing available evidence for the efficacy of the HPS approach to school interventions revealed that none of the seventeen primary trials identified had randomly selected schools and then randomly allocated into treatment conditions. Most evaluations relied on either active volunteering by schools or selectively recruited intervention schools based on some evidence of their commitment to the HPS approach. This presented a new and difficult challenge of developing a model of working with the intervention schools to encourage them to adopt the program. The Hunter region Health Promoting Schools Program Model which was developed for this project was based on Wakefield’s Community Organisation Theory and Bracht and Kingsbury’s five stage Community Health Promotion Model. The model provided a systematic approach to involving communities in interventions and maximising program success. The school is viewed as a community that adopts and "owns" the HPS program. The model was designed to facilitate empowerment of school communities as a means of developing ownership, collective decision making and commitment, thereby increasing the likelihood of implementation of the HPS concept, and therefore effectiveness of the intervention and potential improvements in health status. 

Wakefield argues that failure to actively involve community organizations in the planning and decision-making processes will inevitably lead to less commitment to the programs, and limit to the degree of ongoing maintenance of initiatives. The participatory approach has also been viewed as having intrinsic health benefits. A number of educators have supported this approach as the most promising for long-term change in school communities.
Bracht and Kingsbury define community organization as a “planned process to activate a community to use its own social structures and any available resources to accomplish community goals...and then sustain community improvements and/or new opportunities.” Their experiences and involvement in several community-based health promotion efforts, subsequently led to the identification of five specific stages by which ‘organising’ occurs. The stages describe a process whereby the community becomes aware of a problem, identifies the problem as a priority, undertakes steps to alleviate the problem, and establishes structures and systems to maintain problem resolution.

The Hunter Region Health Promoting Schools Program Model involved four stages, similar to Bracht and Kingsbury’s five stages, (as shown in Figure 7.2) beginning with gaining a commitment from school communities to support healthier lifestyles through adoption of the HPS approach and agreeing to take part in the project. In the second stage, members of the project team would work closely with each school community to identify existing rates of each of the three health risk behaviours, explore health promotion strategies currently in place in the school, establish a HPS Committee and prepare the school for a state of ‘readiness' whereby new strategies could be accepted and implemented. This was called the ‘Mobilisation’ stage. Both stages One and Two, like the first two stages in Bracht’s model, were important in setting the groundwork, that is, putting in place the structures and networks by which change could occur.

Stage Three was known as the PIMMS stage, representing Bracht’s third and fourth stages of implementation and maintenance, and involved:

- Planning of activities and strategies;
- Implementing those strategies within the planned time frame;
chapter seven

- Monitoring progress for process evaluation and to make modifications as required; and
- Maintenance Strategies for sustaining change.

The final stage, Stage Four, allowed evaluation of success of the program in relation to outcome measures and other process evaluation measures. Each of the stages of the program model will now be described in more detail.

**Stage 1 - Gaining Commitment**

The aim of this first stage was to gain commitment from the school community, particularly the principal in the first instance, to support improvements in the health status of students. Principals were sent a letter of invitation to become a HPS and a recruitment kit outlining what the program would involve, together with a description of the benefits of taking part in the program. This invitation was a joint one from the HCHA and the Department of School Education (DSE) to demonstrate to school communities that the program was endorsed by both the health and education sectors, and that the program was an important one that would have potential positive benefits for the whole school community.

Principals were then invited to a meeting with the Working Party team to discuss the proposed program in detail. These meetings were held at the schools to further support the collaboration between health and education. Following the meeting, principals were given time to discuss the program with school staff and parents. A second meeting was held, again at the school, for principals and/or their delegates to return with questions, having had time to consult with others in their school. At this meeting, schools were then asked to give an indication of their willingness to participate in the HPS program. A
follow-up meeting was arranged at which the School Liaison visited the principal at their school to discuss and plan details for baseline data collection procedures.
Figure 7.2 Hunter Region Health Promoting Schools Program Model

Stage 1: Gaining commitment
- Invitation letter sent to program schools
- Meeting with Principals & Project team
- Principals encouraged to discuss project with school staff
- 2nd meeting of Principals (or their reps.) & the project team
- Schools indicate their willingness & commitment to participate in program

Stage 2: Mobilisation
- School Facilitator meets with School Principal
- Meetings with key school staff
- Completion of School Health Promotion Checklist
- Presentations of student survey results & HPS Program at meetings with school groups (P&C, SRC, Staff, Council)
- Identification of interested, key school community members
- Formation of HPS committee

Stage 3: Planning
- Schools “Planning” Workshops
- HPS Committee meetings
- Development of Action Plans
  - review of school policies
  - cross-curriculum planning
  - parent & community involvement
  - health services
  - environmental support
- Communication of Action Plan to school community
- Endorsement of Action Plan by school community

Stage 4: Implementation
- Ongoing HPS committee meetings
- Provision of resources & facilitation of actions by School Facilitators
- Setting time-frames & targets to be achieved
- Nominated individuals & school groups carry out plans
- Publication of actions in HPS Newsletter

Stage 5: Monitoring & Maintenance Strategies
- Ongoing HPS committee meetings to review progress & revise action plan
- Indicators of progress assessed
- Minutes of meetings kept and copies sent to Project Team
- Policy & Structural changes

Stage 6: Evaluation
- HPS Committees review goals & objectives achieved
- Process evaluation measures
- Post-test student survey
- New School Health Profile produced
After agreeing to be involved, schools moved into the next stage of 'Mobilisation' involving much formal and informal consultation between School Liaisons and key groups and individuals within each school community. The School Liaison attempted to gain an understanding of the physical and social environment in which the school functioned on a day-to-day basis. They developed rapport with the School-based Coordinators and other school members through informal interviews. The interviews were conducted for the purpose of identifying existing school policies and health promotion strategies and activities currently being implemented in the school.

Information from interviews and results of student surveys were collated and presented to the school community at meetings with various school groups, such as the teaching staff, Student Representative Council, Parents & Citizens Association, and School Executive Committee. This helped to raise awareness among the school community about the three health risk behaviours, gather views and opinions, and inform them of the HPS program. Though not strictly considered a 'needs assessment', this action of feeding back information and consultation with the school community was viewed as crucial to gaining commitment from, and empowering, the school communities. Many evaluations of community health promotion initiatives have overlooked this step, labeled by the WHO as establishing program relevance. Key people and other interested persons were then invited to form a HPS committee having representation from teacher, student, parent and local community groups.
Stage 3 - PIMMS

This stage of the model was seen to comprise a number of sub-stages that were on-going and overlapping.

Planning

Members of the school committees and other school staff were invited to attend a one-day workshop on how to develop an Action Plan to implement the program in their school. School Liaisons stayed in close contact with schools by attending committee meetings and providing guidance on strategies that were likely to be most effective in reducing the target behaviours. Having an early success was seen as being important to keeping the committee members motivated, so they were encouraged to set goals which were effective but achievable in the short-term.

The Action Plan developed by schools was allowed to take any form, but schools were provided with a prepared sample proforma, which detailed objectives, actions, who was involved, when tasks would be achieved, how progress would be monitored and what resources will be utilised. Schools were encouraged to develop Action Plans for each of the three health risk behaviours utilising the principles of the Ottawa Charter. That is, schools were encouraged to consider and plan strategies in each of the following five areas:

1. review of school policies relating to smoking, alcohol and sun protection;

2. a cross-curriculum approach to ensure that students were provided with adequate knowledge, skills and appropriate attitudes;
3. strategies for improving the school community environment to support the desired behaviour and enable healthy lifestyle choices;

4. efforts to increase parental and wider community involvement in decision-making and the implementation of health promotion strategies;

5. improving links between the school and local community health services by utilising existing services and enhancing the scope and quality of school health services provided for students, teachers and school community members.

Health Promoting School Committees were asked to communicate their Action Plans to the wider school community and to seek the endorsement and support of planned activities by appropriate school community groups.

Implementation

Health Promoting School Committees were encouraged to meet regularly to plan for the implementation of their Action Plans. School Liaisons assisted with the implementation of strategies where possible or where required, and encouraged schools to set their own time-frame for when activities would be carried and to identify relevant individuals or groups within the school community who could assist them in their efforts. Communication and publicising of planned events and changes through school bulletins, assembly announcements and committee meetings was also encouraged. A number of resources were developed and distributed to schools. These included sample school policies, cross-curriculum projects, whole-school activity suggestions, sample action plan proformas, parent letters, and retailer letters. Other resources provided to program schools included access to community health organisations, personnel and other community groups. A HPS Newsletter was
published and distributed to participating schools once a school term. This newsletter contained reports on strategies which schools were implementing, upcoming events and activities, news items, health information and competitions etc.

\textit{Monitoring \& Maintenance Strategies}

Schools were asked to monitor their progress during the program, in particular by including strategies for doing so in their Action Plans. This could involve simple actions such as direct observations, small-scale surveys, and anecdotal feedback from school community members through informal discussions. As information came to hand, schools would make decisions about the effectiveness of strategies and consider ways of improving the likelihood that actions would be more successful in the future. On-going committee HPS committee meetings provided schools with the opportunity to do this, and further revise their Action Plans. Copies of the minutes of all meetings were kept by School Liaisons and forwarded to the Project team to keep them up-to-date with progress. Schools were also encouraged to consider policy and structural changes within the school which would facilitate and sustain behaviour change.

\textit{Stage 4 - Evaluation}

School committees were asked to review their goals and objectives achieved. A post-test survey of the same cohort of students was conducted and a number of process and outcome measures were collected both during and after the two-year intervention period. The effectiveness of the program was assessed by a range of outcome measures outlined in Chapter Eight, and
process measures outlined below. Finally, results of both outcome and process evaluations for each of the three intervention schools were compiled into a written School Health Profile. These were presented by the School Liaisons at staff meetings, student representative councils and parent meetings, and copies were provided for each school to retain and display.

**Health Promoting School Actions**

As previously described, a range of health promotion strategies or actions were devised which targeted each of the three health risk behaviours. These actions addressed each of the domains of the HPS concept and factors associated with the behaviours as identified in the previous chapter. Actions were developed by both members of the Working Party and HPS Committees in consultation with School Liaisons, who then attempted to encourage each of the actions in all three intervention schools. A list of actions targeted at each of the health risk behaviours is shown in Table 7.1. Though the actions are listed using the HPS domains, several of the actions were viewed as addressing more than one domain concurrently. For instance, distributing letters to local tobacco retailers aimed to decrease availability and accessibility of cigarettes in the local environment while at the same time involving retailers as members of the local school community in efforts to reduce smoking among school students. Each of the actions will be now be described. Copies of all written materials produced for each action are contained in Appendices 7.1 to 7.8.
Table 7.1 Health Promoting School Actions focused on the health risk behaviours of smoking, unsafe alcohol use and inadequate sun protection

<table>
<thead>
<tr>
<th>Formal Curriculum</th>
<th>School Ethos and Environment</th>
<th>Links with home and community</th>
<th>Active participation by school</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking</strong></td>
<td>• Smoking in PDHPE curriculum in yrs7 - 10.</td>
<td>• Parent smoking pamphlet.</td>
<td>1-day workshops.</td>
</tr>
<tr>
<td></td>
<td>• Suggestions for cross-curriculum activities.</td>
<td>• HPS Newsletter.</td>
<td>HPS Committees.</td>
</tr>
<tr>
<td></td>
<td>• 'Health Chips' interactive computers program.</td>
<td>• Tobacco retailer letters.</td>
<td>Presentations at staff meetings.</td>
</tr>
<tr>
<td><strong>Unsafe alcohol use</strong></td>
<td>• Unsafe alcohol use in PDHPE curriculum in yrs7 - 10.</td>
<td>• Responsible parting pamphlet.</td>
<td>School Coordinators.</td>
</tr>
<tr>
<td></td>
<td>• Suggestions for cross-curriculum activities.</td>
<td>• HPS Newsletter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 'Health Chips' interactive computers program.</td>
<td>• Alcohol retailer letters.</td>
<td></td>
</tr>
<tr>
<td><strong>Sun protection</strong></td>
<td>• Sun protection in PDHPE curriculum in yrs7 - 10.</td>
<td>• Melanoma Awareness Day.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Suggestions for cross-curriculum activities.</td>
<td>• Hat promotions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 'Health Chips' interactive computers program.</td>
<td>• HPS Newsletter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• School sun protection policy.</td>
<td>• Presentations at P&amp;C meetings.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sunscreen fundraising &amp; availability ↑.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Boundary adjustments to ↑ access to shade.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hat promotions &amp; tree programs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


chapter seven

**PDHPE Curriculum**

'Personal Development, Health and Physical Education' (PDHPE) is one of eight key learning areas (KLA) of the national school curriculum, to which all Australian states and territories are signatories though they reserve the right to adapt and develop their own curriculum frameworks. In NSW, PDHPE is a mandatory subject across all school years from Kindergarten to Year 10, with a minimum time allocation of 300 hours across Years 7 to 10. This syllabus addresses, among other topics, smoking, alcohol and sun protection. Given this existing requirement by teachers to address each of the health risk behaviours in the curriculum, efforts were focussed on ensuring that the teachers were satisfying these requirements. This was done by the School Liaison meeting with the Head PDHPE teacher and using a checklist to determine in what school years smoking, alcohol and sun protection were each being addressed, how many hours were devoted to the topics, what specific content was covered, and ways of addressing any 'gaps' identified.

Following consultations with health promotion experts, KLA consultants from the Department of School Education, teachers and parents, a 'Teacher Resource Package' was also developed containing available teaching resources and suggested learning activities appropriate to each of the KLAs (i.e. PDHPE, Creative arts, Design & Technology, English, Science, Languages Other Than English, & Human Society and Its Environment) to encourage a cross-curriculum approach to each of the topic areas. In addition, to supplement the knowledge and skills gained by students from the formal curriculum, a number of pamphlets designed to address specific areas of knowledge, were distributed to all students and an interactive touch-screen computer program, 'HEALTHCHIPS', was loaned out to each school for a short period during the intervention. Both strategies are discussed in more detail below.
Several pamphlets and one-page leaflets were developed for a number of different purposes and groups within the school community with the general aim of providing information and improving knowledge. These included:

- One-page leaflets for each of the following groups – principals, teachers, parents, P & C Associations and Student Councils, listing general suggested strategies and actions that each respective group could take to support their school in becoming a health promoting school. These were distributed by the School Liaison during the ‘Mobilisation’ phase of the intervention in their meetings with each of the various groups.

- Two pamphlets on smoking were produced. The first of these The effects of smoking on sporting performance was designed for students and aimed to supplement their learning in the formal curriculum. Sufficient copies of pamphlets were provided to PDHPE teachers to distribute to each student in years 7 to 10. A second pamphlet Parents and Smoking was designed for parents and provided them with suggestions and tips to help their child make the decision to not smoke. These pamphlets were provided to principals who then organised for them to be mailed to all students’ parents, attached to the weekly or fortnightly school newsletter.

- A pamphlet entitled Responsible Partying, aimed at both students and parents, contained information and tips on how to hold parties in a manner which minimised the risk of harm to guests, in addition to the legal rights and responsibilities of party hosts in regard to the sale and supply of alcohol to persons under 18 years of age. Sufficient copies of these were provided for schools to distribute to both students and parents.

- Finally, two pamphlets providing suggested strategies for improving the amount of and access to existing shade in schools was distributed to
principals, teachers, parents and members of the HPS Committee. Strategies for increasing access to shade and making it more 'user-friendly' for students included: mulching under large trees and placing seats and rubbish bins under trees and in shady areas. Advice was also provided on the best types of trees to plant in the local environment, which would grow quickly, were non-deciduous and provided dense shade.

HEALTHCHIPS

Each school was offered the use of two personal ‘touchscreen’ computers pre-programmed with an interactive information and education program “HEALTHCHIPS” on tobacco, alcohol and several other health-related topics, over a period of a month. Schools were advised to locate the computers in a central location accessible to all students, and under adult supervision, such as the school library. Options available to students included:

- drinking assessment quiz;
- staying in control – ways to keep control when drinking;
- information on what constitutes a standard drink;
- ways to say no to smoking;
- quit tips;
- is it harmful?; and
- is it legal?
Workshops

Two, one-day workshops were conducted during school hours to which all three intervention schools were invited to attend, with funding provided for relief for two teachers for a full-day from each school. Each school was invited to send representatives from all groups in the school, including teachers, students and parents. The first workshop Health Promoting Schools: What, how and your school... was held in the early stage of the program and aimed to provide participants with:
chapter seven

• a better understanding of the HPS concept;

• simple principles of behaviour change;

• motivation and strategies for involving the whole school community;

• available resources, support and materials; and

• the opportunity and guidance to work on developing a school health ‘action plan’ which addressed each of the three health risk behaviours.

A number of experts and presenters were involved in the workshop, including representatives from the HCHA, NSW Department of School Education, NSW Cancer Council, School Liaisons and members of the Working Party. Sample action plan proformas were provided to assist schools in the development and adaptation of their own individual action plans.

Later in the program, in response to feedback and requests from schools, a second workshop was conducted on the development and implementation of a Smoke-free School Policy. It was decided that the workshop would focus specifically on smoking because of the importance of policy in this area. Due to limited time constraints it was unrealistic to address all three health issues within the one day. This workshop aimed to provide participants with:

• reinforcement of their understanding of the HPS approach;

• identification of key actions which are most likely to reduce smoking among young people;

• an appreciation of the importance of school policies;

• the opportunity and guidance to work on writing and implementing a School Smoke-free policy.
Sample policies were distributed and participants were encouraged to individually tailor these to the own school needs and situation.

Photo 2: Schools attending the one-day workshop

**School Policies**

Following the success of the second workshop on the smoke-free policy development, a 'School Policy' resource was developed containing suggested criteria for an optimal 'model' school policy, with specific examples supplied for each of smoking, alcohol and sun protection. School Liaisons were responsible for distributing the resource and worked with HPS Committees and key school groups to encourage schools to review existing policies and where necessary to re-write their existing policies in accordance with the
model criteria contained in the resource, while still tailoring policies to individual school needs.

**World No Tobacco Day (WNTD)**

Schools were encouraged to celebrate World No Tobacco Day (WNTD), an internationally celebrated event held in May each year, in which smokers are urged to quit and non-smokers are praised for being a non-smoker. A number of activities were suggested, with an emphasis on involving parents and the wider community. Posters and stickers were distributed for display around the school buildings and grounds, and news items placed in school newsletters that were mailed to parents. Guest speakers, such as representatives of the Area Health Service and local sporting celebrities, were invited to talk about the negative effects of smoking and benefits of being a non-smoker at special school assemblies to which parents were also invited.

Photo 3: Local sports starts talking with students about quitting smoking at assembly on World No Tobacco Day
Melanoma Awareness Day (MAD)

Melanoma Awareness Day (MAD) is an annual event organized by the Melanoma and Skin Cancer Research Institute of Australia with the aim of raising awareness of the dangers of skin cancer and melanoma, and the need to adequately protect ourselves in the sun. An additional aim of the event is to raise funds for skin cancer research. Schools were invited to participate in the event by raising funds through the sale of MAD badges. The MAD badge, when exposed to sunlight, changes colour demonstrating that ultraviolet light is reaching exposed skin. The badge is not intended to act as a light meter, but to indicate to the wearer that the sun's invisible rays are striking exposed skin. Other sun protection activities planned for the week during which MAD fell included:
- distribution of *Do a mole patrol* leaflets to students;

- skin cancer posters displayed in classrooms;

- project material and teaching resources on skin cancer and sun protection provided for PDHPE teachers;

- free sunscreen samples provided to students, teachers and parents;

- daily messages and reminders about how to protect oneself in the sun conveyed by teachers at morning school roll calls, and on school assemblies;

- notices in school newsletters to parents about MAD and associated activities happening in the school;

- a sun-hat competition day for which the wearer of the hat judged to be the best sun-hat would win a prize.
An action suggested by one of the Health Promoting School Committees was to hold a Parent-Student evening forum on the topic of unsafe alcohol use by young people. The main aims of the forum were to provide parents with: advice to give their children in relation to safe drinking; an opportunity to hear young people's views; and enhance skills of both parents and students in communicating with each other about drinking issues. The forum was conducted using the program and guidelines outlined in the *Reducing the Risk: Alcohol Action Program for Schools* resource produced by the Australian Drug Foundation, with activities such as guest speakers, student role plays, small group discussions, and demonstration breath-analysers to determine blood alcohol concentrations.
chapter seven

Letters to Retailers

To reduce the availability and accessibility of tobacco and alcohol for school students, local retailers in and around each of the school communities were invited to participate in the program by ensuring that they did not sell to persons under 18 years of age. Sample letters were drafted then tailored to each participating school and distributed either in person by student representatives or by postal delivery. Retailers were encouraged to sign a declaration indicating their willingness to comply. Accompanying the letters were stickers for display near cash registers and brochures containing advice for training retail staff on how to comply with their legal responsibilities. After a brief period of time, participating retailers were re-visited and presented with a Certificate of Appreciation on behalf of the school.

