EFFECTIVENESS OF UNIVERSAL SCHOOL-BASED RESILIENCE INTERVENTIONS IN REDUCING TOBACCO, ALCOHOL AND ILLICIT SUBSTANCE USE IN ADOLESCENTS

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requirements for the degree of

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DECLARATIONS

Statement of originality

I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision. The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

Thesis by publication

I hereby certify that this thesis is in the form of a series of papers. I have included as part of the thesis a written statement from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers.

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08/12/2017

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

Chapter 1

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Chapter 7

Chapter 8

LIST OF APPENDICES

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Chapter 7

THESIS ABSTRACT

Background

Tobacco, alcohol and illicit substance use initiation typically occurs during adolescence. Intervention in schools to reduce substance use and a universal approach to such interventions are recommended by governments and commonly implemented by schools. As both individual and environmental resilience protective factors have been reported to be inversely associated with adolescent substance use, increasing student resilience has been suggested to be a means of reducing such substance use. Evidence of the effectiveness of interventions specifically addressing these factors is however limited.

Aims

The thesis aims were to: i) review the effectiveness of universal school-based resilience interventions in reducing adolescent substance use; ii) determine the effectiveness of such an intervention approach in reducing adolescent substance use overall and iii) by subgroup; and iv) explore the associations between individual and environmental resilience protective factors and adolescent substance use.

Methods

A systematic review of the effectiveness of universal school-based interventions that addressed student 'resilience' in reducing adolescent substance use was conducted, as was a cluster-randomised controlled trial of a 'resilience' only focused intervention. The trial was conducted in 32 secondary schools and involved a cohort of 2105 students. Self-report substance use outcomes were measured before and after a 3-year intervention that addressed resilience protective factors delivered under 'real-world' conditions by schools. Investigation of the relative associations between the 14 resilience protective factors addressed by the intervention and seven measures of adolescent substance use was conducted.

Key findings

The systematic review findings were equivocal, with interventions that included a focus on both resilience protective factors and other factors being found to be effective for reducing illicit substance use but not tobacco or alcohol use. The cluster-randomised trial found that

the universal school-based resilience focused intervention was not effective in reducing adolescent substance use, or in increasing resilience protective factors, either for students overall or for student subgroups. Only two of the 14 resilience protective factors were consistently associated with all measures of adolescent substance use.

Conclusion and implications for future research and practice

The thesis findings suggest that universal school-based resilience interventions alone are unlikely to reduce adolescent use of a range of substances. Based on these findings and related research, the following implications for future research and for policy and practice in this area were identified. First, to identify the most appropriate focus of future resilience focused interventions, further understanding is required of the longitudinal associations and interactions between substance use risk and protective factors, resilience protective factors and adolescent substance use. Second, to enhance the likelihood of a positive intervention effect on the prevalence of adolescent substance use, further investigation is required of the effectiveness of interventions that include both a universal and a selective intervention approach, and address both substance use risk and protective factors and resilience protective factors. Third, to enhance the benefit of government and school investment in substance use prevention initiatives, school substance use prevention programs/curriculum should be reviewed in terms of their alignment with evidence of effective intervention approaches and practical guidance provided to schools to facilitate their selection and delivery of evidence-based substance use prevention programs.

LIST OF PUBLICATIONS INCLUDED AS PART OF THIS THESIS

The main body of this thesis consists of six papers that are either published (five papers) or under review in peer-reviewed journals. The details of these papers are listed below. As these papers have been written as stand-alone publications there is some overlap in content between the papers, particularly in the background and methods sections. The papers included in this thesis include references to some appendices that were not included in the published versions of these papers.

Chapter 2

Hodder RK, Freund M, Wolfenden L, Bowman J, Gillham K, Dray J, Wiggers J. Systematic review of universal school-based resilience interventions targeting adolescent tobacco, alcohol or illicit drug use: review protocol. BMJ Open, 2014; 4:e004718.

Chapter 3

Hodder RK, Freund M, Wolfenden L, Bowman J, Nepal S, Dray J, Kingsland M, Yoong S, Wiggers J. Systematic review of universal school-based 'resilience' interventions targeting adolescent tobacco, alcohol or illicit substance use. Preventive Medicine 2017, 100: 248-268.

Chapter 4

Hodder RK, Freund M, Bowman J, Wolfenden L, Campbell E, Wye P, Hazell T, Gillham K, Wiggers J. A cluster randomised trial of a school-based resilience intervention to decrease tobacco, alcohol and illicit drug use in secondary school students: study protocol. BMC Public Health, 2012; 12: 1009.

Chapter 5

Hodder RK, Freund M, Bowman J, Wolfenden L, Campbell E, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Effectiveness of a pragmatic school-based universal resilience intervention in reducing tobacco, alcohol and illicit substance use in a population of adolescents: cluster-randomised controlled trial. BMJ Open 2017;7:e016060.

Chapter 6

Hodder RK, Freund M, Bowman J, Campbell E, Wolfenden L, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Effectiveness of a universal school-based intervention in reducing adolescent tobacco, alcohol and illicit substance use: exploratory assessment of effect by student socio-demographic and substance use initiation. Under editorial review with BMJOpen.

Chapter 7

Hodder RK, Freund M, Bowman J, Wolfenden L, Gillham K, Dray J, Wiggers J. Association between adolescent tobacco, alcohol and illicit drug use and individual and environmental resilience protective factors. BMJ Open 2016;6:e012688.

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By signing below I confirm that **Rebecca Kate Hodder** contributed to the publication:

Hodder RK, Freund M, Wolfenden L, Bowman J, Gillham K, Dray J, Wiggers J. Systematic review of universal school-based resilience interventions targeting adolescent tobacco, alcohol or illicit drug use: review protocol. BMJ Open, 2014; 4:e004718. DOI:10.1136/bmjopen-2013-004718.

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By:

- Leading the conduct of the review;
- Designing and conducting the study search;
- Undertaking the title and abstract and full text screening;
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- Undertaking study synthesis and analysis;
- Interpreting the results;
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By:

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OTHER PAPERS PUBLISHED DURING CANDIDATURE

During candidature, the candidate co-authored twenty-two additional relevant publications: four papers specifically relevant to the topic of this thesis, six relevant to resilience generally, six relevant to tobacco, alcohol and illicit substance use generally, and six related to child and adolescent health generally. The details of these papers are provided below.

Papers specifically relevant to the topic of this thesis

Hodder RK, Wolfenden L. Comparison of online and paper survey secondary school parent response rates in a child health survey. Australia and New Zealand Journal of Public Health, 2017; 41 (5): 547-548.

Hodder RK, Campbell E, Gilligan C, Lee H, Lecathelinais C, Wiggers J. Association between Australian adolescent alcohol use and alcohol use risk and protective factors, 2011 and 2014. Invited submission for Drug and Alcohol Review special issue on the decline in youth drinking (in press).

Hodder RK, Freund M, Wolfenden L, Bowman J, Nepal S, Dray J, Kingsland M, Yoong S, Wiggers J. Systematic review of universal school-based 'resilience' interventions targeting adolescent alcohol. Conference paper: 42nd Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society, May 2016; Stockholm, Sweden.

Hodder R, Daly J, Freund M, Bowman J, Hazell T, Wiggers J. A school-based resilience intervention to decrease tobacco, alcohol and marijuana use in high school students. BMC Public Health, 2011; 11:722.

Papers related to resilience broadly

Hodder RK, Homer S, Freund M, Bowman J, Lecathelinais C, Colyvas K, Campbell E, Gillham K, Dray J, Wiggers J. The association between adolescent condom use and individual and environmental resilience protective factors. Australia and New Zealand Journal of Public Health (in press).

Dray J, Bowman J, Campbell E, Freund M, Wolfenden L, **Hodder RK**, McElwaine K, Tremain D, Bartlem K, Small T, Bailey J, Wiggers J. Resilience interventions targeting resilience and mental health in adolescence: A systematic review (meta-analysis). Journal of the American Academy of Child and Adolescent Psychiatry, 2017; 56 (10): 813-824.

Dray J, Bowman J, Campbell E, Freund M, **Hodder RK**, Wolfenden L, Richards J, Leane C, Green S, Lecathelinais C, Oldmeadow C, Attia J, Gillham K, Wiggers J. Effectiveness of a pragmatic school-based universal intervention targeting student resilience protective factors in reducing mental health problems in adolescents. Journal of Adolescence 2017, 57: 74-89.

Dray J, Bowman J, Freund M, Campbell E, **Hodder R**, Lecathelinais C, Wiggers J. Mental health problems in a regional population of Australian adolescents: association with socio-demographic characteristics. Child and Adolescent Psychiatry and Mental Health, 2016, 10(32):1-11.

Dray J, Bowman J, Wolfenden L, Campbell E, Freund M, **Hodder RK**, Wiggers J. Systematic review of universal resilience interventions targeting child and adolescent mental health in the school setting: review protocol. Systematic Reviews 2015, 4 (1).

Dray J, Bowman J, Freund M, Campbell L, Wolfenden L, **Hodder R**, Wiggers J. Improving adolescent mental health and resilience through a resilience-based intervention in schools: study protocol for a cluster randomised trial. Trials, 2014; 15:289.

Papers related to preventing tobacco, alcohol and illicit substance use broadly

McLaren N, Kamper SJ, **Hodder R**, Wiggers J, Wolfenden L, Bowman J, Campbell E, Dray J, Williams C. Increased substance use and poorer mental health in adolescents with problematic musculoskeletal pain. Invited submission to Journal of Orthopaedic & Sports Physical Therapy; 2017; 47 (10): 705-711.

Stockings EA, Wolfenden L, Bartlem K, Gilligan C, **Hodder RK**, Kingsland M, Wiggers J. Systematic Review and Recommendations Final Report: The efficacy of multi-setting

community based alcohol and other drug (AOD) interventions for reducing population-level harms (2016). Commissioned report by the Alcohol and Drug Foundation.

Tzelepis F, Paul CL, Williams CM, Gilligan C, Regan T, Daly J, **Hodder RK**, Wiggers J. Real-time video counselling for smoking cessation: review protocol. Cochrane Database of Systematic Reviews. Cochrane Database of Systematic Reviews 2017, Issue 5. Art. No.: CD012659.

Wiggers J, Tindall J, Kingsland M, **Hodder RK**, Gillham K. Public opinion and experiences of crime two and five years following the implementation of targeted regulation of licensed premises in Newcastle, Australia. Conference paper: 42nd Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society, May 2016; Stockholm, Sweden.

Gilligan C, Wolfenden L, Foxcroft DR, Kingsland M, Williams AJ, **Hodder RK**, Small T, Sherker S, Rae J, Tindall J, Stockings E, Wiggers J. Family-based prevention programs for alcohol use in young people. Cochrane Database of Systematic Reviews 2016, Issue 7. Art. No.: CD012287.

Kingsland M, Wiggers JH, Vashum KP, **Hodder RK**, Wolfenden L. Interventions in sports settings to reduce risky alcohol consumption and alcohol-related harm: systematic review. Systematic Reviews 2016, 5 (1): 12.

Papers related to children and adolescent health broadly

Wolfenden L, Nathan NK, Sutherland R, Yoong SL, **Hodder RK**, Wyse R, Delaney T, Grady A, Fielding A, Tzelepis F, Clinton-McHarg T, Parmenter B, Butler P, Wiggers J, Bauman A, Milat A, Booth D, Williams CM. Strategies for enhancing the implementation of school-based policies or practices targeting risk factors for chronic disease. Cochrane Database of Systematic Reviews 2017; 11:CD011677. DOI: 10.1002/14651858.CD011677.pub2.

Hodder RK, Stacey FG, Wyse RJ, O'Brien KM, Clinton-McHarg T, Tzelepis F, Nathan NK, James EL, Bartlem KM, Sutherland R, Robson E, Yoong SL, Wolfenden L. Interventions for increasing fruit and vegetable consumption in children aged five years and under. Cochrane Database of Systematic Reviews 2017, Issue 9. Art. No.: CD008552.

Williams CM, Nathan NK, Wyse RJ, Yoong SL, Delaney T, Wiggers J, Sutherland R, Freund M, **Hodder RK**, Wolfenden L. Strategies for enhancing the implementation of school-based policies or practices targeting risk factors for chronic disease: review protocol. Cochrane Database of Systematic Reviews 2015, Issue 4. Art. No.: CD011677.

Bell AC, Wolfenden L, Sutherland R, Coggan L, Young K, Fitzgerald M, **Hodder R**, Orr N, Milat AJ, Wiggers J. Harnessing the power of advertising to prevent childhood obesity. International Journal of Behavioral Nutrition and Physical Activity, 2013; 10:114.

Bell AC, Campbell L, Wolfenden L, Gillham K, **Hodder R**, Francis L, Wiggers J. (2013). Chapter 5: Eating and physical activity behaviours: telephone survey. Good for Kids, Good for Life, 2006-2010: Evaluation Report. Sydney: NSW Ministry of Health. http://www.health.nsw.gov.au/research/Documents/Good-for-Kids-report.pdf

Wolfenden L, Wyse RJ, Britton BI, Campbell KJ, **Hodder RK**, Stacey FG, McElduff P, James EL. Interventions for increasing fruit and vegetable consumption in children aged 5 years and under. Cochrane Database of Systematic Reviews, 2012; Issue 11. Art. No.:CD008552.

Wolfenden L, Wyse RJ, Britton BI, Campbell KJ, **Hodder RK**, Stacey FG, McElduff P, James EL. Interventions for increasing fruit and vegetable consumption in preschool aged children (protocol). Cochrane Database of Systematic Reviews, 2010; Issue 6. Art.No.:CD008552.

CONFERENCE PRESENTATIONS GIVEN DURING CANDIDATURE AND RELEVANT TO THIS THESIS

During candidature, the candidate presented the contents of this thesis 17 times at conferences, 12 of which were at international conferences. The details of these presentations are provided below.

Oral presentation

Hodder RK, Freund M, Wolfenden L, Bowman J, Nepal S, Dray J, Kingsland M, Yoong SL, Wiggers J. Are universal school-based protective factors interventions effective in reducing adolescent substance use? Results from a systematic review. Australasian Society for Behavioural Health and Medicine - Australian Psychological Society College of Health Psychologists Conference, July 2017; Gold Coast, Australia.

Hodder RK, Freund M, Bowman J, Campbell E, Wolfenden L, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Effectiveness of a universal school-based intervention in reducing adolescent tobacco, alcohol and illicit substance use. Australasian Society for Behavioural Health and Medicine - Australian Psychological Society College of Health Psychologists Conference, July 2017; Gold Coast, Australia.

Hodder RK, Freund M, Bowman J, Campbell E, Wolfenden L, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Effectiveness of a universal school-based intervention in reducing adolescent tobacco, alcohol and illicit substance use within student subgroups: exploratory assessment. Australasian Society for Behavioural Health and Medicine - Australian Psychological Society College of Health Psychologists Conference, July 2017; Gold Coast, Australia.

Hodder RK, Freund M, Wolfenden L, Bowman J, Nepal S, Dray J, Kingsland M, Yoong S, Wiggers J. Systematic review of universal school-based 'resilience' interventions targeting adolescent tobacco, alcohol or illicit substance use. The 14th International Congress of Behavioral Medicine, December 2016; Melbourne, Australia.

Hodder R, Freund M, Wolfenden L, Bowman J, Nepal S, Dray J, Kingsland M, Yoong S, Wiggers J. Are universal school-based protective factor interventions effective in reducing

adolescent alcohol use: results from a systematic review. 42nd Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society, May 2016; Stockholm, Sweden.

Hodder RK, Freund M, Bowman J, Wolfenden L, Campbell L, Wye P, Hazell T, Gillham K, Wiggers J. A school-based resilience intervention to decrease adolescent tobacco, alcohol and illicit drug use: C-RCT protocol. Population Health Congress, September 2015; Hobart, Australia.

Hodder RK, Freund M, Bowman J, Wolfenden L, Gillham K, Dray J, Wiggers J. Tobacco, alcohol and illicit drug use in adolescents: does resilience matter? Australasian Society for Behavioural Health and Medicine. 12th Annual Scientific Meeting. February 2015; Perth, Australia.

Hodder RK, Freund M, Bowman J, Wolfenden L, Campbell L, Wye P, Hazell T, Gillham K, Wiggers J. A cluster randomised trial of a school-based resilience intervention to decrease tobacco, alcohol and illicit drug use in secondary school students: study protocol. Australasian Society for Behavioural Health and Medicine. 12th Annual Scientific Meeting. February 2015; Perth, Australia.

Hodder RK, Freund M, Bowman J, Wolfenden L, Gillham K, Dray J, Wiggers J. Tobacco, alcohol and illicit drug use in adolescents from disadvantaged areas: does resilience matter? 22nd Australian Health Promotion Association and 18th Chronic Disease Network; September 2014; Alice Springs, Australia.

Hodder RK, Freund M, Bowman J, Wolfenden L, Gillham K, Dray J, Wiggers J. Tobacco, alcohol and illicit drug use in adolescents: does resilience matter? 13th International Congress of Behavioral Medicine; August 2014; Groningen, the Netherlands.

Hodder R, Freund M, Daly J, Campbell E, Wolfenden L, Bowman J, Gillham K, Hazell T, Wiggers J. A school-based resilience intervention to decrease adolescent tobacco, alcohol and marijuana use: pilot results and study protocol for RCT. 6th International Drugs and Young People Conference; May 2011; Melbourne Australia.

Hodder R, Daly J, Freund M, Bowman J, Hazell T, Wiggers J. A school-based resilience intervention using the Health Promoting Schools framework to decrease adolescent

tobacco, alcohol and marijuana use. Australian Health Promoting Schools 8th National Conference; October 2010; Perth, Australia.

Hodder RK, Freund M, Bowman J, Wolfenden L, Campbell L, Wye P, Hazell T, Gillham K, Wiggers J. A cluster randomised trial of a school-based resilience intervention to decrease tobacco, alcohol and illicit drug use in secondary school students. Psychology Department Colloquium Series, The University of Newcastle. October 2011; Newcastle, Australia.

Poster presentation

Hodder RK, Campbell E, Freund M, Wolfenden L, Bowman J, Dray J, Green S, Gillham K, Wiggers J. Limitations of pragmatic approaches to school-based health promotion: a case study. Global Implementation Conference, June 2017; Toronto, Canada.

Hodder RK, Freund M, Bowman J, Campbell E, Wolfenden L, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Effectiveness of a school-based universal protective factor intervention in reducing tobacco, alcohol and illicit substance use in a population of adolescents: cluster-randomised controlled trial. The 14th International Congress of Behavioral Medicine, December 2016; Melbourne, Australia.

Hodder RK, Freund M, Bowman J, Campbell E, Wolfenden L, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Effectiveness of a universal school-based intervention in reducing tobacco, alcohol and illicit substance use within student subgroups: exploratory assessment. The 14th International Congress of Behavioral Medicine, December 2016; Melbourne, Australia.

Hodder RK, Freund M, Bowman J, Wolfenden L, Gillham K, Dray J, Wiggers J. Adolescent tobacco, alcohol and illicit drug use: does resilience matter? Population Health Congress, September 2015; Hobart, Australia.

CHAPTER 1

The need to prevent tobacco, alcohol and illicit substance use, and the potential for universal school-based interventions that address resilience protective factors to reduce such use by adolescents

INTRODUCTION

This chapter provides an overview of the need and opportunities for addressing the consumption of harmful substances (tobacco, alcohol and illicit drugs) by adolescents. It begins by describing the burden of disease that is attributable to tobacco, alcohol, and illicit substance use generally and for adolescents, both internationally and in Australia. The prevalence of tobacco, alcohol, and illicit substance use in adults and adolescents is then described, followed by an overview of international and Australian guidelines and legislation regarding the consumption of, and access to tobacco, alcohol and illicit substances by adolescents. Policy recommendations from high-income countries regarding interventions to prevent adolescent tobacco, alcohol and illicit substance use are then described, including recommendations regarding schools as an intervention setting, the implementation of universal prevention approaches in this setting, and the addressing of adolescent resilience as an intervention approach. An overview of evidence of the association between resilience protective factors and adolescent tobacco, alcohol, and illicit substance use is then presented, as is an overview of evidence regarding the effectiveness of interventions addressing such factors in reducing adolescent substance use. The chapter concludes by describing the aims of the thesis and the chapters that address each aim.

BURDEN OF DISEASE ATTRIBUTED TO TOBACCO, ALCOHOL AND ILLICIT DRUG USE

Tobacco, alcohol and illicit drug use each contribute considerably to the global burden of disease, and impose significant negative impacts at both individual and societal levels.[1;2]

Tobacco use

Use of tobacco has a causal relationship with various diseases including cancers (such as lung, pancreatic, cervical and stomach cancer), respiratory diseases (such as pneumonia and chronic respiratory diseases) and cardiovascular diseases (such as coronary heart disease).[3] In the most recent examination of the burden of tobacco undertaken in 2004, smoking was found to cause 71% of lung cancers, 42% of chronic respiratory disease and 10% of cardiovascular disease globally (Table 1.1).[4]

Table 1.1. Global estimates of tobacco-attributable death rates for selected diseases in 2004*

Diseases	Death rates (per 100,000)	Attributable to tobacco (Proportion)
All communicable diseases	226	5%
Tuberculosis	39	7%
Low respiratory infections	69	12%
All non-communicable diseases	1,136	14%
All malignant neoplasms	245	22%
Trachea, bronchus, lung cancers	45	71%
All other malignant neoplasms	200	12%
All cardiovascular diseases	570	10%
Ischaemic heart disease	243	12%
Cerebrovascular disease	183	7%
Other cardiovascular diseases	135	12%
All respiratory diseases	134	36%
Chronic obstructive pulmonary disease	103	42%
Other respiratory diseases	31	13%

*Table adapted from the World Health Organization 2012.[4]

Tobacco use makes the greatest contribution to the global burden of disease of all preventable risk factors. In terms of global mortality, the World Health Organization reported that approximately 5 million or 12% of all deaths,[4] and 6.3% of the global burden of disease and injury as measured by Disability Adjusted Life Years (DALYs) were attributed to tobacco use in 2010.[5] It is predicted that the global disease burden attributable to tobacco use will increase to 8.3 million deaths by 2030.[6]

Estimates across high-income countries (including the United States, Canada, United Kingdom, Australia and New Zealand) by the World Health Organization in 2004 reported tobacco use to be the leading risk factor for both mortality and burden of disease, accounting for 17.9% of all deaths and 10.7% of DALYs.[7] In Australia in 2011, tobacco use was estimated to be responsible for approximately 15,000 deaths and 9% of the burden of disease and injury as measured by DALYs.[8]

Between 2002 and 2030, across high-income countries, deaths attributable to tobacco are predicted to decline by 9%.[9] Even with a predicted decline, it is estimated that tobacco use will be responsible for more than a million deaths in high-income countries alone in 2030.[9]

According to the Australian Institute of Health and Welfare, the DALYs attributable to tobacco use in Australia between 2003 and 2011 declined by 0.2%.[10] Underlying this slight decline, was a large decrease in the burden of cardiovascular disease (26,000 DALYs), which was compensated by an increase in the burden for both cancer and respiratory diseases attributed to tobacco use (15,000 and 10,000 DALYs respectively).

Annually, tobacco-related harms were estimated to cost more than US$300 billion in the United States in 2014,[11;12] CAN$17 billion in Canada in 2002,[13] £13.9 billion the United Kingdom in 2014,[14] and NZ$1.7 billion in New Zealand in 2005.[15] In Australia, between 2004 and 2005, tobacco use was estimated to cost A$31.5 billion.[16]

Alcohol consumption

The harmful consumption of alcohol has a causal relationship with more than 200 diseases, injuries, and other health conditions (Table 1.2).[17] Such health impacts are caused by three mechanisms of harm: toxic effects on tissues and organs; intoxication, whereby physical coordination, consciousness, cognition, perception, affect or behaviour is impaired; and dependence, whereby self-control of drinking behaviour is impaired.[17] The main diseases and health conditions found to be causally linked with alcohol consumption include several types of cancers, cirrhosis of the liver, and pancreatitis. Injuries attributed to alcohol consumption include poisonings, road traffic incidents and violence.[18]

The occurrence of alcohol-related harm is determined primarily by the volume and pattern of alcohol consumption. In terms of volume, a dose-response relationship exists between most diseases and harms caused by alcohol consumption, with the higher the consumption of alcohol the larger the risk of disease or injury.[17] The pattern of alcohol consumption over time also impacts on the risk of harm. Heavy episodic consumption, that is, the consumption of 6 or more standard alcoholic drinks on one single occasion, is associated with harm irrespective of whether an individual's average level of alcohol consumption is relatively low.[17]

In terms of mortality, the harmful consumption of alcohol was reported to be responsible for 3.3 million or 5.9% of all deaths globally in 2012.[17] In the same year, 5.1% of the global burden of disease and injury as measured by DALYs was attributed to alcohol consumption equating to 139 million DALYs.[17] Globally, the harmful use of alcohol is a leading cause of

death and disability, with data indicating that of all causes of death and disability, the DALYs attributable to alcohol have risen from eighth place in 1990, to fifth place in 2010.[5]

Table 1.2. Global estimates of alcohol-attributable fractions for selected causes of death, disease, and injury*

Disease/Injury/Condition	% of disease burden attributable to alcohol	
	Deaths	DALYs
Alcohol use disorders	100%	100%
Fetal alcohol syndrome	100%	100%
Liver cirrhosis	50%	50%
Oral cavity and pharynx cancers	30%	31%
Pancreatitis	25%	27%
Laryngeal cancer	23%	24%
Oesophageal cancer	22%	23%
Interpersonal violence	22%	20%
Self-harm	22%	20%
Poisoning	18%	14%
Other unintentional injuries[a]	17%	14%
Falls	16%	13%
Traffic injuries	15%	13%
Drownings	13%	10%
Tuberculosis	12%	11%
Liver cancer	12%	12%
Epilepsy	12%	10%
Haemorrhagic stroke	11%	11%
Fire	11%	8%
Colorectal cancer	10%	10%
Hypertensive heart disease	8%	10%
Conduction disorders[b]	8%	10%
Breast cancer	8%	8%
Ischaemic heart disease	7%	5%
Lower respiratory infections	4%	2%
Pancreatic cancer	4%	4%
Ischaemic stroke	4%	4%
HIV/AIDS	1%	1%

[a] includes smothering, asphyxiation, choking, animal or snakebites, hypothermia and hyperthermia; [b] and other dysrhythmias. *Table adapted from World Health Organization (2014).[17]

The proportion of alcohol-attributed deaths is similar across high-income countries. For example, in 2012 the WHO Global Status Report of Alcohol and Health reported alcohol-attributable deaths as a proportion of all deaths to be 3.2% in the United States, 3.4% in Canada, 3.2% in the United Kingdom, and 2.8% in New Zealand.[17] In Australia, alcohol use was estimated to be responsible for 3.2% of all deaths in 2012,[17] and 5.1% of the burden of disease and injury as measured by DALYs in 2011.[8] The DALYs attributable to alcohol use are reported to have increased in Australia between 2003 and 2011 by 5.4%.[10]

Whilst there are limited comparable global data regarding the social and economic costs of alcohol misuse, data from high-income countries suggests a significant financial burden from such misuse. Alcohol misuse was estimated to cost US$234 billion in the United States in 2006,[19] CAN$14.6 billion in Canada in 2002,[13] £21 billion in the United Kingdom in 2009,[20] and NZ$4.9 billion in New Zealand in 2005/2006. In Australia, the cost of alcohol was estimated to be A$15.3 billion in 2004/2005.[16]

Illicit substance use

Illicit drugs are defined as those drugs whose non-medical use are prohibited under international drug control treaties, and include cannabis, opioids, cocaine, amphetamine-type stimulants and heroin.[21] Use of illicit drugs can lead to premature death in terms of drug overdoses, and is also associated with other substantial negative health impacts due to disability, including injury, organ failure, blood borne viruses (such as hepatitis C and Human Immunodeficiency virus/AIDS) and mental health problems.[22]

With respect to global mortality, it was estimated that 207,400 deaths were attributable to illicit drug use in 2014, which corresponds to 43.5 deaths per million people.[23] Drug overdose deaths were estimated to account for up to a half of all such drug related deaths.[23] Additionally, 0.8% of the global burden of disease and injury in 2000 as measured by DALYs was attributed to illicit drug use.[21] Table 1.3 shows the global DALYs attributable to amphetamine, cannabis, cocaine, and opioid dependence in 2010. Estimates across high-income countries (including the United States, United Kingdom, Canada, New Zealand and Australia) by the World Health Organization in 2004 reported illicit substance use to be the eighth leading risk factor for the burden of disease, accounting for 2.1% of DALYs.[7]

Table 1.3. Estimated overall global DALYs for drug use disorders in 2010*

Drugs / diseases	DALY (number)
All drugs	19 995 000
Cannabis dependence	2 057 000
Amphetamine dependence	2 617 000
Cocaine dependence	1 110 000
Opioid dependence	9 152 000
Other drug use disorders	5 059 000

*Table adapted from Degenhardt 2013.[21]

In Australia, illicit substance use was estimated to be responsible for 976 drug-induced deaths in 2007,[24] and 1.8% of the burden of disease and injury as measured by DALYs in 2011.[10] The proportion of the disease burden as measured by DALYs that was attributable to drug use in Australia by disease group is shown in Table 1.4. The DALYs attributable to illicit substance use was reported to have increased by 22% in Australia between 2003 and 2011.[10]

Table 1.4. Proportion of burden attributable to drug use by disease in Australia, 2011*

Diseases	DALY (number)	DALY (per cent)
Drug use disorders (excluding alcohol)	31,951	100.0%
Chronic liver disease	24,531	51.5%
Liver cancer	16,257	55.3%
Suicide and self-inflicted injuries	6,594	5.8%
HIV/AIDS	252	5.0%
Hepatitis B (acute)	107	44.6%
Hepatitis C (acute)	49	82.5%

*Table adapted from AIHW 2011.[10]

The worldwide cost of illicit drug use is not feasible to estimate, given the lack of cost estimate data for the majority of countries, and inconsistency in the calculation of estimates between those countries for which cost estimate data is available.[25] However, within high-income countries, illicit drug use has been estimated to cost US$193 billion in the United States[26] in 2007, CAN$8.2 billion in Canada in 2002,[13] £8.4 billion in the United Kingdom in 2010,[27] and NZ$1.8 billion in New Zealand in 2014/2015.[28] In Australia, the cost attributable to illicit substance use was estimated to be A$8.2 billion in 2004/2005.[16]

Burden of disease associated with tobacco, alcohol and illicit substance use by adolescents

Substance use during adolescence, defined by the World Health Organization as individuals aged 11-19 years,[29] has short term health impacts which places individuals at higher risk of disability and mortality early in life.[30] The short term health consequences of tobacco use in young people include respiratory (e.g. a reduced rate of lung growth,[31] shortness of breath[32]) and non-respiratory effects (e.g. reduced physical fitness,[31] increased visits to health professionals for emotional or psychological complaints[32]), addiction to nicotine and increased risk of using other drugs (e.g. alcohol, marijuana and cocaine).[32] The short term effects of alcohol use in young people include a general impairment of ability (e.g. impairment of vision, slower response time and difficulty concetrating), mood changes (e.g. feelings of depression when blood alcohol levels decrease, and feeling more positive when blood alcohol levels increase), and increased risk-taking which may lead to decision making without consideration for long term consequence (e.g. unsafe sexual practices and driving under the influence of alcohol).[33] The short term health effects of illicit drug use during adolescence include substance dependence, psychotic symptoms, fatal overdose, road traffic accidents, and HIV, hepatitis C virus and hepatitis B virus infection.[34]

Substance use that is initiated during adolescence also has longer terms impacts. The younger the age of initiation to such substance use there is a greater likelihood of ongoing use, dependence in later life,[4] and a higher risk of developing chronic disease in adulthood.[30] For example, early initiation to tobacco has been found to be associated with subsequent regular smoking, irrespective of gender or ethnicity.[35] The risk of harm from smoking is also magnified by smoking at an early age, with studies showing early signs of cardiovascular disease in adolescent smokers, and that smoking at an early age increases the risk of lung cancer.[21;36] Consumption of alcohol during adolescence, in particular before age 14 has been found to lead to increased risk of alcohol consumption, dependence and abuse in adults.[21] Adolescents have been found to be more vulnerable to alcohol-related harm compared to other age groups from a given volume of alcohol.[17] With respect to chronic disease risk, in youth aged 15-24 years, alcohol consumption and illicit drug use are the first and fifth ranked risk factors contributing to global disability adjusted life years (8% and 2% of global DALYs respectively).[37] Whilst tobacco smoking is often initiated in youth, it is reported to not impact on DALYs in youth aged 15-24 years, with impacts from tobacco smoking only apparent later in life.[37] For example, in the 25-59 year and 60 years and over age group

tobacco smoking is the fourth and second ranked risk factor that contributes to global DALYs respectively.[37]

A range of other negative social and behavioural outcomes have also been found to be associated with tobacco, alcohol and illicit substance use in adolescence. These include lower educational attainment, criminal activity, violence and aggressive behaviours, risky sexual behaviour, intentional self-harm, and social problems including impacts on employment and financial independence.[34]

PREVALENCE OF TOBACCO, ALCOHOL AND ILLICIT SUBSTANCE USE IN ADULTS

Tobacco use

Globally it was estimated that between 11% and 39% of adults (15 years or older) were current smokers in 2015-2016 (Figure 1.1).[38] In high-income countries it is estimated between 14.7%[39] and 17.2%[40] of adults are current smokers (Table 1.5).