Peer Support Training.

Many health programs in the school setting have harnessed the influence of peers in a positive way, with evidence suggesting that peer involvement in the planning and implementing of activities is an efficacious strategy for reducing substance use among adolescents.44,45 Peer involvement was utilised in this program through training sessions for Peer Support Leaders and the distribution to Student Representative Councils of resources outlining the actions which students can undertake in their school to address each of the health risk behaviours. Peer Leaders were also encouraged to initiate their own health promotion actions.
School Liaisons and the Health Promoting School Committees were encouraged to undertake several actions, outlined in the sample sun protection policy, which addressed the availability of shade, sunscreen and protective clothing for students during school hours. These actions included:

- Increasing the amount of and access to existing shade in school grounds by planting trees and making previously shaded out-of-bounds areas in-bound zones;

- Making existing shaded areas more student friendly by mulching under trees and placing seats and rubbish bins nearby;

- Timetabling outdoor events, such as school assemblies, sport lessons and carnivals, for the hours of least intensive ultraviolet light radiation (i.e. before 10.00am and after 2.00pm in Eastern Standard Time, and before 11.00am and after 3.00pm in summer daylight saving time);

- Reviewing school uniform requirements to ensure that shirts and dresses have sleeves which cover the shoulders and permitting students to wear any type of hat;

- Fundraising activities to maintain supply of sunscreen and actions which increase its availability to students, such as teachers offering sunscreen to students outside during recess periods, providing students with sunscreen to apply before outdoor sport lessons, and informing students of its constant availability at a central location within the school grounds;

- Liaising with local surf-wear shops and clothing retailers to provide discounts to school students who purchase broad-brimmed hats, and
chapter seven

dendorsing their discounted hat products on school open and orientation days.

Photo 6: An example of one school's efforts in improving access to shade and making existing shade more 'user friendly' with seating and rubbish bins

Photo 7: Students utilising the new seating and shade
Photo 8: Another example of mulching under trees and log seating to make shade more user friendly for students

Photo 9: Students participating in a hat promotion day
Photo 10: An example of a school which moved its weekly school assembly indoors to avoid having students exposed to the sun

*Health Promoting Schools Newsletters*

A four-page HPS newsletter was produced by the candidate and members of the Working Party once a term, (four times a year) and distributed to schools. The newsletter aimed to firstly inform schools about recent research evidence and up-coming events relevant to the prevention of smoking, alcohol and sun exposure, and second, to provide schools with support and positive reinforcement for their efforts and to benefit from hearing about other schools' experiences. Schools were invited to contribute stories and articles once a term prior to the newsletter's production.
Process Evaluation

Procedure and Measures

A range of assessments were carried out to evaluate the process of program reach, extent of program implementation and participant awareness and satisfaction, with several indicators used for each of the measures. The measures, indicators and methods by which data were collected are summarized in Table 7.2.

Program reach is defined as the proportion of target population exposed to the program, that is, teachers, students and parents. Several indicators of program exposure, such as numbers and attendances at school meetings and presentations, and program resources distributed, were derived from diaries kept by School Liaisons over the whole intervention period and committee meeting minutes. Attendances at workshops were evaluated on the day using an Evaluation Form. (See Appendix 7.9) Numbers of students utilizing the HEALTHCHIPS interactive touch-screen computers and specific programs viewed were downloaded from the program’s database and analysed using SAS statistical software.

The extent of program implementation was assessed by first documenting the time frame over which the program model stages were initiated and second, the number of health promotion actions targeted at each of the health risk behaviours which were implemented using data recorded in the School Liaison diaries. Participant awareness of, and satisfaction with, school health promotion and the HPS program was assessed using surveys of both teachers and students. (See appendix 7.10) The student survey was conducted as part of the post-intervention questionnaire administered to the same cohort of students in both intervention and control schools, who at the
completion of the program were in Years 9 and 10. Satisfaction with the one-day workshops were evaluated on the day.

Table 7.2 Summary of Process Evaluation Measures and Indicators

<table>
<thead>
<tr>
<th>Measures</th>
<th>Indicators</th>
<th>Data Procedure</th>
<th>Collection</th>
<th>Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Reach</td>
<td>No. of presentations to school</td>
<td>School Liaison Diaries</td>
<td>INT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. of meetings with school groups</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>No. of HPS Committee meetings &amp; membership</td>
<td>HPS Committee Minutes</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attendance at workshops</td>
<td>Workshop Evaluations</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. of contacts &amp; between school &amp; liaisons</td>
<td>School Liaison Diaries</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. of resources distributed</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>No. of &quot;hits&quot; on HEALTHCHIPS database records</td>
<td>HEALTHCHIPS</td>
<td>database records</td>
<td></td>
</tr>
<tr>
<td>Program Implementation</td>
<td>Time frame of implementation of program model stages</td>
<td>School Liaison Diaries</td>
<td>INT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. of HP actions implemented</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Participant Awareness &amp; Satisfaction</td>
<td>Teacher awareness of &amp; attitudes towards school health promotion</td>
<td>Teacher survey</td>
<td>INT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workshop participant satisfaction</td>
<td>Workshop Evaluations</td>
<td>INT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student perceptions of HP actions &amp; attitudes towards school health promotion</td>
<td>Student Post- Intervention Survey</td>
<td>INT &amp; C</td>
<td></td>
</tr>
</tbody>
</table>

INT = Intervention; C = Control
In addition to these quantitative process measures, qualitative data was gathered and recorded by School Liaisons in relation to the acceptability, satisfaction and perceived barriers of the program through their meetings with school groups and contacts with School Coordinators and other key individuals.

Results

Program Reach

Across the three schools, a total of 25 presentations and/or meetings were with various school groups and committees during the 'Mobilisation' stage of the program. All existing groups and committees were involved, including: principals, School Executive committees, teaching staff, P & C groups, Welfare committees and Student Representative Councils. Two out of three schools formed HPS committees which met between six and 14 times across the two years of the program, with a median committee attendance of eight members. Membership involved two to three representatives each from students, parents (including the President of the P & C group), teachers (including the principal) and the School Liaison.

All three schools attended the first workshop held with a median attendance of eight participants again involving representatives from students, parents and teachers. Two out of three schools attended the second workshop with similar attendance numbers and participant representatives. In addition to the above, School Liaisons recorded a total of 366 contacts made with the three intervention schools over the period of the program, an average of 122 contacts per school. These contacts mainly occurred in the form of telephone
conversations, faxes and mail-outs, together with personal visits by the School Liaisons to the school to meet with staff and/or to deliver resource materials. In nearly all instances, program resources were distributed to 100 percent of the target population for which each resource was specifically designed.
Table 7.3 Numbers of target group members reached by the program

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Schools</th>
<th></th>
<th></th>
<th>TOTAL</th>
<th>% target pop'n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with School Groups</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>No. of presentations &amp;/or meetings with various school groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPS Committees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of meetings held</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>25</td>
<td>100%</td>
</tr>
<tr>
<td>Median attendance</td>
<td>0</td>
<td>6</td>
<td>8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Workshops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of workshops attended</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median attendance</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>No. of additional contacts between school and liaisons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of resources distributed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Resource Package</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>21</td>
<td>100%</td>
</tr>
<tr>
<td>1-page HPS pamphlets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Effects of smoking on sports performance&quot;</td>
<td>189</td>
<td>203</td>
<td>187</td>
<td>579</td>
<td>100%</td>
</tr>
<tr>
<td>&quot;Parents and Smoking&quot;</td>
<td>650</td>
<td>600</td>
<td>500</td>
<td>1750</td>
<td>100%</td>
</tr>
<tr>
<td>&quot;Responsible Partying&quot;</td>
<td>650</td>
<td>600</td>
<td>500</td>
<td>1750</td>
<td>100%</td>
</tr>
<tr>
<td>Strategies for improving shade in schools</td>
<td>1200</td>
<td>1500</td>
<td>1000</td>
<td>3700</td>
<td>100%</td>
</tr>
<tr>
<td>School Policy Resource</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Mole Patrol Leaflets</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Letters to retailers</td>
<td>650</td>
<td>600</td>
<td>500</td>
<td>1750</td>
<td>100%</td>
</tr>
<tr>
<td>Student Representative Council Resource</td>
<td>8</td>
<td>0</td>
<td>6</td>
<td>14</td>
<td>64%</td>
</tr>
<tr>
<td>HPS Newsletters</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>HEALTHCHIPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total no. of &quot;hits&quot;</td>
<td>4753</td>
<td>2182</td>
<td>3451</td>
<td>10386</td>
<td></td>
</tr>
<tr>
<td>No. of users</td>
<td>831</td>
<td>332</td>
<td>319</td>
<td>1482</td>
<td>41%</td>
</tr>
<tr>
<td>Alcohol programs &quot;hits&quot;</td>
<td>505</td>
<td>228</td>
<td>522</td>
<td>1259</td>
<td></td>
</tr>
<tr>
<td>Smoking program &quot;hits&quot;</td>
<td>941</td>
<td>520</td>
<td>772</td>
<td>2233</td>
<td></td>
</tr>
</tbody>
</table>

a = as a proportion of all teaching staff, parents at P& C Meetings & students in Student Representative Councils.

b = as a proportion of all students in Years 7 to 10.

c = as a proportion of all students in Years 7 to 12.
A total number of 1,482 students utilized the HEALTHCHIPS touchscreen computer programs during the two-month installation period at schools, representing 41% of the total student population across the three schools. One school in particular had a large number of users (n= 831), while the other schools had over 300 users each. The computers recorded a total number of 10,836 hits on various programs, an average of seven hits per student. While programs contained information pertaining to a number of different health issues and behaviours, smoking and alcohol-related programs were the most heavily used by students, recording an average of 418 and 744 hits respectively.

**Program Implementation**

Each of the three schools differed in terms of how much time and energy was required to move through each of the stages of the program model, with the 'Mobilisation' stage requiring approximately one year to complete, as shown in Figure 7.3. For two of the three schools, this stage culminated in the formation of a HPS Committee. In the case of School A, after a number of failed attempts to form a school committee, the School Liaison adopted a different approach of working directly with existing school committees (in particular the School Welfare Committee), the School Coordinator and other key individuals and groups within school as appropriate to different health promotion actions and when needs arose. All three schools proceeded to the next stage of planning, implementation and monitoring of strategies (PIMMS), with the first health promotion actions occurring approximately within two months of one another.
Figure 7.3 Time frame of implementation of program model stages

School A
- Pre-test
- Mobilisation
- PIMS
- Post-test

July '94 - July '95 - August '96

School B
- Pre-test
- Mobilisation
- HPS C’te
- PIMS
- Post-test

July '94 - July '95 - August '96

School C
- Pre-test
- Mobilisation
- HPS C’té
- PIMS
- Post-test

July '94 - July '95 - August '96

Indicates when first health promotion actions were implemented
In addition to a number of measures involving active participation by the school, School Liaisons recorded the number of health promotion actions which were targeted at each of the three health risk behaviours of smoking, unsafe alcohol use and sun protection. A tally of these recordings indicated that each school had undertaken approximately the same total number of health promotion actions (School A = 22; School B = 20; School C = 21), though there was some variation between schools in relation to which specific actions were or were not carried out. A complete list of actions undertaken by each school is shown in Table 7.4. Analysis of the actions by health risk behaviour showed that smoking and sun protection were the two behaviours for which the most actions were implemented, with an average of nine and seven actions each respectively. Alcohol was targeted to a lesser degree with an average of five actions implemented by each school.

Participant awareness and program satisfaction

Results of the evaluations of the first workshop indicated that 100 percent of participants agreed that the workshop provided them with a better understanding of motivation and ideas on how to become a HPS. Eighty-three percent of participants also agreed that the workshop was either “very useful” or “fairly useful” in providing HPS resources, information on how to develop an action plan and how to implement and evaluate actions. All of the participants reported that they would recommend the workshop to other schools.
<table>
<thead>
<tr>
<th>Health Promotion Action</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum Checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-Curriculum Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEALTHCHIPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking Policy Workshop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoke-free Policy development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letters to tobacco retailers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>World No Tobacco Day Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Support Training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Smoking Pamphlets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking &amp; Sport pamphlets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum Checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-Curriculum Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEALTHCHIPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Alcohol Policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol Parent Forum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letters to alcohol retailers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsible Partying Pamphlets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Support Training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum Checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-Curriculum Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sun Protection Policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunscreen fundraising &amp; availability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary adjustments &amp; shade improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melanoma Awareness Day activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree planting program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hat promotions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When asked what they liked best about the workshop, participants’ responses were generally positive and referred to the involvement of students and opportunity of sharing ideas with other schools. Typical comments included:

“I liked the overall workshop because it gave me a lot of information on the topics we discussed. In particular, it was good to hear what other schools are planning to do.”

“It was great to have input from other schools on the issues, and ideas for networking and new resources. Having the student input was also important.”

“Getting new ideas, sharing ideas – particularly the students’ ideas, and useful for providing a structure for within to set up a HPS.”

Evaluation of the second workshop on the development of a smoke-free policy indicated similar positive responses and satisfaction by participants. Ninety-seven percent of participants agreed that the workshop was either “very useful” or “useful” in highlighting the importance of good planning and school policies, and 89% found the workshop to be very helpful in developing a school smoke-free policy. Comments regarding the best qualities of the workshop again related to networking with other schools and having input from students and parents. Some examples included:

“It was great to get ideas from other schools – what has worked and what hasn’t. Having input from students and parents was also valuable.”

“The devotion of the people working on this program. The best thing was having something concrete done by the end of the day.”

“Being able to talk to teachers and other adults, and them listening to my opinion and taking up some of my ideas.” (from a student)
A total of 108 teachers across the three intervention schools completed a teacher survey at the end of the program period, representing 58% of all teaching staff. Of these, 91% indicated that they were aware of the HPS program and its associated activities. While 69% of teachers surveyed reported that they were either “very satisfied” or “satisfied” with the HPS program, and 82% agreed that health promotion should be a priority for schools, approximately a third of all teachers stated that they didn’t have the time to promote the health of students of their school.

Results of the student survey conducted as part of the post-test evaluation found a greater proportion of students in the intervention schools (42%) agreed that the health of students was seen as very important in their school, in comparison to students in the control schools (38%), though this difference was not statistically significant. A significantly greater proportion of students in intervention schools (53%) also agreed that health promotion should be a priority on their school, in comparison to control school students (42%) ($\chi^2=10.98$, df=1, $p=0.0009$).

Analysis of the qualitative data recorded by School Liaisons after their contacts and meetings with key individuals and various school groups indicated some positive perceptions of the quality and usefulness of the program. These comments tended to come from two or three of the more motivated members of the school community. In addition, a number of perceived barriers to the program were recorded, particularly in the early stages of the program when awareness was low and there was a minimal degree of support and commitment to the program. There were also a number of changes in teaching staff and/or delegation of responsibilities by the principal to other school staff not as committed to the program, during the first year of the program. Lack of allocated time for staff to attend meetings led some staff to perceive their involvement as “over and above” their existing
work commitments. This barrier of competing time demands meant that staff would only consider involvement if they perceived that minimal work was required on their part.

While the approach was not intended to be prescriptive, School Liaisons and the project team received frequent requests from schools and the committees for specific recommendations about what health promoting actions to take. Schools felt confident that the current classroom curriculum was adequately addressing students’ knowledge needs, but were less certain about appropriate actions within the HPS domains of school ethos and the home/school/community interface.

Discussion

Program reach, extent of program implementation and participant awareness and satisfaction were all measured as part of the process evaluation of the Hunter Region HPS Program implemented over a two-year period. Results of several indicators of program reach suggest that most, if not all, of the target population was reached through at least one or more of the program’s activities or health promotion actions. This was in part supported by a high degree of awareness of the program among surveyed teachers at its completion. Success in this area probably reflects the large amount of time and effort invested during the ‘mobilisation’ stage of the program, in which School Liaisons attempted to meet, or at least have contact with, as many of the key school groups and individuals as was permitted. In addition, where resources were developed and distributed, sufficient numbers were provided to adequately reach the total target populations of students, parents or teachers.
Assessment of the extent of program implementation and its congruence with the planned program model indicate that while all four stages of the program were implemented over the two-year intervention period, the second stage of 'mobilisation' required a much greater period of time than was initially estimated, taking approximately one year to complete in all schools. This stage culminated in the formation of HPS committees in two of the three schools, with the third school electing to operate under an alternative model of direct contact between their School Liaison and existing school committees and/or key individuals. A number of barriers, such as no allocated time for staff to attend meetings and a perceived lack of expertise among members of all intervention schools on appropriate and effective actions within the HPS domains, together with the large amount of energy expended by Liaisons just in maintaining and keeping the committees going, led to the modification of the program model. This adaptation was based in part on consultations with program participants and in part on the experiences with other community-action based health promotion projects. Both the Cancer Action in Rural Towns (CART)\textsuperscript{46} project and The Adolescent Project (TAP)\textsuperscript{47} found community committees preferred an approach that involved concrete and specific instructions about strategies to be implemented, and preferred that the Liaisons take greater responsibility for implementation of actions. The roles of committees in these two projects\textsuperscript{46,47} evolved into one of providing access to "gatekeepers" and giving advice on tailoring health promotions to the local community.

Another key indicator of program implementation was the number and type of health promotion actions implemented over the course of the intervention period. Results of this process evaluation measure shows that actions were successfully implemented across all three domains of the HPS approach, that is, the formal curriculum, the school ethos and environment, and links with home and the community. Attendance at workshops, the formation of HPS
committees and other activities also provides evidence that the fourth criteria - active participation by the school, was attained to a certain degree. The higher number of actions targeted at smoking and sun protection may reflect a higher priority placed on these behaviours. Alternatively, this finding may reflect a greater degree of comfort and/or assumed effectiveness in addressing these issues within the school community, with unsafe alcohol use perceived as a more 'difficult' behaviour to tackle. Another possible explanation may lie in fact that smoking and inadequate sun protection are more visible behaviours in the school setting. That is, these behaviours are more likely to occur at school and during school hours in comparison to unsafe alcohol use which mostly occurs away from school and out-of-school hours (eg. weekends and nights), and therefore schools perceive fewer opportunities to address unsafe alcohol use.

A third dimension of process evaluated related to level of satisfaction with the program. Workshop participants were very satisfied with the content and quality of the two, one-day workshops with many commenting on the involvement of students and parents and the opportunity to share ideas with other schools. Results of the teacher survey indicate that the majority were generally satisfied with the intervention program, and both students and teachers considered that health promotion should be a priority for their school. However, consultations with school members and other qualitative data suggest that several barriers, including insufficient allocated time, competing demands, and perceived lack of expertise in applying the HPS domains, inhibited progress somewhat and may have lessened the desired impact of the overall intervention program.

Several factors emerged from the evaluation which appeared to at least enhance the process of working with school communities and facilitate the implementation of actions within the HPS domains. These included:
• gain strong support from schools in the initial stages, particularly from regional or district education bodies as well school principals and senior teaching staff who can legitimize and endorse proposed programs;

• provide school communities with school-specific, data-based profiles of the health status of students and current health promotion activities as a vehicle for demonstrating the need for intervention and the potential for action;

• identify key individuals or "gatekeepers" within schools who are both interested in and motivated to become involved, thereby facilitating the process of initiating health promotion action;

• encourage principals to allow staff allocated time during work hours to attend meetings, plan and carry out health promotion actions;

• provide schools with suggested actions which reflect current health promotion best practice from empirical evidence, and supply supporting resources which can be tailored to individual school needs;

• introduce suggested actions to schools one at a time and assist with the implementation to keep the work load for staff to a minimum;

• provide continuous feedback and positive reinforcement for their efforts and successes to maintain motivation for further action.