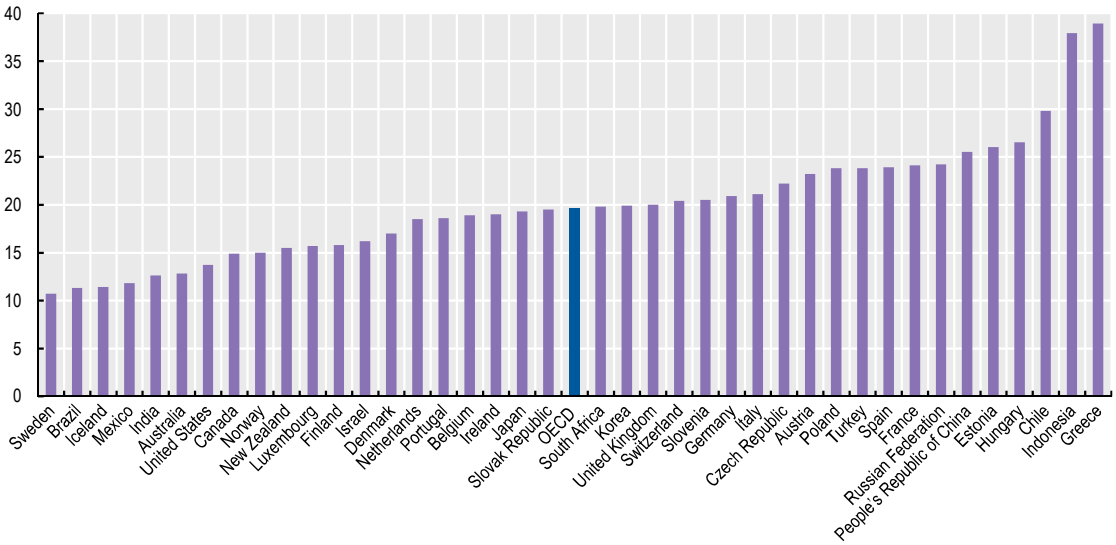

Figure 1.1. Global estimates of adult population (aged 15 and over) smoking daily (as percentage of adult population), 2015-2016[38]

In Australia, 14.7% of adults were reported to be daily smokers in 2014-2015.[50] However, relatively higher rates of smoking are evident in some population groups. In 2011,

Table 1.5. Prevalence of tobacco, alcohol and illicit substance use in selected high-income countries

Country	Tobacco use	Alcohol use	Illicit substance use
United States	15.1% people aged 18 or over are current smokers (2015)[41]	52% are current regular drinkers (at least 12 drinks in the last year; 2011)[42] 16.9% of people aged 15 or over heavy episodic drinking (2010)[17,a]	Cannabis use 14.1% of people aged 15-64 years (2010)[43] illicit drug use by persons aged 12 years or over 16.0% (2012)[43]
Canada	15% of people aged 15 or over current smokers (2013)[44]	76% of people aged 15 or over consumed alcohol in the past year (2013)[44] 17.8% of people aged 15 or over heavy episodic drinking (2010)[17,a]	11% of people aged 15 or over used an illicit drug (2013)[44,d] 11% of people aged 15 or over used cannabis in the past year (2013)[44] 0.2% - 1% of people aged 15 or over used cocaine or crack, hallucinogens, ecstasy, speed/methamphetamine in the last year (2013)[44]
United Kingdom	17.2% of people aged 18 or over were current smokers (2015)[40]	54-68% had an alcoholic drink in the last week (2010)[45] 28.0% of people aged 15 or over heavy episodic drinking (2010)[17,a]	9% of adults reported illicit drug use in last year (year)[46]
New Zealand	16.3% of people aged 15 or over current smokers[c] (2015/2016)[47] 14.2% of people aged 15 or over daily smokers (2015/2016)[47]	80.0% of people aged 15 or over past-year drinker (2015/2016)[47] 20.8% of people aged 15 or over hazardous drinkers[b] (2015/2016)[47]	1.1% of adults aged 16-64 years reported amphetamine use in the past year (2015-2016)[48] 11% of adults aged 15 and over reported cannabis use in the past year (2012-2013)[49]

Country	Tobacco use	Alcohol use	Illicit substance use
Australia	14.7% of adults were daily smokers (2014-2015)[39;50] 12.8% of people aged 14 or older were daily smokers (2013)[51] 15.5% of people aged 14 or older were current smokers (2013)[51]	78.2% of people aged 14 or older reported recent use of alcohol (2013)[51] 6.5% of people aged 14 or older reported consuming alcohol daily (2013)[51] 18.2% of people age 14 or older reported consuming more than 2 standard drinks per day (risk of lifetime harm; 2013)[51] 26.4% of people aged 14 or older reported consuming more than 4 standard drinks on 1 occasion at least once a month (monthly risk of single occasion harm; 2013)[51] 39.5% consume alcohol weekly (2010)[8] 10.9% of people aged 15 or over heavy episodic drinking (2010)[17,a]	42% of people aged 14 or older reported illicit drug use in their lifetime (2013)[51] 12.0% of people aged 14 or older reported recent use of any illicit drug (2013)[51] 10.2% of people aged 14 or older reported use of marijuana/cannabis (2013)[51] 2.5% of people aged 14 or older reported ecstasy use (2013)[51] 2.1% of people aged 14 or older reported meth/amphetamine use (2013)[51] 2.1% of people aged 14 or older reported cocaine use (2013)[51] 1.3% of people aged 14 or older reported hallucinogen use (2013)[51] 0.1% of people aged 14 or older reported heroin use (2013)[51]

[a] Consumed at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days; [b] Defined as a score of 8 points or more on the Alcohol Use Disorders Identification Test (AUDIT); [c] Smoke at least monthly; [d] Defined as use of at least one of six illicit drugs in the past 12 months (cannabis, cocaine or crack, speed, ecstasy, hallucinogens or heroin).

Aboriginal and Torres Strait Islander people compared to non-Indigenous people, people living in remote and very remote geographic locations compared to those living in major cities, those living in the most socioeconomically disadvantaged areas compared to those in other areas, were more likely to smoke.[8]

There is an overall worldwide declining trend in the prevalence of tobacco smoking, particularly in many high-income countries including the United States, Canada, the United Kingdom and New Zealand.[40;52] A similar pattern of declining prevalence is evident in Australia; with rates of smokers continuing to decline from 16.1% in 2011-2012 to 14.5% in 2014-2015.[39] However, smoking prevalence has decreased to a lesser extent for some subgroups. For example, rates of smoking between 2011-2012 and 2014-2015 have decreased to a greater extent in younger compared to older adults.[39]

Alcohol consumption

Globally, there is considerable variation in the volume and patterns of alcohol consumption by adults. Worldwide in 2015-2016 it was estimated that people aged 15 years or over consumed between 0.1 and 12.2 litres of alcohol per capita (Figure 1.2). However, the majority of people world-wide abstain from consuming alcohol, with 61.7% of people aged 15 years or older reporting no alcohol consumption in the previous year.[17] The worldwide prevalence of heavy episodic drinking (defined as 60 grams or more of alcohol in a single occasion monthly) in adults in 2010 was 16%.[17] In high-income countries, the prevalence of heavy episodic drinking ranged from 4.5%[17] in New Zealand to 28.0%[17] in the United Kingdom in 2010 (Table 1.5).

In Australia in 2014-2015, 10.7% of people aged 18 years or over had never consumed alcohol and 80.6% had consumed alcohol in the previous year.[39] Regarding the amount of alcohol that was consumed, 17.4% of people aged 18 years or over reported consuming more than two standard drinks per day and 44.4% consumed more than 4 standard drinks on a single occasion.[39] Relatively higher rates of alcohol use are evident in a number of Australian population subgroups. For example, in 2011 people living in remote and very remote geographic locations compared to those living in major cities were more likely to consume more than two standard drinks of alcohol per day.[8]

Whilst there are some limitations of the data collected globally regarding the prevalence of current drinkers, there is an increasing global trend in the volume of alcohol consumption

per capita.[17] However, this increase is not evident in all high-income countries. For example, between 2003-2005 and 2008-2010, the amount of consumption of alcohol by adults 15 years or older was stable in the United States (9.5 and 9.2 liters per capita respectively) and Canada (9.8 and 10.2 litres per capita), decreased in the United Kingdom (13.2 to 11.6 litres per capita) and increased in line with overall global trends in New Zealand (9.4 to 10.9 litres per capita).[17]

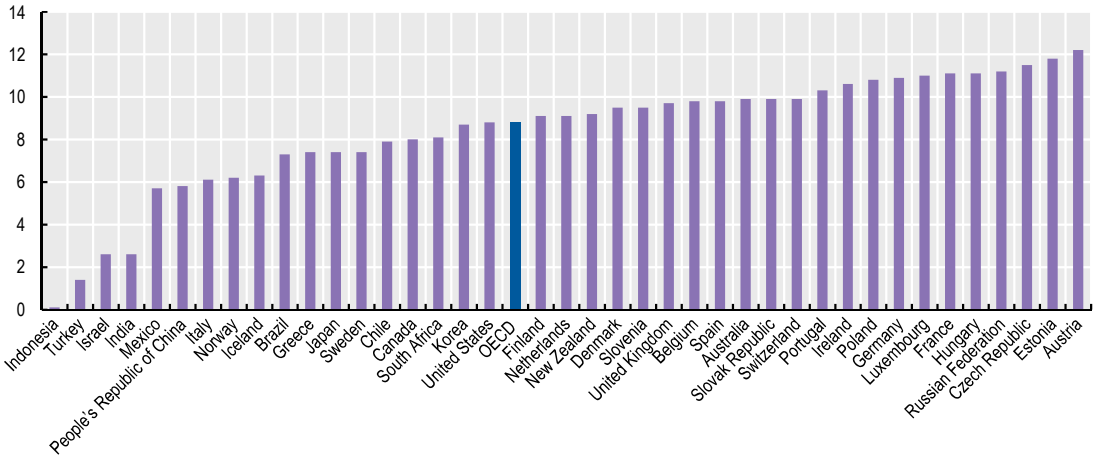

Figure 1.2. Global estimates of alcohol consumption among population aged 15 and over (litres per capita), 2015-2016[53]

In Australia, there is some evidence of a declining trend in alcohol consumption with variation between measures of alcohol consumption and population subgroups. The proportion of adults who consumed more than two standard drinks a day decreased from 19.5% in 2011-2012 to 17.4% in 2014-2015,[39] with the proportion of males doing so decreasing from 29.1% to 17.4%, with no change for females over the same time period (2011-2012 10.1%, 2014-2015 9.3%). In contrast, the proportion of adults consuming four or more alcoholic drinks on a single occasion in the last year was stable between 2011-2012 (44.7%) and 2014-2015 (44.0%).[39]

Illicit substance use

In 2014 it was estimated that globally 5.2% of individuals or 247 million people used an illicit substance in the past year.[23] The illicit substances most commonly reported to be used were cannabis, amphetamines, opiates, opioids, and heroin.[23]

Whilst there is some inconsistency in the measurement of illicit substances across high-income countries, the reported prevalence of any illicit drug use in the last year in the United States, Canada, United Kingdom and New Zealand ranges from 0.2%[44] to 11%[49] (Table 1.5). Across all such countries, cannabis is consistently reported to be the illicit drug most commonly used.

In Australia in 2013, 15% of people aged 14 years or older reported illicit drug use in the previous 12 months.[51] Relatively higher rates of illicit drug use are evident in some population groups. In 2011, Aboriginal and Torres Strait Islander people compared to non-Indigenous people, people living in remote and very remote geographic locations compared to those living in major cities, and people who were unemployed compared to those who were employed, were more likely to have used an illicit drug.[8]

Global trends in the prevalence of illicit substance use vary by substance type. For example, data from the 2016 United Nations Office on Drugs and Crime[23] report show the prevalence of cannabis and amphetamine use is stable, whereas the prevalence of cocaine use is rising.[23]

Within Australia, trends in the prevalence of illicit substance use similarly vary by substance. Overall, the proportion of people aged 14 or older in Australia that recently used any illicit drug was stable between 2004 and 2013 at 15%. Whilst this stable trend was evident for a number of illicit drugs (including cannabis, methamphetamine) it was not evident for use of other illicit drugs. For example, between 2010 and 2013, recent use of ecstasy declined whereas use of cocaine in the last 12 months increased.[54]

PREVALENCE OF TOBACCO, ALCOHOL AND ILLICIT SUBSTANCE USE IN ADOLESCENTS

Substance use by adolescents is common, is often considered a normal part of adolescence, and can be intermittent or experimental. However, initiation to substance use during adolescence increases the risk of both short and long-term harms as described in section 1.4 above.

Tobacco use

The Global Youth Tobacco Survey estimated the current use of tobacco products by adolescents aged 13-15 years from 131 countries between 2007 and 2014 to be 18% for males and 8% for females.[55] In high-income countries, between 23%[56] and 45%[57] of all adolescents had ever smoked a cigarette and between 5%[58] and 11%[44] were current smokers (typically defined as one or more cigarettes in the last week) (Table 1.6).

In Australia in 2014, of adolescents aged 12-17 years, 19% had ever smoked a cigarette, 8% had smoked a cigarette in the last month and 5% were current smokers.[59] The prevalence of tobacco smoking is similar for males and females aged 12-17 years, and tobacco smoking increases with age, with 6% of 12 year olds having ever smoked a cigarette compared with 39% of 17 year olds.[58]

Across high-income countries, such as the United States, Canada, the United Kingdom and New Zealand the prevalence of current smoking by adolescents is declining.[55] In Australia, the prevalence of smoking in adolescents is similarly declining. For example, only 5% of 12-17 year olds were current smokers in 2014 compared to 7% in 2008.[58] This decline is similar across both males and females, and younger and older adolescents.[58]

Alcohol consumption

Whilst global estimates of adolescent alcohol use are limited due to lack of survey data from low income countries,[18] between 43%[56] and 71%[57] of adolescents in high-income countries have ever consumed an alcoholic drink (Table 1.6). With respect to more regular use, between 25% and 30% of all adolescents in high-income countries consumed an alcoholic drink in the last month. For measures of risky or binge drinking (typically defined as 5 or more drinks on one day in the last month), between 22% and 52% of all adolescents report risk drinking.

In Australia, 68% of adolescents aged 12 to 17 years had ever had an alcoholic drink, 25% had consumed alcohol in the last month and 5% reported single occasion risky drinking (5 or more alcoholic drinks on one occasion) in the last week in 2014.[58] The prevalence of alcohol use differs by both age and gender. For example, in 2014 the prevalence of alcohol use in the past year increased with age (19% of 12 year olds, 76% of 17 year olds), and

Table 1.6. Prevalence of tobacco, alcohol and illicit substance use in adolescents from selected high-income countries

Country	Tobacco use	Alcohol use	Illicit substance use
United States	Ever: 45% (Grades 7-12; 2011)[57] Daily: 1.4% (8th graders; 2014); 3.2% (10th graders; 2014); 6.7% (12th graders; 2014)[60] Use in last month: 8% (12-17 years; 2011)[61]	Ever: 71% (Grades 7-12; 2011)[57] Use in last month: 13% (12-17 years; 2011)[61] Use in last month: 38% (Grades 7-12; 2011)[57] Binge drinking[a] last month: 7% (12-17 years; 2011)[61] Binge drinking[a] last month: 22% (Grades 7-12; 2011)[57] Heavy episodic drinking last 30 days[b]: 19.8% (15-19 years; 2010)[17]	Ever any drugs: 31% (15 years; 2016)[60] Any drug in last year: 12% (15 years; 2016)[60] Any drug in last month: 6% (15 years; 2016)[60]
Canada	Ever: 25.5% (15-19 years; 2010)[62] Current smoker: 11% (15-19 years; 2013); 6% (15-17 years; 2013)[44] Daily smoker: 5% (15-19 years; 2013); 2% (15-17 years; 2013)[44]	Use in past year: 60% (15-19 years; 2013)[44] Heavy episodic drinking[b] last 30 days: 33.2% (15-19 years; 2010)[17]	Any illicit drugs: 23% (15-19 years; 2013)[44] Used cannabis in last year: 22% (15-19 years; 2013)[44]
United Kingdom	Ever: 23% (11-15 years; 2012)[56] Use in last week: 4% (11-15 years; 2012)[56] Regular smoker: 10% (15 year; 2012)[56]	Ever: 43% (11-15 years; 2012)[56] Ever drunk: 74% (15 years; 2012)[56] Drunk in last week: 25% (15 years; 2012)[56]	Ever marijuana: 40% (11-15 years; 2012)[56] Used marijuana in last 30 days: 23% (11-15 years; 2012)[56]

Country	Tobacco use	Alcohol use	Illicit substance use
		Heavy episodic drinking[b] last 30 days: 40.5% (15-19 years, 2010)[17]	Ever used cocaine: 7% (11-15 years; 2012)[56] Used cocaine in the last 30 days: 3% (11-15 years; 2012)[56] Ever used ecstasy: 8% (11-15 years; 2012)[56] Ever used hallucingens: 9% (11-15 years; 2012)[56] Ever used heroin: 3% (11-15 years; 2012)[56] Ever used methamphetamine: 4% (11-15 years; 2012)[56]
New Zealand	Current smoker: 6% (15-17 years; 2015/2016)[47]	Use in last year: 57% (15-17 years; 2015/2016);[47] Heavy episodic drinking[b] last 30 days: 17.8% (15-19 years; 2010)[17]	At least monthly marijuana: 22.6% (12-18 years; 2012)[63]
Australia	Ever: 6.8% (12-17 years; 2013)[51] Daily smoker: 3.4% (12–17 years; 2013)[51] Current smoker: 5.1% (12-17 years; 2014)[58] Weekly use: 1.1% (12–17 years; 2013)[51] Use in last month: 7.5% (12-17 years; 2014)[58]	Ever: 68.0% (12-17 years; 2014)[58] Recent drinker[c]: 28.8% (12-17 years; (2013)[51] Current drinker[d]: 14.6% (12-17 years; 2014)[58] Weekly use: 3.4% (12-17 years; 2013)[51]	Ever marijuana: 15.8% (12-17 years; 2014)[58] Marijuana in last month: 7.1% (12-17 years; 2014)[58] Ever any illicit: 14.9% (12-17 years; 2014)[58]

Country	Tobacco use	Alcohol use	Illicit substance use
	Use in last year: 13.8% (12-17 years; 2014)[58]	Daily use: <0.1% (12-17 years; 2013)[51] Use in last month: 25.0% (12-17 years; 2014)[58] Use in last year: 45.1% (12-17 years; 2014)[58] Single occasion risky drinker[e]: 4.9% (12-17 years; 2014)[58] Heavy episodic drinking[b] last 30 days: 19.6% (15-19 years; 2010)[17]	Any illicit last month: 6.9% (12-17 years; 2014)[58]

[a] 5 or more alcoholic drink on one occasion; [b] Consumed at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days; [c] Consumed at least a full serve of alcohol in the previous 12 months; [d] Consumed alcohol in the past 7 days; [e] Drank five or more drinks on one day in past seven days.

depending on age group, either males or females reported a higher prevalence of use (15 year olds: females were more likely than males; 12-13 year olds: males were more likely than females).[58]

The prevalence of alcohol use by adolescents is declining in high-income countries such as the United States, Canada, the United Kingdom and New Zealand.[58;64;65] Consistent with international trends, the proportion of students reporting alcohol use in Australia is also declining. For example, the proportion of adolescents aged 12 to 17 years who consumed alcohol in the past week, month and in their lifetime, was significantly lower in 2014 compared to 2011 (past week: 14.7% v 17.4%; past month: 25.0% v 29.1%; lifetime: 68.0% v 74.0%; $p<0.01$).[58] Such declines in prevalence are consistent across both males and females, and younger and older adolescents.[58]

Illicit substance use

A global survey in 2012 reported 17.9% of adolescents aged 12-17 years reported use of any illicit substance.[22] In high-income countries between 15%[58] and 40%[56] of adolescents have ever used an illicit substance, and between 6%[60] and 23%[56] have used an illicit substance in the last month (Table 1.6). The most commonly used substances across such countries were marijuana (23%), hallucinogens (9%), ecstasy (8%) and cocaine (7%).[57]

In 2014 in Australia, of all adolescents aged 12-17 years, 16% had used marijuana, 3% had used hallucinogens, 3% had used ecstasy, and 2% each had used amphetamines, opiates or cocaine.[58] The use of substances such as cannabis, hallucinogens, ecstasy and amphetamine by adolescents aged 12-17 years appears to increase with age, whereas the use of inhalants appears to decrease with age.[58] Differences by gender in the use of illicit substances is evident for some age groups for some substances, with males more likely to use illicit substances than females.[58]

The prevalence of illicit substance use in adolescents internationally is reported to be declining. Global survey data from adolescents aged 12-17 years reported use of any illicit substance to be at the lowest prevalence in 10 years in 2012 at 17.9% compared with 19.0% in 2011.[22] This decline in any illicit substance use has been reported for a number of high-income countries including the United States,[60] the United Kingdom[56] and New Zealand,[63] whereas for other high-income countries such as Canada[44] the prevalence of illicit substance use by adolescents is reported to be stable.

Within Australia the proportion of adolescents aged 12-17 years reporting any illicit substance use in their lifetime did not change between 2008 and 2014.[58] Whilst the use of cannabis over the same time period did not change, differing patterns of use were found for other illicit substances. Between 2008 and 2014 the prevalence of inhalant, hallucinogen, amphetamine, opiate and cocaine use by adolescents aged 12-17 years declined.[58] Similarly, the use of ecstasy by 12-17-year-old adolescents declined between 2008 and 2014, whereas ecstasy use in the last month by 16-17 year olds between 2011 and 2014 increased.[58] Such trends in use across all illicit substances were similar when examined by age and gender.[58]

PREVENTION OF TOBACCO, ALCOHOL AND ILLICIT SUBSTANCE USE AMONG ADOLESCENTS

Various population level initiatives are implemented by governments to prevent the harm caused by the use of tobacco, alcohol and illicit substances. Such initiatives include legislation, regulation, and mass media campaigns. In response to evidence that first use of such substances typically occurs during adolescence, and that such use during adolescence predicts greater harm and dependence later in life, governments have implemented a range of initiatives that specifically aim to prevent substance use by adolescents (see Table 1.7). Such initiatives include population wide guidelines with respect to the consumption of tobacco and alcohol, with specific guidance for children and adolescents; legislation to restrict the availability or access of tobacco, alcohol and illicit substances by children and adolescents; and national substance use prevention strategies that provide broad recommendations regarding interventions to prevent tobacco, alcohol and illicit substance use by adolescents.

Guidelines regarding the safe consumption of tobacco and alcohol

Tobacco use

As reported by the United States Surgeon General in 2010, there is no safe level of tobacco consumption or exposure to second hand tobacco smoke.[66] This finding extends to all tobacco products, including smoking cigarettes, pipes, cigars and smokeless tobacco, and all members of the population, including adolescents.

Table 1.7. Population level substance use prevention initiatives applied to prevent tobacco, alcohol and illicit substance use in young people*

Strategy	Hypothesised mechanism through which effect occurs	Tobacco	Alcohol	Illicit substances
Scheduling of substances under international conventions that do not permit use for non-medical purposes	Substances will be available and used for only medical or scientific purposes, on the assumption that people will be deterred from using illegal substances in fear of criminal penalties for selling and use	n/a	n/a	✓
Availability restrictions	Restrict the number and type of outlets that can sell the substance to reduce sales and overall consumption	✓	✓	n/a
Sales restrictions	Restriction of selling hours might reduce consumption and acute harms associated with use	✓	✓	n/a
Minimum legal age for use	Substance use will be minimised because it is not legal to purchase; implemented through civil penalties for selling and use of substance	✓	✓	n/a
Taxation	Increasing price will decrease demand and use	✓	✓	n/a
Banning advertising of products	Reduces the extent to which substances are marketed and promoted to reduce acceptability and normalisation of use	✓	✓	n/a
Mass media campaigns	Young people will receive messages from governments or other agencies about the harms of using drugs and might be deterred from doing so	✓	✓	✓
Psychologically-based interventions targeting populations of young people (e.g. schools)	Young people will learn about the risks and harms of using substances, and develop skills to refuse offers to use substances	✓	✓	✓
Psychologically-based interventions targeting parents of young people	Family-based interventions focus on psychosocial development rather than exclusively on the prevention of the target drug use, and might potentially improve many areas of a young person's development, including information about substance use, development of rules, monitoring and supervision and parent–child communication	✓	✓	✓

*Adapted from Stockings 2016.[67]

Alcohol consumption

There is uniformity across international guidelines that adult consumption of alcohol beyond a specified level should be avoided to reduce risk of harm,[68-72] however there is no consensus regarding what actual level of alcohol consumption is 'safe' to consume on a daily basis or a single occasion to reduce either acute or chronic risk of harm (Figure 1.3).

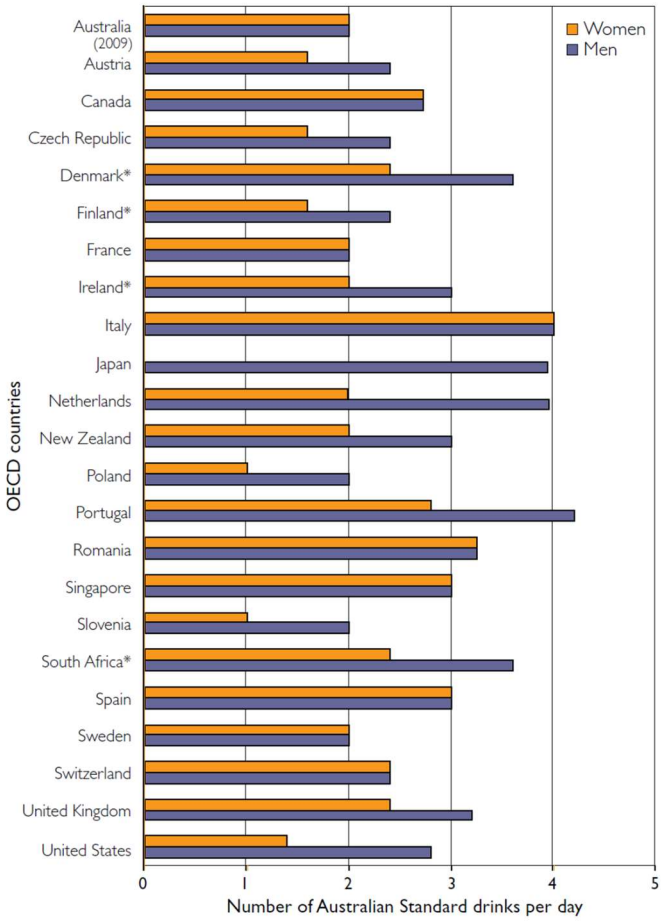

Figure 1.3. International recommendations regarding safe level of alcohol consumption per day in adults to avoid long term risk of harm compared to Australian guidelines and standard drinks[69]

Across high-income countries there is similar variability in recommendations regarding the safe level of alcohol consumption by adolescents (Table 1.8). With respect to children and young people, guidelines from the United States,[68] New Zealand[70] and Australia[69] provide consistent specific guidance and recommend not drinking alcohol to be the safest option for

Table 1.8. Guidelines regarding the safe consumption of alcohol in selected high-income countries

Country	Guideline	Recommendation for adults	Recommendation for adolescents
United States	2015-2020 Dietary Guidelines for Americans[68]	Women consume no more than one alcoholic drink[a] per day Men consume no more than 2 per day.	Anyone younger than 21 years of age should not consume alcohol.
Canada	Low-Risk Alcohol Drinking Guidelines[72]	Reduce long-term health risks by drinking no more than: • 10 standard drinks[b] a week for women, with no more than 2 standard drinks a day most days; • 15 standard drinks a week for men, with no more than 3 standard drinks a day most days; • Plan non-drinking days every week to avoid developing a habit. Reduce risk of injury and harm on any single occasion: • Women drink no more than 3 standard drinks; • Men drink no more than 4 standard drinks.	Delayed at least until the late teens and be consistent with local legal drinking age laws. Once a decision to start drinking is made, drinking should occur in a safe environment, under parental guidance and at low levels (i.e., one or two standard drinks[a] once or twice per week).
United Kingdom	United Kingdom Chief Medical Officer Guidelines[71]	Drinking no more than 14 units of alcohol per week.	No specific guidelines for children and adolescents.
New Zealand	Ministry of Health recommendation[70]	To reduce long term risk of harm: • Women drink no more than two standard drinks[e] a day and no more than 10 standard drinks a week, inclusive of two alcohol-free days a week; • Men drink no more than 3 standard drinks a day to reduce long-term health risks and no more than 15 standard drinks a week, inclusive of two alcohol-free days a week. To reduce risk of injury on a single occasion of drinking: • Women drink no more than 4;	Not drinking alcohol is recommended to be the safest option for children and young people.