While health promotion actions were implemented across each of the HPS domains, and there was some active participation by schools in the program, it is questionable as to whether the actual intervention strictly conformed to the underlying philosophy of the HPS approach. Despite intensive efforts to empower school communities by providing training and resources, fostering collective decision making and commitment to the program, schools seemed
reluctant to want to take ownership of the program. They preferred a modified approach in which the School Liaison assumed greater responsibility for planning and implementing actions by consulting with school committees and key individuals and tailoring actions to meet the specific needs of each school.

Other research, such as the “Fighting Back” substance abuse program described by Hallfors\textsuperscript{48}, has observed that the community coalition model may be ineffective when their expectations are unrealistic and their planning and implementation of actions are not evidence-based. However, Green and Kreuter\textsuperscript{49} suggest that it may be the expectations of researchers and health promotion practitioners regarding community coalitions which are unrealistic and too “grandiose”. This appears to have been the case in the present study in which the candidate and project team’s expectations of the HPS committees were initially quite high in regard to their level of commitment and ability to plan and carry out appropriate, effective health promotion action.

**Limitations of the Process Evaluation**

Despite efforts to monitor and evaluate a range of process measures, several limitations were evident with the evaluation procedure. First, indicators of program reach appeared to show that the majority of the target population were reached, however the response rate to the teacher survey was less than optimal and though the majority reported being aware of the program, it was not possible to gauge whether staff had a clear and accurate understanding of the HPS approach. Second, there was no attempt to measure awareness of the program among students and/or parents. This could have been undertaken as part of the student survey, but was a much more difficult task with parents. Despite this gap in the evaluation process, it raises the question
of how useful would such a measure in these two populations really be? For instance, findings showed that both groups were involved in a number of health promotion actions and were the recipients of several pamphlets and other resources. It may be argued that this is sufficient to satisfy the criteria of the HPS approach, and that it is not necessary for students and parents to know that this action is part of a larger conceptual program. If these actions lead to the desired change in behaviour or other intended outcome, then the program is effective, regardless of its awareness or not by the recipients.

A third weakness in this evaluation relates to the lack of measurement of the acceptability and satisfaction with each of the individual health promotion actions, particularly the many written resources and pamphlets which were developed and distributed. It is assumed that if the action was not acceptable to the school, then they wouldn't have agreed to its undertaking in the first place. This may explain why some schools undertook some actions and others chose not to. Nevertheless, it would have been advantageous to assess each action on its own merits, to determine its acceptability for use by other schools in the future. For example, in the case of the Parents and Smoking pamphlet, process evaluation could have considered: the number of parents who recalled receiving the pamphlet; the number who recalled having read it and what its content was; and the number of parents who found receiving such material both acceptable and beneficial. Though not impossible, evaluation of potential process measures such as these would be very labour intensive and quite difficult to obtain.

A final limitation of the process evaluation that was alluded to earlier in the discussion, relates to the difficulty in obtaining an objective measure of complete adoption of the principles and philosophy of the HPS approach by schools. This is mainly due to the lack of clear, explicit criteria by which a HPS can be defined and schools can be measured against, as discussed in
Chapter One. Therefore, the candidate is cautious in not decisively concluding that the Hunter Region Health Promoting Schools Program was implemented entirely in the manner in which it was intended and that the intervention program was a successful demonstration of the HPS approach to school health promotion programs.

**Strengths**

Despite the several weaknesses identified above, this evaluation of a HPS intervention can also be seen to include a number of strong positive points. First, this study was unique in that schools were randomly selected from the target region with no pre-requisite selection criteria, such as evidence of a pre-existing commitment to the HPS approach. This enabled a true evaluation of the process of facilitating schools to adopt the HPS approach from a zero starting point.

Second, the intervention program was very resource and labour intensive, involved multiple strategies across all domains of the HPS model, with every effort made to strive for schools becoming a HPS. Several of the printed resources developed for this study have subsequently been utilised in other school-based programs in the Hunter region. Third, the candidate was able to adapt and modify the coalition or HPS committee approach to working with schools after feedback that the initial model was not feasible, and scale back expectations regarding the committees' role and goals.

Finally, the process evaluation of the intervention as described in this chapter was comprehensive with a lot of effort invested into ascertaining whether the program was implemented as intended. As commented earlier, very few HPS trials have even considered process evaluation, let alone undertaken such an extensive assessment.
Conclusion

In complying with the recommendations in several international and national reports, this chapter has described the study design, development of the Hunter Region HPS Program, its planned model of intervention, and evaluation of the process of its implementation, within the context of the WHO framework and eco-holistic paradigm. Findings from the process evaluation indicate that while a significant number of health promotion actions were successfully implemented within each of the HPS domains, the process of working with schools was not carried out in accordance with the intended program model. Uncertainty remains on the final judgement as to whether the Hunter Region HPS Program qualifies as a true example of the HPS approach. The need to adapt the process of working with school communities in this study raises the question of whether a true example of a HPS is actually feasible and/or achievable? One influencing factor may have had to do with the unique study design. Unlike other trials, this study randomly selected schools using no selection criteria or need for evidence of pre-existing commitment to the HPS approach. Perhaps pre-existing motivation and commitment are essential requirements for a successful, true implementation of the HPS approach, but if so, how do we motivate unmotivated schools?
References for Chapter Seven


Chapter Eight

Evaluation of a Health Promoting Schools Intervention Program

Part Two: Outcome Evaluation

Parts of this chapter have been presented as papers at the following conferences and published in the proceedings:

Lynagh MC, Sanson-Fisher R. Results of a randomized controlled trial of a pilot health promoting schools project. The Fifth International Congress of Behavioral Medicine, Copenhagen, Denmark, 12-22 August, 1998.

Lynagh M, Schofield M, Sanson-Fisher R. Preliminary results of a randomized controlled trial of a pilot health promoting schools program. 2nd National Health Promoting Schools Conference, Sydney, Australia, December, 1996.
Introduction

In the previous chapter, the Hunter Region Health Promoting Schools Program, its planned model of intervention and evaluation of the process of its implementation were all described. This chapter describes the evaluation of outcomes associated with the Hunter Region HPS Program.

Outcome evaluation has been defined previously as the extent to which any intended changes were produced by the program.\(^1\) Though a distinction is often made between ‘impact’ and ‘outcome’ evaluation, with the former concerned with the assessment of immediate effects of an intervention and the later associated with more long-term effects,\(^2,3\) both are involved with assessing the objectives or aims of the program and cause-and-effect relationships. Though this thesis is limited to, and is probably more correctly defined as, an impact evaluation, only the term outcome evaluation will be used in this chapter for the sake of simplicity and inclusive of immediate impact. The term ‘outcome’ is commonly used in this context by a number of practitioners and reports.\(^4\) Differentiation between the causal chain of events and the sequence of factors for assessment will be discussed later on in this chapter.

An important question to consider at this point is “what outcomes are appropriate for assessment in evaluating health promoting school programs?” Findings from the review of primary HPS trials outlined in Chapter Six indicated that a diverse range of outcome measures have been utilised by researchers in the past. These include changes in: students’ knowledge, behaviour, attitudes and beliefs, self-efficacy; teachers’ behaviour and knowledge; parents’ behaviour and knowledge; school organisational and environmental factors; and student physiological variables. Findings also indicated that the evidence for HPS programs improving these outcomes is inconsistent and inconclusive.
chapter eight

This makes defining and communicating what constitutes success in HPS programs a difficult challenge, open to different interpretations. For example, in the final evaluation report of the European Network of Health Promoting Schools, the project was viewed as a success because: no schools dropped out; the size of the network increased through informal dissemination of the project philosophy; and there were changes to school policy.\(^5\) In the Western Australian School Health (WASH) project,\(^6\) findings that the majority of participating schools had carried out action in three categories: individual factors (such as teacher and parent knowledge); school health promotion activities; and changes in school structure (for example, forming health committees, writing healthy policies) was considered as evidence of a successful project. In the South-Western Sydney HPS study, an increased level of awareness of the HPS concept was seen as evidence of partial success, even though there were no significant changes to school structures or policies and practices.\(^7\) In contrast, the Dartmouth Health Promotion Study\(^8\) was viewed as unsuccessful because there was no improvements in students' heart health or mental health measures, even though the program was positively viewed and awareness of health was raised. These examples highlight the differences in opinion and lack of universal agreement over what outcomes are appropriate and achievable in health promoting school interventions.

There have been some attempts to conceptualise and identify appropriate outcomes for evaluating the success of health promotion interventions in general and more specifically, in relation to health promoting school interventions in recent years.\(^6,9-15\) In the first of these, Nutbeam\(^13\) distinguishes between "health outcomes" in general and outcomes associated with health promotion activity in his conceptual model containing three categories of outcomes:
1. Health and social outcomes which represent the end-point of health and medical interventions and include mortality and morbidity;

2. Intermediate health outcomes which represent the determinants of health and social outcomes and include health lifestyles, healthy environments and effective health services;

3. Health promotion outcomes which represent individual, social and environmental factors that are modifiable and have an impact on the intermediate health outcomes.\(^{13}\)

The model is viewed as dynamic and flexible rather than static and linear. Nutbeam’s framework is an attempt to “move us away from a reductionist, psycho-social and behavioural paradigm to a more ‘expansionist’ approach to thinking about health promotion and evidence of success in health promotion.”\(^{13}\) He contends that the assessment of success of health promotion action should be based on change in three types of outcomes:

1. improved personal health literacy. These would include measures of: knowledge, attitudes, behaviour, intentions, and self-efficacy;

2. positive changes to social norms and community mobilisation. Examples of these might include: favourable public opinion towards health promoting action and community empowerment; and

3. changes to public policies and organisational practices, such as new laws and regulations, and allocation of funding and resources within organisations.\(^{13}\)

In a slight variation of Nutbeam’s\(^{13}\) model, King\(^{14}\) also proposes a three-stage hierarchy of outcomes representing the three time frames of immediate, intermediate and long-term. The short-term outcomes describe process evaluation measures of program implementation and reach, while the
intermediate level outcomes represent both the determinants of health and the focus of health promotion actions within the Ottawa Charter domains. The five categories of outcomes against which health promotion actions can be evaluated include:

1. Health risk behaviour;
2. Healthy environments;
3. Healthy public policy;
4. Social climate and public opinion; and
5. Infrastructure for prevention.¹⁴

Both of these frameworks¹³,¹⁴ are useful in providing a better understanding of the link between health promotion action and health outcomes, and stress more realistic expectations about the type and amount of change that is feasible for different levels of health promotion action and within certain time frames. Though they broaden the scope for defining success in health promotion, these frameworks are conceptual schema, and do not provide specific measurable indicators that are valid, reliable and acceptable to both researchers and practitioners.

In relation to school-based health promotion, St Leger⁹ notes that traditionally there has been a disparity in outcomes of interest between the health sector, for which the focus has been on measures of health status and health risk behaviour, and the education sector which has concentrated on conventional teaching and learning-related indicators, such as knowledge and skills. There have, however, been some recent endeavours to align the interests of the two sectors through the articulation of a set of common, more comprehensive outcomes. In the first of these, the WHO Expert Committee on
Comprehensive School Health Education identified five types of indicators which were seen to reflect the interests of both sectors. The five types were:

1. Children’s health status measures (for example, body mass index, nutritional intake, dental caries, injury rates, hospitalisation rates);

2. Attendance and learning-related achievements (for example, school grades, knowledge levels, problem solving, literacy and numeracy skills,);

3. Health-related behaviours (for example, smoking, alcohol use, dietary habits, physical activity, sexual activity);

4. Physical and psychosocial environment of school (for example, policies and practices affecting health; sanitation; shade provision, positive relationships between students and staff);

5. Implementation of school health programs which follow the HPS approach, that is, incorporate the formal curriculum, include links with parents and the wider school community, and access to health services.

Though these indicators are an important advancement, much work remains for developing valid and reliable measures of a number of the indicators. For instance, there is little understanding of how best to measure the psychosocial environment of schools and links with, and involvement of, the wider school community. There has also been little effort by programs to undertake initiatives in the development of such indicators and/or address them in their evaluation procedures.

In the European Network of Health Promoting Schools (ENHPS) Project, 12 criteria were originally devised as a guideline for schools to work towards and to also serve as a checklist of evaluation. The 12 original criteria were:

1. Students’ self-esteem
Findings from the evaluations of the ENHPS Project indicated that most school networks in the majority of participating countries had a number of difficulties in firstly understanding, and then implementing and evaluating all 12 criteria mainly due to their lack of operationalisation. The indicators were subsequently discarded and replaced with a smaller number of generic indicators applicable to two levels – the national/regional level and the school level. At the school level, schools were guided by four broad indicators (impact, visibility, structure and commitment) and encouraged to develop their own objectives and outcomes based on the 12 criteria and reflecting their stage of development in trying to meet with the HPS philosophy. This approach has yet to be evaluated and while the changes appear more feasible, both the project team and others have acknowledged that more work is required to operationalise them into specific, measurable outcomes.

Within Australia, the NHRMC developed a list of potential indicators of a HPS in 1996 which included some 45 indicators grouped into the HPS domains of:

- the formal curriculum;
chapter eight

- policies and practices;
- physical environment;
- social environment;
- school-home-community; and
- health services.\textsuperscript{16}

However, since that time, little has been done to operationalise this large set of indicators into specific outcomes, and to develop valid and reliable measurement instruments that can be universally applied to health promoting school programs both within Australia and internationally.\textsuperscript{17}

Given the lack of research and agreement on appropriate outcomes for evaluating HPS interventions, perhaps the most useful guidelines at this point in time are those proposed by St Leger\textsuperscript{9} to assist researchers in selecting "a manageable set of indicators which will facilitate more accurate judgements of the school health program".\textsuperscript{9} He advises that researchers choose outcomes which:

- provide useful data and add value, while being sensitive to the time and commitment of various participants;
- are achievable within the time and resource constraints of the intervention;
- contribute to our knowledge and understanding of the process of implementation;
- involve the key stakeholders in their development and application; and
• represent the five categories of indicators developed by the WHO Expert Committee\(^{15}\) (listed on page six) which were viewed as reflecting the interests of both the health and education sectors.\(^9\)

These broad guidelines, together with the principles of the WHO's Evaluation in health promotion: Principles and Perspectives report\(^4\) and eco-holistic paradigm\(^{18}\) (described in Chapter Seven), were utilised in the selection and development of appropriate outcomes for the evaluation of the Hunter Region Health Promoting Schools Program.

**Aims of the Hunter Region Health Promoting Schools Program**

The aims of the program which were evaluated in this chapter are:

1. To reduce the prevalence of three health risk behaviours:
   - Smoking;
   - Unsafe alcohol use; and
   - Inadequate sun protection;

2. To have a positive impact on factors associated with each of the three health risk behaviours, namely:
   - Knowledge;
   - Intentions;
   - Parent behaviour;
   - Rules at home;
Methods

Study Design

The design for this study is described in Chapter Seven.

Procedure

A pre-test survey of all consenting students in Years 7 and 8 was conducted in 1994 and the procedure for this survey is described in Chapter Four. Following the completion of the intervention program over a two-year period, a post-test survey of the same cohort of students was carried out in August 1996 when students were in Years 9 and 10. The procedure for conducting the post-test survey was similar to that implemented at pre-test, with active parental consent required. Students completed the post-test surveys in classrooms under the supervision of teachers and trained research staff, in the afternoon class period directly after the lunch break.

Intervention

The Hunter Region Health Promoting Schools Program is described in Chapter Seven.
Outcome Measures

The same self-administered questionnaire utilised in the pre-test survey was again used in the post-test survey with a few modifications to the formatting and presentation. In addition, questions pertaining to socio-demographic characteristics were removed (as these were expected to be unchanged) and several new items, which provided further information on potential predictors and assisted with process evaluation, were inserted. (see Appendix 8.1)

New items assessed perceived access to cigarettes and alcohol with two separate questions: How easy is it for you to get cigarettes/alcohol if you wanted to? Responses were measured on a five-point scale from Very easy to Extremely difficult and Don’t know. Perceived peer smoking and drinking norms were measured with two separate questions: Roughly what percentage of people your age do you think smoke cigarettes/ drink alcohol regularly? Responses were measured on an 11-point scale in which participants were required to circle a number from 0% to 50%. Similarly, perceived peer sun protection norms were assessed with question: Roughly what percentage of people your age do you think protect themselves adequately when they go out in the sun? (ie. wear a hat, SPF15+ sunscreen, long-sleeved shirt). Responses were also measured on an 11-point scale in which participants were required to circle a number from 0% to 100%.

Sibling smoking and drinking behaviour was measured with the questions: Do any of your brothers or sisters smoke cigarettes? and Do any of your brothers or sisters drink alcohol? Responses were measured on a four-point scale – Yes, No, Don’t know, Don’t have any brothers or sisters. Two new items also assessed students’ use of hats and sunscreen during PE/sport lessons with the question: During summer, how often would you wear a hat/sunscreen at school during PE/sport lessons? Responses were measured using a four-point scale – Every lesson, Most lessons, Some lessons, Not at all.
Four new items were also added to assess students’ views about, and level of bonding with, their school: How much do you like your school?; academic performance Overall, how do you think your teachers would rate how well you do in school?; and intentions to finish their schooling Do you intend to stay at school until you complete your Higher School Certificate?; and pursue higher education Do you intend to go on to further education after leaving school? eg. university, TAFE college.

The principal outcome measures were divided into three sub-sections:

1. Smoking outcomes;
2. Alcohol outcomes; and
3. Sun protection outcomes.

These outcome measures will now be described in more detail.

1. Smoking outcomes

Smoking behaviour

Smoking behaviour was assessed over three different time periods:

1. lifetime smoking (Have you ever smoked even part of a cigarette?);
2. smoking in the past month (Have you smoked cigarettes at all in the last four weeks? and About how many cigarettes would you have smoked in the last month?); and
3. ‘current smoking’ or smoking in the last week (How many cigarettes have you smoked in the last seven days);
Students responded to this last question by completing a retrospective diary in which they indicated how many cigarettes, if any, they had smoked each day over the past seven days.

The principal outcome smoking behaviour measure was current smoking at post-test, defined as having smoked at least one cigarette in the past seven days. This measure was identical to the measure of current smoking at pre-test, and allowed direct comparison between the two time periods. This measure was selected as the main outcome measure for the additional reasons that the other two measures (that is, lifetime smoking and smoking in the past month) were likely to have higher prevalence rates and act as more general assessments of smoking behaviour over a longer period time. Therefore, they were more likely to be subject to recall bias and be less modifiable over the intervention period. Smoking in the past seven days has also been commonly used in Australia-wide surveys and other school-based studies.

**Smoking-related knowledge**

Knowledge of safe levels of smoking and correct legal age at which cigarettes can be sold in New South Wales were measured at both pre- and post-test surveys to evaluate any change in smoking-related knowledge in participants.

**Smoking behaviour intentions**

Another outcome of interest was students' intentions for engaging in smoking in the future. Intentions regarding smoking behaviour were measured at both pre- and post-tests with the question: One (1) year from now, do you think
you will...be smoking cigarettes regularly/ be smoking cigarettes occasionally/ not be smoking at all?

**Parent smoking behaviour**

Parental smoking was measured at both pre- and post-tests using the questions: *Does your father smoke cigarettes?* and *Does your mother smoke cigarettes?*.

**Sibling smoking behaviour**

Sibling smoking was measured at post-test only using the question: *Do any of your brothers or sisters smoke cigarettes?*

**Smoking Rules at home**

Rules at home regarding smoking were measured at both pre- and post-tests with the question: *What are the rules about smoking in your home?*

**Perceived peer smoking behaviour, norms and attitudes**

Peer smoking behaviour and attitudes towards smoking were measured at both pre- and post-tests with the questions: *How many of your close friends smoke cigarettes?* and *What do your friends think about smoking cigarettes?*. Perceived peer smoking norms were assessed at post-test only with the
question: Roughly what percentage of people your age do you think smoke cigarettes regularly?