Country	Guideline	Recommendation for adults	Recommendation for adolescents
		• Men drink no more than 5 standard drink on any single occasion.	
Australia	National Health and Medical Research Council guidelines[69]	Long term risk of harm: • Consume no more than two standard drinks[d] a day to reduce the risk of alcohol-related harm over a lifetime. Short term risk of alcohol related injury on a single occasion of drinking: • No more than four standard drinks should be consumed.	Not drinking and delaying initiation of drinking alcohol for children and young people under the age of 18 years is recommended.

[a] One alcoholic drink-equivalent is defined as containing 14 grams (0.6 fl oz) of pure alcohol; [b] A "standard drink" is equal to a 341 ml (12 oz.) bottle of 5% strength beer, cider or cooler; a 142 ml (5 oz.) glass of 12% strength wine; or a 43 ml (1.5 oz.) shot of 40% strength spirits (NB: 1 Canadian standard drink = 17.05 ml or 13.45 g of ethanol); [c] One standard drink equals 10 grams of pure alcohol; [d] 10g of alcohol (equivalent to 12.5 mL of pure alcohol).

children and young people (Table 1.8). No guidance specific to adolescents is provided in United Kingdom alcohol consumption guidelines,[71] and both delayed initiation and a low level of consumption is recommended for young people in the Canadian Low-Risk Alcohol Drinking Guidelines.[72]

Legislation to restrict the availability of, or access to tobacco, alcohol and illicit substance use by children and adolescents

Across high-income countries, laws prohibit the purchase and consumption of tobacco and alcohol by some people, and the use of most illicit substances by all people (e.g. cannabis, opiods). For tobacco and alcohol this variously involves legislation covering who can purchase; the location of consumption; time and day of purchase and consumption; the product type available for purchase; and the promotion of products. Legislation that relates specifically to adolescents in selected high-income countries is summarised in Table 1.9 and the following section.

Tobacco use

To restrict access to and subsequent harm from tobacco products, laws are implemented by governments internationally making it illegal to sell or supply tobacco products to children and adolescents. In the United States, Canada, the United Kingdom, New Zealand and Australia the minimum legal age to purchase tobacco products is 18 years of age (Table 1.9).[73-77]

Alcohol consumption

Governments internationally implement legislation that relate to alcohol and children and adolescents. Such legislation addresses the age at which it is legal for adolescents to consume, purchase or attend premises that supply alcohol, as well as legislation related to the supply of alcohol to children and young people, and alcohol advertising. Whilst there is variation both between, and within high-income countries the most common legislation relates to the age at which it is legal to purchase alcohol and the age at which it is legal to consume alcohol. The legal age of alcohol purchase across high-income countries ranges from 18 to 21 years of age.[78-84] The age from which it is legal to consume alcohol generally ranges from 16 to 21 years of age, however

Table 1.9. Legislation regarding the sale to and consumption of tobacco, alcohol and illicit substances by adolescents in selected high-income countries

Country	Tobacco legislation	Alcohol legislation	Illicit substance legislation
United States	The Family Smoking Prevention and Tobacco Control Act[73] restricts tobacco marketing and sales to youth by banning: • Sales to minors; • Vending machine sales (except in adult-only facilities); • Sale of packages of fewer than 20 cigarettes; • Tobacco-brand sponsorships of sports and entertainment events or other social or cultural events; • Free giveaways of sample cigarettes and brand-name non-tobacco promotional items. Federal law requires states to have a minimum age of 18 years for sale/purchase of tobacco products.	National Minimum Drinking Age Act[78] bans the purchase of alcoholic drinks by people under the age of 21 years. The legal age of alcohol consumption varies by individual states. All states prohibit the provision of alcohol to children, however within a number of states it is legal to provide alcohol to your own child.	The Controlled Substance Act[85] prohibits the possession of controlled substances including cannabis, cocaine, amphetamines, ecstasy, heroin.
Canada	The Tobacco Act[74] prohibits: • Sale of tobacco products to persons under 18 years of age; • Promotion and advertising of tobacco products when the terms "light" or "mild" are used.	Under the Constitution of Canada,[79] each province or territory sets its own drinking age which ranges from 18-19 years of age. In most provinces and territories alcohol may not be sold to persons of legal age who intend to transfer it to minors.	Controlled Drugs and Substances Act[86] prohibits the posession of various illicit drugs including cannabis, methamphetamines, amphetamines, LSD.

Country	Tobacco legislation	Alcohol legislation	Illicit substance legislation
United Kingdom	The Children and Young Persons (Sale of Tobacco etc.) Order 2007[75] states the minimum purchase age to be 18 years of age. Tobacco Advertising and Promotion Act 2002 ("TAPA")[87] governs tobacco advertising, promotion and sponsorship, other than on broadcast media. The Tobacco Advertising and Promotion (Display) (England) Regulations 2010 prohibit the display and advertising of tobacco products in most retail shops.	Licensing Act 2003[80] (England and Wales) states it is illegal to sell, serve, offer or consume alcoholic beverages on licensed premises under the age of 18, with the exception of minors aged 16 or 17 who may consume wine, beer or cider on licensed premises when ordered with a meal, and accompanied by an adult.	Misuse of Drugs Act 1971[88] describes unlawful supply; intent to supply, import or export and unlawful production of cocaine and crack, ecstasy, heroin, LSD, methadone, methamphetamine, amphetamine and cannabis.
New Zealand	Smoke-free Environments Act 1990:[76] • Requiring smokefree indoor workplaces, including restaurants and bars; • Limiting tobacco advertising and promotion and the sponsorship of events or activities by anyone who manufactures or sells tobacco; • Restricting the sale or supply of tobacco products to those over 18-years-of-age; • Not allowing the sale of single cigarettes and packs of fewer than 20 cigarettes; • Requiring the buildings and grounds of schools and early childhood centres to be smokefree.	Sale of Liquor Act 1989[81] stipulates: • Legal alcohol purchase age of 18 years; • Minors are not permitted in a restricted area; • Minors are permitted in a supervised area if accompanied by a parent or guardian; • Minors can only be supplied alcohol by a parent or guardian (who must do so in a responsible manner); • Promoting alcohol in any way likely to appeal to minors is an offence.	Misuse of Drugs Act 1975[89] prohibits the use, possession, cultivation or trafficking of illegal drugs including methamphetamine, magic mushrooms, cocaine, heroin, LSD (Acid), cannabis opium, ecstasy and amphetamine-type substances

Country	Tobacco legislation	Alcohol legislation	Illicit substance legislation
Australia	All State Governments in Australia have legislation that: • Make it illegal for retail outlets to sell tobacco products to young people under 18 years of age; • Impose penalties on those selling and in some cases, supplying to minors; • Restrict the location of vending machines.[77]	The legal drinking age across all Australian states is 18 years of age. Individual state laws govern the sale and consumption of alcohol, some of which have additional regulations with respect to adoelscents: • South Australia - Liquor Licensing Act 1997;[90] • Victoria - Liquor Control Reform Act 1998;[91] • New South Wales – Liquor Act 2007;[82] • Western Australia - Liquor Control Act 1988[92] and the Liquor Control Regulations 1989;[93] • Queensland – Liquor Act 1992;[83] • Tasmania - Liquor Licensing Act 1990.[84]	The Commonwealth Criminal Code Act 1995[94] prohibits the import and export of certain drugs (including narcotics and cannabis), whereas State and Territory laws prohibit the possession, use and supply of illicit drugs. For example, the NSW Drug Misuse and Trafficking Act 1985[95] prohibits the use, possession, supply and trafficking of cannabis, heroin, ecstasy, amphetamines, LSD, cocaine, and methadone. Therapeutic Goods Act 1989 enables access to medicinal cannabis products for clinical trials and individual patients under the Special Access and Authorised Prescriber Schemes administered by the Therapeutic Goods Administration (TGA).[96]

this is dependent on where the alcohol is consumed.[78-84] For example in the United Kingdom the consumption of alcohol on licensed premises is prohibited for those under 18 years of age, however it is legal for people 16 years of age to consume alcoholic beverages such as wine or beer on licensed premises when accompanied by an adult and ordered with a meal[80] (Table 1.9). In Australia, 18 years of age is the legal age for purchase and consumption of alcohol on licensed premises.[82-84] There is no law within Australian jurisdiction that prohibits the consumption of alcohol on private premises for people under 18 years of age.

Illicit substance use

Across most high-income countries including Australia, legislation prohibits the use, possession, production and supply of illicit substances by all members of society, including children and adolescents (Table 1.9). Medicinal use of some illicit substances, such as cannabis, is legal in some high-income countries including Australia.[96]

Substance use prevention strategies to reduce tobacco, alcohol and illicit substance use by adolescents

Given the considerable burden of illness associated with adolescent use of tobacco, alcohol and illicit substance, both during adolescence and later in adulthood, governments have implemented and invested in various national strategies that aim to provide recommendations for the prevention of such harms. These include strategies that address the use of tobacco, alcohol or illicit substance use across the lifecourse including adolescence, as well as strategies to prevent the use of tobacco, alcohol or illicit substance use by children and young people specifically. Table 1.10 provides examples of such national strategies in selected high-income countries. Whilst there is variation between strategies with respect to how to prevent harms from substance use, recommendations commonly include:

- interventions be implemented in multiple community settings (including schools);
- universal or whole of population strategies are implemented;
- interventions be implemented that address factors known to be associated with adolescent substance use (i.e. protective factors) and individual resilience.

Similar to international examples of the population level strategies to prevent adolescent substance use (Table 1.7), the Australian National Drug Strategy 2010-2015[97] provides recommendations for reducing harms from tobacco, alcohol and illicit substance use by

adolescents. Key recommendations that relate to interventions relevant to the prevention of tobacco, alcohol or illicit substance use by adolescents include settings-based approaches

Table 1.10. Substance use prevention strategies to reduce tobacco, alcohol and illicit substance use by adolescents in selected high-income countries

Country	National Policy or Strategy / Year published	Recommended intervention settings	Recommendations regarding prevention approach (universal, selective, indicated)	Recommendations regarding intervention content (e.g. protective factors, risk factors and resilience)
United States	United States National Drug Control strategy 2013; 2013[99]	School-based substance use prevention programs.	Not stated.	Substance use prevention efforts must be comprehensive in scope and take into account both risk factors (e.g., aggressive behaviour, drug availability, and poverty) and protective factors (e.g., parental influence, academic competence, and family support).
Canada	National Framework for action to reduce the harms associated with alcohol and other drugs and substances in Canada; 2005[98]	Substance use control should occur within the context of a young person's family and community.	Preventing and reducing the harms associated with alcohol and other drugs and substances require activities, programs, and policies that include a combination of population-based and targeted intervention.	Problematic substance use is shaped by social and other factors. Addressing problematic substance use requires a population health approach that addresses potential risk and protective influence of socio-economic status, culture, gender, housing, education, geography, family, law and policies, and other factors. Create supportive environments that promote the health and resiliency of individuals, families and communities in order to prevent problematic use of alcohol, other drugs and substances.

Country	National Policy or Strategy / Year published	Recommended intervention settings	Recommendations regarding prevention approach (universal, selective, indicated)	Recommendations regarding intervention content (e.g. protective factors, risk factors and resilience)
United Kingdom	Drug Strategy 2010; 2010[100]	Schools have a clear role to play in preventing drug and alcohol misuse as part of their pastoral responsibilities to pupils by providing accurate information on drugs and alcohol through drug education and targeted information.	Vulnerable groups - such as those who are truanting or excluded from school and those at risk of involvement in crime and anti-social behaviour, those with mental ill health, or those whose parents misuse drugs or alcohol - need targeted support to prevent drug or alcohol misuse or early intervention when problems first arise.	Not stated.
New Zealand	National Drug Policy 2015 to 2020; 2015[101]	Develop a system map of potential resilience and intervention points across a person's life stages.	Not stated.	The promotion and protection of wellbeing integrates physical, mental and social needs to strengthen protective factors for individuals, families and communities. Create a people-centred intervention system: develop a system map of potential resilience and intervention points across a person's life stages.

Country	National Policy or Strategy / Year published	Recommended intervention settings	Recommendations regarding prevention approach (universal, selective, indicated)	Recommendations regarding intervention content (e.g. protective factors, risk factors and resilience)
Australia	National Drug Strategy 2010-2015; 2011[97]	Priority settings for preventive interventions on alcohol, tobacco and other drugs include families, educational settings and communities. Improve the application of evidence based whole-of-school drug education policies and programs.	Whole-of-population strategies for alcohol and tobacco and for those illegal drugs that are widely used. Targeted approaches to users and at-risk groups. Successfully reducing the misuse of alcohol, and the use of tobacco and other drugs requires a range of approaches across the continuum of use, from experimental to dependent use.	Work with other national policies to reduce risk factors and build protective factors, while recognising the diverse range of influences on drug use. Support efforts to promote social inclusion and resilient individuals, families and communities. Socially inclusive communities and resilient individuals and families are less likely to engage in harmful drug use. Resilient individuals can adapt to changes and negative events more easily and reduce the impacts that stressors have on their lives—and are less likely to use drugs.

such as those delivered within schools, and those that address social inclusion and resilience of individuals.[97]

Despite the broad recommendations in national guidelines in both Australia and other high-income countries regarding setting, prevention approach and intervention content, little guidance is provided in these guidelines regarding which interventions or which specific intervention content should be implemented in each recommended setting.

SCHOOLS AS A SETTING FOR THE PREVENTION OF ADOLESCENT TOBACCO, ALCOHOL AND ILLICIT SUBSTANCE USE

As indicated in Table 1.10, schools are commonly recommended as a setting for the prevention of adolescent tobacco, alcohol and illicit substance use.[97-101] Schools not only provide access to the majority of adolescents,[10] they also have a significant role in the growth and development of adolescents;[11] and embrace values, curricula and policy that focus on supporting students' health and wellbeing.[12]

Approaches to school-based interventions

Universal school-based interventions

Universal substance use prevention interventions are common in schools.[102-104] In a school setting, universal substance use prevention interventions involve delivery to all students in a school, a grade or class[105;106] regardless of an individual's risk of substance use to prevent initiation to substance use. In contrast, selective prevention approaches are delivered to those groups of students who are identified as having an elevated risk of substance use, and indicated interventions are those that are delivered to individuals who have already initiated substance use.[106] For universal interventions, investigation of intervention effects across student subgroups is recommended to identify whether all students benefit from such interventions.[107;108]

Health Promoting Schools Framework

An approach to implementing universal school-based prevention-focused interventions in schools that is frequently adopted in high-income countries is the World Health Organization's Health Promoting Schools (HPS) framework.[109] The HPS framework involves a whole-school approach to the delivery of health promotion interventions, an approach

that has been applied to the prevention of various health risks such as substance use, physical activity and fruit and vegetable consumption.[105] The framework targets three domains of school activity: i) curriculum, teaching and learning; ii) ethos and environment; and iii) partnerships and services.[109] A systematic review of interventions based on the HPS framework suggested that it is effective in improving a range of student health outcomes including tobacco use, but not alcohol or illicit substance use.[105]

Evidence from systematic reviews regarding universal school-based interventions in reducing adolescent substance use

Numerous systematic reviews have been undertaken to determine the effectiveness of school-based interventions (universal or otherwise) in reducing adolescent tobacco, alcohol and illicit substance initiation and use.[102-104;110-114] Such reviews have broadly focused on assessing the efficacy of any intervention approach that is implemented within schools. For example, three separate Cochrane reviews have examined the effectiveness of school-based interventions to reduce tobacco,[104] alcohol[103] or illicit substance use.[102]

For the prevention of tobacco use by children and adolescents, a Cochrane systematic review assessing the effectiveness of school-based interventions on outcomes including preventing initiation and frequency of use was published in 2013 by Thomas et al.[104] The review included 134 randomised controlled trials (involving 428,293 participants) of any prevention approach (i.e. not limited to universal interventions), and classified interventions into five subgroups for analysis: i) information only curricula; ii) social competence curricula (interventions aiming to help adolescents to refuse substance use offers), iii) social influence curricula (interventions aiming to increase adolescents' awareness and skills in identifying and addressing social influences that support substance use), iv) combined social competence and social influence curricula, and v) multimodal programs.[104] For these subgroups, meta-analyses showed evidence of effect for interventions that combined social competence and social influence interventions at both short and long term follow up, and social competence interventions at long term follow up only.[104]

For the prevention of alcohol use, a Cochrane systematic review assessing the effectiveness of universal school-based interventions in preventing alcohol misuse and intiation in school-aged children was published in 2011 by Foxcroft et al.[103] The review included 53 randomised controlled trials.[103] Whilst pooled effects via meta-analysis were not able to be

calculated due to the heterogeneity of included studies (including heterogeneity of interventions, populations and outcome measures), authors reported that 20 of the included studies reported statistically significant reductions in alcohol, of which most employed generic psychosocial and developmental prevention interventions.[103] The authors defined such psychosocial approaches as any intervention that aimed to develop the psychological or social skills of young people and concluded that such interventions require further examination to confirm their effectiveness.[103]

For the prevention of illicit substance use, a Cochrane systematic review evaluating the effectiveness of universal school-based interventions in reducing drug use was published in 2014 by Faggiano et al.[102] Fifty-one controlled studies (involving 127,146 participants) were included in the review that were categorised by intervention type for analysis as knowledge-focused, social competence-focused, social norms-focused, combined programs, or other types of interventions.[102] Results from meta-analyses showed evidence of effect for interventions that were based on a combination of social competence and social influence approaches.[102]

Whilst the categorisation and definitions of intervention approaches differ across the three Cochrane reviews, when combined the results suggest the potential of social influence, social competence and some psychosocial approaches in the prevention of substance use by adolescents.[102-104] Such approaches address a range of factors associated with substance use, including decision-making skills, self-efficacy and social skills. The review findings suggest the potential for interventions that address such factors to be effective in reducing adolescent substance use.

Resilience protective factors

As previously described and shown in Table 1.10 above, addressing the 'resilience' of individuals and related protective factors is recommended in international and Australian substance use prevention strategies as an approach to reducing harms associated with substance use.[97;98;101] As a consequence, significant government and school investment is made in the delivery of such interventions. Such recommendations and investments are broadly, but not specifically supported by the previously described findings of systematic reviews of school-based substance use interventions suggesting that interventions that address psychosocial traits, social skills and social competence have the potential to reduce adolescent substance use.[102-104]

The study of resilience has stemmed from research examining why some children exposed to risk factors (such as poverty or familial conflict) that are associated with an increased risk of negative outcomes (such as substance use) thrive under such circumstances.[115] Despite a large body of research that has been undertaken regarding the concept of 'resilience' in children, there is no consensus on its definition (see Table 1.11). Most broadly, resilience is suggested to be a "process, capacity or outcome of successfully adapting to challenging or threatening circumstances".[116]

As a process or capacity, resilience has been described as involving interactions between risk factors and protective processes that modify the effects of adverse life events.[117;118] Risk factors include those factors found to be associated with an increased risk of a negative outcome in adolescents, whereas those found to be associated with a decreased risk of a negative outcome are defined as protective factors. The protective factors of children who demonstrate resilience have been variably labelled as promotive factors, social-emotional skills, resources, strengths and assets. Hereafter in this thesis, such characteristics are referred to as resilience protective factors.[117;119-121] Whilst there is no consensus on the definitive set of such protective factors that lead to an individual demonstrating resilience, classification of the most commonly reported factors, such as that proposed by Masten[122] has been reported (Table 1.12). Resilience protective factors are frequently categorised, as either those that relate to personal skills or traits of an individual (individual factors), or to those that relate to the social environment of an individual such as family, school and community protective factors (environmental factors).[123-125]

Table 1.11. Definitions of resilience*

Author, Year	Definition of resilience
The Oxford Dictionary of English, 2005	Able to recoil or spring back into shape after bending, stretching, or being compressed; (of a person) able to withstand or recover quickly from difficult conditions.
World Health Organization, 2009	Something that embraces positive adaptation, with protective factors and assets that moderate risk factors and therefore reduce the impact of risk on outcomes.
American Psychological Association, 2009	The process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress – such as family and relationship problems, serious health problems, or workplace and financial stressors. It means 'bouncing back' from difficult experiences.
Masten, 1990; Masten, 2001; Masten, 2006	The process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances; good outcomes in spite of serious threats to adaptation or development; processes and patterns of positive adaptation in development, during or following threats to adaptation.
Werner, 1992	An innate self-righting mechanism.
Rutter, 1999	Effective negation of risk exposure earlier in life facilitates a resilient response later.
Luthar, 2000	A dynamic process encompassing positive adaptation within the context of significant adversity; genetics perspective: resilience can be viewed as the degree to which the person at genetic risk for maladaptation and psychopathology are not affected.
Adger, 2000	Social resilience: the ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change.
Curtis, 2003	Neuroscience/biological contributors to resilience: competent functioning despite adversity, but emphasize it is a 'dynamic process that is influenced by neural and psychological self-organization, as well as transactions between the ecological context and the developing organism'.
Connor, 2003	Personal qualities that enable the individual to thrive in the face of adversity.
Kitano, 2005	In the context of school and education, resilience is the ability to thrive academically despite adverse circumstances.

Author, Year	Definition of resilience
Hjemdal, 2006	The protective factors, processes and mechanisms that contribute to a good outcome despite experiences with stressors that carry significant risks for mental ill health.
Ong, 2006	Ability to overcome, steer through and bounce back from adversity.
Roth, 2007	Personality factor that protects against life adversities and negative emotions by resourceful adaptation, flexibility and inventiveness.
Netuveli, 2008	The ability to 'bounce back' from adversity and go on with life.
Bartley, 2009	Multidimensional definition of resilience, which refers to the process of withstanding negative effects of risk exposure, demonstrating positive adjustment in the face of trauma or adversity and beating the odds associated with risks, focusing on socio-economic disadvantage and poverty.
Kirkwood, 2010	Relatively stable personality trait.

*Table adapted from Windle 2011.[117]

Table 1.12. Examples of resilience protective factors*

Individual protective factors	Environmental protective factors
• Social and adaptable temperament in infancy • Good cognitive abilities, problem solving, executive function • Ability to form/maintain positive peer relationships • Effective emotional/behavioural regulation strategies • Positive view of self (self-confidence, high self-esteem, self-efficacy) • Faith and sense of meaning in life • Characteristics valued by society and self (talents, sense of humour, attractiveness to others)	Family protective factors: • Stable/supportive home environment • Harmonious interparental relationship • Close relationship to sensitive/responsive caregiver • Authoritative parenting style • Positive sibling relationships • Supportive connections with extended family • Parents involved in child's education • Socioeconomic advantages • Postsecondary education of parent • Faith and religious affiliations Community protective factors: • High neighbourhood quality • Safe neighbourhood • Low level of community violence • Affordable housing • Access to recreational centers • Clean air and water • Effective schools • Well-trained and well-compensated teachers • After-school programs • School recreation resources (e.g. Sports, music, art) • Employment opportunities for parents/teens • Good public health care • Access to emergency services • Connections to caring adult mentors and prosocial peers Cultural/societal protective factors: • Protective child policies (child labour, child health and welfare) • Value and resources directed at education • Prevention of and protection from oppression or political violence • Low acceptance of physical violence

*Adapted from Masten's 'Short list'.[122]

THE POTENTIAL FOR SCHOOL-BASED RESILIENCE INTERVENTIONS TO REDUCE ADOLESCENT TOBACCO, ALCOHOL AND ILLICIT SUBSTANCE USE

Association between resilience protective factors and substance use

A large number of studies have examined the association between individual and environmental resilience protective factors and adolescent tobacco, alcohol and illicit substance use. The majority of such studies report inverse associations between single or small numbers of factors and substance use. Students with low levels of resilience protective factors have been found to be more likely to report substance use compared to those with high levels of protective factors. This includes individual factors such as self-esteem[126-128] and problem solving ability[129;130] that have been found to be inversely associated with adolescent tobacco, alcohol and illicit substance use (e.g. Pearson correlation coefficient self-esteem versus any substance use -0.17, $p<0.001$[130]). Similarly, environmental factors such as connection to school,[127;130-136] family,[127;131;133;137;138] and pro-social peers[138;139] have been found to be inversely associated with tobacco, alcohol and illicit substance use (e.g. adjusted odds ratio parent relatedness versus tobacco use 0.96, $p<0.05$[131]). Whilst such research suggests the potential of strengthening resilience protective factors as a means of preventing tobacco, alcohol and illicit substance use, such research is limited in a number of ways. For example, previous studies have not considered a broad range of resilience protective factors in multivariable analyses,[140] or have created aggregate scores of such factors,[141] precluding assessment of the association and interaction of factors.

Studies that have investigated the potential of a universal school-based resilience intervention in reducing adolescent substance use

Prior to the research undertaken for this thesis, no reported systematic reviews had specifically examined the efficacy of universal school-based resilience interventions in reducing adolescent tobacco, alcohol or illicit substance use. However, a number of previous individual studies (of any design) had examined the effectiveness of universal school-based interventions that addressed resilience protective factors as a means of reducing adolescent tobacco, alcohol or illicit substance use.[142-159] The majority (16 of 17) of such controlled studies addressed resilience protective factors as part of a broad intervention approach,

such as social influence or social competence approaches to substance use prevention.[142;145-160] Seven of these studies reported a positive impact on at least one measure of substance use at one follow up time point.[139;145;147;148;150;151;155] Only one controlled study was identified that solely addressed resilience protective factors as part of a universal school-based intervention to reduce the prevalence of substance use in adolescent school students.[161] The cluster-randomised controlled trial conducted in 26 Australian secondary schools investigated the effectiveness of a three year universal intervention delivered by schools addressed a number of individual and environmental resilience protective factors in preventing tobacco, alcohol and marijuana use in a cohort of students.[144] Outcomes were assessed at baseline, mid-intervention (after one year of intervention) and following intervention completion. Despite promising results mid-intervention for tobacco use, at follow up the confidence intervals for the adjusted odd ratios for tobacco, alcohol or marijuana use outcomes indicated a non-significant result.[162] Whilst the study focused solely on resilience protective factors, it was limited by only addressing a restricted range of such factors. For example, only two individual and two environmental resilience protective factors were addressed by the intervention. Additionally, the authors cited the insufficient intervention content addressing environmental resilience protective factors may have been a possible explanation for the results.

Collectively, the results from previous studies suggest promise for school-based interventions that address resilience protective factors for adolescent substance use prevention, a promise that requires further research to confirm the likely benefits of such an approach that addresses a broad range of individual and environmental resilience protective factors.

A pilot study, conducted in Australia investigated the potential of such a comprehensive universally implemented resilience factor intervention in reducing adolescent substance use.[143] The non-controlled before and after pilot study conducted in three secondary schools aimed to reduce the prevalence of tobacco, alcohol and marijuana use by adolescents via the implementation of a three-year intervention addressed a broad range of both individual and environmental resilience factors. The intervention involved schools implementing strategies to enhance the resilience protective factors of students within all domains of the Health Promoting Schools framework, and included a range of additional strategies reported to enhance the implementation of the intervention, including human and fiscal resources, local consensus and adaptation, and monitoring and feedback.[163-166]

Results of the pilot study showed that the cross-section of students in Years 7-10 at follow up had significantly higher individual and environmental resilience protective factor scores (individual: median of 18.18 compared to 18.00 $p<0.01$; environmental median of 17.67 compared to 17.25 $p<0.01$), and significantly lower prevalence of tobacco (26.8% compared to 50.6% $p<0.01$), alcohol (29.5% compared to 48.7% $p<0.01$) and marijuana use (6.8% compared to 16.3% $p<0.01$).[143] Such results suggest both the potential for, and feasibility of, a universally implemented school-based resilience protective factor intervention in reducing the prevalence of adolescent tobacco, alcohol and marijuana use. A more rigorous controlled evaluation of this intervention approach is required to confirm this potential.

THESIS AIMS

The thesis has four aims:

i. To review the effectiveness of universal school-based intervention studies that address resilience protective factors in reducing adolescent tobacco, alcohol or illicit substance use

Existing systematic reviews of school-based interventions have not assessed whether interventions that address adolescent resilience protective factors are effective in reducing adolescent tobacco, alcohol and illicit substance use. Given this, a systematic review was undertaken to determine the potential of universal school-based interventions that address resilience protective factors to reduce adolescent tobacco, alcohol and illicit substance use (Chapters 2 and 3).

ii. To determine the effectiveness of a school-based universal intervention that solely addresses resilience protective factors in reducing adolescent tobacco, alcohol and illicit substance use

The only randomised controlled trial of an intervention that solely addressed resilience protective factors addressed a limited number of such factors and found no effect. Given this limited evidence base, a cluster randomised controlled trial was undertaken to determine the effectiveness of an intervention that addressed a comprehensive range of such factors in reducing the prevalence of tobacco, alcohol and illicit drug use in a population of adolescent school students (Chapters 4 and 5).

iii. To determine the differential effectiveness of a universal school-based resilience intervention in reducing adolescent substance use between subgroups defined by adolescent socio-demographic and substance use characteristics

A secondary analysis of data collected for the above cluster-randomised controlled study was undertaken to explore the differential effectiveness of the intervention on adolescent tobacco, alcohol and illicit substance use and resilience protective factors according to student socio-demographic and previous substance use characteristics (Chapter 6).

iv. To identify the associations between individual and environmental resilience protective factors and adolescent tobacco, alcohol and illicit substance use and determine which factors are most prominent

Whilst research suggests the potential of resilience protective factors to be a target for interventions aiming to reduce adolescent tobacco, alcohol and illicit substance use, such research has been limited in terms of the number of such factors and the inconsistent findings across studies in terms of both the presence and direction of association between specific resilience protective factors and substance use. To address these limitations, a study was conducted to investigate whether a generalized association exists between a comprehensive range of individual and environmental resilience protective factors and adolescent tobacco, alcohol, marijuana and other illicit substance use (Chapter 7).

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CHAPTER 2

Systematic review of universal school-based resilience interventions targeting adolescent tobacco, alcohol or illicit drug use: review protocol

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ABSTRACT

Introduction

Tobacco, alcohol and illicit drug use contribute significantly to global rates of morbidity and mortality. Despite evidence suggesting interventions designed to increase adolescent resilience may represent a means of reducing adolescent substance use, and schools providing a key opportunity to implement such interventions, existing systematic reviews assessing the effectiveness of school-based interventions targeting adolescent substance use have not examined this potential.

Methods and analysis

The aim of the systematic review is to determine whether universal interventions focused on enhancing the resilience of adolescents are effective in reducing adolescent substance use. Eligible studies will: include participants 5-18 years of age; report tobacco use, alcohol consumption or illicit drug use as outcomes; and implement a school-based intervention designed to promote both internal (e.g. self-esteem) and external (e.g. school connectedness) resilience factors. Eligible study designs include randomised controlled trials, cluster randomised controlled trials, staggered enrolment trials, stepped wedged trials, quasi-randomised trials, quasi experimental trials, time series/interrupted time-series trials, preference trials, regression discontinuity trials and natural experiment studies with a parallel control group. A search strategy including criteria for participants, study design, outcome, setting and intervention will be implemented in various electronic databases and information sources. Two reviewers will independently screen studies to assess eligibility, as well as extract data from, and assess risk of bias of, included studies. A third reviewer will resolve any discrepancies. Attempts will be made to quantify trial effects by meta-analysis. Binary outcomes will be pooled, and effect sizes reported using odds ratios. For continuous data, effect size of trials will be reported using a mean difference where trial outcomes report the same outcome using a consistent measure, or standardised mean difference where trials report a comparable measure. Otherwise trial outcomes will be described narratively.

Dissemination

Review findings will be disseminated via peer-reviewed journals and conferences.

INTRODUCTION

Tobacco, alcohol and illicit drug use contribute significantly to global rates of morbidity and mortality.[1,2] School-based interventions have been recommended to be implemented to reduce this burden given initiation of such drug use typically occurs during adolescence,[3] and schools provide almost universal access to adolescents for prolonged periods. Given this, universal school-based interventions have been implemented by governments internationally in an attempt to reduce adolescent initiation to substance use.[4-6]

Despite widespread implementation, Cochrane reviews have found little evidence for the effectiveness of school-based drug prevention programs on adolescent substance use, with such reviews focused on any or only universal intervention approaches.[4-6] Of the multiple intervention approaches examined by such reviews, little or no evidence of effectiveness has been found for the most commonly implemented curricula or information-only interventions. Some evidence however has been found for various psychosocial interventions, including those that adopt a social competence and social influence, generic psychosocial or individual social skills approach.[4-6] A review by the World Health Organization examining school-based drug prevention programs similarly concluded that programs that promote young people's mental wellbeing were most likely to be effective, suggesting that interventions incorporating a mental wellbeing approach may have the best chance of impacting on substance use.[7]

The concept of resilience and closely related research regarding protective factors provides one avenue for addressing mental wellbeing that is suggested to have an impact on adolescent substance use.[8-17] Resilience has been variably defined as the process of, capacity for, or outcomes of successful adaptation in the context of risk or adversity.[9,10,12,13,18] Despite this variability, it is generally agreed that a range of both individual and environmental protective factors are thought to: contribute to an individual's resilience; be critical for positive youth development; and protect adolescents from engaging in risk behaviours, such as substance use.[19-22] Individual, or internal resilience factors refer to the personal skills and traits of young people (including self-esteem, empathy, and self-awareness).[23] Environmental, or external resilience factors refer to the positive influences within a young person's social environment (including connectedness to family, school and community).[23] Various studies have separately reported such factors to be negatively associated with adolescent use of different types of substances,[12,16,24-36] for example higher self-

esteem[16,29,32,35] associated with a lower likelihood of tobacco and with lower likelihood of alcohol use.

Despite this associative evidence, to the authors knowledge existing systematic reviews assessing the effectiveness of school-based substance use interventions have not reported the effectiveness of universal resilience-based interventions on adolescent use of multiple substances.[4-6,37] Three existing Cochrane reviews have individually examined the efficacy of school-based tobacco, alcohol and illicit drug use programs.[4-6] Such reviews have not reported outcomes for universal resilience-based interventions specifically, but have included such interventions in broader categories of intervention type for subgroup analysis. As a consequence, a systematic review of the efficacy of universal resilience-based interventions specifically remains unreported. For example a tobacco-focused review which included any intervention type, classified interventions with a component of resilience content into different subgroups such as social competence or social influence interventions, finding evidence for both broad intervention approaches.[6] For the alcohol-focused review, only universal interventions were included with such interventions grouped according to whether they addressed alcohol alone or addressed multiple substance types.[5] Whilst meta-analysis was not conducted due to the heterogeneity of studies, the review concluded that some psychosocial and developmental prevention programs were effective. Given such inability to draw conclusions with respect to universal resilience interventions and studies suggest an association exists between resilience and substance use, there is a need to examine whether more specifically defined universal resilience interventions are efficacious in reducing substance use by adolescents. Such a review would also provide an update to the existing Cochrane reviews which do not represent the current state of knowledge as searches are between two and ten years old.

Objective

To determine if universal school-based interventions designed to enhance resilience are efficacious relative to a comparison group in reducing the extent of adolescent tobacco, alcohol or illicit drug use.

METHODS

All methods employed in the review will be consistent with the Cochrane Handbook for Systematic Reviews of Interventions.[38]

Eligibility criteria

Study characteristics

Participants

Studies will be included if they report results of participants aged 5 to 18 years. Studies that select participants based on a diagnosis of a psychiatric or other mental illness, cognitive or developmental disability will be excluded from the study. There will be no exclusions on the basis of study country.

Study design

Studies with the following designs will be included: randomised controlled trials including cluster randomised controlled trials; staggered enrolment trials[39] or stepped wedged trials;[40] quasi-randomised trials where group allocation is not purely random;[41, 42] quasi experimental trials including, non-randomised pre-post,[43] time series/interrupted time-series trials including multiple baseline trials with independent control groups,[39,43] preference trials[40] and regression discontinuity trials;[39] and natural experiment studies.[44] Trials with non-random assignment of groups will be included given Medical Research Council recommendations that non-randomised designs may represent the most appropriate evaluation deign for some complex public health interventions,[45] and as an acknowledgment of the value of non-randomised designs in assessing intervention effects in public health interventions.[46] Studies with a length of follow up of at least 6 months post intervention commencement will be included in the review. Studies will be excluded if they do not include a parallel comparison group.

Comparison group

The comparison group may have received no intervention, usual practice, attention only or an alternate intervention.

Primary outcomes

Studies will be included if they report one or more of the following outcomes:

- tobacco use (including but not limited to proportion ever smoked, frequency of smoking, number of cigarettes smoked, tobacco use in last week, current smoking status, or established tobacco use);
- alcohol consumption (including but not limited to proportion ever consumed an alcoholic drink, alcohol use in last week, frequency of alcohol consumption, binge drinking, or established alcohol use);

- illicit drug use (including but not limited to ever use or frequency of use of any illicit drug or a specific drug for example cannabis, amphetamines, or cocaine).

Substance use data collected via various methods will be included, for example data collected via observation; self-report via face to face or telephone, internet survey; secondary report by peers or parents; and biochemical measurement of substance use (such as carbon monoxide or cotinine detection).

Secondary outcomes

Any adverse outcomes reported in included studies will be described in the results.

Interventions

A study will be included if it reports a universal intervention that specifically aims to improve at least one internal and at least one external resilience factor. A universal intervention is defined as an intervention delivered to an entire school population. As the internal and external factors that comprise resilience are not consistently reported, numerous bodies of work were reviewed to identify an inclusive list of internal and external resilience factors.[9,10,12,13,18] Internal resilience factors will include: cooperation and communication, self-efficacy, self-esteem, empathy, problem solving, decision-making skills, autonomy, self-awareness, goals and aspirations, social and emotional skills or competence, and self-control or self-regulation.[9,10,12,13,18,47-49] External resilience factors will include: meaningful participation, high adult expectations, caring relationships and support within home, school and community environments; peer caring relationships and pro-social peers.[9,10.12.18,47-49]

Given the theoretical and componentry cross over between resilience and other intervention approaches (such as strengths-based, social competence, social influence, skills focused, affective focused, social and emotional learning/wellbeing, mental wellbeing, and psycho-social[50-53]), a study will be included irrespective of the stated overall intervention approach if it specifically aims to address at least one internal and one external resilience factor as defined above. Studies will be included irrespective of whether substance use is the primary outcome measure.

There will be no exclusion criteria regarding other intervention elements, the duration of intervention, the format of intervention delivery (for example curricula-based or internet-

based), or the intervention administration (for example the intervention could be delivered by school-staff, research staff, community members or students).

Setting

Studies will be included if the intervention is implemented across a whole school.

Publication characteristics

Studies of any language will be included and translated using Google translate where required. Studies published in the last 20 years in peer reviewed journals will be eligible for inclusion.

Information sources

Electronic databases

The following electronic databases will be searched: Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL, PsycINFO, ERIC and the first 200 citations only of Google scholar.

Other sources

The following additional information sources will be searched or contacted for eligible studies:

- Hand searching of three relevant journals in the field (last 5 years) (Addiction, Journal of Adolescent Health, Journal of School Health);
- Reference lists of included studies;
- Reference lists of existing Cochrane reviews on school-based interventions targeting tobacco, alcohol and illicit substances;[4-6]
- Corresponding authors of included studies;
- PubMed single citation searcher.

Search strategy

The search strategy will include terms for participants, setting, intervention, study design[54] and outcome (sourced from current Cochrane systematic reviews examining the effectiveness of tobacco, alcohol and illicit substance use interventions; see Web Only Appendix 2.1 for Medline search strategy).[4-6] The search strategy will be tailored as required for implementation in other information sources.

Study selection

Two reviewers will independently screen the titles and abstracts of all studies identified via the implementation of the above search strategy. The reviewers will not be blind to study authors. A standardised screening tool will be used to assess study eligibility with those titles and abstracts not meeting the criteria excluded from the review (Appendix 2.2). The full texts of the remaining papers will be sourced and examined independently by the two reviewers to assess study eligibility. Any disagreement between the two reviewers regarding study eligibility, that cannot be resolved via consensus, will be assessed by a third reviewer. Corresponding authors will be contacted if there is not sufficient information to determine eligibility. If sufficient information remains unavailable, the study will be deemed ineligible. The details of ineligible studies for which the full text was sourced will be reported in the results section including the reason the study was ineligible.

Data extraction

The two study reviewers will independently extract data from the eligible studies using a standardised form. Reviewers will not be blind to study authors. Any unresolved discrepancies between reviewers regarding the extracted data will be resolved by the third reviewer. Where there is insufficient data to make a judgement regarding eligibility, the corresponding authors will be contacted for clarification.

The following information will be extracted from eligible studies where available: authors, year of publication, year/s of study, country, study design, intervention (including resilience factors targeted, duration, intensity), comparison group type, substance use targeted, measurement tool characteristics, study participants' demographics (including age and gender), study results (including sample size, consent rate/s, participation rate/s, length of follow up, attrition, relevant outcome results and intra-class correlation), intervention fidelity (including any process measures) and information to determine any potential study bias (see below).

Assessment of risk of bias

Study bias of eligible studies will be assessed independently by the two reviewers against the Cochrane Handbook for Systematic Reviews of Interventions study characteristics including: sequence generation (selection bias), allocation sequence concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome

assessment (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias) and other potential sources of bias.[38]

Included non-RCTs will be assessed for selection bias that may have resulted in confounding of the outcome of interest using the Newcastle-Ottawa Scale,[38] and where possible statistical methods will adjust for such confounding. Any additional biases specific to individual study designs will be assessed by the reviewers and reported.[38]

The reviewers will not be blinded to the names of the authors, institutions, journal or results of studies. Any disagreement between the two reviewers regarding study bias that is not resolved via discussion will be resolved by a third reviewer.

Data analysis

Data synthesis and analysis

Attempts will be made to quantify trial effects from randomised controlled trials by meta-analysis using data from intention to treat analyses. Where multiple measures (for example biochemical and self-reported smoking status) for the same outcome are reported, the most objective measure of outcome will be used. Similarly, where studies report data from multiple follow up periods, data from final follow up periods will be extracted. Binary outcomes, (such as tobacco use) will be pooled and effect size reported using odds ratios. For continuous data, the effect size of trials will be reported using a mean difference where trial outcomes are reported using a consistent measure, or a standardised mean difference where outcomes across trials report the same outcome using comparable measures. Sensitivity analysis will be conducted excluding trials judged to be at high risk of bias. Meta-analyses will be performed using a random effects model, when there is little evidence of heterogeneity (I^2<50%) and only for randomised trials. Otherwise trial outcomes, including those from non-randomised trials, will be described narratively.

Assessment of study heterogeneity

Study heterogeneity will be assessed via examination of forest plots and calculation of I^2 statistic. If an I^2 score over 50% is found, the cause of the heterogeneity will be explored via the conduct of subgroup analyses and sensitivity analysis via meta-regression.

Issues of clustering

If any included cluster randomised controlled trials have not accounted for clustering, intra-class correlations will be requested from authors or if not available, estimates from similar studies (defined as those with similar school and student characteristics including gender and scholastic year proportions) will be used to adjust for clustering.

Dealing with missing data

Authors of included studies will be contacted to provide any missing data (for example missing participant data due to drop out or missing statistics such as standard deviations). If not available, attempts will be made to compute them, including an intention-to-treat analysis where appropriate.

Assessment of reporting bias

Possible reporting bias will be determined by examining funnel plots of the included studies and comparison with trial registers.

Additional analyses

If possible, additional analyses will be conducted by subgroup (e.g. gender), intervention intensity, intervention duration and length of follow up. Further subgroup analysis is planned based on whether included interventions focused solely on resilience (resilience interventions) versus interventions that focused on resilience as well as other determinants of substance use (multi-dimensional interventions).

ETHICS AND DISSEMINATION

Given this is a systematic review, ethics approval is not required. Findings of this review will be disseminated via peer-reviewed journals and conference presentations.

DISCUSSION

This systematic review will be the first internationally to examine the effectiveness of universal school-based resilience interventions in reducing the prevalence of adolescent tobacco, alcohol and illicit drug use. Given the majority of adolescents attend school, population level implementation of an effective intervention approach has the potential to provide significant health gains by reducing adolescent substance use, and as a result will be of interest to researchers and policy makers.

AUTHORS' CONTRIBUTIONS

RH led the drafting of the protocol and will lead the review. All authors contributed to the refinement of the review protocol, approved the final manuscript and will be involved in the preparation of the review.

COMPETING INTERESTS STATEMENT

The authors are currently undertaking a randomised controlled trial of a school-based resilience intervention to decrease adolescent substance use. The authors have not received any benefit, in cash or in kind, any hospitality or any subsidy from the alcohol industry or any other source perceived to have an interest in the outcome of this review.

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CHAPTER 3

Systematic review of universal school-based 'resilience' interventions targeting adolescent tobacco, alcohol or illicit substance use

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Hodder RK, Freund M, Wolfenden L, Bowman J, Nepal S, Dray J, Kingsland M, Yoong S, Wiggers J. Systematic review of universal school-based 'resilience' interventions targeting adolescent tobacco, alcohol or illicit substance use. Preventive Medicine 2017, 100: 248-268. DOI: 10.1016/j.ypmed.2017.04.003.

ABSTRACT

Universal school-based interventions that address adolescent 'resilience' may represent a means of reducing adolescent substance use, however previous systematic reviews have not examined the effectiveness of such an intervention approach. A systematic review was undertaken to 1) assess whether universal school-based 'resilience' interventions are effective in reducing the prevalence of tobacco, alcohol or illicit substance use by adolescents, and 2) describe such effectiveness per intervention characteristic subgroups. Eligible studies were peer-reviewed reports (1994-2015) of randomised controlled trials including participants aged 5-18years that reported adolescent tobacco, alcohol or illicit substance use, and implemented a universal school-based 'resilience' intervention (i.e. those addressing both individual (e.g. self-esteem) and environmental (e.g. school connectedness) protective factors of resilience). Trial effects for binary outcomes were synthesised via meta-analyses and effect sizes reported as odds ratios. Subgroup (by intervention type, prevention approach, setting, intervention duration, follow up length) and sensitivity analyses (excluding studies at high risk of bias) were conducted. Nineteen eligible studies were identified from 16,619 records (tobacco: n=15, alcohol: n=17, illicit: n=11). An overall intervention effect was found for binary measures of illicit substance use (n=10; OR 0.78, 95% CI: 0.6 - 0.93, p=0.007, Tau^2=0.0, I^2=0%), but not tobacco or alcohol use. A similar result was found when studies assessed as high risk of bias were excluded. Overall intervention effects were evident for illicit substance use within multiple intervention characteristic subgroups, but not tobacco and alcohol. Such results support the implementation of universal school-based interventions that address 'resilience' protective factors to reduce adolescent illicit substance use, however suggest alternate approaches are required for tobacco and alcohol use.

INTRODUCTION

Tobacco, alcohol and illicit drug use contribute significantly to global rates of morbidity and mortality.[1;2] School-based interventions have been recommended to reduce this burden given that initiation of such drug use typically occurs during adolescence[3-5] and schools provide comprehensive access to adolescents for prolonged periods of time.[6;7] School-based interventions delivered to all students regardless of an individual's risk of substance use, that is universal interventions[8] have been recommended to reduce the prevalence of substance use by preventing or delaying substance use initiation.[9]

Despite such recommendations, three recent Cochrane reviews focused on reduction of adolescent tobacco, alcohol and illicit substance use, found little evidence of effectiveness for school-based intervention approaches.[10-12] In particular, of the various intervention approaches examined by the reviews, no evidence of effectiveness was found for information-only focused interventions.[10;12] Whereas, results the individual tobacco, alcohol and illicit substance focused reviews found evidence of effectiveness for various psychosocial interventions, including those that adopt a social competence and social influence, and generic psychosocial programs.[10-12] A review of reviews by the World Health Organization examining school-based health promotion programs similarly concluded substance use prevention programs were ineffective, and based on the effectiveness of interventions targeting young people's mental wellbeing, suggested that programs that promote young people's mental health may have the potential to reduce the prevalence of substance use.[13]

The concept of 'resilience' provides one avenue for addressing the mental wellbeing of adolescents with a view to reducing adolescent substance use. 'Resilience' most broadly has been defined as the process of, capacity for, or outcome of successful adaptation in the context of risk or adversity.[14-16] Whilst there is considerable variability in the definition of resilience, it is generally accepted that protective factors, both individual and within a young person's environment, can moderate such risk or adversity to facilitate 'resiliency' that might otherwise lead to poor outcomes including substance use.[17-23] Individual resilience protective factors are suggested to include the personal skills or characteristics of young people (e.g. self-esteem, empathy, self-awareness), whereas resilience protective factors within their environment are suggested to include characteristics related to a young person's family, school and community such as caring relationships.[17-23] A range of resilience protective factors, have been found to be negatively associated with adolescent

substance use.[20;21;24-35] Such evidence is consistent with the theoretical basis of resilience, where protective factors across multiple levels are suggested to protect children from negative outcomes such as initiation or escalation of substance use,[36] and highlights the potential of addressing both individual and environmental resilience protective factors as a means to reducing substance use in adolescents.

Whilst a number of systematic reviews have been conducted examining the effectiveness of any universal school-based intervention targeting adolescent substance use,[10-12] none have synthesised the evidence regarding the effectiveness of universal school-based 'resilience' interventions in reducing adolescent substance use. For example, previous Cochrane reviews have pooled studies in meta-analyses under broad categories of intervention approach, such as social competence, social influence or multimodal approaches, with interventions that address both individual and environmental resilience protective factors represented in each of these groups, and not examined separately.[10;12] As a consequence, a systematic review of the effectiveness of universal school-based 'resilience' interventions specifically remains unreported. Given this limitation, a systematic review was undertaken to 1) assess whether universal school-based interventions that target resilience individual and environmental factors are effective in reducing the prevalence of tobacco, alcohol or illicit substance use by adolescents, and 2) describe such effectiveness according to intervention characteristic subgroups.

METHODS

The methods employed in this review have been described previously[37] and are consistent with the Cochrane Handbook for Systematic Reviews of Interventions.[38] Any deviations from the study protocol are noted.

Criteria for considering studies for this review

Types of studies

Eligible studies included randomised controlled trials (RCTs) and cluster randomised controlled trials (C-RCTs). Studies without a parallel comparison group or follow up less than 6 months post intervention commencement were excluded. Non-randomised trials were not included given the large number of randomised trials that were identified and the precision of pooled estimates of included studies.

Types of participants

Eligible studies included participants aged 5 to 18 years attending school. Studies that selected participants based on a diagnosis of a psychiatric or other mental illness, or cognitive and developmental disabilities were excluded.

Types of interventions

Studies that implemented a universal school-based resilience intervention were included in the review (irrespective of overall stated intervention type). Interventions were defined as having a universal prevention approach if they involved delivery of an intervention to an entire population of students (i.e. whole school, year group or classroom) regardless of an individual's risk of substance use.[8] Interventions that were an exclusively targeted approach, that is, selected students at elevated risk (selective) or those who had already initiated substance use (indicated)[8] were excluded as it was beyond the scope of the review, however studies that combined a universal with a targeted (selective or indicated) prevention approach were eligible. School-based interventions were defined as those delivering a component of the intervention to students in a school during school hours.

The consensus that both individual and environmental (family, school or community) protective factors facilitate resilience was used as the basis for the definition of a resilience intervention. That is, to be included an intervention was required to address at least one individual and at least one environmental resilience protective factor. Previous studies that have aimed to identify the individual and environmental resilience protective factors have reported similar, but not identical sets of such factors. To address this inconsistency, a comprehensive list was compiled based on previous empirical research identifying resilience protective factors (between publication of the protocol and implementation of the search strategy this list was expanded; see Appendix 3.1 for final list of included resilience protective factors).[14;15;18;20;39] Reported resilience protective factors that specifically related to refusing (e.g. self-efficacy and self-control for substance use refusal) or limiting use of substances (e.g. parental limit setting with respect to alcohol) were not eligible for inclusion. Despite being described by some authors as resilience protective factors, demographic characteristics (such as socio-economic status), community characteristics (such as affordable housing) and personality traits (such as sense of humour)[40] were not eligible for inclusion as they were deemed unlikely to be influenced by a school-based intervention.

There were no exclusion criteria regarding intervention duration, mode of intervention delivery (e.g. classroom or internet-based), or agents of administration (e.g. delivered by school-staff, research staff, community members or students).

Comparison group

Studies were included that had a comparison group that received no intervention, usual practice, attention only (i.e. group receives same level of support and attention as the intervention group but none of the active ingredients by which the intervention is expected to cause change) or an alternate intervention.

Types of outcome measures

Primary outcomes

Studies were included if they reported from any source, over any time period assessed during adolescence (defined as 10 to 18 years of age) on:

- tobacco use (e.g. prevalence of use, current smoking status, number of cigarettes smoked); or
- alcohol consumption (e.g. prevalence of use, frequency of alcohol consumption or binge drinking, number of alcoholic drinks consumed); or
- illicit substance use (e.g. prevalence of any type of illicit substance or a specific substance e.g. cannabis).

Secondary outcomes

Any reported adverse outcomes to participants, schools or school staff identified in included studies were included in the review.

Search methods for identification of studies

Peer-reviewed studies published between January 1994 and August 2015 in any language were identified via searching of the following electronic databases: MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), EMBASE, CINAHL, PsycINFO, and ERIC. The search strategy initially developed for MEDLINE (Appendix 3.2) was tailored for each database. In addition, the first 200 citations from GoogleScholar (January 1994 to August 2015) and all results from the World Health Organization International Clinical Trials Registry Platform were searched (August 2015). Hand searching was undertaken (January 2009-August 2015) for the journals Addiction, the Journal of Adolescent Health, and the Journal of School Health as well as the reference lists of both included studies and Cochrane

reviews of school-based interventions targeting tobacco,[12] alcohol,[11] and illicit substances.[10] Corresponding authors of included studies were contacted via email to request details of any other potentially eligible studies. The planned search strategy using the PubMed single citation searcher was not undertaken given the comprehensive coverage of existing searches.

Data collection and analysis

Selection of studies

Two reviewers independently screened the titles and abstracts of all identified studies (RH and PE). The full texts of potentially eligible papers were then screened (RH and JD, MK, LW, SY, PE), the reason for ineligibility documented and any disagreement resolved via a third reviewer (MF). Corresponding authors of all studies without sufficient information to determine eligibility were contacted via email, and if required information was not available the studies were deemed ineligible.

Data extraction and management

Two study reviewers (RH and SN) independently extracted data from the eligible studies using a standardised form. Any unresolved discrepancies between reviewers regarding the extracted data were resolved by a third reviewer with expertise in review methodology (LW). Corresponding authors were contacted via email for clarification of unclear data.

Issues of clustering

Cluster-randomised trials were assessed for unit of analysis errors. The authors of studies that did not account for clustering in analyses were contacted for intra-class correlations so that effective sample sizes could be calculated prior to pooling. If such information was not available or provided, a mean of the intra-class correlations for that outcome from all other included studies was used to adjust for clustering. Similarly, the mean intra-class correlation and reported outcome data were used to calculate effective sample sizes for studies where the reported estimates or standard errors were either missing or not suitable for pooling.

Dealing with missing data

Authors of included studies were contacted and requested to provide any missing outcome data that precluded study pooling (for example missing statistics such as standard deviations). Individual study data was not requested from study authors; therefore it was

not possible to undertake intention-to-treat analysis for studies with missing data who did not do so.

Assessment of risk of bias in included studies

Eligible studies were assessed using the risk of bias tool described in the Cochrane Handbook for Systematic Reviews of Interventions.[38] C-RCTs were additionally assessed for other potential sources of bias (including recruitment bias, baseline imbalance, loss of clusters and incorrect analysis).[38] Risk of bias was assessed independently by two reviewers (RH and SN). Any disagreement between the two reviewers regarding study bias was resolved by a third reviewer (LW). Given studies of this nature are typically rated high risk of bias for both performance bias (due to inability to blind participants and personnel)[10] and detection bias (given blinding is not possible due to self-report nature of outcome data), studies with a rating of high on 3 or more domains were assessed as having an overall high risk of bias.

Assessment of quality of evidence

For each substance use outcome, two review authors (RH and LW) rated the overall quality of evidence using the GRADE system[41] to determine the confidence in review findings for those studies included in meta-analyses. This included assessment of within-study risk of bias (methodological quality), directness of evidence, heterogeneity, precision of effect estimates and risk of publication bias. Any disagreement between the two reviewers regarding GRADE rating was resolved via a third reviewer (SY).

Assessment of reporting bias

Possible reporting bias was determined by examining funnel plots of the included studies and comparison with trial registers or prospectively registered study protocols.

Data synthesis

Attempts were made to quantify trial effects from C-RCTs and RCTs by meta-analysis using data from intention-to-treat analyses where available. Where multiple measures for the same outcome were reported, the most conservative measure (i.e. the lowest usage[12]) were utilised in pooled synthesis (e.g. measures of ever use over use in the last 7 days). For studies reporting use of multiple illicit substances, use of marijuana was preferred for use in pooled analyses of illicit substances, followed by the next most prevalent illicit substance. Where available, data were extracted for both the first and the longest post-intervention

follow up periods for which the mean age of participants was 18 years or younger, with such data included in the main and subgroup analyses respectively.

Where possible, for each outcome binary outcome data were pooled and effect sizes calculated as odds ratios using the generic inverse variance method. Meta-analyses were performed using a random effects model. A number of trials were unsuitable for pooling due to insufficient similar trials (for example comparative effectiveness and trials reporting continuous outcomes) or outcome data suitable for pooling was not available, and are instead summarised narratively.

Assessment of heterogeneity

Study heterogeneity was assessed via examination of forest plots and calculation of the I^2 and Tau^2 statistic. In instances where there was evidence of heterogeneity, such heterogeneity was explored via the conduct of subgroup analyses.

Subgroup analysis

Subgroup analyses planned *a priori* were conducted by intervention type ('resilience': focused exclusively on selected protective factors; 'multidimensional': selected protective factors addressed as a component of a broader intervention), prevention approach (universal/universal and targeted), setting (school only/school and family/school, family and community), and intervention duration (2 years/3 years; studies of <2 years and >3 years were excluded from this analysis due to excessive heterogeneity in duration). Planned subgroup analysis by was not possible for intervention intensity (due to insufficient information reported regarding intensity) and gender (due to insufficient studies reporting results by gender). In addition, data for studies reporting long term follow up (defined as one year or greater) were pooled to assess sustainability of effects.

Sensitivity analysis

Sensitivity analyses were conducted:

- excluding trials assessed as being at high risk of bias (high on three or more domains);
- using a maximum reported intra-class correlation rather than mean for those C-RCTs which did not report intra-class correlations and it was necessary to calculate effective sample sizes for the trial results to be pooled;

- using a cut point of both four and six resilience protective factors to meet intervention eligibility criteria.