Perceived access to cigarettes

Perceived ease of access to cigarettes was assessed at post-test only with the question: How easy is it for you to get cigarettes if you wanted to?

Smoking-related attitudes and beliefs

A number of items were utilised to measure three attitude and belief factors at both pre- and post-test surveys: perceived risks associated with smoking; perceived benefits associated with smoking; and self-efficacy beliefs.

2. Alcohol outcomes

Unsafe alcohol use behaviour

Lifetime and recent drinking behaviour was first assessed over four different time periods:

1. lifetime drinking behaviour (Have you ever had even part of an alcoholic drink?);

2. drinking in the past year (Have you had an alcoholic drink in the last 12 months?);

3. drinking in the past month (Have you had an alcoholic drink in the last 4 weeks?); and
chapter eight

4. drinking in the past fortnight (How much alcohol have you had in the last 2 weeks?)

Students responded to the last question by completing a retrospective diary in which they indicated the number of standard alcoholic drinks consumed on each of the preceding 14 days, beginning with 'yesterday'. Current drinking at post-test was defined as having consumed at least one standard drink of alcohol in the previous two weeks.

Unsafe alcohol use was also assessed using questions on the frequency with which students reported having experienced a number of effects from alcohol use (eg. feeling very drunk or sick; passing out) and engaged in potentially harmful behaviours associated with their own or other people's use of alcohol (eg. gone swimming within four hours of drinking; walked along the edge of a road within four hours of drinking; drunk alcohol without your parents knowing). These questions are described in Chapter Four.

The principal outcome measures of ‘unsafe alcohol use’ at post-test were defined and measured in three ways:

1. in terms having engaged in binge-drinking, defined as having drunk five or more standard drinks on at least one occasion in the previous fortnight for males and having drunk three or more standard drinks on at least one occasion in the previous fortnight for females. This measure was assessed using the retrospective diary which asked: How much alcohol have you had in the last two weeks?

2. in terms of reporting having experienced effects from alcohol use, that is, responses of either Often or Occasionally to the questions: In the last 12 months when you have drunk alcohol, how often have you...felt very drunk or sick?... or passed out as a result of drinking?; and
3. In terms of having engaged in harmful behaviours associated with own and other people's use of alcohol in the last 12 months, that is, responses of either 10 or more times, 3 to 9 times and 1 or 2 times (meaning at least once) to the question which asked: In the last 12 months when you have drunk alcohol, how many times have you done the following?...eg. gone swimming within four hours of drinking; walked along the edge of a road within four hours of drinking; drunk alcohol without you parents knowing.

As with smoking behaviour outcome measures, the principal outcome measure of unsafe alcohol use selected to demonstrate an intervention effect was binge drinking over the past two weeks because of its likelihood of having the greatest degree of accuracy and because of it being realistically, the most modifiable over the intervention period.

**Alcohol-related knowledge**

Knowledge of safe levels of drinking for males and females and correct legal age at which alcohol can be purchased in New South Wales were measured at both pre- and post-test surveys to evaluate any change in alcohol-related knowledge in participants.

**Drinking behaviour intentions**

Another outcome of interest was students' intentions to engage in drinking in the future. Intentions regarding alcohol consumption were measured at both pre- and post-tests with the question: One (1) year from now, do you think you that, when you go out with friends, you will...be drinking a lot of alcohol (3 glasses or more) / be drinking a moderate amount of alcohol (1-2 glasses) /
be drinking a small amount of alcohol (2 glasses or less) / not be drinking at all?

Parent drinking behaviour

Parental smoking was measured at both pre- and post-tests using the questions: How often does your father drink alcohol? and How often does your mother drink alcohol?

Sibling drinking behaviour

Sibling alcohol use was measured at post-test only using the question: Do any of your brothers or sisters drink alcohol?

Alcohol rules at home

Rules at home regarding alcohol use were measured at both pre- and post-tests with the questions: In your home, what are the rules about how much alcohol you are allowed to drink? and In your home, what are the rules about how often you are allowed to drink alcohol?

Perceived peer drinking behaviour, norms and attitudes

Peer drinking behaviour and attitude towards alcohol were measured at both pre- and post-tests with the questions: How many of your close friends do you think have drunk alcohol in the last 12 months? and What do your friends
think about drinking alcohol?*. Perceived peer drinking norms were assessed at post-test only with the question: *Roughly what percentage of people your age do you think drink alcohol regularly (ie. at least once a week)?*

*Perceived access to alcohol*

Perceived ease of access to alcohol was assessed at post-test only with the question: *How easy is it for you to get alcohol if you wanted to?*

*Alcohol-related attitudes and beliefs*

A number of items were utilised to measure five attitude and belief factors at both pre- and post-test surveys: perceived risks associated with alcohol use; perceived barriers to alcohol use; beliefs related to self-efficacy or conditions under which drinking is safe; perceived peer drinking behaviour; and perceived influence of advertising.

3. **Sun protection outcomes**

*Sun exposure and sun protection behaviour*

Students’ usual use of hats and sunscreen at school during recess were assessed at both pre- and post-tests with the questions: *During summer, how often would you wear a hat at school during lunch-time?* and *During summer, how often would you wear sunscreen at school during lunch-time?*. Responses to these questions were measured using a five-point scale (Every
day; 3 – 4 days a week; 1 – 2 days a week; Less than once a week; and Not at all.) Students were also questioned on their usual use of hats and sunscreen during PE/sport lessons at school in the post-test survey only.

To measure current behaviour, a diary format was utilised to obtain information on the prevalence of sun protection behaviour during school recess periods on the day on which the survey was conducted. Students were asked to indicate whether they were outdoors for each of three periods - recess, first half of lunch, and second half of lunch using the question: Where were you mostly during this activity? Responses were measured on a three-point scale (indoors; outdoors, mostly in the sun and outdoors, mostly in the shade.) For each of the three periods, students were then asked to indicate whether they were wearing a hat, (What were you wearing on your head?); or wearing sunscreen, (Were you wearing any sunscreen on your face/ neck/ arms/ legs?). The questions concerning protective clothing that were included in the pre-test survey were omitted from the post-test survey, as it was found that all students were already wearing protective clothing because of school uniform requirements and this form of sun protection behaviour was not expected to have changed from pre- to post-test, regardless of the intervention.

Based upon responses in the diary, a solar protection score was then calculated for each student. The formula used to quantify the level of sun protection was a modified version of that used in the pre-test survey, in which weighted points are allocated to the most exposed body regions of the face and neck, to reflect the relative risk of that region developing melanoma or skin cancer. Students were allocated points for the use of either appropriate headwear or sunscreen on each body region. For example, three points would be awarded for protection of the face if students reported having worn appropriate headwear and/or applied sunscreen to the face. One point was
awarded for adequate protection of the neck region. The maximum possible score for each school recess period was four points. An overall indicator of sun protection behaviour for each student was obtained by adding scores across all three periods and dividing by the individual’s number of sun exposure opportunities, (ie. school recess periods when the student was neither inside nor under shade). Students who scored three points or more were defined as being ‘adequately sun protected’.

Three additional outcome measures were derived from the diary, as indicators of preferred sun protection method (ie. shade, hats or sunscreen) by students during school hours. The three measures included: use of shade for recess periods, use of hats for all recess/PE lesson periods, and use of sunscreen for all recess/PE lesson periods. Students were also assessed on their history of sunburn with the question: During last summer, did you get a sunburn which was sore or tender the next day? Responses were measured on a three-point scale: Yes, once; Yes, a few times and No.

**Sun protection-related knowledge**

Knowledge of skin cancer and effective sun protection was measured at both pre- and post-test surveys to evaluate any change in sun-related knowledge in participants. A ‘high sun protection knowledge’ was defined as providing four or more correct responses to the eight knowledge items, and ‘low sun protection knowledge’ was defined as equating to three or fewer correct responses.
Sun protection behaviour intentions

Another outcome of interest was students' intentions for tanning and efforts to protect themselves from the sun in the future. Intentions regarding sun protection were measured at both pre- and post-tests with the question: *Next summer, do you think will...try to get as deep a tan as possible / try to get a medium suntan / try to get a light suntan / not even think about tanning / try to protect yourself against the sun as much as possible?*

Perceived peer sun protection norms

Perceived peer sun protection norms were assessed at post-test only with the question: *Roughly what percentage of people your age do you think protect themselves adequately when they go out in the sun? (ie. wear a hat, SPF15+ sunscreen, long-sleeved shirt)?*

Sun protection-related attitudes and beliefs

A number of items were utilised to measure four attitude and belief factors at both pre- and post-test surveys: perceived risks of sun exposure; perceived benefits of sun exposure; perceived parent behaviour and attitudes; and perceived effectiveness of sun protection methods.
Analysis

Each post-test questionnaire was coded for computer entry and matched with an individual identification code assigned to each participant at pre-test, thus producing matched paired data for analysis of intervention effects. The percentage of matched participants and sample characteristics for both intervention and control groups were analysed using SAS to assess the comparability of participants in the two groups. Each of the outcome measures was firstly tested for any significant changes between pre- and post-test time periods in both intervention and control conditions using McNemar’s test for dichotomous variables and the Cochran-Mantel-Haenszel test for variables with three or more levels. Differences in means between pre- and post-test and between treatment group measures were tested using paired and non-paired t-tests respectively. Outcome measures for which there were significant changes were then tested for intervention effects, by controlling for pre-test measures, using logistic regression in SUDAAN with adjustment for intra-school clustering.

Chi-square analyses were conducted to test for association between the individual, social and environmental variables from both pre- and post-test surveys and each of the main outcome measures of the health risk behaviours. Those variables reaching a p value of 0.2 or less were then subsequently entered in to a series of backward stepwise logistic analyses, conducted first in SAS to eliminate non-significant variables, and then in SUDAAN with adjustment for intra-school clustering, to identify significant independent predictors of each of the main health risk behaviour outcome measures after adjustment for all other factors and outcome measures. Only those variables that were significant (ie. the confidence interval did not include 1.0) remained in the final model. Adjusted odds ratios and 95% confidence intervals, with corrections for finite populations, were calculated to
examine the strength of association of significant factors with smoking, unsafe alcohol use and inadequate sun protection while controlling for the effects of other variables. All analyses were conducted using the SAS and SUDAAN statistical programs and figures drawn using Microsoft Excel spreadsheets.

Results

Sample characteristics

A total of 1,953 students were enrolled in Years 7 and 8 at the six schools at pre-test. Of these, 1,589 students participated, giving an overall consent rate of 81%. At post-test, conducted two years later when students were in Years 9 and 10, a total of 1,354 students participated. After matching pre- and post-test data, the final sample for analysis was 1,338 or 84% of the pre-test sample. The attrition rate of 16% compares favourably with an annual attrition rate of 25% as reported by the High 5 Alabama School Project, which was a whole school-based intervention study conducted over a two-year period. Examination of the proportions of the study sample in intervention and control groups over the study period, as shown in Table 8.1, showed that these remained identical, indicating that attrition was evenly spread between the two groups.

Table 8.1 Proportions of matched study sample by treatment group over the study period.

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th></th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Intervention</td>
<td>899</td>
<td>57%</td>
<td>765</td>
</tr>
<tr>
<td>Control</td>
<td>690</td>
<td>43%</td>
<td>573</td>
</tr>
<tr>
<td>Total</td>
<td>1,589</td>
<td>43%</td>
<td>1,338</td>
</tr>
</tbody>
</table>
As shown in Table 8.2, the study sample comprised slightly higher proportions of boys than girls, and Year 9 over Year 10 students, but the proportions in intervention and control groups were not significantly different from each other. The majority of students were aged 15 or 14 years, with fewer aged 16. The greatest proportion of students in both intervention and control groups were from Australia/New Zealand-born parents, with the United Kingdom/Ireland and other European nominated next. Only small proportions of students derived from Asian, USA/other and Mediterranean/Middle East backgrounds. None of the proportions of different ethnic backgrounds were significantly different between intervention and control groups. There was a significantly higher proportion of students from low socio-economic status families in the control (70%) compared to the intervention (49%) group (p=0.03). However, this difference was constant over the study period and was controlled for in the multivariate analyses by adjustment for clustering by school.
<table>
<thead>
<tr>
<th>Table 8.2 Socio-demographics of matched cohort sample by treatment group.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>n</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Year (at post-test)</strong></td>
</tr>
<tr>
<td>Year 9</td>
</tr>
<tr>
<td>Year 10</td>
</tr>
<tr>
<td><strong>Age (at post-test)</strong></td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td><strong>Ethnic origin</strong></td>
</tr>
<tr>
<td>Australia/New Zealand</td>
</tr>
<tr>
<td>UK/Ireland</td>
</tr>
<tr>
<td>Mediterranean/Middle East</td>
</tr>
<tr>
<td>Other European</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>USA/Other</td>
</tr>
</tbody>
</table>

*Socio-economic status*


**Smoking outcomes**

**Smoking behaviour**

At post-test, 61% of students reported having ever smoked in their life in the intervention group, compared with 70% in the control group. The proportion of students who had ever smoked significantly increased from pre- to post-test in both treatment groups (22% and 23% increase in intervention and control groups respectively). However, results of logistic regression analysis indicated no significant intervention effect on rates of lifetime smoking.

At post-test, 49% of the intervention group reported having smoked in the past month compared with 60% in the control group, representing a pre- to post-test increase of 14% in the intervention group versus 20% in the control group. Results of logistic regression analysis, with adjustment for clustering, indicated that there was a significant effect of the intervention on rates of smoking in the past month, with students in the intervention group less likely to report having smoked in the past month at post-test compared to those in the control group (OR=0.65; 95%CI: 0.4-0.9). Students who reported having smoked in the past month at pre-test were also significantly more likely to report the same at post-test (OR=3.2; 95%CI: 1.8-5.7).

In relation to the main smoking behaviour outcome measure, 16% of students in the intervention group reported having smoked in the last week compared with 22% of students in the control group. This represented a pre- to post-test increase of 7% in the intervention group and a 10% increase in the control group, as shown in Figure 8.1.
Results of logistic regression analyses first indicated that there was a significant intervention effect on rates of current smoking, with students in the intervention group less likely to report having smoked in the last week at post-test (OR = 0.7; 95% CI: 0.5 – 0.9). However, after adjustment for clustering by school, treatment group was not significant (OR = 0.7; 95% CI: 0.3 – 1.5), indicating that the Hunter Region HPS Program did not have an intervention effect on rates of current smoking at post-test.

Among current smokers, the mean number of cigarettes smoked per week significantly increased from 8.4 to 20.3 cigarettes per week in the intervention group (t=-4.1, df=32, p=0.0003) and from 18.4 to 33.0 cigarettes per week in the control group (t=-5.2, df=40, p<0.0001) from pre- to post-tests. There were also significant differences between the treatment groups at both pre-test (t=-3.7, df=127, p=0.0003) and post-test (t=-4.6, df=202, p<0.0001), as shown in Figure 8.2.

Figure 8.1 Rates of current smoking in treatment groups at pre- and post-test.
Figure 8.2 Mean number of cigarettes smoked per week for current smokers in treatment groups at pre- and post-test.

Smoking-related knowledge

There were significant increases in both treatment groups (19% and 12% in intervention and control groups respectively) in the proportion of students who scored a high or the maximum level of knowledge score, related to safe levels of smoking and correct legal age for cigarette sales, from pre- to post-test. Results of logistic regression analysis indicated that the increase was significantly greater in the intervention group, with students in that group significantly more likely to score a high level of knowledge at post-test than students in the control group (OR=1.9; 95% CI: 1.3 – 2.7), indicating a positive intervention effect on smoking-related knowledge. Students who scored a high knowledge score at pre-test were also significantly more likely to score a high score at post-test (OR=2.4; 95%CI: 1.6 – 3.4).
Smoking behaviour intentions

The proportion of students who reported intending not to be smoking in one year’s time declined over the study period in both intervention (3.4% decrease) and control (8.4% decrease) groups, however the decrease was significant only in the control group ($S=15.1$, $df=1, p<0.0001$). Results of logistic regression analysis showed a significant intervention effect on intentions for future smoking behaviour, with students in the intervention schools more likely to report that they intended to not be smoking in one year’s time at post-test, compared to students in control schools (OR=$1.7$; 95%CI: $1.1 - 2.6$). Results also showed that students who intended to not be smoking in one year’s time at pre-test were more likely to report the same at post-test (OR=$4.7$; 95%CI: $3.0 - 7.5$).

Parent smoking behaviour

There were no significant changes in either treatment group from pre- to post-test in the proportions of students who reported having a mother or father who smoked.

Sibling smoking behaviour

As sibling smoking was measured at post-test only, the evaluation was not able to determine if there had been any changes in this measure over the study period. There was however, a significant association between sibling smoking and current smoking at post-test, with 56% of current smokers having one or more siblings who smoked compared to 24% of non-smokers ($\chi^2 = 91.45$, $df=1$, $p<0.0001$). There was also a significant difference between
treatment groups in the proportion of students who reported having one or more siblings who smoked, with a greater proportion in control group students (36%) compared to intervention group students (26%) ($\chi^2 = 12.26$, df=1, p=0.0005).

**Smoking rules at home**

A significant decrease in the proportion of students who reported that smoking was not allowed at home was found in both intervention and control groups (18% decrease and 17% decrease respectively), however there was no significant intervention effect on rules about smoking at home.

**Perceived peer smoking behaviour, norms and attitudes**

Perceived peer smoking norms were significantly associated with current smoking at post-test ($\chi^2 = 11.47$, df=1, p=0.0007) with more non-smokers perceiving that prevalence of smoking among young people their age was greater than 20%, compared to non-smokers. There were also differences between treatment groups, with students in the control group more likely to perceive that the prevalence of smoking among their peer group was less than 20% ($\chi^2 = 17.6$, df=1, p<0.0001).

There was a significant association between the number of close friends who smoked at pre-test and the same at post-test in both intervention ($\chi^2 = 50.42$, df=1, p<0.0001) and control ($\chi^2 = 40.79$, df=1, p<0.0001) groups, with students who had one or more close friends who smoked at pre-test more likely to report having the same at post-test. Results of logistic regression analysis in SAS first appeared to indicate a significant effect of the
intervention on peer smoking behaviour, with intervention group students more likely to report having no close friends who smoked (OR=1.87; CI: 1.4 – 2.5) however, after adjustment for clustering, the intervention failed to produce a significant effect on peer smoking behaviour (OR=1.87; CI: 0.9 – 3.9).

A significant change in perceived peer attitude to smoking from pre-test to post-test was found in the intervention group ($\chi^2 = 44.36$, df=4, p<0.0001) but no such change was detected in the control group. Analysis of the change in attitudes indicated that in comparison to the control group, students in the intervention group who at pre-test perceived that their peers thought that smoking was *neither cool or uncool* were more likely to change their views and report that their friends thought smoking was *uncool* at post-test. A greater proportion who perceived a peer attitude of smoking being *uncool* at pre-test retained the same attitude at post-test.

*Perceived access to cigarettes*

There was a significant association between current smoking at post-test and perceived access to cigarettes ($\chi^2 = 7.42$, df=1, p=0.0065) with non-smokers more likely to report that it was *difficult* or *very difficult* to get cigarettes if they wanted to. There was also a significant difference between treatment groups in the views of students regarding the accessibility of cigarettes, with students in the intervention group more likely to perceive that access was difficult ($\chi^2 = 5.86$, df=1, p=0.0155). As perceived access was not measured at pre-test, the analysis was not able to determine if there was a direct intervention effect on this outcome measure.
Smoking-related attitudes and beliefs

There were no significant changes to students' beliefs about the risks and perceived benefits associated with smoking from pre- to post-test in either of the treatment groups. There were, however, significant changes in both groups' perceptions regarding the self-efficacy of smokers, with a shift towards believing that smokers were not very self-efficacious. This transformation of attitudes was greater in intervention group students ($\chi^2 = 34.12$, df=4, $p<0.0001$) than in control students ($\chi^2 = 20.71$, df=4, $p=0.0004$).