RESULTS

Description of studies

Results of the search

After the removal of duplicates, the literature search identified 16,619 records. The full text of 610 articles were reviewed in more detail, with 569 articles excluded (see reasons studies were excluded in Appendix 3.3) and 41 articles relating to 19 studies satisfying all criteria for inclusion (see Figure 3.1). One study [42] which met review inclusion criteria had no study data available at the time the review was conducted.

Included studies

Overall 17 C-RCTs and two RCTs with a total of 51,867 participants across 40 study arms were included (see Appendix 3.4 for characteristics of included studies). Thirteen trials were conducted in the United States, three in Australia, and one each in Hong Kong, Croatia and Sweden. Seventeen trials compared an intervention with a control group, one trial compared the effectiveness of two interventions, and one trial compared two intervention groups with a control group. One trial was focused exclusively on selected 'resilience' protective factors, whereas the other 18 trials addressed selected 'resilience' protective factors alongside other intervention components as part of a broader 'multidimensional' intervention approach. The stated theoretical intervention approaches of included studies were variable. However, the majority were social-based theories or models, such as social influence model, social learning theory, theory of triadic influence, social cognitive theory, social development or positive youth development. Seventeen trials involved a universal-only and two a combined universal and selective prevention approach. Four trials delivered intervention in the school setting only, ten in both school and family settings, three in school, family and community settings, and two in school and community settings. Intervention duration ranged from 2 days to ten years. Sixteen trials reported outcome data immediately following the conclusion of the intervention, and 11 trials reported follow up data one or more years following intervention conclusion.

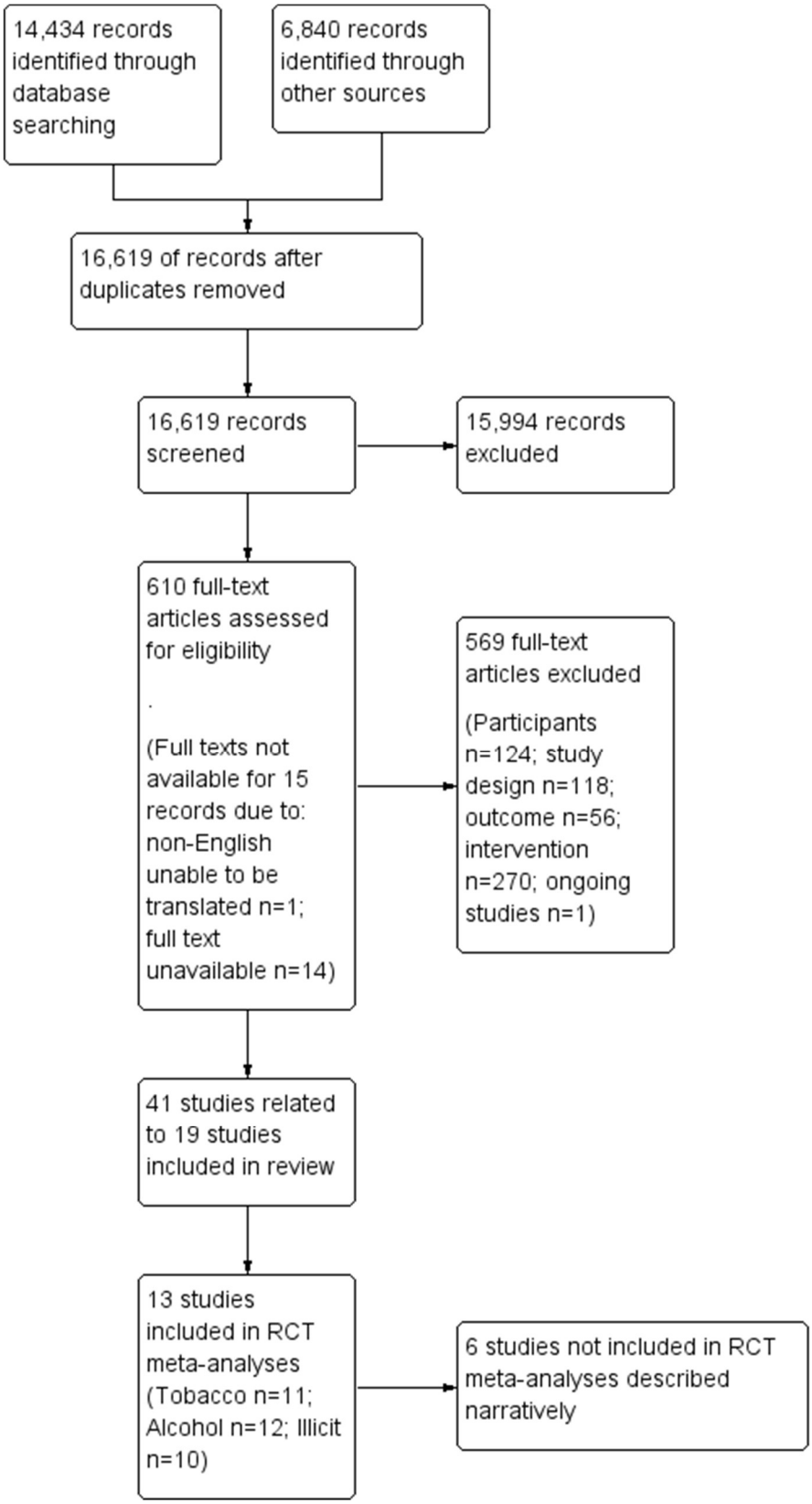

Figure 3.1. PRISMA statement

Risk of bias in included studies

Assessment of risk of bias is shown in Figure 3.2 (see further details in Appendix 3.4: characteristics of included studies). Thirteen of the 19 included studies were rated as high risk of bias overall. All studies were rated as high risk of bias for performance bias due to the nature of the interventions implemented and high risk of detection bias due to the self-report nature of outcome assessment.

Quality of body of evidence included in this review

The quality of evidence (GRADE) was classified 'moderate' for the alcohol and illicit substance use outcomes due to methodological limitations (all studies rated as high risk of bias due to lack of blinding and unclear risk of bias for allocation concealment) (Table 3.1) and 'low' for the tobacco outcome due to methodological limitations and high probability of publication bias due to visual inspection of the funnel plot (Appendix 3.5).

Effects of interventions

Primary outcomes

Tobacco use

Fifteen trials reported a tobacco use outcome (Appendix 3.4: characteristics of included studies). Eleven studies provided data enabling inclusion in meta-analysis which found no significant overall intervention effect (Odds Ratio (OR) 0.96, 95% confidence interval (CI) 0.85-1.08; p=0.48; Tau^2=0.0; I^2=6%; Figure 3.3). Data from four trials were unsuitable for inclusion in meta-analysis (intervention effects for these studies are detailed in Appendix 3.4). Similarly, sensitivity analyses removing studies with high risk of bias, using maximum intra-class correlations to calculate effective sample sizes and effect sizes, or using cut points of either four and six resilience protective factors to meet intervention eligibility criteria did not identify significant overall intervention effects, nor did subgroup analyses (Table 3.1; Appendix 3.6).

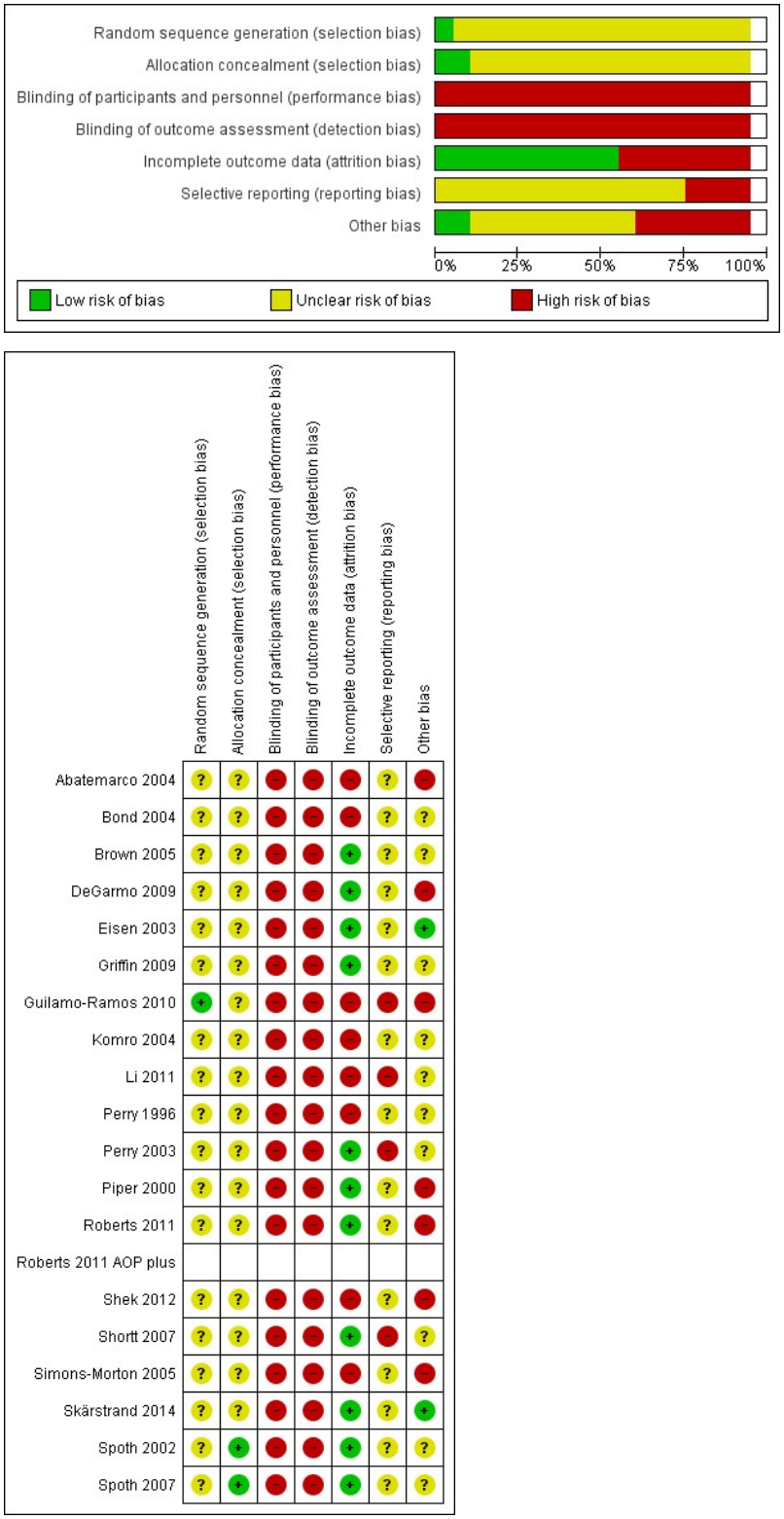

Figure 3.2. 'Risk of bias' graph: review authors' judgements about each risk of bias item presented as percentages across all included studies 'Risk of bias' summary[a]

[a] The non-coloured section of the graph represents the 2nd intervention arm of the only multiple arm study for which outcome data were analysed as for two studies, and risk of bias assessed as a single study (Roberts 2011)

Table 3.1. Summary of meta-analysis findings[a]

Overall/Subgroup	Studies	Effect Estimate Odds ratio [95% CI]	Certainty of the evidence (GRADE) †
TOBACCO			
Overall analysis[b]	12	0.96 [0.85, 1.08]	⊕⊕⊖⊖ Low
Intervention type			
'Multidimensional'[b]	11	0.96 [0.83, 1.11]	
Prevention approach			
Universal[b]	11	0.95 [0.83, 1.08]	
Setting			
School only	3	0.97 [0.79, 1.18]	
School + family[b]	6	1.04 [0.84, 1.29]	
School + family + community	2	0.83 [0.66, 1.04]	
Intervention duration			
2 years[b]	5	1.03 [0.80, 1.33]	
3 years	3	0.89 [0.72, 1.10]	
Long term follow up			
Follow up >=1 year[b]	9	0.93 [0.82, 1.05]	
ALCOHOL			
Overall analysis[b]	13	0.86 [0.73, 1.02]	⊕⊕⊕⊖ Moderate
Intervention type			
'Multidimensional'[b]	12	0.85 [0.71, 1.02]	
Prevention approach			
Universal[b]	12	0.86 [0.7, 1.03]	
Setting			
School only	3	0.87 [0.66, 1.15]	
School + family[b]	7	0.89 [0.78, 1.03]	
School + family + community	2	0.97 [0.58, 1.63]	
Intervention duration			
2 years[b]	6	0.90 [0.76, 1.06]	
3 years	5	0.92 [0.61, 1.39]	
Long term follow up			

Follow up >=1 year[b]	9	0.87 [0.69, 1.10]	
ILLICIT SUBSTANCES			⊕⊕⊕⊖ Moderate
Overall analysis	10	**0.78 [0.66, 0.93]**	
Intervention type			
'Multidimensional'	9	**0.77 [0.62, 0.94]**	
Prevention approach			
Universal	9	**0.76 [0.63, 0.92]**	
Setting			
School only	3	**0.76 [0.60, 0.98]**	
School + family	4	0.76 [0.55, 1.06]	
School + family + community	2	0.86 [0.56, 1.33]	
Intervention duration			
2 years	3	0.68 [0.44, 1.06]	
3 years	3	0.77 [0.57, 1.03]	
Long term follow up			
Follow up >=1 year	7	**0.84 [0.72, 0.99]**	

[a] Planned subgroup analyses was not conducted due to insufficient study numbers (by 'resilience' intervention type (n=1), 'universal and targeted' prevention approaches (n=1), gender (n=1)) and insufficient information reported to classify trials (by intervention intensity); [b] One study (Roberts 2011) which compared two interventions to a control group was entered into meta-analyses as two studies with the number of events and total number of participants from the control group equally divided and entered separately as comparison for each intervention group;[38] ⊕ GRADE Working Group grades of evidence; Boldface indicates statistical significance (p<0.05).

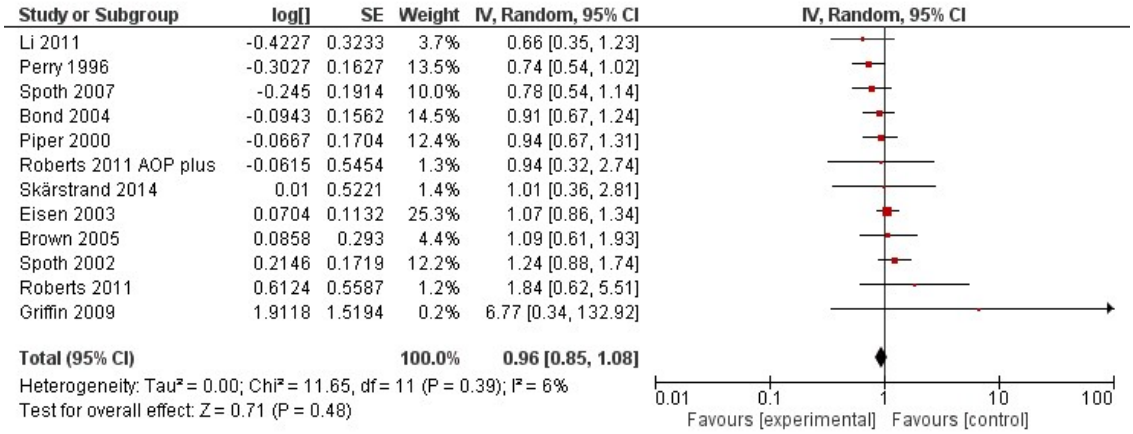

Figure 3.3. Forest plots of resilience intervention versus control for tobacco use

Alcohol use

Seventeen trials reported an alcohol use outcome (Appendix 3.4). Twelve studies provided data enabling inclusion in meta-analyses, which found no significant intervention effect (OR 0.86, 95% CI 0.73-1.02, *p*=0.08; Tau²=0.05, I²=65%; Figure 3.4). Five trials could not be included in meta-analyses due to heterogeneity of measures (Appendix 3.4). Sensitivity analyses showed no overall intervention effects when studies at overall high risk of bias were excluded, when maximum intra-class correlations were used to calculate effective sample sizes and effect sizes, or when using cut points of either four and six resilience protective factors to meet intervention eligibility criteria (Appendix 3.7). Similarly, no overall intervention effects were found in subgroup analyses (Table 3.1; Appendix 3.7).

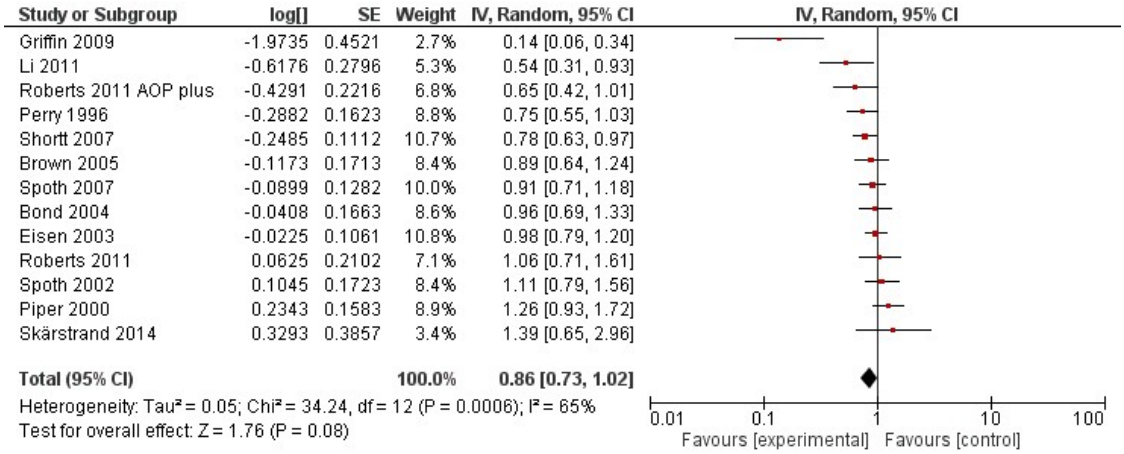

Figure 3.4. Forest plots of resilience intervention versus control for alcohol use

Illicit substance use

Eleven trials reported an illicit substance use outcome (Appendix 3.4). Ten studies provided data enabling inclusion in meta-analyses, which found an overall intervention effect (OR 0.78, 95% CI 0.66-0.93, *p*=0.007, Tau²=0, I²=0%; Figure 3.5). One trial could not be included in meta-analyses due to unsuitability of measures (Appendix 3.4). Sensitivity analyses showed an overall intervention effect when maximum intra-class correlations were used to calculate effective sample sizes and effect sizes (n=10; OR 0.77, 95% CI 0.64-0.93, *p*=0.006, Tau²=0.0, I²=0%), when studies assessed as high risk of bias were excluded (n=6; OR 0.78, 95% CI 0.62-1.00, *p*=0.05, Tau²=0.0, I²=0%) or when using a cut points of four resilience protective factors to meet intervention eligibility criteria (n=8; OR 0.77, 95% CI 0.32-0.93, *p*=0.0008, Tau²=0, I²=0; only one study addressed six resilience protective factors) (Appendix 3.8). Overall intervention effects in subgroup analyses were found for: 'multidimensional' intervention content (n=9; OR 0.77, 95% CI 0.62-0.94, *p*=0.01, Tau²=0,

I^2=0%), universal-only prevention approach (n=9; OR 0.76, 95% CI 0.63-0.92, *p*=0.005, Tau^2=0, I^2=0%), school only setting (n=3; OR 0.76, 95% CI 0.60-0.98, *p*=0.03, Tau^2=0, I^2=0), and studies reporting follow up data of one year or more (n=7; OR 0.84, 95% CI 0.72-0.99, *p*=0.04, Tau^2=0, I^2=0) (Table 3.1; Appendix 3.8).

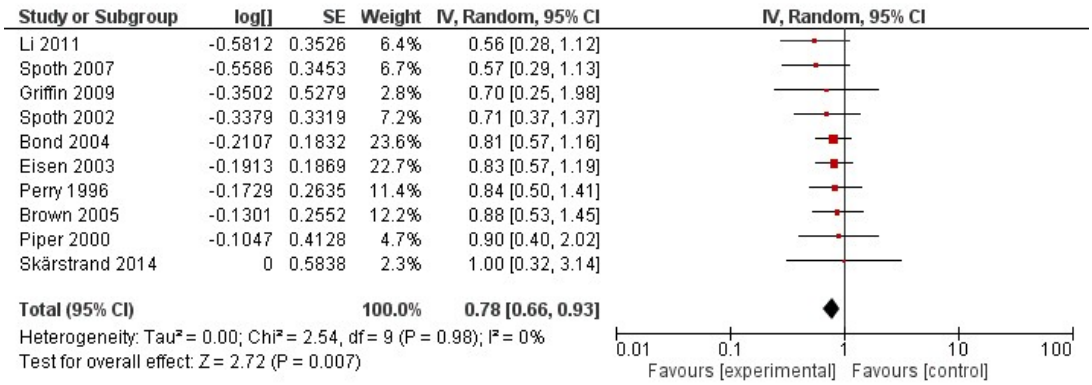

Figure 3.5. Forest plots of resilience intervention versus control for illicit substance use

Assessment of heterogeneity

Heterogeneity, as assessed via calculation of the I^2 (>75%)[38] and Tau^2 statistics, was not present for the main effect of any outcome (see Figures 3.3, 3.4 and 3.5; Appendices 3.6, 3.7, 3.8).

Secondary outcome: Adverse effects of universal school-based interventions to decrease adolescent tobacco, alcohol or illicit substance use

None of the included trials reported any adverse effects as a result of an intervention.

DISCUSSION

This systematic review is the first that has examined the effectiveness of universal school-based interventions that addressed adolescent individual and environmental resilience protective factors, among other factors, in reducing the prevalence of adolescent tobacco, alcohol and illicit drug use. Without consideration of study quality, such interventions were effective in reducing the prevalence of adolescent illicit substance use, but not tobacco or alcohol use. When studies at high risk of bias were excluded, intervention effects were evident for illicit substance use only.

Subgroup analyses without consideration of study quality showed a variable pattern of results. For tobacco and alcohol use, there was no evidence of effect for any subgroup. Whereas for illicit substance use, effects were evident for interventions that addressed 'resilience' protective factors as part of a multidimensional intervention approach, those that adopted a universal-only prevention approach, interventions that were implemented within a school setting only, and those studies reporting long term effects.

Whilst no previous reviews have specifically investigated whether universal school-based interventions that address individual and environmental 'resilience' protective factors are effective in reducing adolescent substance use, the results are consistent with previous Cochrane reviews that have individually investigated the effectiveness of different categorisations of intervention approaches on illicit substance use. For example, meta-analysis results from a Cochrane review of universal school-based interventions targeting illicit substance use found interventions that were based on a combination of social competence and social influence approaches, both of which typically address such 'resilience' protective factors (such as problem solving and self-esteem) as a component of the intervention, to be effective.[10] The lack of an overall effect on tobacco use however contrasts with the meta-analysis findings of a Cochrane review of school-based interventions focused on tobacco use, which found trials combining social competence and social influences to be effective in reducing tobacco use.[12] The review included any prevention approach (i.e. was not limited to universal interventions) and hence the results are not directly comparable. Similarly, the lack of an overall effect on alcohol use contrasts with findings from a narrative Cochrane review of school-based interventions targeting alcohol use, that found evidence of effectiveness for intervention approaches that focused on generic psychosocial and developmental prevention programs.[11]

Limitations

Various limitations in the characteristics of the included studies may have impacted the findings. First, approximately one third of the included studies that reported tobacco use (4/15) or alcohol use (5/17) reported data that could not be synthesised in meta-analysis. This may suggest that the true effects for each outcome differ to the review results, however results from such studies unable to be included in meta-analyses were largely consistent with the review results suggesting this may not be the case. Second, the majority of included studies (15/19) and those studies with data suitable for meta-analysis (8/13) were

conducted in the United States, which may limit the generalisability of the review results to different countries.

Third, due to the limited number of studies available for inclusion in some subgroup analyses, we were unable to investigate whether intervention effect sizes differed by whether content focused exclusively on 'resilience' protective factors (only one study included in the meta-analysis) and whether the intervention approach was universal and targeted (only one study included in the meta-analysis).

Fourth, both the stated intervention approach and the 'resilience' protective factors that were addressed as part of the intervention of included studies varied considerably. Whilst all studies met the inclusion criteria regarding both individual and environmental 'resilience' protective factors, the contribution of the protective factor component of the interventions relative to other intervention components was not able to be assessed due to insufficient information regarding intensity and dose of all intervention components. The definition of 'resilience' intervention adopted may have biased the results, however results from sensitivity analyses showed increasing the number of resilience protective factors required to meet intervention eligibility criteria had no impact on the results. Similarly, the extension of the included 'resilience' protective factors post publication of the protocol may have biased the results, however this did not result in any additional studies being included. The majority of studies that were included in review were 'multidimensional' in that they addressed resilience protective factors as part of a broader intervention approach, it is therefore unclear whether the overall evidence of effect on illicit substance use was due to the resilience content of the interventions or other intervention components.

Fifth, there was considerable variability across included studies with respect to the outcome measures. Despite using the criteria of the most conservative available measure, pooled binary data for each outcome originated from various measures, such as from prevalence of lifetime tobacco use to prevalence of current smokers. Such variability in the outcome measures that were reported and extracted from included studies may have biased the results, however the most conservative measure was selected to reduce this risk. Also, a range of assumptions were made (and documented in the included studies table) for included trials where basic data such as the number of participants analysed in intervention and control groups at follow up was not reported or provided, which may have biased the results of the review. Finally, the ineligibility of non-randomised trials led to the exclusion of a number of school-based studies. Whilst the impact of this is not known, a previous

review of school-based interventions that included non-random pretest/posttest designs found higher, lower and similar effect sizes in a sensitivity analyses restricted to randomised controlled trials.[43]

In terms of the quality of the evidence as assessed by GRADE, due to limitations in the methodological quality in terms of lack of blinding and allocation concealment, the overall quality level was moderate for the alcohol and illicit substance use outcomes and low for the tobacco outcome. Such an assessment suggests the true effect may differ from the intervention effects reported in the review. Limitations in methodological quality were mainly as a result of a lack of reporting of methods of randomisation and allocation concealment.

Strengths of this review include the comprehensive search strategy, the use of Cochrane review methodology, the pre-specified subgroup analyses and planned sensitivity analyses.

CONCLUSIONS

The review found evidence that universal school-based interventions that addressed adolescent 'resilience' protective factors as part of any intervention approach are effective in reducing adolescent illicit substance use, supporting the implementation of such universal school-based interventions to reduce illicit substance use by adolescents. However there was no evidence that such intervention approaches are effective for reducing adolescent tobacco or alcohol use, suggesting alternate approaches are required. Given the inability to investigate whether interventions focused solely on 'resilience' protective factors or those approaches that combine universal and targeted approaches to addressing such protective factors, further research is required to investigate the potential of such intervention approaches in reducing adolescent tobacco, alcohol and illicit substance use. Additionally, given assessment of changes in targeted resilience protective factor was outside the scope of this review, future studies should examine whether this, in particular studies with illicit substance use outcomes.

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AUTHORS' CONTRIBUTIONS

RH led the review. RH and DB designed and conducted the study search. RH and PE undertook title/abstract screening. RH and JD, MK, LW, SY, PE undertook full text screening, and MF was the third reviewer. RH and SN undertook data extraction and risk of bias assessment, and LW was the third reviewer. RH undertook study synthesis and analyses. RH, MF, LW, JB and JW contributed to the conception of the research, and all authors were involved in the preparation of the review, including providing comments on drafts. All authors read and approved the final manuscript.

AUTHORS' CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

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CHAPTER 4

A cluster randomised trial of a school-based resilience intervention to decrease tobacco, alcohol and illicit drug use in secondary school students: study protocol

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ABSTRACT

Background

Whilst schools provide a potentially appropriate setting for preventing substance use among young people, systematic review evidence suggests that past interventions in this setting have demonstrated limited effectiveness in preventing tobacco, alcohol and other drug use. Interventions that adopt a mental wellbeing approach to prevent substance use offer considerable promise and resilience theory provides one method to impact on adolescent mental wellbeing. The aim of the proposed study is to examine the efficacy of a resilience intervention in decreasing the tobacco, alcohol and illicit drug use of adolescents.

Methods

A cluster randomised controlled trial with schools as the unit of randomisation will be undertaken. Thirty-two schools in disadvantaged areas will be allocated to either an intervention or a control group. A comprehensive resilience intervention will be implemented, inclusive of explicit program adoption strategies. Baseline surveys will be conducted with students in Grade 7 in both groups and again three years later when the student cohort is in Grade 10. The primary outcome measures will include self-reported tobacco, alcohol, marijuana and other illicit drug use. Comparisons will be made post-test between Grade 10 students in intervention and control schools to determine intervention effectiveness across all measures.

Discussion

To the authors' knowledge this is the first randomised controlled trial to evaluate the effectiveness of a comprehensive school-based resilience intervention, inclusive of explicit adoption strategies, in decreasing tobacco, alcohol and illicit drug use of adolescents attending disadvantaged secondary schools.

BACKGROUND

Globally, a significant proportion of people, including those in Australia, are at risk of harm from smoking, alcohol misuse or illicit drug use.[1,2] Of all age groups, young people report the greatest prevalence of such substance use.[3] The younger the age of initiation of substance use, the greater the likelihood of ongoing use, dependence and harm in later life.[4] As such, primary prevention efforts focusing on preventing initiation of substance use by young people have been recommended.[5]

Schools provide an appropriate setting for improving the immediate and long-term health of young people as adolescents,[6-8] however there is limited evidence that school-based programs are effective.[5,9,10] A recent review of school-based programs targeting alcohol however has reported that interventions that aimed to develop the psychological or social skills of young people had the most promise.[5,9] The findings of these reviews are consistent with a World Health Organization review that concluded that programs that promote young people's mental wellbeing were most likely to be effective.[11] The same World Health Organization review suggests that school-based interventions that address the school curriculum, school environment and community were the most likely to achieve a beneficial outcome, a method known as the Health Promoting Schools approach.[11]

Resilience theory, which has arisen from the study of risk factors for, and their impact on, positive youth development represents one approach to improving adolescent mental or psychosocial wellbeing.[12-18] Whilst there is variation in the definition of resilience, it is generally agreed that both individual (internal) as well as environmental (external) characteristics contribute to individual resilience and are critical for positive youth development and the avoidance of risk behaviours.[19-21] An inverse association has been found to exist between adolescent resilience characteristics and substance use.[22-24] Although a number of school-based studies have reported targeting some aspect of adolescent resilience as a basis for intervention, none have applied the approach in a comprehensive manner nor have they demonstrated consistent effect.[25-30] In a number of such studies, the researchers have concluded that inadequate intervention dose and fidelity may have contributed to the limited outcomes.[29] A number of barriers to intervention adoption have been cited including: a lack of financial resources for planning, training, and teacher release; inadequate levels of professional development; inadequate program resources; failure to adopt a 'whole of school' approach to implementation and monitoring; and inadequate support by school executives.[31]

A pilot study of a comprehensive intervention addressing both internal and external adolescent resilience factors in a convenience sample of three socio-economically disadvantaged secondary schools has recently been reported (Appendix 4.1). The intervention was delivered using the Health Promoting Schools approach,[32] and included explicit strategies to enhance intervention adoption such as adoption support staff, resource provision and staff training. The evaluation suggested significant increases across all three schools in internal and external resilience scores, and significant decreases across all three schools in prevalence of student smoking, alcohol consumption and marijuana use.[32] Such positive outcomes were demonstrated for all grades and genders, and exceeded declining temporal trends in the broader population.[32] Whilst the findings of the pilot study were positive, a more rigorous study design is required to confirm the potential of such a comprehensive resilience enhancing approach. A cluster randomized controlled trial is planned to examine the efficacy of a comprehensive resilience intervention, inclusive of intervention adoption strategies, in decreasing the tobacco, alcohol and illicit drug use of adolescents attending secondary schools in a socio-economically disadvantaged region.