Multivariate analyses

Results of chi-square analyses for each of the 36 variable representing individual, social and environmental predictors indicated that all except three variables (ethnicity, rules about smoking at home at pre-test, and sun protection score) were statistically associated with current smoking (that is, having smoked in the past seven days) at post-test at $p<0.2$ level, and were subsequently entered into backward stepwise logistic regression analyses in SAS. The seven variables which significantly predicted current smoking at post-test, in order of entry, were: smoking status at pre-test; mother's smoking behaviour at pre-test; number of close friends who smoked at pre-test; number of close friends who smoke at post-test; intention to smoke to smoke in one year's time at post-test; perceived smoking norms; and intention to stay at school and complete the HSC. These seven variables were entered into logistic regression analysis in SUDAAN with adjustment for intra-school clustering. Two of the seven variables, perceived peer smoking norms and number of close friends who smoke at post-test, became non-significant after adjusting for clustering, leaving five variables significantly
associated with current smoking at post-test in the final model, as shown in Table 8.3.

The odds of a student smoking in the past seven days at post-test was greater for those who reported current smoking at pre-test (OR = 7.0; 95% CI: 2.6 – 18.7). Students whose mothers smoked at pre-test were significantly more likely to be current smokers at post-test (OR = 1.9; 95% CI: 1.2 – 3.2). Having one or more close friends who smoked at pre-test significantly increased the odds of being a current smoker at post-test (OR = 2.2; 95% CI: 1.5 – 3.4). Intention to smoke in one year’s time at post-test and intention to remain at school complete the HSC were also both significantly associated with current smoking at post-test compared to students who did not hold such intentions (OR = 21.8; 95% CI: 12.3 – 38.4; OR = 3.2; 95% CI: 1.6 – 6.4 respectively).
Table 8.3 Result of multiple logistic regression analyses, with adjustment for intra-school clustering, for variables associated with current smoking (ie. having smoked in the past seven days) at post-test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence interval</th>
<th>Wald F</th>
<th>P-value Wald F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-6.4</td>
<td>0.91</td>
<td>0.0000</td>
<td>0.0000 - 0.0200</td>
<td>26.3</td>
<td>0.0037</td>
</tr>
<tr>
<td>Smoking status at pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoked in past week</td>
<td>1.95</td>
<td>0.38</td>
<td>7.0</td>
<td>2.6 - 18.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother's smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother a non-smoker</td>
<td>0.66</td>
<td>0.19</td>
<td>1.9</td>
<td>1.2 - 3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of friends smoking at pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No friends smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 or more friends smoke</td>
<td>0.80</td>
<td>0.17</td>
<td>2.2</td>
<td>1.5 - 3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to smoke at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intend not to smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intend to smoke</td>
<td>3.1</td>
<td>0.22</td>
<td>21.8</td>
<td>12.3 - 38.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to do HSC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intend to do HSC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No intention to do HSC</td>
<td>1.2</td>
<td>0.27</td>
<td>3.2</td>
<td>1.6 - 6.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: n=1189*
Alcohol outcomes

Lifetime drinking and drinking in the last 12 months

At post-test, 91% of students reported having ever drunk alcohol in their life in the intervention group compared with 92% in the control group. The proportion of students who had ever drunk alcohol significantly increased from pre- to post-test in both treatment groups by approximately 12% (p<0.0001). Similarly significant increases were also found in the proportion of students who reported having drunk alcohol in the last 12 months (14% and 16% increase in intervention and control groups respectively). Results of logistic regression analyses indicated no significant intervention effect on rates of lifetime drinking or drinking in the last 12 months. Students who reported these behaviours at pre-test were significantly more likely to report the same at post-test (OR = 11.9; 95% CI: 7.8 – 18.1 for lifetime drinking and OR = 3.6; 95% CI: 2.4 – 5.3 for drinking in the last 12 months).

Drinking in the last four weeks

At post-test, 74% of the intervention group reported having drunk alcohol in the last four weeks compared with 72% in the control group, representing a significant pre- to post-test increase of 30% in the intervention group (p<0.0001) versus 22% in the control group. (p<0.0001). Results of logistic regression analysis however, indicated no significant effect of the intervention on this outcome measure. Those who reported alcohol use in the last four weeks at pre-test were significantly more likely to report having drunk alcohol in the last four weeks at post-test (OR=2.1; 95% CI: 1.6 – 3.0).
Current drinking

There was a similar significant increase in the proportion of students who reported current drinking (that is, having drunk alcohol in the past two weeks) over the study period, with the increase being less among control group students (9% increase) compared to the intervention group (15% increase). Findings from the logistic regression analysis, however, indicated that the difference between treatment groups was not significant. Current drinkers at pre-test were more likely to also report current drinking at post-test (OR = 2.5; 95% CI: 1.9 – 3.4).

Among current drinkers, the mean number of standard alcoholic drinks consumed in the past two weeks increased from 6.9 to 12.6 drinks in the intervention group (t=-2.9, df=60, p=0.0046) and from 6.3 to 16.4 drinks in the control group (t=-3.9, df=44, p=0.0002) from pre- to post-tests, as shown in Figure 8.3. There was no significant difference between the treatment groups at pre-test, but the difference between groups at post-test was significant (t=-2.1, df=265, p=0.04000) indicating that the intervention had a significant positive effect on the number of standard drinks consumed per fortnight.

Binge drinking

In relation to the main outcome measures of unsafe alcohol use, the same proportion (16%) of students in both treatment groups reported having engaged in binge drinking in the previous two weeks at post-test (that is, for boys - having consumed five or more drinks on the one occasion, and for girls – having drunk three or more drinks on the one occasion). This represented a pre- to post-test increase of 14% in the intervention group and a 13% increase in the control group, as shown in Figure 8.4. Results of logistic regression analyses indicated there was no significant intervention effect on
rates of binge drinking. Binge drinking at pre-test was significantly associated with binge drinking at post-test (OR = 3.9; 95% CI: 2.1 – 7.2).

Figure 8.3 Mean number of standard alcohol drinks consumed in the past two weeks in treatment groups at pre- and post-test.

Experienced effects of alcohol use

Similar proportions of students in both groups also reported having experienced effects of alcohol in the past 12 months at post-test (44% in intervention and 41% in control group). This represented significant increases of 31% and 17% in each group respectively, as shown in Figure 8.5, however there was no significant intervention effect as indicated by logistic regression analysis. Those who reported having experienced the effects of alcohol in the past 12 months at pre-test were more likely to report the same at post-test (OR = 2.0; 95% CI: 1.3 – 3.2).
Figure 8.4 Rates of binge drinking in treatment groups at pre- and post-test.

Figure 8.5 Rates of having experienced effects of alcohol (i.e. felt drunk, sick and/or passed out) in the past 12 months in treatment groups at pre- and post-test.
Engaged in alcohol-related harms

The prevalence of having engaged in one or more alcohol-related harms in the past 12 months also rose significantly in both groups over the study period, with 94% of students in the intervention group and 93% of students in the control group reported having done so at post-test. The respective increases between pre- and post-tests are shown in Figure 8.6. Logistic regression analysis indicated no significant intervention effect, with students who reported having engaged in one or more harms associated with their own or other people’s alcohol use at pre-test more likely to report the same at post-test (OR = 2.8; 95% CI: 1.5 – 5.4).

Figure 8.6 Rates of having engaged in one or more alcohol-related harms in the last 12 months in treatment groups at pre- and post-test.
Alcohol-related knowledge

There were no significant changes in either treatment group in the proportions of students who scored a high or the maximum level of knowledge score related to safe levels of drinking (for males and females) and correct legal age for purchasing alcohol, from pre- to post-test.

Drinking behaviour intentions

The proportion of students who reported intending not to be drinking alcohol in one year’s time or drinking at safe levels, declined over the study period in both intervention (23% decrease) and control (20% decrease) groups. This decline was significant in both groups ($\chi^2 = 135.1$, df=1, $p<0.0001$ and $\chi^2 = 78.3$, df=1, $p<0.0001$ for intervention and control groups respectively). Results of logistic regression analysis showed no significant intervention effect on intentions for future drinking. Students who intended to be drinking at unsafe levels in one year’s time at pre-test were more likely to report the same at post-test (OR=4.0; 95%CI: 2.7 – 6.0).

Parent drinking behaviour

There was a significant association between fathers’ drinking status at pre-test and their drinking status at post-test in both intervention ($\chi^2 = 13.4$, df=1, $p=0.0003$) and control ($\chi^2 = 7.2$, df=1, $p=0.0071$) groups, with more students reporting having fathers who drink at post-test then at pre-test. A similar result was also found for mothers’ drinking status in both intervention ($\chi^2 = 18.1$, df=1, $p<0.0001$) and control ($\chi^2 = 16.1$, df=1, $p<0.0001$) groups. Results of
logistic regression analyses indicated that the intervention failed to have an effect on either fathers' or mothers' drinking behaviour.

Sibling drinking behaviour

As sibling drinking behaviour was measured at post-test only, the evaluation was not able to determine if there had been any changes in this measure over the study period. There was however, a significant association between use of alcohol by siblings and current drinking at post-test, with 66% of current drinkers having one or more siblings who drank compared to 44% of non-drinkers ($\chi^2 = 50.46$, df=1, $p<0.0001$). There was no significant difference between treatment groups in the proportion of students who reported having one or more siblings who drank alcohol.

Alcohol rules at home

There was a significant increase in the proportion of students who reported that no drinking or only safe drinking was permitted at home in the intervention group ($\chi^2 = 18.1$, df=1, $p<0.0001$) from pre-test (67%) to post-test (77%). At the same time in the control group, there was a small decline (3%) in students who reported that only safe or no drinking at all was allowed at home, however the decrease was not significant. Results of the logistic regression conducted in SAS first indicated that there was a significant intervention effect on alcohol rules at home (OR=0.7; 95% CI: 0.5 – 0.9), however after adjustment for intra-school clustering in SUDAAN, the intervention failed to show a significant effect.
Perceived peer drinking behaviour, norms and attitudes

There was no association between perceived peer drinking norms and current drinking at post-test, and there were no differences between treatment groups in perceptions about the prevalence of current drinking among young people their age. There was a significant association between the number of close friends who drank alcohol at pre-test and the number at post-test in both intervention ($\chi^2 = 106.1$, df=1, $p<0.0001$) and control ($\chi^2 = 85.5$, df=1, $p<0.0001$) groups, with students who had one or more close friends who drank at pre-test more likely to report having the same at post-test. Results of logistic regression analyses indicated no significant effect of the intervention on peer drinking behaviour.

A significant change in perceived peer attitude to drinking from pre-test to post-test was found in the intervention group ($\chi^2 = 51.69$, df=4, $p<0.0001$) but no such change was detected in the control group. Analysis of the change in attitudes indicated in comparison to the control group, students in the intervention group who at pre-test perceived that their peers thought that drinking was cool were more likely to change their views and report that their friends thought that drinking was neither cool or uncool at post-test.

Perceived access to alcohol

There was a significant association between current drinking at post-test and perceived access to alcohol ($\chi^2 = 24.67$, df=1, $p<0.0001$) with non-drinkers more likely to report that it was difficult or very difficult to get alcohol if they wanted to. There was also a significant difference between treatment groups in the views of students regarding the accessibility of alcohol, with students in the control group more likely to perceive that access was difficult ($\chi^2 = 6.3$, $p<0.0001$).
df=1, p=0.0121). As perceived access was not measured at pre-test, the analysis was not able to determine if the difference in perceptions between treatment groups was due to the intervention or not.

Alcohol-related attitudes and beliefs

There was a significant association in intervention students’ perceptions regarding the safety and self-efficacy of young drinkers, with the majority of students (94%) retaining their beliefs over the study period, that a number of behaviours (eg. driving, swimming) are unsafe when associated with alcohol ($\chi^2 = 4.5$, df=1, p=0.0339). There was no corresponding association in control group students, who reported a small decline (2%) in the proportion of students who held these beliefs. Results of logistic regression analysis indicated no significant intervention effect on self-efficacy beliefs. Students who disagreed with most self-efficacy statements (ie. 2 to 4) at pre-test were significantly more likely to disagree with the same number of beliefs at post-test (OR = 2.5; 95% CI: 1.2 – 5.4) compared to those who disagreed with a few (ie. 0 to 1).

A significant decline was found in the proportion of students who agreed that there were a number of barriers to youth drinking in the community (eg. people selling alcohol often check kids’ ages) from pre- to post-test in both treatment groups. This shift in attitudes was less in intervention group students (5% decline; $\chi^2 = 10.36$, df=1, p=0.0013) than in control group students (15% decline; $\chi^2 = 5.88$, df=1, p=0.0153). However, findings from logistic regression analysis with adjustment for intra-school clustering showed no significant intervention effect on perceived barriers to drinking.
Significant changes over the study period in beliefs about the 'norm' drinking behaviour of young people were also found in both groups ($\chi^2 = 38.83$, df=1, $p<0.0001$ and $\chi^2 = 10.77$, df=1, $p=0.0010$ for intervention and control groups respectively). The transformation of beliefs was equivalent for both groups, with more students indicating that they believed that drinking was widespread among young people at post-test in comparison to the proportion of students who held those beliefs at pre-test. Results from logistic regression analysis with adjustment for intra-school clustering showed no significant intervention effect on perceived youth drinking norms. Students who disagreed with more beliefs (ie. 2 to 3) about drinking being widespread at pre-test were more likely to retain their disagreement at post-test (OR = 2.6; 95%CI: 1.9 – 3.4) compared to students who disagreed with fewer (ie. 0 to 1) beliefs.

A large shift was also found in students' beliefs about the presence and influence of alcohol advertising, with an overwhelming shift in attitude among both groups, towards disagreeing with the belief that alcohol advertising influences young people and with sports sponsorship by alcohol companies being allowed to continue. There were declines in both treatment groups in the proportions of students who perceived a number of risks associated with drinking over the study period. While this decline was significant in the control group ($\chi^2 = 4.75$, df=1, $p=0.0292$) it was not significant in the intervention group. Findings from logistic regression without adjustment for clustering showed a positive intervention effect on perceived risks associated with drinking, however after adjustment for intra-school clustering, treatment group was not significant.
Multivariate analyses

Multivariate logistic regression analyses were conducted to determine the significant predictors of two of the outcome measures of unsafe alcohol use, that is, binge drinking in the past two weeks and having experienced the effects of alcohol in the past 12 months. The third measure of unsafe alcohol use – having engaged in one or more harms associated with alcohol use at least once in the past 12 months – was not tested for significant predictors because of the high prevalence rate (93%) associated with this measure at post-test. Current drinking behaviour was also not tested for predictors as by definition (ie. having consumed at least one standard drink in the past two weeks) it does not constitute ‘unsafe alcohol use’. Results of the multivariate analyses for each of the measures of binge drinking and experienced effects of alcohol are presented below.

Binge drinking

A total of 54 chi-square analyses were conducted for each of the variables representing individual, social and environmental predictors of binge drinking at post-test. Results of these indicated that all except ten variables (gender, ethnicity, treatment group, rules about drinking at home at pre-test, alcohol-related knowledge, perceived risks associated with alcohol at pre-test, attitudes towards alcohol advertising at both pre- and post-test, beliefs about the presence of barriers to youth drinking and adequate sun protection behaviour at post-test) were statistically associated with binge drinking in the past two weeks at post-test at p<0.2 level. The remaining 44 variables were subsequently entered into backward stepwise logistic regression analyses in SAS.
The six variables which significantly predicted binge drinking in the past two weeks at post-test, in order of entry, were: number of close friends who drank at pre-test; having experienced effects of alcohol in the past 12 months at post-test; intention to drink in one year’s time at post-test; perceived access to alcohol at post-test; liking or disliking school; and smoking status at post-test. These six variables were then entered into logistic regression analysis in SUDAAN with adjustment for intra-school clustering. Three of the six variables – intention to drink; perceived access to alcohol; and attitude towards school - became non-significant after adjusting for clustering, leaving three variables significantly associated with binge drinking in the past two weeks at post-test in the final model, as shown in Table 8.4.

Table 8.4 Results of multiple logistic regression analyses, with adjustment for intra-school clustering, for variables associated with binge drinking in the past two weeks at post-test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence interval</th>
<th>Wald F</th>
<th>P-value</th>
<th>Wald F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-4.372</td>
<td>0.307</td>
<td>0.01</td>
<td>0.01 - 0.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking status at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoked in past week</td>
<td>1.425</td>
<td>0.240</td>
<td>4.2</td>
<td>2.2 - 7.7*</td>
<td>39.8</td>
<td>0.0015</td>
<td></td>
</tr>
<tr>
<td>No. of friends drinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No friends drank</td>
<td>0.860</td>
<td>0.136</td>
<td>2.4</td>
<td>1.7 - 3.4*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 or more friends drank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced effects of alcohol in past 12 months at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not experienced effects</td>
<td>1.239</td>
<td>0.170</td>
<td>3.5</td>
<td>2.2 - 5.3*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have experienced effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant odds ratio difference compared to reference group.
Note n=838.
The odds of a student binge drinking in the past two weeks at post-test was greater for those who reported current smoking at post-test (OR = 4.2; 95% CI: 2.2 – 7.7). Having one or more close friends who drank alcohol at pre-test significantly increased the odds of being a binge drinker at post-test (OR = 2.4; 95% CI: 1.7 – 3.4) and having experienced negative effects associated with alcohol use (ie. felt drunk or sick or passed out) in the past 12 months at post-test was also significantly associated with binge drinking at post-test compared to students who reported not having experienced such effects (OR = 3.5; 95% CI: 2.2 – 5.3).

**Experienced the effects of alcohol**

A total of 54 chi-square analyses were conducted for each of the variables representing individual, social and environmental predictors of having experienced alcohol effects within the past 12 months at post-test. Results of these indicated that all except 11 variables (ethnicity, treatment group, father's drinking status at pre-test and at post-test, rules about drinking at home at pre-test, alcohol-related knowledge at pre-test, perceived risks associated with alcohol at pre-test, attitudes towards alcohol advertising at both pre- and post-test, lifetime drinking behaviour at post-test and drinking in the past 12 months at post-test) were statistically associated with having experienced the effects of alcohol within the past 12 months at post-test at \( p<0.2 \) level. The remaining 43 variables were subsequently entered into backward stepwise logistic regression analyses in SAS.

The 11 variables which significantly predicted having experienced effects of alcohol in the past 12 months at post-test, in order of entry, were: current drinking status at pre-test and at post-test; mother’s drinking behaviour at pre-test; drinking behaviour in the past four weeks at post-test; binge drinking
behaviour at post-test; alcohol use by siblings; peer attitude to drinking at post-test; intention to drink in one year’s time at post-test; beliefs about youth drinking norms at post-test; intention to complete the HSC; and smoking status at post-test. These 11 variables were entered into logistic regression analysis in SUDAAN with adjustment for intra-school clustering. Three of the 11 variables – alcohol use by siblings; peer attitude towards drinking; and intention to complete the HSC - became non-significant after adjusting for clustering, leaving eight variables significantly associated with having experienced effects of alcohol at post-test in the final model, as shown in Table 8.5.

The odds of a student reporting having experienced the effects of alcohol in the past 12 months at post-test was greater for those who reported drinking in the past fortnight at pre-test (OR = 1.9; 95% CI: 1.2 – 3.0) but interestingly was lower for students who reported current drinking at post-test (OR = 0.5; 95% CI: 0.4 – 0.8). Two other drinking behaviour outcome measures at post-test - drinking in the past four weeks and binge drinking in the past fortnight - were also both significantly associated with experiencing the effects of alcohol at post-test (OR = 2.1; 95% CI: 1.3 – 3.4 and OR = 5.1; 95% CI: 2.5 – 10.5 respectively).

Having a mother who drank alcohol at pre-test significantly increased the odds of having experienced the effects of alcohol within the past 12 months at post-test (OR = 1.5; 95% CI: 1.2 – 1.9) and intending to drink in an unsafe manner in one year’s time at post-test significantly predicted experienced the effects of alcohol (OR = 3.2; 95% CI: 2.3 – 4.4). Agreeing that alcohol use was widespread among young people significantly increased the odds of reporting having experienced the effects of alcohol (OR = 2.3; 95% CI: 1.4 – 3.7) while being a current smoker at post-test was also associated with
experienced effects of alcohol (OR = 2.4; 95% CI: 1.4 – 4.3) in comparison to non-smoking students.
Table 8.5 Results of multiple logistic regression analyses, with adjustment for intra-school clustering, for variables associated with having experienced effects of alcohol in the past 12 months at post-test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>Wald F</th>
<th>P-value Wald F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-3.547</td>
<td>0.903</td>
<td>0.03</td>
<td>0.00 - 0.29</td>
<td>11.6</td>
<td>0.0191</td>
</tr>
<tr>
<td>Current drinking status at pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-drinker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drank in past fortnight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current drinking status at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-drinker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drank in past fortnight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s drinking behaviour at pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-drinker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking in the past 4 weeks at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No drinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drinking at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-binge drinker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drinker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to drink in one year’s time at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intend to not drink or drink safely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intend to drink unsafely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beliefs about youth drinking norm at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree alcohol use is widespread</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreed alcohol use is widespread</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking status at post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoked in past week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant odds ratio difference compared to reference group.
Note n=841.
Sun Protection Outcomes

Sun exposure and sun protection behaviour

There were no significant changes, from pre- to post-test, in either treatment group in the proportions of students who were adequately sun protected as measured by the sun protection score calculated from the diary of sun exposure and sun protection behaviours during school recess periods on the day of the surveys. Rates of adequate sun protection remained relatively stable at 20% in the intervention group and 30% in the control group, as shown in Figure 8.6.

Figure 8.6 Rates of ‘adequately sun protected’ during school recess period on survey days at pre- and post-test, as measured with a sun protection score.

Of the three additional outcome measures of preferred sun protection method during school recess periods (i.e. hats, shade or sunscreen) derived from the
diary, the only significant change between pre- and post-test was a decline (6%) among intervention students in the proportion who reported wearing a hat during school recess periods on the survey day ($\chi^2 = 13.29$, df=1, $p=0.0003$). Results of logistic regression analyses further supported a significant negative intervention effect on hat use, even after adjusting for intra-school clustering, with intervention students less likely to have worn a hat during recess periods in comparison to control students (OR=0.48; 95% CI: 0.3 – 0.8). Rates of use for each of the three measures are shown in Figures 8.7, 8.8 and 8.9.

Figure 8.7 Rates of use of shade as during school recess periods on survey days at pre- and post-test.
Figure 8.8 Rates of use of hats during school recess periods on survey days at pre- and post-test.

Figure 8.9 Rates of use of sunscreen during school recess periods on survey days at pre- and post-test.
There were no significant changes in students’ reported usual use of sunscreen at school during recess from pre- to post-test in either treatment group. There were significant declines in students’ reported usual use of hats at school during recess over the study period in both intervention ($\chi^2 = 49.5$, df=1, $p<0.0001$) and control ($\chi^2 = 8.2$, df=1, $p=0.0042$) groups. However, results of logistic regression analyses indicated no significant differential effect of the intervention on this outcome.

Although measured at post-test only, findings showed a significant association between treatment group and use of sunscreen during PE lessons, with students in the intervention group more likely to report that they wore sunscreen in most or every PE lesson at school, compared to control group students ($\chi^2 = 11.59$, df=1, $p=0.0007$). There was also a significant association between reported use of sunscreen during PE lessons and sun protection scores, with those who reported a greater use of sunscreen more likely to be classified as adequately sun protected during school recess ($\chi^2 = 14.06$, df=1, $p=0.0002$). Also measured at post-test only, use of hats during PE lessons was significantly associated with treatment group, with more students in the control group (36%) reporting that they wear a hat in most or every PE lesson at school, compared to intervention group (28%) students ($\chi^2 = 10.3$, df=1, $p=0.0013$). More frequent use of hats during PE lessons was also significantly associated with being adequately sun protected during school recess ($\chi^2 = 288.68$, df=1, $p<0.0001$).

As a final measure of sun exposure behaviour, students were asked about their history of sunburn over the past summer. Equal proportions of students in both groups (66%) reported having got sunburned on one or more occasions over the past summer at pre-test, which rose to 72% at post-test. Frequency of sunburn at pre-test was significantly associated with sunburn at post-test in both intervention ($\chi^2 = 8.36$, df=1, $p=0.0038$) and control ($\chi^2 =$...
17.33, df=1, p=0.0068) groups. There was no significant intervention effect in frequency of sunburn as indicated by logistic regression analyses.

Sun protection-related knowledge

There were significant increases in both treatment groups (15% and 19% in intervention and control groups respectively) in the proportion of students who scored a high or the maximum level of knowledge score, related to facts about skin cancer and effective methods of sun protection from pre- to post-test. Results of logistic regression analysis conducted in SAS first showed a significant positive intervention effect, with students in the intervention group more likely to score a high level of knowledge at post-test than students in the control group (OR=1.4; 95% CI: 1.1 – 1.7). However, results of the subsequent logistic analysis conducted in SUDAAN with adjustment for clustering, indicated no significant effect of the intervention of sun protection related knowledge. Students who scored a high knowledge score at pre-test were significantly more likely to score a high score at post-test (OR=2.9; 95%CI: 1.8 – 4.6).

Sun protection behaviour intentions

No significant changes were found in students’ future intentions for obtaining a tan or protecting themselves in the sun in either treatment group. Rates remained relatively constant over the study period with 49% of intervention and 47% of control group students intending to protect themselves against the sun as much as possible.
Perceived peer sun protection norms

Though measured at post-test only, no significant differences between treatment groups were detected in students’ perceptions of other young people’s sun protection behaviour. There was a significant association between perceived peer sun protection norms and being adequately sun protected during school recess, with students who perceived that less than 50% of people their age adequately protected themselves when exposed to the sun being more likely to be adequately sun protected themselves at school recess in comparison to students who perceived that the rates were 50% or higher ($\chi^2 = 8.47$, df=1, p=0.0036).

Sun protection-related attitudes and beliefs

In both treatment groups, a significant negative change in attitude towards perceived benefits of sun exposure (eg. getting a tan is a good way to look attractive) was detected from pre- to post-test, with fewer students disagreeing with a number of perceived benefits ($\chi^2 = 48.87$, df=1, p<0.0001 and $\chi^2 = 51.86$, df=1, p<0.0001 for intervention and control groups respectively). Results of logistic regression analysis indicated that the attitude shift was no greater or less in intervention group students. Significant positive changes over the study period in beliefs about the risks associated with sun exposure were found in both groups ($\chi^2 = 48.38$, df=1, p<0.0001 and $\chi^2 = 30.19$, df=1, p<0.0001 for intervention and control groups respectively). The transformation of beliefs was large and equivalent for both groups, with approximately 56% more students in each treatment group indicating that they agreed with a number of risks associated with sun exposure. Logistic regression analysis indicated no significant effect of the intervention on perceived risks of sun exposure.
A strong association was found between students' beliefs about the effectiveness of sun protection methods at pre-test and their beliefs at post-test ($\chi^2 = 47.39$, df=1, $p<0.0001$ for intervention and $\chi^2 = 19.18$, df=1, $p<0.0001$ for control groups) however, there were no significant changes in attitudes in either group due to the intervention as indicated by logistic regression analysis. At pre-test there was almost 100% agreement among students in both groups that parents had positive attitudes towards sun protection and encouraged children to use adequate sun protection, however at post-test, this agreement had declined to 81% in the intervention group and 78% in the control group. No significant intervention effect was indicated by logistic regression analysis.

**Multivariate analyses**

A total of 39 chi-square analyses were conducted for each of the variables representing individual, social and environmental predictors of adequate sun protection during school recess at post-test, the main outcome measure of sun protection behaviour. Results indicated that 16 variables were statistically associated with adequate sun protection behaviour at post-test at $p<0.2$ level, and these were subsequently entered into backward stepwise logistic regression analyses in SAS.

The four variables which significantly predicted adequate sun protection behaviour during school recess at post-test, in order of entry, were: being a member of the control group, being adequately sun protected at pre-test, wearing a hat three days a week or more at pre-test, and perceiving that less than 50% of young people adequately protected themselves in the sun. These four variables were then entered into logistic regression analysis in SUDAAN with adjustment for intra-school clustering. One of the four variables
chapter eight

- hat wearing behaviour at pre-test - became non-significant after adjusting for clustering, leaving three variables significantly associated with being classified as adequately sun protected during school recess at post-test in the final model, as shown in Table 8.6.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>Standard Error</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>Wald F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.25</td>
<td>0.168</td>
<td>0.29</td>
<td>0.19 - 0.44</td>
<td>61.1</td>
<td>0.0005</td>
</tr>
<tr>
<td>Adequate sun protection at pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not adequately sun protected</td>
<td>0.97</td>
<td>0.124</td>
<td>2.6</td>
<td>1.9 - 3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequately sun protected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>-0.57</td>
<td>0.144</td>
<td>0.57</td>
<td>0.39 - 0.82</td>
<td>15.4</td>
<td>0.0112</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived peer use of sun protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived &lt;50% of peers used adequate sun protection</td>
<td>-0.61</td>
<td>0.203</td>
<td>0.55</td>
<td>0.32 - 0.92</td>
<td>8.9</td>
<td>0.0307</td>
</tr>
<tr>
<td>Perceived &gt;50% of peers used adequate sun protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant odds ratio difference compared to reference group.
Note n=1166.

The odds of a student being categorized as adequately sun protected during school recess at post-test was significantly greater for those who were
classified as adequately sun protected at pre-test (OR = 2.6; 95% Cl: 1.9 - 3.6). Belonging to the intervention group (OR = 0.57; 95% Cl: 0.39 – 0.82) and perceiving that more than 50% of peers used adequate sun protection when exposed to the sun (OR = 0.55; 95% Cl: 0.32 – 0.92) were both significantly associated with lower odds of using adequate sun protection behaviour at post-test.

Discussion

Overall, the results of this study indicated that the Hunter Region Health Promoting Schools intervention program had very few significant positive effects on student-related outcomes. Of the three health risk behaviours targeted, smoking and its associated factors, appears to have been most improved by the intervention. Before discussing the effectiveness of the program on each health risk behaviour and associated outcome measures in more detail, attention is first given to outlining a number of limitations and strengths of the research.

Limitations

First, a limitation in the study design may have discounted several significant effects which otherwise may have been evident. Though the total cohort sample size of 1,388 students provided sufficient power and precision to detect individual changes, because of an intra-cluster correlation within schools, the effective cluster or sample size was reduced to six, being the total number of schools which participated in the study. This meant that any differences between treatment groups and intervention effects needed to be
extremely significant to be detected. This statistical impediment was partially supported by results of the multivariate regression analyses. Several outcome measures including current smoking, peer smoking behaviour, drinking rules at home, perceived risks associated with alcohol use and sun protection knowledge, were initially found to show significant positive intervention effects when analysed in SAS. After adjustment for intra-school clustering through analyses in SUDAAN, all of these outcomes showed non-significant intervention effects. A larger number of schools, or clusters, would have increased the power of the study to detect significant effects. However, the candidate was greatly limited by practical restrictions on resources and budgetary constraints on the number of schools which were feasible to include in this thesis.

A second limitation, and further potential reason for the lack of success, relates to the duration of the intervention and time frame of the pre-post evaluation. As commented on in Chapter Six, two years may be an unreasonable time period in which to expect significant changes to student behaviour and attitudes. The present intervention falls short of the WHO recommendation of a minimum of three years. Therefore, continuation of the Hunter Region HPS program over a third year may have resulted in more significant effects, but financial and resource constraints limited the present study to two years.

Third, despite random selection of schools and random allocation into groups, there were some significant differences between treatment groups in baseline measures of several of the outcome measures, for example, mean number of cigarettes smoked per week, rates of having experienced effects of alcohol in the past 12 months, and rates of adequate sun protection behaviour. Though this made detection of real intervention effects more difficult, this was overcome by the application of appropriate statistical analysis methods (that
is, logistic regression) which accounted for pre-test measures in the
determination of any intervention effect on post-test results.

A fourth limitation of this intervention trial lies in its use of self-report as the
main method of measurement of outcome measures. Self-report of smoking,
alcohol use and sun protection behaviour is generally accepted as reliable
and valid in adolescent populations (as discussed in Chapter Three), and the
questionnaire was deemed to have face, content and construct validity and
good acceptability (as discussed in Chapter Four). However, the overall
adequacy and accuracy of results from self-report measures must still be
considered with caution, particularly for those measures which attempted to
measure behaviour over a long period of time, for example, having engaged
in one or more harmful behaviours associated with alcohol over the past 12
months. Because of the greater chance of inaccuracies with such measures,
the principal outcome measures of health behaviour in this study focused on
the more recent or immediate measures of behaviour, such as, smoking in
the past seven days.

A final limitation of mention relates to the selection of outcome measures
used to evaluate the effectiveness of the program. The main focus of the
outcome evaluation was on student-related behaviour and factors associated
with their behaviour. A number of other types of indicators, such as learning-
related achievements and teacher-related health behaviours and attitudes, as
identified by previously described conceptual frameworks,$^9, ^{13-15}$ were not
evaluated. Developing measures of, and encompassing, these outcomes into
the study may have revealed greater intervention effects.
Strengths

In spite of these limitations as described above, there were a number of strengths associated with the research. First, in relation to the study sample, there was a high retention rate of 84% of students between pre- and post-test measures. This provided an adequate sample of matched cohort data, strengthening the statistical analysis procedures. Comparisons of the study sample at baseline with census data indicated that overall the sample was representative of the adolescent population of the region. Further, comparisons of subjects in the treatment groups revealed that the groups were equivalent in all socio-demographic characteristics, with the exception of socio-economic status which was controlled for in the multivariate analyses by adjustment for clustering by school.

A second strength of the research was the study design used to evaluate the intervention program. The randomised controlled trial is considered the most rigorous research design for overcoming a number of potential confounders, including bias, and for maximising comparability between treatment groups. Though the choice of study design presented some difficulties, this research has demonstrated that RCTS are feasible in the evaluation of school-based interventions.

Third, associated with the RCT study design, this research was one of the few HPS evaluation trials in which schools were randomly selected from a target population and then randomly allocated into treatment conditions. There was no attempt to select schools on the basis of pre-existing knowledge of, or commitment to, the HPS approach, as the majority of previous studies have done. This allowed for a ‘true’ evaluation of the HPS approach in schools with no prior knowledge of, or activity associated with, the approach.
A fourth strength of this evaluation lies in the actual intervention program which was ambitious, with every effort made by the candidate and project team to implement the philosophy of the HPS approach. Partnerships were forged with participating schools and multiple health promotion actions were carried out across all domains of the approach, targeted at each of the three health risk behaviours.

Finally, this research was also ambitious in its choice of outcome measures. The principal outcomes and aims of the study focussed on change in student health risk behaviour. This has been regard by some as perhaps one of the more difficult outcomes to have an effect on, particularly for those behaviours which may have an addictive component (such as smoking and alcohol use), and those associated with strong family and lifestyle habits (such as sun protection).

The findings from the study are now discussed in more detail below.

**Smoking outcomes**

Consistent with trends found in other research,23, 24 the prevalence of current smoking among the study cohort increased with an increase in age. This was not an unexpected finding. Though this increase was less in the intervention group (7% increase) in comparison to the control group (10%), the difference was not due to the effect of the intervention. Of the three outcome measures related to smoking behaviour, only smoking in the past four weeks was positively impacted on by the intervention. The program showed no significant effect on parent smoking behaviour, smoking rules at home or any of the three attitude factors (ie. perceived risks, benefits and smoking self-efficacy) although changes in attitudes were in a positive direction. Some outcomes were measured at post-test only, therefore it was not possible to determine if
these were positively impacted upon by the intervention, however, they appeared to be in favour of the intervention group. For example, fewer students in the intervention group reported having one or more siblings who smoked and fewer perceived that access to cigarettes was easy or very easy. The program was successful in improving knowledge related to safe levels of smoking and the legal age for cigarette sales, smoking behaviour intentions and peer attitude towards smoking.

**Alcohol outcomes**

As found with smoking, alcohol use by students became more prevalent from pre- to post-test as students increased in age. This finding is consistent with other research which has shown that as students progress through secondary school, more students drink and the quantity of alcohol consumed increases.\textsuperscript{25, 26} The intervention failed to have an effect on any of the alcohol use behaviour outcomes, including the three measures of unsafe alcohol use, with one exception. Quantity of alcohol consumed was successfully impacted upon, with intervention group students drinking significantly fewer drinks over the past two weeks in comparison to control group students.

No significant intervention effects were detected for any of the other alcohol outcomes, however, there were some outcomes in which positive change had occurred favourable to the intervention group, though non-significant. For example, there was a 10% increase in the proportion of intervention students who reported that no drinking or only safe drinking was permitted at home, while in the control group there was a 3% decline at the same time. Students in the intervention group were also more likely to have adopted a negative view on peer attitude towards drinking. Those who at pre-test perceived that their friends thought that drinking was cool were more likely to report that their
chapter eight

friends thought that drinking was *neither cool or uncool* at post-test. While there was a negative change in attitude towards barriers to youth drinking in both treatment groups, the shift was not as great in intervention students as in control students. Similarly, the results showed a negative shift in perceived risks associated with drinking over the study period, however, the change in attitudes was less in intervention group students.

**Sun protection outcomes**

There were no significant positive effects of the intervention on any of the sun protection outcomes, but some non-significant changes in outcomes which were favourable to the intervention group. For example, more students in the intervention group scored a high level of knowledge related to facts about skin cancer and effective methods or sun protection, in comparison to control group students. Also, there was a slight increase from pre- to post-test in sunscreen use among the intervention students, while at the same time this declined among control group students. Results of the evaluation also indicated a negative impact on the use of hats during school recess periods. Significantly fewer students in the intervention group reported wearing hats at post-test, in comparison to control students. One possible explanation for this adverse effect could have been that the heavy emphasis on other methods of sun protection by the program, particularly sunscreen and use of shade, may have shifted the focus away from hats in intervention schools to these other forms of sun protection. The increase in sunscreen use in intervention schools, though non-significant, adds some support to this reasoning.
Predictors of health risk behaviour

Though results of analyses initially indicated that numerous individual, social and environmental factors were found to be associated with each of the health risk behaviours at post-test, further exploration by multivariate logistic regression analyses reduced the number of independent significant predictors to only a few.

As found in the pre-test survey (Chapter Five), the greater the number of close friends who smoked or drank at pre-test, the more likely were students to have smoked or engaged in binge drinking at post-test. Those who believed that alcohol use was widespread among young people were also more than twice as likely to report having experienced the effects of alcohol in the past 12 months at post-test. These findings provide further support to the association between adolescent health risk behaviour and perceived or actual behaviour of peers as demonstrated in previous studies. While it was not possible to determine the causal direction of the association at pre-test, the results of the post-test survey appear to indicate that similarities in risk behaviour among adolescents may be due to peer influence rather than peer selection as proposed by Peer Cluster Theory. That is, peers have either a direct or indirect influence on a young person's decision to engage in certain behaviour. The findings are consistent with those of a recent school and community-based alcohol use prevention trial which showed that alcohol use behaviour among peer groups was due to processes of peer influence rather than peer preference and selection.

Another finding consistent with both pre-test results and previous literature was the strong predictive association between smoking and unsafe alcohol use, and students' intentions to smoke and drink unsafely in one year's time at post-test. Students who intended to smoke in one year's time at post-test were 21.8 times more likely to report having smoked in the past seven days at
post-test. Students who are currently experimenting with smoking and drinking may be receiving some form of positive reinforcement for the behaviour, leading them to have strong expectations about persisting with the behaviour in the future. Another possible explanation may be linked with the finding related to peer influence, in that, students who hold an expectation about engaging in future health risk behaviour do so because of the real or perceived existing behaviour of close friends.

A predictor of health risk behaviour which was not evident in the pre-test data, but emerged as significant in this study, was the smoking and drinking behaviour of students' mothers. Students whose mothers smoked or drank at pre-test were significantly more likely to have smoked or engaged in unsafe alcohol use at post-test. There was no corresponding association with the smoking and drinking behaviour of fathers. Unfortunately, the data was not able to indicate whether this relationship was evident when a student had both parents or if they only had a mother. While previous research provides conflicting views on the influence of parent behaviour and attitudes, there is some evidence to support that the smoking and drinking behaviour of parents, particularly of mothers, can have a significant impact on adolescent smoking and drinking behaviour. It was not possible to determine whether a similar association existed between sun protection behaviour of parents and that of their children, as parental behaviour was not directly assessed in either pre- or post-test survey. However, findings indicated no association between parental attitudes towards sun protection and/or encouragement of their children to use adequate sun protection and students' own sun protection behaviour.