METHODS

Study design

A cluster randomised control trial design (Figure 4.1) will be conducted, with schools as the unit of randomisation. Thirty-two schools will be randomly selected to participate in the study, with 20 schools randomly allocated to the intervention group, and 12 to the control group. A resilience intervention will be implemented in schools allocated to the intervention group. Schools allocated to the control group will not receive any intervention during the study period. To assess the efficacy of the intervention, baseline web-based surveys will be conducted with Grade 7 students. Follow up data will be collected using the same method three years later when the original cohort of students are in Grade 10.

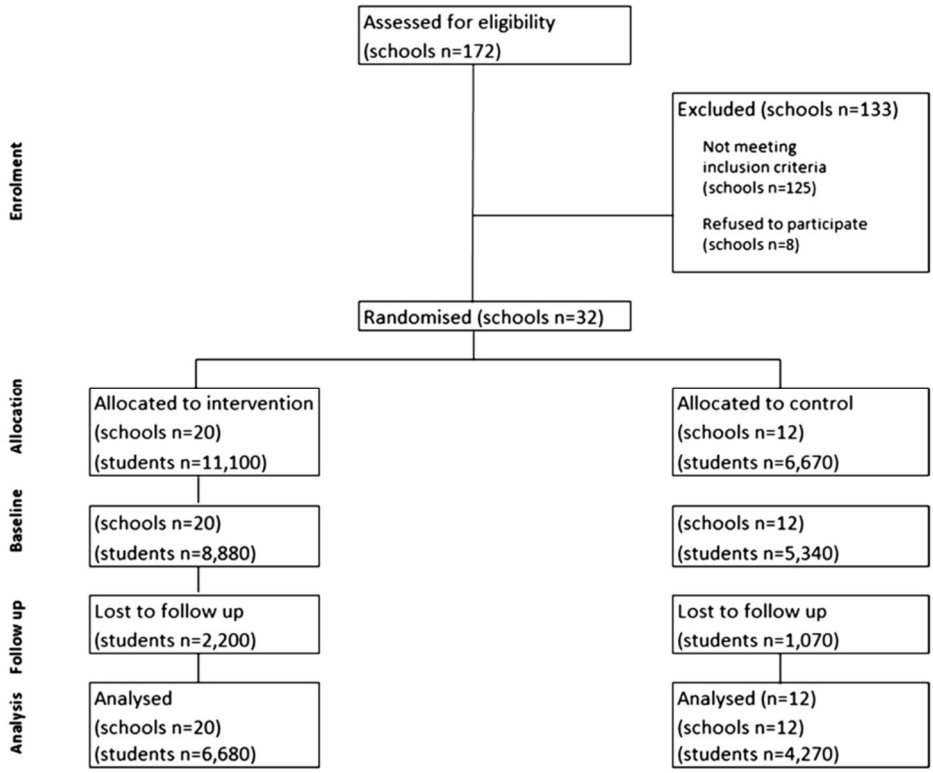

Figure 4.1 Estimated CONSORT flow diagram of the school progress through the phrases of the trial.

The trial has been approved by the Hunter New England Health Human Research Ethics Committee (Ref no. 09/11/18/4.01; Appendix 4.2), The University of Newcastle Human Research Ethics Committee (Ref no. H-2010-0029; Appendix 4.3), the Aboriginal Health and Medical Research Council (Ref no. 776/11; Appendix 4.4), the New South Wales Department of Education and Training State Education Research Approval Process (Ref no. 2008118; Appendix 4.5), and the relevant Catholic Schools Offices (Appendix 4.6). In addition, the trial is registered with the Australia and New Zealand Clinical Trials Register (Ref no. ACTRN12611000606987; Appendix 4.7).

Participants

School sample

The study will be conducted in 32 government and Catholic secondary schools within the Hunter New England Local Health District of New South Wales, Australia. Approximately 135,000 adolescents reside in the Hunter New England Local Health District which encompasses metropolitan, regional, rural and remote locations across an area of 130,000 square km.[33] Schools will be selected from a list of all government and Catholic secondary

schools in the study area obtained from the Department of Education and Training and from relevant regional Catholic School Offices.

Schools will be eligible if they are located in a disadvantaged Local Government Area (as defined by the SEIFA Index of Relative Socio-Economic Advantage/Disadvantage by Local Government Area),[34] have more than 400 total student enrolments, and have enrolments in Grades 7 to 10. In addition, due to the likelihood of differential effects, schools which are entirely special needs or selective, central schools, boarding schools or are not co-educational schools are ineligible for inclusion in the trial.

School recruitment

Before being invited to participate in the trial, briefing meetings will be held to inform all school principals of the study. An eligibility interview will subsequently be conducted with each school principal to identify current implementation of resilience strategies. Schools considered to be implementing a comprehensive resilience intervention within each domain of the Health Promoting Schools framework across all grades will be ineligible and removed from the list of eligible schools.

The order in which eligible schools will be invited to participate will be determined using a random number function (in Microsoft Excel) by an independent statistician. The principals of the first 32 randomly selected eligible secondary schools will be sent a letter (Appendix 4.8) informing them about the study and requesting written consent for their school to participate. Within one week from the initial information letters being sent, research staff will contact non-responding principals to answer any questions they may have and to prompt their reply. Principals that do not reply within a further week will receive additional prompts from research staff. If a school declines to consent the next school on the list will be invited, following the same procedure above.

Random allocation of schools

Once 32 schools have been recruited to the study, the sample will be stratified by engagement in a national government initiative directed at schools in disadvantaged areas,[35] and school size (medium sized school 400–800; large sized school >800). Schools will then be randomly allocated in a 20:12 block design ratio to either the intervention or the control group. Neither schools, parents of students, nor students attending selected schools will be blinded to the school allocation.

Student sample

All students in Grade 7 (first year at high school and aged 12 to 13 years) attending consenting schools will be eligible to participate in the study (approximately 3,600 students at baseline).

Student recruitment

Active parental consent will be required for child participation in the evaluation component of the study. A number of strategies will be employed to maximize parental consent for child participation based on a recent review of school-based recruitment methods.[36] Schools will be provided with information to disseminate via existing school communication channels, including school newsletters, assemblies, staff meetings, and school community and parent meetings. Parents of children will be mailed study information packs that include a short cover letter from the school principal on school letterhead (Appendix 4.9), a detailed study information letter for parents (Appendix 4.10), a simplified study information letter for students (Appendix 4.11), a parental consent form for child participation in the study (Appendix 4.12) and a reply-paid envelope. The information letter will also provide the details for a free call message service on which parents can leave their details if they do not want to be prompted for consent. Parents will be asked to return the consent form by either using the reply-paid envelope or by providing it to their child's school.

Two weeks after distribution of the information packs, non-responding parents will be telephoned by school affiliated staff to prompt return of the child consent form. During the phone call, parents will be asked if they consent to their child participating in the survey. Parents who provide verbal consent during this phone call will be mailed a replacement information sheet and consent form (with reply paid envelope) so that written consent can be obtained.

Resilience intervention

Intervention content

A multi-strategy intervention, based on a range of programs and strategies that address both internal and external adolescent resilience factors will be implemented for the whole school. Schools will be asked to implement a range of strategies in each of the Health Promoting Schools domains (curriculum, teaching and learning; ethos and environment; and partnerships and services) to enhance student resilience.[37] The strategies schools select will be informed by a comprehensive and structured planning process and will be selected from a list of evidence based programs (e.g. MindMatters program). In this manner, the

strategies implemented by each school may differ. However, schools will be asked to implement strategies to an intervention standard (see Table 4.1).

Table 4.1. Resilience intervention standards

Curriculum, teaching and learning
• 100% of students in Grade 7-10 receive a minimum of 12 age appropriate resilience lessons across subjects (e.g. implementation of MindMatters curriculum resources)[38] • 100% of students in Grade 7-10 receive an additional 9 hours of non-curriculum based resilience programs (e.g. implementation of the 'Resourceful Adolescent Program[34]
Ethos and environment
• Rewards and recognition program implemented across the whole school • Peer support/peer mentoring programs implemented across the whole school • Anti-bullying programs implemented across the whole school • Cultural awareness program implemented across the whole school • Teacher offered training to implement effective pedagogy within learning environments (e.g. MindMatters Teaching and Learning for Engagement)[38]
Partnerships and services
• Promotion and engagement of local community organizations/groups/clubs in the school (e.g. charity organizations, church or sporting groups) • Promotion and engagement of health and community services in the school (e.g. Youth and Child and Adolescent Mental Health Services) • School implement strategies to increase parental involvement in school (e.g. school events, effective parent communication strategies) • School promotes strategies to address students' resilience at home (e.g. newsletters regarding enhancing student resilience)

Intervention adoption strategies

To increase the extent of intervention adoption and fidelity across schools, a number of strategies will be implemented that have been previously reported to facilitate adoption of school-based interventions, to change the service delivery practices of human service organizations, and to build capacity of organizations.[17,31,39-44]

School intervention officers

A part-time school intervention officer will be located in each school to support data collection, and program planning, implementation and monitoring. Their role will be to support schools to implement the resilience intervention. School intervention officers will

not implement intervention strategies directly with students. Such officers will be employed for three years and allocated to intervention schools at a ratio of one officer per four schools. Prior to intervention implementation, school intervention officers will undertake a two week intervention training program.

A school project coordinator will be employed full time for two years to support the implementation of the intervention at a regional level, provide support to the school intervention officers, and liaise with schools and the two education sectors.

Fiscal resources

In each year of the intervention, schools will be provided with an annual allocation of AUS$2,000 seed funding to facilitate training, professional development and teacher release time for intervention implementation.

Leadership

A school core team will be established, or an existing team will be enhanced, at each school to lead the implementation of the project. The core team will include the allocated school intervention officer, school staff and involvement of at least one member of the school executive.

Structured planning process

A structured planning process will be undertaken to design and implement the intervention in each school. A needs assessment will be undertaken immediately prior to intervention implementation to inform the development of strategies targeting student resilience. This assessment will include a resilience factor and substance use survey of all students in Grades 7 to 10 and a school environment survey of school policies, practices and curriculum that may impact on student resilience.

Planning workshops will then be held at each school to prioritize student resilience needs and identify feasible strategies to address them. Following this, each school will develop an individual intervention plan which will be endorsed by the school executive and integrated into existing student welfare governance processes and school planning. Schools will be provided with an implementation guide (Appendix 4.13) that describes in detail the steps required to implement this planning process, inclusive of available resilience programs, tools and templates.

Training

Key school staff will be provided with training in the planning, delivery and monitoring of the resilience intervention strategies (including resilience professional development). All school staff will be offered training in effective pedagogy for enhancing student resilience,[45] and mental health literacy.[46]

Monitoring and feedback

The school intervention officer will be responsible for monitoring and maintaining project records. School specific feedback regarding intervention progress and data collected via student surveys will be provided to each. Intervention progress will also be provided to senior managers from the New South Wales Department of Education and Training and the relevant regional Catholic School Offices.

Control group

Schools allocated to the control group will receive a report of their student survey data in the first and fourth year of the study. In addition, control schools will be given all printed intervention resources at the conclusion of the trial.

Data collection procedures

Student outcomes

Baseline data will be collected via a student survey (Appendix 4.14) completed by all consenting students in Grade 7 in both intervention and control schools in the first year of the study. Follow up data will be collected from the same students in the fourth year of the study when the student cohort is in Grade 10 in the same season as baseline. The student survey will take approximately 25 minutes to complete. Data collection staff will be recruited and trained to support students to complete the online survey during class time.

School outcomes

At baseline and follow up, a school environment survey (Appendix 4.15) will be undertaken with key school staff including principals and head teachers of both intervention and control schools to identify existing school policies and practices that target student resilience.

Measures

Student demographics

The student survey (Appendix 4.14) will include the following demographic items: age, Grade, gender, ethnicity and Aboriginal and Torres Strait Islander status, languages spoken at home, and postcode.

Primary outcome measures – substance use

The outcome measures will be student-reported smoking, alcohol use and illicit drug use. For both recent tobacco and alcohol use, retrospective diaries will be used to measure consumption in the past 7 days.[25,47,48] Recent use will be defined as having smoked any cigarettes or consumed any alcoholic drinks in the last week. These items are used regularly in Australian state-wide surveys of secondary school student health behaviours.[49] For risky alcohol consumption, the Australian guidelines recommend that there is no safe drinking level for adolescents.[50] As such, a measure of risky drinking based upon the Australian recommendations for adult risk for injury (no more than 4 standard drinks on one occasion) will be used.[50] For illicit drug use, data regarding marijuana and any other illicit drug use in the past month will be collected.[49] The items are used regularly in state-wide surveys of secondary school student health behaviours.[49] Data will also be collected regarding known moderators of tobacco and alcohol use, including sibling use, parent/carer use, access, receipt of pocket money or income from paid employment, and belief health will be damaged by tobacco and alcohol use.[51,52]

In a selection of schools, a 10% random selection of students whose parents have provided consent will be asked to provide a saliva sample at the completion of the student survey in the fourth year of the study. The saliva sample will be used to test for the presence of cotinine (a metabolite of nicotine) to validate the accuracy of their self-reported tobacco use.[53] All students attending these schools will be informed that they may be selected to provide a saliva sample to confirm their smoking status (a variation of the bogus pipeline method).[54] Although the accuracy of cotinine assessment may be influenced by less frequent adolescent smoking, it is the most suitable measure given its low level of personal intrusion, portability and cost.[55]

Secondary outcome measures - resilience

Items from the California Healthy Kids Survey will be used to measure student internal and external resilience. The survey addresses six internal resilience factor subscales and eight

external resilience factor subscales which have demonstrated adequate reliability.[31] The internal resilience subscales include Likert scale items addressing: cooperation and communication (2 items); self-efficacy (4 items); empathy (3 items); problem solving (3 items); self-awareness (3 items); goals and aspirations (3 items); school support (6 items); school meaningful participation (3 items); community support (6 items); community meaningful participation (3 items); home support (6 items); home meaningful participation (3 items); peer caring relationships (3 items); pro-social peers (3 items).

School environment survey

The school environment survey (Appendix 4.15) will be developed by the research team and will aim to measure the programs, curriculum, policies, practices, and partnerships that schools are currently implementing that target student resilience.

Sample size

Based on past research,[7,56] and the pilot study results, an estimated 80% of students will consent to participate. Based on this, and an estimated loss of students to follow up from Grade 7 to Grade 10 of 25% a cohort sample of 1,360 Grade 7 students and 1,020 Grade 10 students in the control condition, and 2,270 Grade 7 students and 1,700 Grade 10 students in the intervention condition, will be the subject of analysis. Assuming 80% power, a 5% significance level, an intra-cluster correlation of 0.01, and a Grade 10 control group smoking prevalence of 14% the study will be able to detect a 4.8% lower prevalence of smoking for the intervention group. For recent and risky alcohol consumption, assuming a Grade 10 control group prevalence of 36.2%, a 7.0% lower prevalence of consumption can be detected. For use of marijuana, assuming a Grade 10 control group prevalence of 25%, a 6.2% lower prevalence of use respectively can be detected for marijuana. Finally, for other illicit drugs, assuming a Grade 10 control group prevalence of 9.3%, a 3.9% lower prevalence of use can be detected for the intervention group.

Statistical analysis

All analyses will be undertaken using SAS Software Version 9.2.[57]

Demographic characteristics

Intervention and control school parental consent rates will be examined for non-response bias using Chi square analysis. Intervention and control school student demographic characteristics will be compared at baseline and follow up also using Chi square analysis.

Primary outcomes – substance use

Comparisons in prevalence of substance use will be made between Grade 10 students in intervention and control schools at follow up to determine intervention effectiveness for each outcome measure. Generalized linear models (generalized estimating equation (GEE approach)) will be used.[58] The GEE will cater for dichotomous outcome data, school clustering, levels of strategy implementation, and student or school characteristics that are potential confounding variables. Usual assumptions of linear regression will be tested (including linearity, independence, constant variance and normality), with variations from normality adjusted for using the robust variance estimator. For all outcome analyses, school will be included in the model as the clustering unit.

Secondary outcomes - resilience

Assuming resilience scores are not normally distributed (as with the data from the pilot study) comparison of median scores will be made post-test between Grade 10 students in intervention and control schools to determine intervention effectiveness. Linear regression models (GEE) will test differences in overall sub-scale levels of resilience factors (predictor variable being treatment group).

School environment survey outcomes

Existing resilience intervention implementation collected via the school environment surveys in both intervention and control groups will be compared at both baseline and follow up using descriptive statistics.

Implementation cost

Costs will be calculated with the support of a health economist from the perspective of routine school delivery (development and research costs will be excluded). The proposed costing approach has previously been successfully undertaken and reported by the study team.[59,60]

DISCUSSION

To the authors' knowledge this is the first randomised controlled trial to evaluate the effectiveness of a comprehensive school-based resilience intervention, inclusive of explicit adoption strategies, in decreasing the self-reported tobacco, alcohol and illicit drug use of adolescents attending disadvantaged secondary schools. The intervention has been found to be feasible and acceptable when piloted in three secondary schools. The current study

offers the opportunity to provide evidence that a resilience approach is effective in addressing adolescent substance use in line with the recent reviews that suggest this. If the results indicate the resilience intervention is effective in decreasing the prevalence of adolescent substance use, a new and strengthened intervention model will be available to aid policy makers and educationalists in implementing interventions targeting adolescent substance use, inclusive of program adoption strategies.

COMPETING INTERESTS

There are no competing interests for any of the authors of this manuscript. Authors' contributions RKH drafted the manuscript; and participated in the conception, design and coordination of the study. MF, JB, EC, KG and JW helped draft the manuscript and participated in the conception, design and coordination of the study. LW, PW and TH helped draft the manuscript and participated in the conception and design of the study. All authors read and revised the manuscript critically for intellectual content, and approved the final manuscript.

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CHAPTER 5

Effectiveness of a pragmatic school-based universal resilience intervention in reducing tobacco, alcohol and illicit substance use in a population of adolescents: cluster-randomised controlled trial

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ABSTRACT

Objectives

Initiation of tobacco, alcohol and illicit substance use typically occurs during adolescence, with the school setting recommended to reduce adolescent substance use. Strengthening individual (e.g. problem solving) and environmental (e.g. caring relationships at school) resilience protective factors of adolescents has been suggested as a strategy for reducing substance use by adolescents, however few studies have examined this potential. A study was conducted to investigate the effectiveness of a pragmatic school-based universal 'resilience' intervention in reducing the prevalence of tobacco, alcohol and illicit substance use, and increasing the individual and environmental protective factors of students.

Design

A cluster-randomised controlled trial

Setting

Thirty-Two Australian secondary schools (20 intervention;12 control)

Participants

Cohort of Grade 7 students followed up in Grade 10 (2014; aged 15-16years)

Intervention

A pragmatic intervention involving school staff selection and implementation of available programs and resources targeting individual and environmental resilience protective factors for all Grade 7-10 students was implemented in schools (2012-2014). School staff were provided implementation support.

Measurements

An online survey collected baseline and follow up data for primary outcomes: tobacco (ever, recent) and alcohol (ever, recent, 'risk') use, and secondary outcomes: marijuana and other illicit substance use, and individual (six factor subscales, aggregate) and environmental (three factor subscales, aggregate) protective factor scores. Generalized and linear mixed models examined follow up differences between groups.

Results

Follow up data from 2105 students (intervention=1261; control=844; 69% of baseline cohort) were analysed. No significant differences were found between intervention and control students for any primary (ever tobacco: OR 1.25, 95% CI: 0.92,1.68, *p*=0.14; recent tobacco: OR 1.39, 95% CI: 0.84,2.31, *p*=0.19; recent ever alcohol: OR 1.11, 95% CI: 0.83,1.48, *p*=0.46; alcohol: OR 1.13, 95% CI: 0.78,1.62, *p*=0.51; 'risk' alcohol: OR 0.98, 95% CI: 0.70,1.36, *p*=0.89) or secondary outcomes (marijuana: OR 1.12, 95% CI: 0.74,1.68, *p*=0.57; other illicit substance: OR 1.19, 95% CI: 0.67,2.10, *p*=0.54; individual protective factors: MD: 0, 95% CI:-0.07,0.06, *p*=0.89; environmental protective factors: MD: -0.02, 95% CI: -0.09,0.06, *p*=0.65).

Conclusions

The universally implemented pragmatic school-based intervention was not effective in reducing the prevalence of tobacco, alcohol or illicit substance use, or in increasing the protective factors of students.

BACKGROUND

Tobacco, alcohol and illicit substance use are responsible for 9% of the global disease burden,[1] 12% of deaths world-wide,[2] and significant health and societal costs.[3-6] Initiation of tobacco, alcohol and illicit substance use in high-income countries generally occurs during adolescence,[7-9] with earlier use associated with greater dependence in adulthood.[1] Whilst data from the United States and Australia show a declining trend in adolescent substance use[9,10] a considerable proportion of adolescents (aged 11-17 years) continue to report such use; 23%-45% having smoked a cigarette, 43%-74% having consumed an alcoholic drink, and 7%-40% having used an illicit substance.[9-11]

Schools represent an opportune setting for interventions to prevent adolescent substance use as they provide access to large numbers of adolescents for prolonged periods, and have curricula and policies that seek to promote student health and wellbeing.[12,13] As a consequence, substance use prevention interventions delivered to all students in a school or classroom regardless of risk (that is universal)[14,15] are common and supported by governments world-wide to reduce the prevalence of adolescent substance use.[16-19] Despite policies recommending comprehensive approaches to substance use prevention address protective factors of substance use[17,19-21] and 'resilience',[17,19] such policies do not provide guidance regarding the specific factors or resilience strategies that should be targeted or the manner in which they should be addressed. Possibly as a result, it is reported that schools frequently develop their own programs,[22] do not implement evidence-based programs or implement existing evidence-based programs[23] and make significant adaptations to cater for local contexts.[24] The extent to which such an approach can realise its intended benefits has not been reported.

Evidence from cross sectional studies suggests a range of individual factors including self-efficacy, problem solving, communication and self-awareness are protective of adolescent substance use; as has evidence regarding environmental factors such as caring relationships with adults and peers, and meaningful participation in home, school and community settings.[25-37] Such factors have similarly been found to be protective of a person's 'resilience',[38-40] most broadly defined as the process of, capacity for, or outcome of successful adaptation in the context of risk or adversity.[40-42]

Various randomised controlled trials have assessed the effectiveness of resilience protective factor interventions on substance use.[43] These have primarily addressed either

resilience protective factors as a component of a broader intervention approach,[44-60] combined universal and targeted interventions,[61,62] combined parent and school-based strategies,[63] or involved elementary school aged students only.[64] However only one controlled trial that assessed the effectiveness of a universal school-based intervention focused solely on the enhancement of both individual and environmental resilience protective factors in reducing the prevalence of adolescent or secondary school-aged students substance use. The cluster-randomised controlled trial conducted in 26 Australian secondary schools, investigated the effectiveness of a three-year whole-of-school intervention delivered by schools (i.e. pragmatic) targeting a number of individual and environmental protective factors in preventing tobacco, alcohol and marijuana use in a cohort of students.[46] Outcomes were assessed at baseline, mid-intervention (after one year of intervention) and following intervention completion. Despite promising results mid-intervention for tobacco use, at follow up the confidence intervals for the adjusted odd ratios for tobacco, alcohol or marijuana use outcomes indicated a non-significant result.[45]

Given the limited evidence regarding the effectiveness of universal interventions promoting protective factors as a means of reducing adolescent student substance use, a cluster randomised controlled trial was conducted to determine the effectiveness of a secondary school staff-delivered pragmatic intervention targeting such protective factors in reducing the prevalence of tobacco and alcohol use (primary outcomes) and marijuana and illicit substance use, and in increasing individual and environmental protective factors (secondary outcomes).

METHODS

Study design and setting

A cluster randomised controlled trial was conducted in secondary schools in one health district of New South Wales, Australia. Outcome assessments were conducted with a cohort of students at baseline (when students were in Grade 7 - aged 12-13 years) and at follow up (when students were in Grade 10). Approximately 114,000 people aged 10 to 19 years reside in metropolitan, regional, rural and remote areas within the district.[65,66] Relevant ethics committee approvals were obtained (Hunter New England Health Ref: 09/11/18/4.01, Appendix 4.1; University of Newcastle Ref: H-2010-0029, Appendix 4.2). Further study details and assessment of other registered outcomes are reported elsewhere.[67,68]

Participants and recruitment

Schools

A national schools database[69] identified 172 schools with secondary enrolments within the study area. Schools were eligible if they: were a Government or Catholic secondary school located within a socioeconomically disadvantaged local government area,[70] had enrolments in Grades 7 to 10 (aged 12-16 years) and had more than 400 total student enrolments. Schools were ineligible if they were: single gender, independent (private), special needs, selective, central (for students aged 5-18 years) or boarding schools.

Randomisation of schools

Eligible schools were approached in random order until a quota of 32 schools consented. Consenting schools were stratified according to participation in a government disadvantaged schools initiative (yes/no)[71] and school size (medium 400-800/large >800), then randomly allocated to intervention or control in a 20:12 block design ratio by an independent statistician using a random number function in Microsoft Excel prior to baseline data collection (the number of intervention schools were increased from planned 12 to 20 following stakeholder consultation).

Students

All students enrolled in Grade 7 (first year at secondary school) were eligible to participate in data collection and active parental consent for student participation was sought via a mailed study information pack (Appendices 4.9-4.12). A free call number was provided for parents who wished to decline. After two weeks, non-responding parents were prompted via telephone by school-affiliated staff who were blind to group allocation.

School staff

Selected school staff (deputy principal, head teachers for student welfare and five key subject areas, and the Aboriginal Education Coordinator or other Aboriginal staff member) at each intervention and control school were invited to participate in data collection at follow up.

Intervention

A three-year universal ('whole of school') intervention was delivered to all students in Grades 8 to 10. The intervention, based on a pilot study,[72] involved 16 broad strategies (see

Table 5.1) seeking to build the protective factors of students implemented across the three domains of the Health Promoting Schools framework.[73] Each of the 16 broad strategies addressed one or more individual (self-efficacy, problem solving, cooperation/communication, self-awareness, empathy, goals/aspirations) or environmental protective factors (school support, school meaningful participation, community support, community meaningful participation, home support, home meaningful participation, peer caring relationships, pro-social peers). Such protective factors have been found to be correlated with adolescent substance use[74] and align with a 'resilience' approach.[38-40,75]

Table 5.1. Intervention and implementation support strategies

INTERVENTION STRATEGIES BY HEALTH PROMOTING SCHOOLS DOMAIN
Curriculum, teaching and learning
1. Age-appropriate lessons (9 hours) on individual protective factors across school subjects (e.g. MindMatters[77] or school-developed curriculum resources)[I,a]
2. Non-curriculum programs (9 hours) targeting protective factors (e.g. the Resourceful Adolescent Program)[78;I,E]
3. Additional program targeting protective factors for Aboriginal students[I,E,a]
Ethos and environment
4. Rewards and recognition program[I,E]
5. Peer support/peer mentoring programs[I,E]
6. Anti-bullying programs[I,E]
7. Empowerment/leadership programs[I,E]
8. Additional empowerment/leadership/mentoring programs for Aboriginal students[I,E,a]
9. Aboriginal cultural awareness strategies[I,.E,a]
Partnerships and services
10. Promotion/engagement of local community organizations/groups/clubs in school (e.g. charity organizations)[E,a]
11. Additional/enhanced consultation activities with Aboriginal community groups[I,E,d]
12. Promotion/engagement of health, community and youth services in the school[I,E,a]
13. Additional /enhanced Aboriginal community organizations promoted or engaged[I,E,d]
14. Referral pathways to health, community and youth services developed and promoted[I,E,a]
15. Strategies to increase parental involvement in school (e.g. school events)[E,a]
16. Information regarding student protective factors provided to parents via school newsletter[I,E,a]

IMPLEMENTATION SUPPORT STRATEGIES

1. Engagement with school community including presentations at school staff meetings regarding planned intervention[b]
2. Embedded staff support:
    - School intervention officer one day a week to support program implementation
    - Project coordinator to liaise with school sectors and support school intervention officers[c]
3. School intervention team formed (new team or re-alignment of existing team, inclusive of school intervention officer and school executive member) to implement intervention
4. Structured planning process to prioritize and select appropriate resources/programs:
    - Needs assessment of student protective factors (when study sample in Grade 7 and 9)
    - Two school community planning workshops and one strategy review workshop[c]
    - School plan to address intervention strategies endorsed by the school executive
5. Intervention implementation guide that described the intervention, planning process, available resources and programs, tools and templates for intervention implementation.
6. Staff mental health training (minimum of one hour per school during staff meetings)
7. AUD $2,000 per year each for:
    - Teacher release time for intervention implementation or professional development
    - Strategies specifically for Aboriginal students[a]
8. Feedback reports regarding student substance use and protective factors, and intervention implementation (termly)[c]
9. An Aboriginal Cultural Steering group was formed comprising of Aboriginal staff from local Aboriginal community organizations and Government Departments to provide Aboriginal cultural advice and direction regarding the study design, implementation, evaluation and dissemination

I To target individual protective factors; E To target environmental protective factors; [a] Implemented in Years 2 and 3 only; [b] Year 1 only; [c] Years 1 and 2 only; [d] Year 3 only. NB. Following publication of the study protocol[67] and based upon advice received from an Aboriginal Cultural Steering Group, intervention strategies 3,8,11,13 were added.