One interesting finding to emerge from the multivariate analyses was a strong association between smoking status and students' intentions to finish their schooling and complete their HSC, with those not intending to do the HSC
being three times more likely to be a current smoker at post-test. This variable was introduced into the post-test survey as one of four items designed to measure students' attachment with, or bonding to, their school. Previous research has demonstrated a strong correlation between indicators of alienation from school and a greater propensity for engaging in health risk behaviours. While the results of this study may appear to provide some support for this contention, none of the other three items measuring school bonding were found to predict smoking, and neither unsafe alcohol use or inadequate sun protection were successfully predicted by any of the four items, suggesting that the evidence may be weak but requires further exploration.

Other strong independent predictors of smoking, unsafe alcohol use, and adequate sun protection behaviour at post-test were smoking, drinking and adequate sun protection behaviour at pre-test. Students who smoked at pre-test were seven times more likely to be smokers at post-test, and students who were current drinkers at pre-test were twice as likely to report having experienced the effects of alcohol in the past 12 months at post-test. This was not an unexpected finding, given the substantial body of evidence that has showed that smoking and drinking in early adolescence are strong predictors of both behaviours in later adolescence and adulthood. A similar predictive association was found for sun protection, with students who were classified as being adequately sun protected at pre-test being 2.6 times more likely to be adequately sun protected during school recess at post-test.

Results also revealed an independent predictive relationship between smoking and unsafe alcohol use, with current smokers at post-test being 4.2 times more likely to report binge drinking in the past fortnight and 2.4 times more likely to have experienced the effects of alcohol in the past 12 months at post-test. Unsafe alcohol use, however, was not found to independently
predict smoking behaviour. These findings are consistent with several studies\textsuperscript{40-42} which have offered a range of explanations for the link between unsafe alcohol use and other health risk behaviour, including other substance use. Some researchers have argued that both behaviours are merely symptoms of other individual-level problems such as low self-esteem, fear of failure and susceptibility to peer influence.\textsuperscript{43} Others have suggested that they result from poor skills in behavioural self-control, that is, the failure to manage or control one's own tendencies for impulsive or disruptive behaviour.\textsuperscript{40} While others have proposed that such problem behaviours are due to personality variables such as a propensity towards rebelliousness and risk-taking.\textsuperscript{41} Though this study showed no link between smoking, unsafe alcohol use and the third health risk behaviour of sun protection behaviour, it appears that there is a link between smoking and drinking. Because of the divergence in explanations for the association, this is clearly one area requiring further research, particularly as gaining a better understanding of the nature of the relationship may provide clues to the determinants of these health risk behaviour and therefore, strategies which aim to reduce them.

Just as important as the findings on significant independent predictors of each of the health risk behaviours, are the several factors that were found to not be significant predictors in this study. Previous findings from research demonstrating significant associations between the three health risk behaviours and related knowledge, rules at home, attitudes and beliefs\textsuperscript{35,44-48} were not supported in this study. Apart from the studies on sun protection, most of the research has been conducted in the US. It is possible that these factors have less influence on an Australian adolescent population, and that other factors not measured in this study have a greater impact. It is difficult to explain however, why so few of the factors which have been found to strongly predict sun protection behaviour in previous research in Australia\textsuperscript{45,46} were not supported by the findings. Perhaps the measures and measurement tool
utilised in this study were not sensitive enough to detect significant associations.

**Comparisons with previous research**

Though the results of this study indicate that only a few outcome measures were successfully improved, in general, the findings are consistent with much of the previous research which has evaluated the effectiveness of HPS interventions, as described in Chapter Six. Comparisons with the systematic review undertaken by the NCCHTA group reveal that the majority of programs, included in existing secondary reviews, similarly reported no or mixed positive effects on student outcomes related to smoking, alcohol use and sun protection. Some programs did report positive short-term effects on behaviour, but only two interventions found positive effects at two years follow-up or longer, the duration of the intervention in this study.

Of the seventeen primary studies reviewed in Part Two of Chapter Six, again the majority found no significant intervention effects on student outcome measures. For example, the Students for Peace project showed no differences between treatment groups in any of the outcome measures of students' aggressive behaviour or school safety. Outcomes which were successfully improved by interventions in the review included mainly non-student-related outcomes such awareness of HPS among teachers, staff development and training in HPS, school health management and policies, and content of school curriculum. These type of outcomes more closely reflect those measures assessed as part of the process evaluation (described in Chapter Seven) of the Hunter Region HPS program, and will be discussed in more detail in Chapter Nine.
The lack of success, particularly, on the principal outcome measures of health risk behaviour, may reflect the potential modifiability of, and or feasibility associated with, changing adolescent health risk behaviour in the school setting with health promotion initiatives. As previously mentioned, behaviours which are widespread and deeply entrenched are likely to be more difficult, and take a longer time, to bring about a positive change in.⁢ Equally so, the lack of positive impact on outcomes such as parent and sibling behaviour, and perceived access to products, may also be beyond the realm of effect by health promotion actions. Therefore, an issue that requires consideration is the possibility that the HPS approach is, in reality, ineffective in altering adolescent health risk behaviour and associated factors. As discussed in Chapter Six, it is possible that the impact of the whole-school approach was weakened for high-risk groups, who may require more intensive and individual focused interventions.⁶¹ The HPS approach may be more effective on certain health risk behaviours,⁴⁹ but less successful in improving more difficult ones such as substance use and sun protection behaviour. Or perhaps the school is not the appropriate setting for health promotion interventions targeted at health risk behaviour in adolescents, but rather the community or other settings are more suitable.⁸

Conclusion

The Hunter Region HPS intervention program appears to have had very few significant effects on student-related outcomes. This was particularly so for alcohol and sun protection, with some positive gains made in smoking. Several limitations associated with the study and its methodology may have contributed to the lack of effects, but there were also a number of strengths of the research which provided reinforcement for the findings. More rigorous
research is required to further identify precisely which outcome measures, if any, are consistently and conclusively modifiable through the HPS approach to school based interventions.
References for Chapter Eight


- 390 -


Introduction

This thesis has applied the first three stages of the Staged Approach to Health Promotion Research and Practice model in an attempt to carry out a systematic and evidence-based approach to the development and evaluation of a HPS intervention targeted at three priority health risk behaviours (smoking, unsafe alcohol use and inadequate sun protection) among a cohort sample of Australian adolescents. To address the questions posed by Stages I and II of the model, the available evidence on the adequacy of measures and current prevalence, determinants and target groups was first reviewed (Chapters Two and Three). Second, a descriptive, baseline study on the prevalence and determinants of the three health risk behaviours among young adolescents in the Hunter region was conducted (Chapters Four and Five).

Research conducted in addressing these Stages of the model indicated several important findings. First, the majority of research conducted into the three health risk behaviours in school-aged populations has been descriptive research, typically on the prevalence and determinants of behaviours. While recognising the important contribution that descriptive research makes, research needs to be directed towards more advanced research of intervention trials which aim to reduce these behaviours. Second, a review of the available descriptive research evidence indicated that widely used and commonly accepted definitions of each of the health risk behaviours do exist. Measurement by self-report, as a whole, is also considered to be 'adequate' in that it meets the criteria of validity, reliability, sensitivity and acceptability.

Third, available literature suggested a large number of factors that may potentially influence, or be associated with, adolescent health risk behaviour. Evidence appears strongest and most consistent for a limited number of
these, while for others, the evidence is weak or inconsistent. Fourth, most descriptive research has been conducted overseas, with only a few studies carried out on specific determinants of the health risk behaviours among Australian adolescents. To address this gap in knowledge, a descriptive, baseline study was carried out, with the adjunct purpose of leading to more advanced intervention research. Results of this study showed that the prevalence rates of each health risk behaviour in the study sample were comparable with both state and national levels. Several factors were significantly associated with each behaviour, most notably: the influence of peers; perceived peer behaviour; future intentions; and perceptions of harm and self-efficacy. Many of these factors appeared to be ideally targeted through school-based interventions.

In addressing Stage III questions of effectiveness and acceptability, a critical review of HPS trials was first presented (Chapter Six). This review indicated that there have been a limited number of well-designed, methodological rigorous evaluation trials of the HPS approach to school-based interventions. While programs appear to have been effective in improving student knowledge, awareness of HPS and some school organisational factors, they have been less effective in having a consistent, positive impact on health-related behaviour, attitudes and beliefs. The review of HPS trials was followed by the development and evaluation of the Hunter Region HPS intervention program using a randomised controlled trial, for which both process (Chapter Seven) and outcome (Chapter Eight) evaluation results were described.

This chapter discusses the intervention research presented in this thesis in relation to each of the evaluated aims of the intervention program, implications and recommendations for both practitioners and researchers. Conclusions regarding the success of the Hunter Region HPS Program and its contribution to the knowledge and evidence base for the effectiveness of
the HPS approach to school-based health promotion are drawn. Implications for Stages IV and V of the *Staged Approach*,¹ that is, dissemination and wide-scale adoption of the HPS approach are also discussed. Though this thesis has made a significant contribution to the existing knowledge and evidence-base for the HPS approach to school-based health promotion, there are a number of limitations and strengths associated with the research which are firstly summarized below.

**Limitations**

First, this thesis has concentrated on only three health risk behaviours identified as priority health issues among Australian adolescents due to their current prevalence and associated burden of illness. The findings and inferences made in relation to the HPS approach must be regarded as limited to the health behaviours of smoking, unsafe alcohol use and inadequate sun protection. It is possible that the HPS approach may be more effective when targeted at other ‘less difficult’ health behaviours and issues in secondary schools. This was partially supported by the results of this research which showed that the intervention program appeared to more successful in having a positive effect on smoking and factors associated with smoking, than it did on unsafe alcohol use and sun protection. The potential differential effectiveness of HPS programs on a range of adolescent health issues should be explored in future research.

Second, though there was a sufficient overall sample size of students across schools to detect individual differences, due to the effects of intra-school clustering, the effective sample size was reduced to six, being the total number of participating schools. This reduced sample size had a large impact on the statistical power of the study to detect significant intervention effects.
This was shown by the results of statistical analyses which in some instances displayed a significant intervention effect before, but not after, adjustments for clustering were made. While this study design weakness could have been remedied by increasing the number of schools in the trial, the candidate was restricted to six schools due to budgetary and resource restraints. Future trials should attempt to maximize the number of schools to increase statistical power.

Third, constraints on budget and resources also limited the duration of the intervention to a two-year period. The issue of appropriate time frames for achieving significant outcomes has already been discussed in this chapter, but is acknowledged again as having potentially contributed to the lack of significant impact on student-related outcomes and therefore being a weakness in the research.

Fourth, while the process evaluation (described in Chapter Seven) indicated that a large number of health promotion actions were implemented across all of the HPS domains in the three intervention schools, the evaluation did not include assessment of actions which may have occurred in control schools over the same period of time. The control schools may have been equally active in carrying out actions targeted at each of the three target behaviours. There were also a number of structural factors and events over the study period that may have lessened any potential intervention effects. Major structural changes within the education sector and school management, which led to changes in school staffing and priorities, may have contributed to delays in establishing strong partnerships and commitment to the program by key stakeholders. It is possible that there was little difference between treatment conditions, explaining why there were so few significant intervention effects.
A fifth limitation of this thesis relates to the selection of outcome measures used to evaluate the effectiveness of the program. Though efforts were made to utilise and report on a broad range of outcomes and incorporate recommended guidelines, the main focus of the outcome evaluation was on student-related behaviour and factors associated with their behaviour. A number of categories of indicators, identified by existing conceptual frameworks, such as student attendance and learning-related achievements, and external recognition and ongoing support of programs, were not assessed. The evaluation also did not consider teacher-related health behaviours and attitudes. Broadening the range of indicators may have contributed to a better understanding of which outcomes were achievable and how these could best be measured.

A final limitation which merits discussion and follows on from the issue raised above is that the measurement of outcomes was conducted immediately after the two-year intervention period. There was no long-term follow-up to assess whether the HPS committees and implemented health promotion actions were maintained and continued beyond the life of the intervention. A two-year follow-up investigation, for instance, would have permitted assessment of the institutionalisation and sustainability of the HPS program, and whether any of the intervention effects found at post-test endured to a later point in time.

**Strengths**

Having considered the limitations of this thesis, discussion now turns to highlight its strengths and strong points. First, in applying the systematic and logical sequence of steps in the *Staged Approach* model to the development, implementation and evaluation of a HPS intervention program, this thesis represents the first attempt to carry out an evidence-based approach to
research in this field. Using the *Staged Approach* model\(^1\) has allowed the candidate to carefully consider the available evidence at each step of the program development and use this evidence to inform and direct the research undertaken. It has also permitted the verification of current knowledge and the identification of existing gaps in evidence.

Second, the audit of research publications conducted as part of this thesis was also the first undertaken in the HPS field, covering an extended 18-year period of time. The classification of published research, using the stages of the *Staged Approach* model,\(^1\) was conducted with a high degree of reliability and methodological rigour. The findings from the audit will provide a useful comparative base for the tracking and assessment of changes in research in the field for future years. Further, the systematic review of HPS trials identified several studies not previously included in any other review.

A third strength of this thesis lies with the actual intervention program which was ambitious, lengthy, resource and labour intensive. A concerted effort was made to implement the philosophy of the HPS approach through the development of collaborative partnerships with schools and encouraging collective decision-making at all stages of the program. Multiple strategies were implemented across all domains of the HPS approach, targeted at each of the health risk behaviours. Numerous resources and support materials were developed and utilised, able to be adapted and tailored to each individual school’s needs.

Fourth, the study design used to evaluate the intervention program was an RCT, chosen because it is the most rigorous research design for overcoming bias, potential confounders and ensuring comparability between treatment groups. While there were a number of difficulties and constraints associated with the study design, this thesis has demonstrated that the RCT is feasible and viable for evaluating school-based health promotion initiatives, though it
is acknowledged that consideration should also be given to other appropriate study designs for research in school settings.

Another strength associated with the study design was the method of recruitment of schools. This is one of the few HPS evaluation trials in which participating schools were randomly selected and then randomly assigned to treatment conditions. There was no attempt to select schools on the basis of pre-existing knowledge of, or commitment to, the HPS approach, as many previous studies have done bringing the issue of comparability of treatment groups into question in these trials. The random selection of schools from a target population in this research therefore allowed perhaps a truer evaluation of the HPS approach and the identification of real-life obstacles and barriers to its acceptability and feasibility.

A number of additional strong points were evident in the methodology and study design utilised in this thesis. These included: good initial consent rates of participating students and a high retention rate of the sample from pre- to post-test time periods; the use of adequate measures with demonstrated reliability, validity and acceptability; a matched cohort sample of participants from pre- to post-test measures; and rigorous statistical analysis of data which accounted for intra-school clustering effects.

Another strength worthy of mention is the comprehensive and in-depth description of the program model, intervention strategies and process evaluation of its implementation. Very few HPS trials have even considered process evaluation, let alone undertaken such an extensive assessment. A great deal of effort was invested into ascertaining whether the program was implemented as intended.

Finally, this principal outcome measures which the intervention focused on were adolescent health behaviour changes. These could be viewed as the
most difficult or hardest of all outcomes to have an effect on through a school-
based intervention program, and therefore provides a further indication of the
ambitiousness of the research.

Aims of the Hunter Region HPS Intervention Program

There were five aims of the Hunter Region HPS intervention program which
were evaluated using process and outcome evaluation measures. The
degree to which each aim was met and the implications of the research
findings presented in this thesis are discussed below.

Aim One: To encourage and empower three secondary school communities
to adopt the HPS approach.

One of the key principles underlying the philosophy of the HPS approach is
the notion of empowerment of school communities. That is, schools are
viewed as communities which adopt and own the approach, participate in
collective decision-making and planning at all stages of the program,
increasing the likelihood of their commitment to the implementation and
therefore the effectiveness of the approach. This tenet embraces the
principles of the Ottawa Charter and the participatory approach espoused by
community action and community organization theory. Based on these
principles, and in an attempt to achieve empowerment of the schools
participating in the study, a four-stage program model was developed. The
model was designed to facilitate the stages of mobilisation of school
communities through the establishment of HPS committees; planning,
implementing and monitoring of health promotion strategies; and evaluation
of the program (See Figure 7.2 in Chapter Seven).
Findings from the process evaluation (Chapter Seven) indicated that though these stages were implemented over the two-year intervention period, the 'mobilisation' stage required a lengthy period of time (approximately one year) and an intensive effort. This stage culminated in the formation of HPS committees in only two of the three schools, with the third school electing to operate under an alternative model utilising the existing school welfare committee. Through these committees and workshops which involved all three intervention schools, schools were provided with the necessary knowledge and skills on how to develop action plans and appropriate health promotion strategies, and encouraged to participate in collective decision making on these. However, schools were resistant to assume ownership of the program, preferring the School Liaison to take greater responsibility for decisions and implementation of actions. The HPS committees favoured the role of 'gatekeepers' by providing access to school community members, and tailoring and endorsing suggested health promotion actions. This modified role has similarly evolved in other community-action based health promotion projects.11,12

Therefore, it remains unclear whether schools became completely empowered in the adoption of the HPS approach. It may be argued that they were empowered, in that they were energized and prepared to initiate action, but not able to make informed decisions regarding the most effective strategies. Perhaps the presence of several barriers, including insufficient time allocation, competing demands, and perceived lack of expertise in applying the HPS domains, may have been insurmountable and prevented school members from taking total ownership of the program. If this was the case, then future school-based interventions may need to adequately address these school health management issues before forming planning committees and decision-making on appropriate health promotion actions. In other studies in which intervention schools have been selected on the basis of
some pre-existing commitment to the HPS approach, the schools may have previously resolved these issues, and were therefore more likely to attain empowerment. As not all schools will have addressed these issues or even be aware of the HPS approach (as was the scenario in this thesis), the challenge remains for future HPS trials to identify a process that is both effective and acceptable to schools in helping them to overcome existing barriers and promote empowerment.

An alternative explanation may lie with the program model being inadequate or not designed well enough to promote the empowerment process. Though based on theories of community action and community organisation,\textsuperscript{5,10} it may be that school communities are unique and/or inherently different in some way from the more traditional notion of 'community'. As such, the principles and stages proposed in these theories may not be applicable to school communities. As commented on in Chapter Seven, some researchers\textsuperscript{13,14} have recently suggested that expectations regarding the community coalition model may be unrealistic and coalitions may be ineffective when their planning and decision-making is not evidence-based. Therefore, school community coalitions or committees may not be the most appropriate model for fostering empowerment and ownership of the HPS approach.

Some final questions raised by the findings of this thesis in relation to Aim One, pertain to the necessity of empowerment as an important criteria for HPS. If schools are still able to develop, implement and maintain strategies within each of the HPS domains (as discussed next), then is this not sufficient enough to meet to the broad definition of a HPS? If not, then how important is complete empowerment to the goal of improved health status of children and school communities? And how does one define it in such a way that it can be measured and evaluated? These questions present a challenge to future
research and have the potential to greatly influence the ways in which health promotion practitioners work with and alongside school communities.

Aim Two: To develop strategies and resource materials for use by schools which adopt the HPS program.

While factors associated with health risk behaviour among adolescents have been heavily researched and further explored in this thesis, and the domains of the HPS approach have been clearly articulated, the specific actions or strategies which are feasible and most effective in reducing health risk behaviour in school communities are less apparent. The candidate, in consultation with members of the Working Party and HPS Committees, and after reviewing the available research evidence, developed a set of actions targeted at each of the health risk behaviours and strategies for encouraging active participation by schools. Actions were developed within each of the HPS domains, with several viewed as addressing more than one domain concurrently.

Many of these initiatives required the development of resources and written materials which were both cost-efficient and acceptable to schools, for example, pamphlets and teacher resource packages. The resources were developed in consultation with members of the Working Party and schools, and were designed to be adaptable, in that, schools were able to modify and tailor each resource to their specific school's needs and/or situation. Participating schools often elected to modify resources in this way. Resources were produced and distributed to schools in both hard-copy and CD-ROM formats to facilitate the tailoring process. These resources have since been utilised in other school-based projects conducted in the Hunter Region of
NSW. Therefore, the second aim of developing strategies and resources for use by schools was successfully achieved.