A pragmatic intervention approach[76] that involved intervention delivery by school staff as a component of routine school practice was adopted to approximate intervention delivery under 'real-world' conditions.[76] Schools were provided with details of existing resources and programs addressing the 16 broad strategy areas from which they could choose to implement (Appendix 5.1). Whilst schools were required to implement programs and resources that addressed each of the 16 broad strategies, they had the flexibility to select which specific program or resource to implement, and the order and manner in which they were implemented. This approach is similar to approaches adopted by previous substance

use prevention studies,[58,61,62] with the exception that selected programs and resources were not required to have been rigorously evaluated.

To facilitate implementation of intervention strategies, programs and resources, schools were provided with a comprehensive range of support strategies, including an embedded psychology or education trained implementation support officer; strategies that have been previously reported to facilitate implementation of interventions (Table 5.1).[79-86]

Control schools implemented usual school curricula and policies which may have included protective factor strategies and resources similar to, or the same as, those systematically provided to the intervention schools, but were not provided with program resources or support. A report describing baseline school-level student substance use and protective factor characteristics was provided to control schools.

Data collection procedures

Student demographic and protective factor characteristics and substance use outcomes

Students completed a confidential web-based survey (Appendix 4.14)[87] in class time prior to intervention commencement (baseline: August-November 2011) and immediately following intervention completion (follow up: July-November 2014). Neither the school staff nor researchers were blind to group allocation.

Implementation of strategies targeting protective factors

To assess intervention implementation by intervention schools,[88] research staff reviewed school documents and recorded the delivery of intervention strategies monthly. In addition, at follow up, telephone-based structured interviews (Appendix 4.15) were conducted with staff from both groups by interviewers regarding school implementation of intervention strategies and engagement with the intervention during the final year of intervention. School staff from intervention schools were asked their level of engagement with the intervention in the final year.

Measures

Student demographic characteristics

The student survey addressed: age, gender, residential postcode, Aboriginal and/or Torres Strait Islander status, ethnicity, and non-English speaking background.

Student substance use

Substance use outcome data were collected using items from an ongoing Australian triennial survey of school students' health behaviours (Appendix 5.2).[9] Primary outcomes included tobacco (ever and recent) alcohol (ever, recent and 'risky') use. Secondary outcomes included marijuana and other illicit substance use. Planned validation of student self-report of smoking via saliva-based cotinine testing,[67,89] was not conducted due to school policies prohibiting drug testing.

Student individual and environmental protective factors

The Resilience and Youth Development module of the California Healthy Kids Survey was used to measure individual and environmental protective factors.[74] Items for all six individual and three of the environmental factor subscales were selected based on their congruence with the intervention (Appendix 5.2). Aggregate individual and environmental protective factor scores were used as secondary outcome measures.

Consistent with a previous study of the survey,[74] analysis of baseline responses confirmed the subscales were internally consistent and valid (Cronbach alpha coefficients: individual 0.55-0.81; environmental 0.77-0.88).[90] Confirmatory factor analysis[74] demonstrated the subscale factor structure to be a good model fit (comparative fit index 0.92, root mean square error of approximation 0.04).

Implementation of strategies targeting protective factors

The telephone survey of school staff assessed reported implementation of programs and resources in each of the 16 broad strategy areas (Table 5.1), and staff in during the final year of intervention. Intervention school staff level of engagement was assessed by a single item (not at all/somewhat/moderately/very/unsure).

Sample size

The sample size was calculated on the basis of 24 schools (i.e. 12 in each group). Based on an assumed parental consent rate of 80%,[32,91] and loss of students to follow up from Grade 7 to Grade 10 of 25%, it was estimated the cohort would consist of 2,720 Grade 7 students (1,360 in each group) and 2,040 Grade 10 students at follow up (1,020 in each group). Assuming 80% power, a 5% significance level, an intra-cluster correlation of 0.01,[72] and Grade 10 control group prevalence of 14% for recent smoking, 36.2% for recent/risk alcohol use, 25% for marijuana use, and 9.3% for other illicit substance use,[92] the study was estimated to be able to detect an absolute reduction in prevalence of 4.8% for recent smoking, 7.0% for recent/risk alcohol use, 6.2% for marijuana use and 3.9% for illicit substance use in intervention compared to control students.

Statistical analysis

Student demographic characteristics

Student-reported residential postcode was used to calculate student socioeconomic status[70] and remoteness of residential location.[93] Characteristics of students (gender, Aboriginality, socioeconomic status, remoteness, baseline substance use and protective factor scores) completing both baseline and follow up surveys were compared to those lost to follow up by logistic regression accounting for potential clustering of students within schools.

Student substance use

Recent tobacco use was defined as having smoked at least one cigarette in the last week, and recent alcohol use as at least one alcoholic drink in the last week (yes/no). The response options for 'risky alcohol use' were dichotomised (either 'none', or 'once'/'twice'/'3-6 times'/'7 or more times'), as were the response options for both marijuana and other illicit substance use (either 'none', or 'once or twice'/'3-5 times'/'6-9 times'/'10-19 times'/'20-39 times'/'40 or more times').

Comparison between groups in the prevalence of substance use at follow up for the cohort Grade 10 students in intervention and control schools was undertaken to determine the effectiveness of the intervention using generalized linear mixed models (binomial distribution with a logit link; analysis as treated). All models included a fixed effect for treatment group (intervention versus control) and a random effect for each school to account for clustering of responses within schools. Models were adjusted for *a priori* selected prognostic variables (age, gender, school type, school size, Aboriginal/Torres Strait

Islander status, ethnicity, non-English speaking background, socio-economic status) and odd ratios with 95% Wald confidence intervals calculated. Intra-class correlations were estimated on the logistic scale using the methods described in Eldridge et al.[94]

Sensitivity analyses were undertaken according to intention-to-treat principles, where multiple imputation was used to assess the sensitivity of results to missing data under the missing at random (MAR) assumption[95] from students that were lost to follow up or changed schools during the intervention period. The method of chained regression equations was used, imputing 10 data sets separately by treatment group and pooling the results using Rubin's method.[96] Specifically, this involved a chained regression equations method of generating 10 complete datasets; logistic regression models were used for categorical (binomial, ordinal or multinomial) variables and linear regression models were used for continuous variables. The imputation model included all substance use outcomes, together with all variables that were in the analysis model and treatment group.

Student individual and environmental protective factor scores

Student protective factor subscale scores were calculated by averaging the responses to all items in each subscale. Aggregate individual and environmental protective factor scores were calculated by averaging all relevant subscale scores for each student.[74] Scores ranged from 1 to 4, with higher scores more favourable.

Linear mixed models were used to assess the effectiveness of the intervention for the aggregate individual and environmental protective factor scores at follow up. The models included a fixed effect for treatment group (intervention vs control) and a random effect for school to account for clustering of responses within schools. Models were adjusted for the same prognostic variables as per the substance use models. Intra class correlation was estimated as the proportion of the total variance that is due to between cluster variance.

Implementation of strategies targeting protective factors

Descriptive statistics summarised the number of intervention schools implementing each of the 16 broad intervention strategies that addressed protective factors as identified via project records (Intervention Years 1-3). Chi-square and t test analyses examined whether intervention and control schools differed with respect to their reported implementation of protective factor strategies in the final year of intervention.

A criterion for statistical significance of $p \leq 0.05$ was used. All analyses were undertaken by an independent statistician using SAS Software Version 9.4.[97]

RESULTS

Sample

Schools

Forty-four of the 47 eligible schools were approached prior to achieving the quota of 32 schools (73% consent rate) (see Figure 5.1). Participating schools included 28 government and four Catholic schools. Of the 32 schools, 21 were medium and 11 were large sized schools. No schools withdrew following allocation.

Students

At baseline, parental consent was provided for 3530 Grade 7 students (76.9% of enrolled students), of which 3115 students participated in the baseline survey (67.9% of enrolled students; 88.2% of students with parental consent). Follow up data were collected from 2,149 of the students who completed the baseline survey (retention rate 69.0%; intervention 67.3%, control 71.6%) with no differential loss to follow up between intervention and control groups (p=0.1). Reasons for lost to follow up included: students no longer attending school (n=652; 65.5%), absent from school on follow up survey days (n=207; 20.8%), or unknown reason for currently enrolled students (n=137; 13.8%). Students who moved between schools (n=30) and those who participated but did not answer substance use items at baseline (n=14) were excluded resulting in a cohort of 2,105 students for the primary analysis. All 3115 students who completed the baseline survey were included in sensitivity analyses.

The demographic characteristics of students who completed the baseline survey are shown in Table 5.2. Students who were lost to follow up compared to those who completed both baseline and follow up surveys (the cohort) were more likely to: report use for each substance use measure (tobacco: ever 17.9% v 8.1% p<0.01, recent 4.1% v 1.4% p<0.001; alcohol: ever 37.6% v 26.8% p<0.01, recent 8.8% v 4.2% p<0.001, 'risky' 8.6% v 3.7% p<0.001; marijuana: 2.6% v 1% p=0.003; other illicit substances: 2.0% v 0.6% p=0.003), and have lower mean individual (2.92 v 3.04 p<.001) and environmental protective factor scores (2.88 v 2.98 p<.001). Students who were lost to follow up were also more likely to be Aboriginal and/or Torres Strait Islander (18.1% v 10.2%, p<.001). There was no difference for any other demographic characteristics.

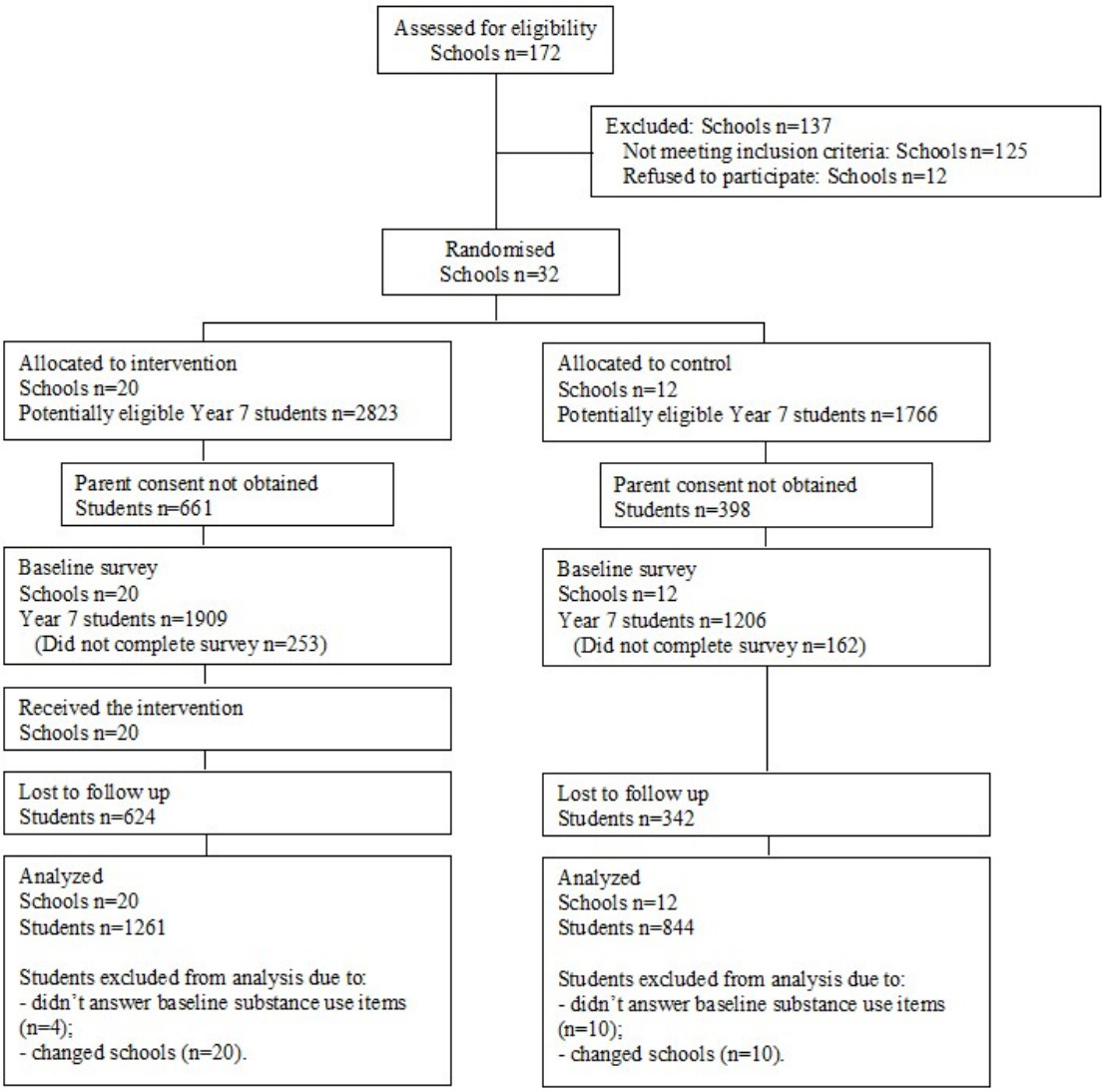

Figure 5.1. Study flow diagram

Table 5.2. Student demographics, substance use and protective factor characteristics of students participating in baseline survey by group (N=3115)

Student characteristics	Intervention n (%)	Control n (%)
TOTAL STUDENTS	1909	1206
Male	950 (49.8)	607 (50.3)
Age (mean (SD))	12.6 (0.53)	12.6 (0.53)
Aboriginal and/or Torres Strait Islander*	245 (12.8)	151 (12.6)

Student characteristics	Intervention n (%)	Control n (%)
Socioeconomic status**		
Low (<990)	1062 (55.6)	718 (59.5)
High (≥990)	847 (44.4)	488 (40.5)
Remoteness (ARIA)**		
Major Cities	744 (39.1)	567 (47.1)
Inner Regional	565 (29.7)	387 (32.1)
Outer Regional/Remote	594 (31.2)	250 (20.8)
Ethnicity		
Other ethnic, cultural or national origin	235 (12.3)	95 (7.9)
Non-English speaking background		
Speak language other than English	119 (6.2)	57 (4.7)
Substance use		
Tobacco use – ever	221 (11.7)	124 (10.5)
Tobacco use – recent	49 (2.6)	21 (1.8)
Alcohol use - ever	615 (32.5)	316 (26.7)
Alcohol use - recent	121 (6.4)	53 (4.5)
Alcohol use – 'risky'	111 (5.9)	50 (4.2)
Marijuana use	34 (1.8)	12 (1.0)
Other illicit substance use	23 (1.2)	8 (0.7)
Protective factor score		
Individual factors (mean (SD))	2.99 (0.48)	3.03 (0.45)
Environmental factors (mean (SD))	2.93 (0.56)	2.96 (0.55)

*Missing for 4 students; **SES and remoteness could not be calculated 5 students' postcode missing (4 Intervention, 1 control).

Student substance use

Table 5.2 shows the proportion of students reporting substance use at baseline. There was no difference between intervention and control students for any measure of substance use at follow up (Table 5.3), with the same result for intention-to-treat sensitivity analyses (see Appendix 5.3).

Student individual and environmental protective factors

Baseline mean individual and environmental protective factor scores are shown in Table 5.2. At follow up there was no difference in mean individual or environmental aggregate protective factor scores between intervention and control students (Table 5.3). Similarly,

there was no difference between intervention and control students in mean scores for any of the individual or environmental protective factor subscales (see Appendix 5.4).

Table 5.3. Intervention versus control group comparisons at follow up (N=2105)

Outcome	Intra class correlations	Intervention group N=1,261	Control group N=844	Intervention v control	
PRIMARY OUTCOMES					
Substance use		n (%)	n (%)	OR (95% CI)	*P*
Tobacco use – ever[a]	0.0182	406 (32.5)	235 (27.9)	1.25 (0.92, 1.68)	.14
Tobacco use – recent[a]	0.0280	148 (11.8)	75 (8.9)	1.48 (0.93, 2.37)	.09
Alcohol use – ever[b]	0.0105	770 (61.8)	494 (58.7)	1.11 (0.83,1.48)	.46
Alcohol use – recent[c]	0.0149	261 (20.9)	156 (18.6)	1.10 (0.77, 1.56)	.60
Alcohol use – 'risky'[d]	0.0152	293 (23.6)	196 (23.4)	1.03 (0.74,1.43)	.86
SECONDARY OUTCOMES					
Substance use					
Marijuana use[e]	0.0163	193 (15.6)	115 (13.7)	1.18 (0.80,1.72)	.39
Other illicit substance use[e]	0.0368	85 (6.9)	47 (5.6)	1.42 (0.85,2.38)	.23
Protective factor score		Mean (SD)	Mean (SD)	Mean diff (95% CI)	*P*
Individual[f]	0.0011	3.02 (0.48)	3.01 (0.49)	-0.01 (-0.07,0.06)	.87
Environmental[g]	0.0010	2.77 (0.61)	2.76 (0.62)	-0.02 (-0.09,0.06)	.67

[a] 13 missing; [b] 18 missing; [c] 23 missing; [d] 25 missing; [e] 29 missing; [f] 7 missing; [g] 4 missing.

School implementation of strategies targeting protective factors

Review of project records across all three years of the intervention identified 12 of the 20 intervention schools were recorded to have implemented programs or resources in each of the 16 strategy areas every year (see Appendix 5.5 for examples of strategies that intervention schools implemented). In each year of the study either 18 or 19 of the 20 intervention schools were recorded to have implemented programs or resources in each of the strategy areas.

A total of 232 of the 256 (91%) school staff completed the telephone survey regarding intervention implementation in the final year of the intervention. Comparison of intervention and control schools reported implementation of intervention strategies in the final year of intervention showed intervention schools were more likely than control schools to have incorporated nine hours of protective factor instruction across at least two school subjects across Grade 7 to 10 (intervention 88% v control 36%, $p<0.01$), but not in

Grade 10 alone (intervention 88% v control 55%, p=0.08) (Appendix 5.6). A higher proportion of Head Teachers at intervention schools reported using resilience resources within curriculum in any Grade than control schools (75% and 49% respectively, p<0.01) and the mean number of resilience resources implemented outside of the classroom was higher in intervention compared with control schools (3.1 and 1.2 respectively, p<0.01). There were no significant differences between intervention and control schools in the reported implementation of the other 15 strategies (Appendix 5.6). Between 73% and 84% of intervention school staff reported being moderately or very engaged in the final year of the intervention (Aboriginal contact 73.7% (14/19); Deputy 84.2% (16/19); Head Teacher Welfare 83.3% (15/18); Head Teachers Key Learning Areas 76.4% (68/89).

DISCUSSION

This study sought to test the effectiveness of a pragmatic intervention delivered by schools on a universal basis that focused on enhancing student individual and environmental 'resilience' protective factors as a means of reducing the prevalence of adolescent tobacco, alcohol and illicit substance use. At follow up, there was no difference in the prevalence of any measure of substance use between intervention and control students, nor was there any difference for aggregate or individual measure of individual and environmental protective factors.

The findings were broadly consistent with evidence from the only other randomised controlled trial of a school-based universal intervention focused solely on promoting the individual and environmental protective factors of adolescent students as a means of reducing substance use.[46] The intervention in that study was similar to that in the current study in terms of: its pragmatic nature; timing (from Grade 8 onwards); duration (3 years); delivery by school staff; strategies (curriculum and school environment); and environmental protective factor content (addressing relationships and meaningful participation at school). However, its content differed in terms of a more limited focus on individual protective factors than the current study.[46] Despite promising findings mid-intervention for tobacco use favouring an intervention effect, at follow up the study similarly found no effect of the intervention on tobacco, alcohol or illicit substance use. Additionally, no effect was found for the protective factors measured (school engagement and social relationships), with authors citing insufficient specific intervention content in these areas as a possible explanation.[46]

The hypothesised mechanism of effect for the current study was based on association evidence that an inverse relationship existed between protective factors and substance use.[25-37,90] As the intervention was ineffective in improving such factors it remains unknown whether the enhancement of such factors can lead to a reduction in the prevalence of adolescent substance use.

Various aspects of the intervention design may have contributed to the null finding for protective factors. First, the universal nature of the intervention without a targeted intervention for students with lower protective factor scores or with other substance use risk factors may have limited its ability to have a measurable impact. Whilst there is conflicting evidence regarding whether universal, selective or targeted interventions are more effective in reducing substance use,[98-101] the positive findings of one cluster-randomised controlled study undertaken in 43 schools in Hong Kong suggest that an intervention combining both a universal and a targeted approach may be effective. The study reported a positive effect for eight of fourteen targeted protective factors, as well as a reduction in illegal substance use.[62]

Second, the use of a pragmatic intervention approach allowing school staff to select the type, manner and order of implementation of curriculum resources and programs may have contributed to the null study findings, as such an intervention approach has been reported to be less likely to be effective than non-pragmatic approaches.[102,103] Although pragmatic intervention approaches are intended to optimise translation into practice, the potential exists for a loss of intervention efficacy, integrity and fidelity to occur through local selection and adaptation of programs.[104,105] The intervention relied, at least in part, upon both schools and teachers selecting from a large number of readily available resources and programs that address resilience protective factors, very few of which are evidence-based, and schools implementing them well. The study findings suggest that the common practice of schools developing and adapting programs,[22-24] an intervention approach assessed in this trial, may not realise the intended substance use reduction benefits.

Third, the use of programs and resources that were also accessible to control schools may have contributed to the null findings due to a lack of differential intervention exposure between groups. The likelihood of such an explanation is heightened by the finding of similar strategy implementation levels in both groups at follow up, with the exception of curriculum-focussed strategies. It is unclear whether contamination with respect to

awareness of programs and resources between intervention and control schools was an issue as it was not specifically assessed, however the cluster-randomised design at least in part may have reduced this risk.

Fourth, similar to the conclusion of the Bond study,[46] the duration of the intervention may have been insufficient to impact on student protective factors. As the full intervention was implemented over two years (only two of 16 strategies were delivered in Year 1) the intervention may not have had sufficient time to impact on student protective factors. This possibility is supported by findings from other school-based substance use prevention studies that suggest interventions delivered over 3-4 years rather than 1-2 years may be more effective.[106] Such a conclusion is also supported by a World Health Organization review of evidence regarding the Health Promoting Schools approach that found interventions of longer duration across a range of outcomes were more effective.[107]

Finally, three additional design factors may have limited the intervention effect: the intervention's focus on protective factors only, with no content addressing known risk factors of substance use (such as peer or familial substance use[108]); the limited focus on family and community-based protective factors (such as caring parental relationships and meaningful community participation), both of which have been reported to be predictors of substance use;[109] and the reported low test-retest reliability of the resilience protective factor measurement tool, which may have led to instability in student responses over time.[74]

Major strengths of this study included the cluster-randomised controlled study design, the use of implementation support strategies and the large sample size. Although the study found, as for school-based research generally,[110] a high rate of student attrition (31%), such attrition did not differ between treatment groups and had little impact on the estimated power of the study (difference of 0.3-0.4%).

Given the significant policy and practice investment in intervention approaches that seek to enhance student protective factors as a means of reducing adolescent substance use, further research is warranted to investigate the effectiveness of this intervention approach. Further research is also warranted regarding whether universal interventions targeting such factors can be effective when augmented with a targeted intervention component either for those students at elevated risk (i.e. selective) or those who have already initiated substance use (i.e. indicated). Similarly, further research is required to identify intervention approaches that are both capable of being scaled-up to be delivered as part of routine school practice

across large populations of secondary schools, and efficacious in reducing adolescent substance use.

AUTHORS' CONTRIBUTIONS

RKH conducted the literature search, drafted the manuscript and contributed to study design, data collection, data analysis, data interpretation, and coordination of the study. JW, MF, JB, LW and EC helped draft the manuscript and participated in the conception, design and coordination of the study. JD helped draft the manuscript and participated in the coordination of the study. CL, CO and JA helped draft the manuscript and conducted data analysis. All authors read and revised the manuscript critically for intellectual content, and approved the final manuscript.

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COMPETING INTERESTS STATEMENT

We have read and understood BMJ policy on declaration of interests and declare that we have no competing interests.

DATA SHARING STATEMENT

Requests for additional unpublished data should be forwarded to Rebecca.hodder@hnehealth.nsw.gov.au

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CHAPTER 6

Effectiveness of a universal school-based intervention in reducing adolescent tobacco, alcohol and illicit substance use: exploratory assessment of effect by student socio-demographic and substance use initiation

Under editorial review in:

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ABSTRACT

Objectives

Interventions addressing the individual and environmental protective factors of adolescents are suggested to have potential for reducing adolescent substance use. Whilst universally delivered school-based substance use prevention interventions are common, previous studies have suggested variable effectiveness by subgroups of students. An exploratory study was undertaken to examine the differential effectiveness of a universal school-based resilience intervention on adolescent substance use and protective factors according to their socio-demographic and previous substance use.

Design

Secondary analysis of data from a cluster-randomised controlled trial.

Setting

32 Australian secondary schools.

Participants

Cohort of Grade 7 students followed up in Grade 10 (aged 15-16 years; 2014).

Intervention

Three year universal school-based intervention addressing resilience protective factors (2012-2014).

Measurements

Primary outcomes included: tobacco (recent, number of cigarettes) and alcohol (recent, 'risk', number of drinks) use, and secondary outcomes: marijuana (recent) and other illicit substance (recent) use, and aggregate individual and environmental protective factor scores. Generalized and linear mixed models examined interactions between treatment and student subgroups [gender; socio-economic disadvantage (low/high); geographic location (major city/inner regional/outer regional-remote); previous substance use (non-user/user)] at follow up (36 models).

Results

Analysis of follow-up data from 2149 students showed no differential intervention effect for any substance use or protective factor outcome for any subgroup, with the exception of one differential effect found by socio-economic status for the outcome of mean number of cigarettes smoked by recent smokers (p=0.003). There was no evidence of an intervention effect within the low (MD -12.89 95%CI -26.00,0.23) or high (MD 16.36, 95%CI -1.03,33.76) socio-economic subgroups.

Conclusions

No evidence of an intervention effect on substance use and protective factors was found according to student subgroups defined by socio-demographic characteristics or previous substance use.

BACKGROUND

Initiation of tobacco, alcohol and illicit substance use in high-income countries generally occurs during adolescence,[1-3] with earlier use associated with greater dependence in adulthood and a range of negative health outcomes.[4] Despite declining trends in adolescent use of tobacco, alcohol and illicit substances internationally,[3;5] a considerable proportion of adolescents (aged 11 to 17 years) from high-income countries continue to report such use; with 23%-45% having smoked a cigarette, 43%-74% having consumed an alcoholic drink, and 7%-40% having used an illicit substance.[3;5;6]

Evidence from cross sectional and longitudinal studies suggests that a range of individual factors, including self-efficacy, problem solving, communication and self-awareness, and environmental factors, such as caring relationships with adults and peers, and meaningful participation in home, school and community settings, are associated with a decreased likelihood of adolescent tobacco, alcohol and illicit substance use, that is, protective factors of such substance use.[7-20] These individual and environmental protective factors are also sometimes described as contributing to 'resilience',[21-23] and in disadvantaged populations in particular, have been found to characterise students with good health and life outcomes despite greater risk status.[24] This is consistent with meta-analysis results from a recent systematic review that reported universal school-based interventions that address individual and environmental resilience protective factors to be effective in reducing illicit substance use by adolescents.[25] Such evidence suggests the potential of school-based resilience interventions that address these individual and environmental protective factors as a means to reducing adolescent substance use.[7;9-20]

School-based substance use prevention interventions delivered to all students in a school or classroom regardless of risk (that is universal),[26 27] are recommended and commonly implemented by governments world-wide.[28-31] It has however been suggested that not all students within a population may benefit equally from universally implemented substance use prevention interventions, with certain subgroups of students either benefiting more or less than others.[32] As a result, investigation of the generalisability of universal substance use intervention effects across subgroups of students has been recommended[33] A recommendation that is consistent with the standards of evidence for effective programs and policies developed by the Society for Prevention Research.[34] For interventions found to be effective overall, investigation of the generalisability of intervention effect across subgroups provides guidance for how to enhance intervention effectiveness for all student

subgroups. For interventions that have a null effect overall, such investigation can provide guidance to hypothesise whether an intervention may be effective for particular subgroups, and identify opportunities for future studies to test such hypotheses.

The only universally implemented school-based intervention focused solely on targeting resilience protective factors has not investigated any variable patterns of effect by participant subgroups. However, of those studies that have implemented school-based interventions that address resilience protective factors amongst other factors as part of a broader intervention approach, a variable pattern of effect by participant subgroup has been reported. [35-38] Such variability has been reported to occur between students defined by both their socio-demographic and previous substance use characteristics.[35-38] For example, studies have reported differential intervention effects on tobacco use by gender, such as reductions in tobacco use for either females[35] or males,[37;38] whereas other studies have reported differential effects by socio-economic level, such as reductions in alcohol use for students of low socio-economic schools but no effect in schools of medium or high socio-economic level.[36] No universally delivered school-based studies addressing protective factors could be found that examined differential intervention effects by subgroups of students defined by geographic location. Previous studies have also examined differential effectiveness of school-based substance use interventions in terms of students classified by risk of substance use, most often defined as substance use initiation prior to intervention. Such studies report mixed results[36], suggesting such interventions are more effective for existing substance users than nonusers, more effective for existing nonusers than users, or no differential effect according to previous substance use.[36;39-41]

A cluster-randomised control study was undertaken to investigate the overall effectiveness of a universally delivered school-based resilience intervention in reducing substance use by adolescents.[42] As previously reported, the study found no effect on primary (tobacco and alcohol use; mental health problems) and secondary (illicit substance use, individual and environmental resilience protective factors) outcomes, however of the 16 outcomes related to the implementation of resilience strategies, intervention schools were more likely than control schools to implement nine hours of resilience curriculum.[43;44] In order to investigate whether any student subgroups benefited from the intervention, a study was conducted to examine the differential effectiveness of the universally delivered school-based 'resilience' protective factor intervention on substance use by adolescents according to their socio-demographic and previous substance use characteristics. A secondary aim was to examine

the differential effectiveness of the intervention on the hypothesised mechanism of effect, student resilience protective factors.