Aim Three: To increase the number of health promotion actions implemented in schools targeted at smoking, unsafe alcohol use and inadequate sun protection.

Findings from the process evaluation indicated that each school had implemented multiple health promotion actions (between 20 and 22) over the intervention period, with some variation between schools in which specific actions were or were not carried out. Smoking and sun protection were the two health risk behaviours for which the most actions were undertaken, with alcohol targeted to a lesser degree. Actions undertaken covered all three domains of the HPS approach, that is, the formal curriculum, the school ethos and environment, and links with home and the community. A limitation of the thesis as noted in Chapter Eight, was that evaluation did not include assessment of actions that may have occurred in control schools over the same period of time. Therefore, control schools may have been equally active in carrying out actions targeted at each of the three target behaviours. Despite this weakness in methodology, it appears that the program was successful in accomplishing the aim of increasing the number of health promotion actions implemented in intervention schools targeted at smoking, unsafe alcohol use and inadequate sun protection.

This finding suggests that practitioners can be confident in identifying health promotion actions targeted at these three health risk behaviours which are acceptable and feasible to school communities. Future research should evaluate the feasibility, effectiveness and cost-effectiveness of each individual action in a range of school communities to determine how
universally they can be applied. The effectiveness of each domain of the HPS approach in promoting positive health should also be explored, though others have noted the difficulties in isolating the impact of actions between the domains of formal curriculum, school ethos and links with home and the community. Appropriate and effective school-based strategies targeted at other health risk behaviours in adolescence, such as physical inactivity, violence, poor dietary habits, and sexual activity, need to also be identified.

Aim Four: To reduce the prevalence of three health risk behaviours – smoking, unsafe alcohol use and inadequate sun protection.

Results of the outcome evaluation of the Hunter Region HPS Program indicated little significant positive effect on the prevalence of the three target health risk behaviours. Of the three outcome measures related to smoking behaviour, only smoking in the past four weeks was positively impacted on by the intervention. Though there appeared to be a positive effect on smoking in the past seven days, it was not statistically significant due to the effect of intra-school clustering. Perhaps smoking in the past four weeks is a more appropriate outcome measure of adolescent smoking given the transient and experimental nature of the behaviour, in which case, the findings would seem more encouraging.

The intervention failed to have an effect on any of the measures of unsafe alcohol use, with the exception of quantity of alcohol consumed. Intervention group students reported drinking significantly fewer drinks per fortnight in comparison to control group students. There were, similarly, no significant positive effects of the intervention on any of the inadequate sun protection behaviour outcomes. Some non-significant changes favourable to the intervention group, such as an increase in sunscreen use, were detected.
However, a negative impact on the use of hats was also found. This opposing impact on different methods of sun protection may reflect the emphasis placed on individual sun protection methods by the intervention program, but more research is needed to explore this issue of preferential use for different sun protection methods by adolescents.

This fourth aim of reducing the prevalence of smoking, unsafe alcohol use and inadequate sun protection among adolescents was partially met for smoking, but not achieved for unsafe alcohol use and inadequate sun protection. A number of possible explanations for the lack of effects of the intervention on health risk behaviour are outlined in Chapter Eight. These include: study design factors; little difference between treatment conditions; too short a duration of the intervention; and the ineffectiveness of the HPS approach on high-risk groups or certain health risk behaviours. While this appears as a somewhat disappointing result, the findings are generally consistent with much of the previous research.\textsuperscript{17-22}

**Aim Five: To have a positive impact on factors associated with each of the three health risk behaviours, namely – knowledge; intentions; parent behaviour; rules at home; perceived peer behaviour, norms and attitudes; and attitudes and beliefs.**

As with its effect on behaviour, the intervention appeared to have the most positive impact on factors associated with smoking and less of an impact on factors associated with unsafe alcohol use and sun protection behaviours. Smoking-related outcomes that were successfully improved included: knowledge, smoking intentions and peer attitude towards smoking. No significant intervention effects were detected for any of the alcohol and sun protection-related outcomes. There were some non-significant positive
changes, for example, drinking rules at home and perceived peer attitude towards drinking. Therefore, this final aim of having a positive impact on factors associated with smoking, unsafe alcohol use and inadequate sun protection among adolescents was also only partially met for smoking, but not achieved for unsafe alcohol use and inadequate sun protection. Once more, the findings are generally consistent with much of the previous research. 17-22

Was the Hunter Region HPS Program a success?

Having assessed whether each of the five aims of the intervention were achieved in turn, discussion now turns to conclusions regarding the overall success of the Hunter Region HPS program. As discussed in Chapter Eight, there is no universal consensus on what defines and constitutes success in the HPS research field. Though a number of attempts have been made to conceptualise and identify appropriate categories of outcomes for the evaluation of HPS programs, 3-6 they remain conceptual schema without specific measurable criteria.

One rather simplistic approach to resolving this question might be to consider the number of aims of the program that were achieved. While reasonably confident that two of the five aims were obtained, the candidate remains cautious in passing judgement on the degree to which the other three aims were attained. While there appears to be evidence that these aims were realised in part, at least for smoking, the relative weighting and importance of the 'parts' is unknown. Therefore, using this crude method of reasoning, one might conclude that the Hunter Region HPS program was only partially successful.

Another method for appraising its success is to compare the findings with conceptual criteria identified by experts and previous researchers in the HPS
field. Applying this process, results will now be compared with three different frameworks or sets of indicators considered as evidence for effectiveness which have been outlined and discussed in previous chapters. The first of these sets of indicators (as outlined in Chapter Six) was generated by HPS experts as part of discussions presented in the *Health Promoting Schools Evidence for Effectiveness Workshops Report* conducted by the IUHPE.²³ Several potential indicators of success were identified, to be considered in combination, rather than as separate stand-alone criterion.²³ Of the indicators listed, the Hunter Region HPS Program appears to have been successful in achieving the following:

- Utilising a before and after evaluation and controlled study design showing some impact (mainly confined to smoking);

- Participation by significant numbers of people and the development of partnerships (collaborative relationships were formed between participating schools and the project team, however, it is unclear from this criteria exactly what is intended in relation to the nature of partnerships);

- Participation by and satisfaction from teachers;

- Supportive testimony of people involved; and

- Efficient use of resources and time, leading to acceptance of approach by stakeholders. (This last criteria is contingent on the argument that though the original program model was not wholly accepted, a modified approach was developed and subsequently accepted by participating schools.)

The attainment of these criteria, in combination with one another, at first appears promising. However, this thesis failed to meet or was unable to demonstrate evidence of the following criteria:
• Positive behaviour change in the intended direction (for two out of three health risk behaviours);

• Empowerment of teachers;

• Institutionalisation and normalisation of health promotion practice;

• External recognition of program and continued support.

The notion of empowerment and its importance in the effectiveness of the HPS approach has already been explored in this chapter. The final two criteria relating to the institutionalisation and continued support for health promotion practice were not supported because they were not directly or indirectly measured in this thesis. Evidence for these criteria would need to be pursued as part of a longer-term follow-up investigation. Future research efforts should explore ways of defining and measuring these criteria. Given that some of the IUHPE indicators appeared to have been met, but several others were not or were not measurable in this thesis, it would seem that the intervention program could not be judged to be successful.

A second framework that offers three types of outcomes against which all health promotion initiatives can be assessed is that developed by Nutbeam (and described in Chapter Eight). The Hunter Region HPS Program had little significant impact on the first of these criteria - personal health literacy factors. There were some positive gains in smoking behaviour, knowledge and attitudes, but much less effect on unsafe alcohol use and inadequate sun protection variables. The second type of outcome - social action and mobilisation - is difficult to assess given the lack of objective measures of these terms and gold standards against which any measurements could be compared. Despite these stumbling blocks, the outcomes may be viewed as being partially achieved in that, two out of three schools did form HPS Committees with the third opting to function through an existing school
committee. Committees were also able to ‘mobilise’ and successfully implement health promotion actions even though they operated under modified conditions somewhat different from the traditional community coalition approach.

In regards to the third category of outcomes – healthy public policy, the intervention appears to have been successful in achieving this criterion, as evidenced by the development of new school policies targeted at each of the health risk behaviours. Through attendance at workshops and distribution of sample policies to schools, all three participating schools developed new ‘Smoke-Free School’ and ‘Sun Protection’ policies, and one school drafted a new ‘School Alcohol Policy’. The writing of healthy policies however, does not automatically mean that they will be disseminated and implemented as intended. Future research should explore ways of following up on the degree to which policies are enforced and isolating the impact of school policies on the health status of children. Utilising Nutbeam’s framework of outcomes for comparison, it therefore appears that the program may be deemed to be only partially effective.

A third and final set of indicators against which the program is assessed are those identified by the WHO Expert Committee on Comprehensive School Health Education. The added advantage in applying these indicators is that they were specifically designed for the evaluation of school-based health promotion initiatives and were seen to reflect the interests of both the health and education sectors. Of the five categories of outcomes identified, the Hunter Region HPS Program appears to have been effective in achieving positive improvements in the following two:

- Physical and psychosocial environment; and
Implementation of school health programs, including links with wider school community and access to health services.

Limited or no evidence was found for positive change in the remaining three outcome categories of:

- Children's health status measures;
- Attendance and learning-related achievements; and
- Health-related behaviours.\(^6\)

Using these criteria, one might again infer that the intervention was at most, only partially successful, however such conclusions are tentative. No attempt was made in this study to evaluate the impact of the program on students’ attendance or learning-related achievements, nor on children’s health status measures which would be considered longer-term outcomes. For all five types of outcomes, much work remains for developing valid and reliable measures and realistic and achievable gold standards.

Having utilised a number of different frameworks and methods for assessing whether the Hunter Region HPS Program was a success, the candidate still remains cautious in coming to a definitive conclusion. Differences in acceptable indicators and the lack of explicit, objective criteria against which outcomes can be evaluated make the task of apportioning success or not difficult. There are of course other criteria and sets of indicators,\(^5, 24-27\) as outlined in Chapter Eight, against which the program could have been assessed, but as most are similar to those utilised, it is believed that no additional insights would be gained in applying these. There is also confusion over the differentiation between process and outcome indicators, with a number of the listed criteria in the frameworks viewed as process measures by some and as outcome measures by others. Nevertheless, in an effort to
address this question, the application of most conceptual frameworks appears to indicate that the Hunter Region HPS Program could at best be viewed as being only partially successful.

What is the available evidence-base for the HPS approach?

The research presented in this thesis has rigorously appraised, and made a significant contribution to, the current evidence-base for the HPS approach to school-based interventions. Exactly what this evidence entails is summarised in the following paragraph.

There is a logical and sound rationale for viewing schools as an ideal setting for health promotion interventions targeted at health and health risk behaviours of school-aged populations. This has been acknowledged and sanctioned by a number of leading Australian and international health organisations. The HPS approach to school-based interventions evolved after more traditional approaches to school health programs failed to demonstrate any significant long-term impact on the health and health risk behaviours of children. Though it embraces universally accepted principles of health promotion, such as those espoused by the Ottawa Charter and notions of community empowerment, and has been strongly endorsed by key health promotion bodies, there have been a limited number of well-designed, methodological rigorous evaluation trials of the approach. The findings from these trials, together with the results of research conducted in this thesis, suggest that the available evidence for the acceptability and effectiveness of the HPS approach to school-based health interventions is limited, inconsistent and inconclusive.
Implications for researchers and practitioners

The findings from this thesis and the conclusions drawn above regarding the existing available evidence for the HPS approach present a number of significant potential implications for both practitioners and researchers. These relate to areas of: achievable outcomes; valid and reliable measures; more rigorous research and the appropriateness of RCTs; greater attention to process evaluations; realistic time frames; the importance of empowerment and or other models of management; school health management factors; staff health issues; cost-effectiveness; and dissemination and wide-scale adoption of the HPS approach. Each of these issues will now be discussed in more detail.

Achievable outcomes and measures

While behaviour change may be achievable in some instances, interventions may need to set more realistic goals about the type and amount of change which is feasible within a given time frame. Several models and frameworks of health promotion outcomes as previously discussed, highlight the need to consider a range of health promotion outcomes, of which behaviour change may or may not be considered appropriate and achievable. Though these frameworks contain similarities, their differences emphasise the need for both researchers and practitioners to reach a consensus on appropriate indicators. Following a decision on acceptable and appropriate criteria for evaluating the success of HPS programs, the challenge remains to develop valid, reliable and acceptable measures of these indicators, and some comparative criteria or gold standard against which measures can be assessed.
More rigorous research

One of the key findings to emerge from this thesis, which has contributed to the lack of clarity on achievable outcomes, is the limited number of rigorously designed and implemented evaluation trials. More intervention trials of the HPS approach, employing methodologically sound research principles, are required. While this thesis has demonstrated that an RCT study design is feasible, it also presented a number of obstacles, both ideological and pragmatic. Recent discussion and objections raised about the appropriateness of RCTs in evaluating both HPS programs and health promotion initiatives in general, \(^2,30,31\) suggests that alternative evaluation methods should be considered, with particular regard to the unique characteristics and factors associated with school communities. Researchers must agree on the type of research design that helps to overcome these obstacles, yet still maintains an acceptable standard of rigour to satisfy a number of methodological issues such as external validity, control of confounding and potential bias, and statistical significance.

Process evaluation

Another issue that has added to the difficulty in attributing success, is the omission by many intervention studies of comprehensive and detailed description of strategies and attention given to process evaluation of programs. This has made it impossible to ascertain whether the limited and inconsistent evidence of outcomes is due to poor implementation of the HPS approach or its ineffectiveness.\(^2\) Future research must invest greater effort into comprehensive and detailed process evaluation to ensure the quality of health promotion is controlled\(^32\) and communicated through research publications.
Realistic time frames

The Hunter Region HPS Program was implemented over a two-year period, falling short of the WHO recommendation of a minimum of three years.\textsuperscript{33} This may have partially explained the lack of significant impact on student behaviour and attitudes. The question of whether three years is a reasonable time frame in which to expect significant changes to behaviour and attitudes, or for that matter other desired outcomes, remains unanswered. Part of the philosophy of the HPS approach is that strategies and actions are maintained and institutionalised beyond the lifespan of the intervention period, however this research has demonstrated that, at least for schools which are initially unaware of or uncommitted to the approach, it may require a much longer time period than three years.

Importance of empowerment

A further issue previously raised in this chapter, relates to the importance of empowerment in school communities. Though it was concluded that participating schools in this study were not completely empowered, a collaborative relationship was formed between schools and members of the project team, and a significant number of health promotion actions were successfully carried out within each of the HPS domains. Precisely how important is empowerment to the goal of improved health status of children and school communities? Can one be achieved without the other? And how does one define and measure empowerment? These questions present a difficult task to researchers and have the potential to greatly influence the ways in which health promotion practitioners work with and alongside school communities.
School health management factors

Related to the issue of empowerment, the presence of several barriers, including insufficient time allocation, competing demands, and perceived lack of expertise in applying the HPS domains, may have prevented school members from taking total ownership of the program. Others noted that budgetary, administrative, professional and personal barriers, lack of community or parental support, and pressure on teachers to focus on non-health school business, such as the teaching of mathematics and science, are all very real and complex obstacles which are not easily overcome. It is clear from this research that teachers play a vital role in the extent to which the HPS approach is embraced and adopted. Previous research has supported this finding, providing evidence that teacher's knowledge and awareness of health issues, together with the existing school climate and environment, can have a significant effect on their willingness to incorporate change and view health promotion as part of their professional role.

Planning and implementing school health programs requires time and support from both the education and health sectors. Practitioners must explore ways in which these school health management issues can be addressed and resolved prior to the formation of planning committees and decision-making on appropriate health promotion strategies. Planning committees may also need much more structured assistance, as was provided by the Liaison Officers in this thesis, with the implementation of programs. It may be unrealistic to expect teachers to participate in health initiatives which are not normally considered as part of their core business. Therefore, future research must also consider the appropriateness of HPS committees or the community coalition approach as an effective model of management of school health programs. An issue recently raised by health promotion experts.
Staff health issues

The focus of this thesis and most school-based health programs has been limited to the health status and health behaviours of school children. There have been few attempts to evaluate whether the impact of the HPS approach has a positive flow-on effect to teacher health-related behaviour and attitudes. Given the vital role that teachers play in the implementation of school-based program, future research should explore the acceptability and effectiveness of strategies targeted at teachers and how, if any, positive gains influence the health-related behaviour and attitudes of students.

Cost-effectiveness

As the current evidence-base for the effectiveness of the HPS approach remains limited and inconsistent, more work needs to be undertaken to examine the cost-effectiveness of programs. There have been some efforts by researchers to assess the costs involved in implementing a program,\textsuperscript{41} however, to date no investigations have undertaken a cost-benefit analysis. The Hunter Region HPS Program was very resource and labour intensive, much more so than initially anticipated. The benefits or results gained do appear somewhat disappointing given the amount of time, effort and costs invested by the candidate and project team. When the issue of acceptable and achievable outcomes has been resolved, research is needed to evaluate both the short and long-term cost-benefits associated with these outcomes.

Dissemination and Adoption of the HPS Approach (Stages IV and V)

Two final issues on which the findings of this thesis have a potentially large bearing are the dissemination and wide-scale adoption of the HPS approach.
These steps in health promotion practice are identified in Stages IV and V of the Staged Approach model which asks the questions: *are there effective and acceptable ways to disseminate programs? and do programs reduce the magnitude of the health problem when implemented on a large scale?* In health promotion, dissemination refers to the fostering of widespread implementation of effective programs, while at the same time curtailing the undertaking of less effective programs. It is an active rather than passive process of working with key stakeholder groups and identifying specific strategies for changing knowledge and practice. Where an efficacious program can be effectively disseminated, the next step is to determine whether the wide-scale implementation of an initiative impacts on the magnitude of the problem, that is, re-addressing the questions raised by Stage II of the model.

As there are potentially large costs and considerable impact associated with these two steps, they play a vital role in the sustainability and overall success of health promotion initiatives, yet are overlooked by many researchers. Results of the audit of research publications in Chapter Two confirmed this with very few studies identified which have explored these issues. Others have noted that due to the lack of research, there is a limited evidence-base for different dissemination strategies and methods in health promotion practice in general.

Despite this gap in knowledge and evidence, efforts have been made to actively promote and disseminate the HPS approach. In Australia, the National Network of Healthy School Communities, Australian Health Promoting Schools Association were formed to forge links between the education and health sectors and other key stakeholder groups. To enhance the dissemination of the approach through policy development, a National Health Promoting School Initiative (NHPSI) was carried out in 1997. Similar
initiatives have been instigated internationally, for example, the European Network of Health Promoting Schools\textsuperscript{44} and the WHO Expert Committee on Comprehensive School Health Education.\textsuperscript{6}

As the findings of this thesis indicate that the existing evidence-base for the effectiveness of the HPS approach remains limited and inconclusive, these efforts at dissemination may be premature. Dissemination of programs is a crucial step in health promotion practice, but should only occur when the evidence-base for the effectiveness of programs is strong and conclusive.\textsuperscript{1} Researchers and practitioners need to address and resolve the outstanding gaps in knowledge and evidence before further efforts are made to promote and disseminate the HPS approach both in Australia and internationally. When this has been achieved, research efforts should focus on dissemination trials to identify the most effective strategies for fostering the adoption of the approach by school communities.

Conclusion

In summarising the discussion presented in this chapter, this thesis has applied the first three stages of the \textit{Staged Approach to Health Promotion Research and Practice} model\textsuperscript{1} in an endeavour to carry out a systematic and evidence-based approach to the development and evaluation of an HPS intervention targeted at three health risk behaviours (smoking, unsafe alcohol use and inadequate sun protection) among a cohort sample of Australian adolescents. Comparison of the findings from the RCT with several conceptual frameworks of outcome categories appears to indicate that the Hunter Region HPS Program was at best, only partially effective or successful in achieving its aims. Though there are several limitations associated with the research in this thesis, overall, the work presented here has made a
significant contribution to the current evidence-base for the HPS approach and highlighted a number of areas for future research and implications for health promotion and school health practice.
References for Chapter Nine