METHODS

Study design and setting

The cluster randomised controlled trial was conducted in secondary schools in one health district of New South Wales, Australia. Outcome assessments were conducted with a cohort of students at baseline in 2011 (when students were in Grade 7 - aged 12-13 years) and at follow up in 2014 (when students were in Grade 10 – aged 15-16 years).

Approximately 114,000 people aged 10 to 19 years reside in metropolitan, regional, rural and remote areas within the district.[45;46] Relevant ethics committee approvals were obtained (Hunter New England Health Ref:09/11/18/4.01; University of Newcastle Ref:H-2010-0029; Appendices 4.2-4.3). Further study details have been reported elsewhere.[42]

Participants and recruitment

Schools

A national schools database[47] identified 172 schools with secondary enrolments within the study area. Schools were eligible if they: were a Government or Catholic secondary school located within a socioeconomically disadvantaged local government area (defined by the SEIFA Index of Relative Socio-economic Advantage/Disadvantage),[48] had enrolments in Grades 7 to 10 (aged 12-16 years) and had more than 400 total student enrolments. Schools were ineligible if they were: single gender, independent (private), special needs, selective, central (for students aged 5-18 years) or boarding schools.

Randomisation of schools

Eligible schools were randomly ordered using a random number function in excel, and approached in that order until a quota of 32 schools consented. The 32 consenting schools were then stratified according to participation in a government disadvantaged school initiative (yes/no)[49] and school size (medium 400-800; large >800). Schools were then randomly allocated to intervention or control in a 20:12 block design ratio (based on stakeholder request to increase the reach of anticipated intervention benefit) by an independent statistician using a random number function in Microsoft Excel prior to baseline data collection.

Students

All students enrolled in Grade 7 (first year at secondary school) were eligible to participate and active parental consent for student participation in data collection was sought via a mailed study information pack (Appendix 4.9-4.12). After two weeks non-responding parents were prompted via telephone by school-affiliated staff who were blind to group allocation. A toll-free number was provided for parents who wished to decline the telephone prompt.

Intervention

A three-year universal ('whole of school') intervention was delivered by school staff to all students in the cohort during Grades 8 to 10. The intervention, based on a pilot study,[50] involved 16 broad strategy areas (see Table 6.1) seeking to build the protective factors of students implemented across all three domains of the Health Promoting Schools framework[51] (Table 6.1). Each broad intervention strategy addressed at least one individual (self-efficacy, problem solving, cooperation/communication, self-awareness, empathy, goals/aspirations) or environmental protective factors (school support, school meaningful participation, community support, community meaningful participation, home support, home meaningful participation, peer caring relationships, pro-social peers). Such protective factors align with a 'resilience' approach.[21-23;52] Schools were provided with details of existing available resources and programs targeting the protective factors identified by researchers. Whilst schools were required to implement all strategies, they were given the flexibility to select the order in which they were implemented and which resources or programs they used when doing so.

Table 6.1. Intervention and implementation support strategies

INTERVENTION STRATEGIES BY HEALTH PROMOTING SCHOOLS DOMAIN
Curriculum, teaching and learning
1. Age-appropriate lessons (9 hours) on individual protective factors across school subjects (e.g. MindMatters[53] or school-developed curriculum resources)[I,a]
2. Non-curriculum programs (9 hours) targeting protective factors (e.g. the Resourceful Adolescent Program)[54;I,E]
3. Additional program targeting protective factors for Aboriginal students[I,E,a]
Ethos and environment
4. Rewards and recognition program[I,E]
5. Peer support/peer mentoring programs[I,E]

INTERVENTION STRATEGIES BY HEALTH PROMOTING SCHOOLS DOMAIN

6. Anti-bullying programs[I,E]
7. Empowerment/leadership programs[I,E]
8. Additional empowerment/leadership/mentoring programs for Aboriginal students[I,E,a]
9. Aboriginal cultural awareness strategies[I,.E,a]

Partnerships and services

10. Promotion/engagement of local community organizations/groups/clubs in school (e.g. charity organizations)[E,a]
11. Additional/enhanced consultation activities with Aboriginal community groups[I,E,d]
12. Promotion/engagement of health, community and youth services in the school[I,E,a]
13. Additional/enhanced Aboriginal community organizations promoted or engaged[I,E,d]
14. Referral pathways to health, community and youth services developed and promoted[I,E,a]
15. Strategies to increase parental involvement in school (e.g. school events)[E,a]
16. Information regarding student protective factors provided to parents via school newsletter[I,E,a]

IMPLEMENTATION SUPPORT STRATEGIES

1. Engagement with school community including presentations at school staff meetings regarding planned intervention[b]
2. Embedded staff support:
    - School intervention officer one day a week to support program implementation
    - Project coordinator to liaise with school sectors and support school intervention officers[c]
3. School intervention team formed (new team or re-alignment of existing team, inclusive of school intervention officer and school executive member) to implement intervention
4. Structured planning process to prioritize and select appropriate resources/programs:
    - Needs assessment of student protective factors (when study sample in Grade 7 and 9)
    - Two school community planning workshops and one strategy review workshop[c]
    - School plan to address intervention strategies endorsed by the school executive
5. Intervention implementation guide that described the intervention, planning process, available resources and programs, tools and templates for intervention implementation.
6. Staff mental health training (minimum of one hour per school during staff meetings)
7. AUD $2,000 per year each for:
    - Teacher release time for intervention implementation or professional development
    - Strategies specifically for Aboriginal students[a]
8. Feedback reports regarding student substance use and protective factors, and intervention implementation (termly)[c]

IMPLEMENTATION SUPPORT STRATEGIES
9. An Aboriginal Cultural Steering group was formed comprising of Aboriginal staff from local Aboriginal community organizations and Government Departments to provide Aboriginal cultural advice and direction regarding the study design, implementation, evaluation and dissemination

I To target individual protective factors; E To target environmental protective factors; [a] Implemented in Years 2 and 3 only; [b] Year 1 only; [c] Years 1 and 2 only; [d] Year 3 only. NB. Following publication of the study protocol[42] and based upon advice received from an Aboriginal Cultural Steering Group, intervention strategies 3,8,11,13 were added.

To ensure implementation of intervention strategies, schools were provided with a comprehensive range of support strategies, including an embedded implementation support officer, strategies that have been previously reported to facilitate implementation of interventions (Table 6.1).[55-62]

Control schools implemented usual school curricula which may have included protective factor strategies and resources similar to or the same as those systematically provided to the intervention schools, and were not provided with program resources or implementation support. A report describing school-level student substance use and protective factor characteristics at baseline was provided to control schools.

Data collection procedures

Student demographic and protective factor characteristics and substance use

Students completed a confidential web-based survey (Appendix 4.14) in class time prior to intervention commencement (baseline: August-November 2011) and immediately following intervention completion (follow up: July-November 2014). Neither the school staff nor researchers were blind to group allocation.

Measures

Student demographic characteristics

The student survey addressed: age, gender, residential postcode, Aboriginal and/or Torres Strait Islander status, ethnicity and non-English speaking background.

Student substance use characteristics

Substance use data were collected using items from an ongoing Australian triennial survey of school students' health behaviours.[3] Outcomes included recent tobacco, recent alcohol,

'risk' alcohol, recent marijuana and other illicit substance use as well as the number of cigarettes and alcoholic drinks consumed in the last week (Table 6.2).

Table 6.2. Substance use and protective factor outcome measures at follow up

Outcomes	Survey item	Response options
PRIMARY OUTCOMES		
Tobacco use - recent	Have you smoked a cigarette in the last week?	Yes/No
Number cigarettes - last week[a]	If yes, starting from yesterday please record the number of cigarettes that you smoked on each day of last week[3]	0-99
Alcohol use – recent	Have you had any alcoholic drinks, such as beer, wine or alcopops/pre-mix drinks in the last week? (do not count sips or tastes)	Yes/No
Number alcoholic drinks – last week[a]	If yes, starting from yesterday please record the number of alcoholic drinks that you had on each day of last week[3]	0-99
Alcohol use - 'risk'	In the last 4 weeks, how many times have you had 5 or more alcoholic drinks in a row? [3]	None/Once/Twice/3-6 times/7 or more times
SECONDARY OUTCOMES		
Marijuana use	How many times in the last four weeks have you smoked or used marijuana/cannabis (grass, hash, dope, weed, mull, yarndi, ganga, pot, a bong, a joint) [3]	None/Once or twice/3-5 times/6-9 times/10-19 times/20-39 times/40 or more times
Other illicit substance use	How many times in the last four weeks have you used any other illegal drug or pill to get "high", such as inhalants, hallucinogens (e.g. LSD, acid, trips), amphetamines (e.g. speed, ice), ecstasy, cocaine or heroin?	None/Once or twice/3-5 times/6-9 times/10-19 times/20-39 times/40 or more times

Outcomes	Survey item	Response options
Individual protective factors[63]	Cooperation and communication subscale: 2 items; e.g. "I enjoy working together with other students my age"	1: Never true, 2: True some of the time; 3: True most of the time; 4: True all of the time
	Self-efficacy subscale: 4 items; e.g. "I can do most things if I try"	As above
	Empathy subscale: 3 items; e.g. "I try to understand what other people feel and think"	As above
	Problem solving subscale: 3 items; e.g. "When I need help I find someone to talk with"	As above
	Self-awareness subscale: 3 items; e.g. "I understand why I do what I do"	As above
	Goals and aspirations subscale: 3 items; e.g. "I have goals and plans for the future"	As above
Environmental protective factors[63]	School support subscale: 6 items; e.g. "At my school there is an adult who really cares about me"	As above
	School meaningful participation subscale: 3 items; e.g. "At my school, I help decide things like class activities or rules"	As above
	Peer caring relationships subscale: 3 items; e.g. "I have a friend who helps me when I'm having a hard time"	As above

[a] At baseline students were asked whether they had ever smoked a cigarette/consumed an alcoholic drink.

Student individual and environmental protective factors

The Resilience and Youth Development module of the California Healthy Kids Survey was used to measure individual and environmental protective factors.[63] Items for six individual and three environmental factor subscales (Table 6.2) that were found to be internally consistent and valid (Cronbach alpha coefficients: individual 0.55-0.81; environmental 0.77-0.88) were selected. Aggregate individual and environmental protective factor scores were used as outcome measures. Consistent with a previous study of the survey tool,[63] analysis of baseline responses confirmed the subscales were internally consistent and valid

(Cronbach alpha coefficients: individual 0.55-0.81; environmental 0.77-0.88). Confirmatory factor analysis[63] demonstrated the subscale factor structure to be a good model fit (comparative fit index 0.92, root mean square error of approximation 0.04).

Statistical analysis

Student socio-demographic subgroups

Student-reported residential postcode was used to calculate student socio-economic status[48] and remoteness of residential location.[64] Students were classified into the following subgroups based on their baseline survey characteristics: gender (males, females), socio-economic status (as defined by SEIFA Index of Relative Socio-economic advantage/disadvantage; low: scores of <990 (most disadvantaged), high: scores 900+[48]), and geographic location (as defined by the Accessibility/Remoteness Index of Australia; Major city: 0-0.2, Inner regional: >0.2-2.4, Outer regional/remote: >2.4-15).

Previous substance use subgroups

Ever use of tobacco and alcohol were used to define baseline tobacco and alcohol use respectively (user, non-user). Use of marijuana and illicit substances in the last four weeks were used to define baseline marijuana and illicit substance use respectively (user, non-user). Baseline use of any substance was defined as use of at least one substance derived from baseline use of tobacco, alcohol, marijuana or illicit substances (user, non-user).

Primary outcomes: Student substance use

Recent tobacco use was defined as having smoked at least one cigarette in the last week, and recent alcohol use as at least one alcoholic drink in the last week (yes/no). An average number of cigarettes and alcoholic drinks consumed in the last week was calculated from the responses for daily consumption. The response options for 'risk alcohol use' were dichotomised (either 'none', or 'once'/'twice'/'3-6 times'/'7 or more times').

Secondary outcomes: Student substance use

The response options for both marijuana and other illicit substance use were dichotomised (either 'none' or 'once or twice'/'3-5 times'/'6-9 times'/'10-19 times'/'20-39 times'/'40 or more times').

Secondary outcomes: Student individual and environmental protective factor scores

Student protective factor subscale scores were calculated by averaging the responses to all items in each subscale. Aggregate individual and environmental protective factor scores were calculated by averaging all relevant subscale scores for each student.[63] Mean scores ranged from 1 to 4, with higher scores more favourable.

Subgroup analyses

Best practice principles for subgroup analysis specify that such analyses should be: exploratory; limited to primary outcomes with a small number of pre-defined subgroups; analysis by formal statistical tests of interaction; and analysis within subgroups conducted only if an interaction is statistically significant.[65;66] As such, comparisons between treatment groups for each dichotomous (5 outcomes) and continuous (4 outcomes) outcome at follow up for the cohort Grade 10 students in intervention and control schools by each of the four subgroups was undertaken to determine the effectiveness of the intervention using generalized linear mixed models (binomial distribution with a logit link) (20 models) and linear mixed models (16 models) respectively. All models included a fixed effect for treatment group (intervention vs control), a random effect for each school to account for clustering of responses within schools, and an interaction term (treatment x subgroup) to determine differential intervention effect. Odds ratios with 95% Wald confidence intervals were calculated for each subgroup category. Where an interaction term was significant, comparisons between treatments groups within each of the subgroups was undertaken using the same modelling approach to determine the effectiveness of the intervention within each individual subgroup.

A criterion for statistical significance of $p \leq 0.01$ was used due to multiple testing.[67] All analyses were undertaken using SAS Software Version 9.4.[68]

RESULTS

Sample

Schools

Forty-four of the 47 were approached to obtain 32 participating schools (73% consent rate). Of those, 28 were government and four Catholic schools, and 21 were medium and 11 were large sized schools (see Figure 6.1). No schools withdrew following allocation.

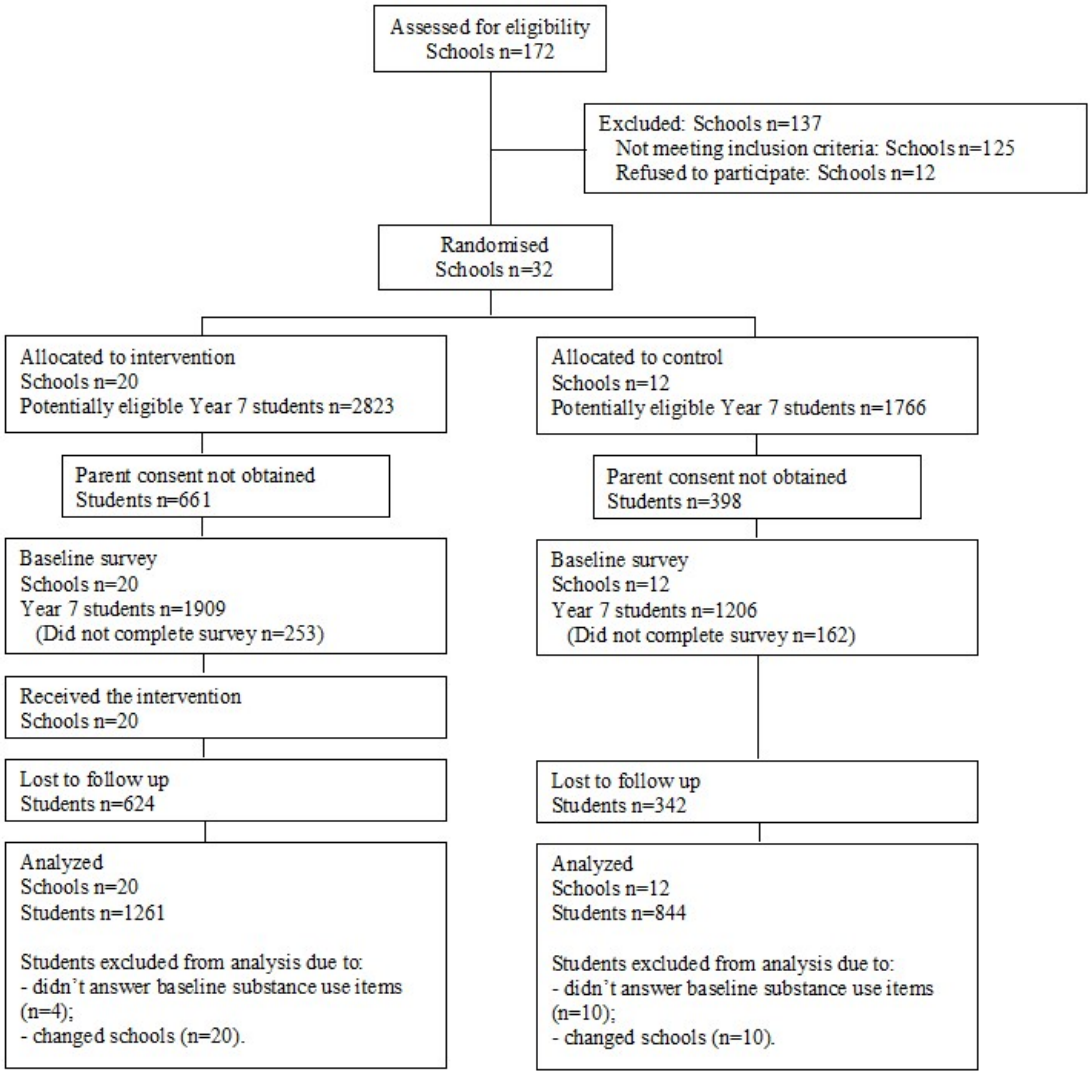

Figure 6.1. Study flow diagram

Students

At baseline, parental consent was provided for 3530 Grade 7 students (76.9% of enrolled students), of which 3115 students participated in the baseline survey (67.9% of enrolled students; 88.2% of students with parental consent). Follow up data were collected from 2,149 of the students who completed the baseline survey (retention rate 69.0%; intervention 67.3%, control 71.6%; 46.8% of students enrolled at baseline) with no differential loss to follow up between groups (p=0.1). Students who moved between schools (n=30) and those who participated but did not answer substance use items at baseline (n=14) were excluded resulting in a cohort of 2,105 students included in the primary

analysis. The demographic characteristics of students who completed the baseline and follow up survey are shown in Table 6.3.

Table 6.3. Demographic and substance use characteristics by group at follow up (N=2105)

Student characteristics	Intervention n (%)	Control n (%)
TOTAL STUDENTS	1261	844
Age M (SD)	15.5 (0.5)	15.5 (0.5)
Aboriginal/Torres Strait Islander	128 (10.2)	95 (11.3)
Gender		
Male	640 (50.8)	431 (51.1)
Female	621 (49.3)	413 (48.9)
Remoteness (ARIA)[a]		
Major Cities	525 (41.7)	508 (60.2)
Inner Regional	612 (48.6)	262 (31.0)
Outer Regional/Remote	123 (9.8)	74 (8.8)
Socio-economic status[a]		
Low (<990) (most disadvantaged)	704 (55.9)	534 (63.3)
High (≥990)	556 (44.1)	310 (36.7)
Previous substance user		
Tobacco user[b]	106 (8.4)	64 (7.6)
Alcohol user[b]	364 (28.9)	200 (23.8)
Marijuana user[c]	14 (1.1)	7 (0.8)
Other illicit user[c]	8 (0.6)	4 (0.5)
Any substance user[d]	387 (30.7)	215 (25.5)

[a] SES and remoteness could not be calculated 5 students' postcode missing (4 intervention, 1 control); [b] Ever use of tobacco and alcohol were used to define baseline tobacco and alcohol use respectively; [c] Use of marijuana and other illicit substances in the last four weeks was used to define baseline marijuana and other illicit substance use respectively; [d] Baseline use of any substance was defined as use of at least one substance derived from baseline use of tobacco, alcohol, marijuana or illicit substances. This was the variable used for baseline use for protective factor outcomes.

Substance use

Table 6.3 shows the characteristics of the subgroups at follow up. Appendix 6.1 shows the proportion of, or mean score for, students in each subgroup reporting each outcome at baseline and follow up respectively. There was no difference between intervention and control students for any measure of substance use at follow up for students overall (Table 6.4). Similarly, there was no differential effect for any of the seven substance use outcomes

between subgroups defined by gender, geographic location, or previous substance use (Table 6.4). A differential effect was found for one of the seven outcomes for subgroups defined by socio-economic status; there was a significant interaction (p=0.003) between treatment and socio-economic status on the mean number of cigarettes smoked (by students who were recent smokers) (Table 6.4). The confidence intervals for the estimates within the both low (mean difference -12.89, 95% CI -26.00, 0.23) and high (mean difference 16.36, 95% CI -1.03, 33.76) socio-economic subgroups included the null value (Table 6.4).

Student individual and environmental protective factors

At follow up there was no difference in mean individual or environmental protective factor scores between intervention and control students (Table 6.4). Similarly, there was no differential effect for any of the protective factor outcomes by any subgroup (Table 6.4).

DISCUSSION

This study sought to examine the differential effectiveness of a universally delivered school-based 'resilience' protective factor intervention on substance use by adolescents according to their baseline socio-demographic characteristics and previous substance use. The study found negligible evidence (1 of 36 tests) of differential intervention effectiveness between student subgroups. A differential intervention effect was found for number of cigarettes smoked by recent smokers, by socio-economic status, which on further examination within subgroups showed significantly lower consumption of cigarettes in intervention compared with control students residing within the most disadvantaged areas. These findings, coupled with the primary study finding of no intervention effect on any measure of adolescent substance use or protective factors for the overall trial sample,[44] suggests that a pragmatic approach to the universal delivery of a resilience focused substance use intervention was not effective at any level.

Table 6.4. Unadjusted intervention versus control group substance use comparisons at follow up by all students and subgroups[a]

Subgroups	TOBACCO		ALCOHOL			ILLICIT SUBSTANCES		PROTECTIVE FACTORS	
	Recent	Amount	Recent	'Risk'	Amount	Marijuana	Other	Individual	Environmental
	OR (CI)	MD (CI)[b]	OR (CI)	OR (CI)	MD (CI)[c]	OR (CI)	OR (CI)	MD (CI)	MD (CI)
ALL STUDENTS									
Unadjusted	1.37	-2.30	1.10	0.97	-0.77	1.12	1.19	0	0
	(0.85,2.22)	(-11.94,7.69)	(0.77,1.57)	(0.71,1.33)	(-2.80,1.25)	(0.74,1.68)	(0.67,2.10)	(-0.08,0.08)	(-0.10,0.10)
Adjusted[d]	1.48	-0.98	1.10	1.03	-0.51	1.18	1.42	-0.01	-0.02
	(0.93,2.37)	(-11.15,9.20)	(0.77,1.56)	(0.74,1.43)	(-2.61,1.59)	(0.80,1.72)	(0.85,2.38)	(-0.07,0.06)	(-0.09,0.06)
GENDER									
Males	1.37	-4.56	1.09	0.80	-1.40	1.04	0.96	0.01	0.02
	(0.77,2.42)	(-19.35,10.23)	(0.72,1.66)	(0.55,1.16)	(-4.29,1.49)	(0.65,1.67)	(0.51,1.82)	(-0.07,0.10)	(-0.09,0.13)
Females	1.38	-0.33	1.12	1.21	0	1.23	1.77	-0.02	-0.02
	(0.78,2.43)	(-13.69,13.03)	(0.72,1.73)	(0.82,1.79)	(-3.01,3.00)	(0.74,2.04)	(0.80,3.92)	(-0.11,0.07)	(-0.13,0.10)
REMOTENESS									
Major city	1.93	7.04	1.30	1.03	-0.87	1.49	2.09	-0.07	-0.13
	(0.91,4.07)	(-15.34,29.42)	(0.76,2.22)	(0.64,1.67)	(-4.57,2.83)	(0.79,2.79)	(0.96,4.57)	(-0.18,0.04)	(-0.26,0.00)
Inner regional	1.36	-7.17	1.08	0.92	-0.78	0.97	0.75	0	0.10
	(0.58,3.21)	(-32.99,18.66)	(0.59,1.97)	0.53,1.62)	(-4.96,3.39)	(0.48,1.99)	(0.30,1.87)	(-0.12,0.12)	(-0.05,0.25)

Subgroups	TOBACCO		ALCOHOL		ILLICIT SUBSTANCES			PROTECTIVE FACTORS	
	Recent	Amount	Recent	'Risk'	Amount	Marijuana	Other	Individual	Environmental
	OR (CI)	MD (CI)[b]	OR (CI)	OR (CI)	MD (CI)[c]	OR (CI)	OR (CI)	MD (CI)	MD (CI)
Outer	0.60	-17.91	0.48	0.98	0.77	0.52	0.36	0.23	0.15
regional/remote	(0.18,2.07)	(-56.18,20.36)	(0.17,1.33)	0.40,2.39)	(-7.28,8.82)	(0.16,1.71)	(0.04,3.18)	(0.02,0.43)	(-0.11,0.40)
SOCIO-ECONOMIC STATUS									
Low n=1238	1.40	-12.89*	1.06	1.06	-0.91	1.30	0.47	0.00	0.01
	(0.79,2.48)	(-26.00,0.23)	(0.70,1.61)	(0.72,1.55)	(-3.65,1.84)	(0.79,2.15)	(0.72,3.01)	(-0.09,0.09)	(-0.10,0.12)
High n=866	1.35	16.36	1.21	0.84	-0.59	0.85	0.82	-0.01	-0.02
	(0.65,2.81)	(-1.03,33.76)	(0.71,2.07)	(0.52,1.35)	(-4.20,3.02)	(0.46,1.56)	(0.34,1.94)	(-0.12,0.10)	(-0.15,0.12)
BASELINE USE									
Non-user	1.39	-5.16	1.22	0.99	-1.05	1.37	-[e]	0.01	-0.01
	(0.83,2.31)	(-16.55,6.23)	(0.76,1.95)	(0.69,1.41)	(-3.76,1.67)	(0.13,14.23)		(-0.07, 0.09)	(-0.11,0.09)
User	1.34	6.83	0.94	0.79	-0.95	1.09	1.15	0.00	0.05
	(0.60,2.97)	(-11.76,25.43)	(0.63,1.42)	0.52,1.21)	(-4.1,2.20)	(0.69,1.72)	(0.58,2.27)	(-0.10,0.10)	(-0.08,0.18)

[a] Estimates presented originate from models inclusive of interaction term (treatment x subgroup), Sample sizes for each comparison ranged from 12 to 2105 and are detailed in Appendix 6.1; [b] Of students who reported tobacco use in the last week; [c] Of students who reported alcohol use in the last week; [d] Models were adjusted for *a priori* selected prognostic variables (age, gender, school type, school size, Aboriginal/Torres Strait Islander status, ethnicity, non-English speaking background, socio-economic status); [e] OR estimated as infinity due to small sample size and zero cell counts; *interaction term (treatment x subgroup) $p<0.01$. NB. OR = Odds ratio; MD = Mean difference.

The findings of the study with respect to subgroups defined by socio-demographic characteristics are generally consistent with previous universal school-based studies that addressed protective factors as part of a broader intervention approach. With respect to subgroups defined by gender, previous studies have reported equivocal support for such interventions being effective for alcohol or illicit substance use for males only,[37] for females only[69] or effective for both males and females[35] in comparison to the current study that found no differential effect. Only one previous study was identified that investigated differential effectiveness of such an intervention approach by socio-economic status, which reported an intervention effect for drunkenness for students of low but not high socio-economic status.[36] No previous studies were identified that investigated differential intervention effectiveness by geographic location for universal school-based protective factor interventions.

The findings of previous studies of intervention effectiveness by subgroups defined by previous substance use are equivocal. For example, previous studies have found no evidence of differential intervention effect between subgroups defined by previous substance use for both tobacco[40] and alcohol.[40;41] In contrast, other studies have found results favouring students who have never used a substance [39] and those who are previous substance users.[41]

The absence of an intervention effect for the hypothesised mechanism of intervention effect, protective factors, for both the overall trial sample[44] and across all subgroups assessed in this study precludes the ability to determine whether the enhancement of protective factors can lead to a reduction in adolescent substance use. However, the singular significant result in this study regarding the consumption of tobacco for recent smokers by socio-economic status suggests that despite not impacting on protective factor levels, the intervention may have been effective in decreasing such use for socio-economically disadvantaged students. Such results may suggest that an alternative mechanism may be responsible for the decrease in tobacco consumption. A more likely explanation for the singular result for 1 of 36 tests undertaken is that the result was false positive due to the number of tests that were conducted.

Various aspects of the intervention design may have contributed to the null finding for protective factors both overall and within the student subgroups. First, the universal delivery of the intervention without any differentiation or targeted intervention for students with lower protective factor scores or students at greater risk within particular

student subgroups may have limited its ability to impact across all students. Second, the use of a pragmatic intervention approach involving school staff selection and implementation of existing readily available curriculum resources and programs may have contributed to the null study findings as pragmatic intervention approaches have been reported to be less likely to be effective than non-pragmatic approaches.[71;72] Third, the duration of the intervention primarily over two years may have resulted in insufficient exposure to impact on student protective factors. Finally, the intervention's focus on protective factors only, with no content addressing known risk factors of substance use (such as peer substance use[73]), and a limited focus on family and community-based protective factors of substance use [74] may have impacted on the findings.

Strengths of the overall study included the cluster-randomised controlled study design, the use of implementation support strategies, and it being a real-world pragmatic effectiveness trial. This study adhered to criteria for a best practice analytical approach to subgroup analyses[65] with the exception that primary and secondary outcomes were examined in subgroups that were not published *a priori*. In terms of further limitations, the number of comparisons undertaken within this study may have increased the risk of type 1 error and led to the sole significant result, however the use of a formal statistical interaction test, rather than examination of intervention effect within individual subgroups reduces this risk.[75] In the overall study, the proportion of enrolled students completing both the baseline and follow up surveys was below 50%, and whilst typical for school-based research,[76] may limit the generalisability of the study results. Additionally, despite the scale of the overall study in 32 secondary schools, it was not designed to be powered to detect differences in outcomes within participant subgroups. The small sample size of the exposure groups in some of the subgroup analyses, such as examination of differences in the number of cigarettes smoked, further limited the statistical power to detect differences between groups. As a result, the subgroup analyses are considered exploratory in order to generate hypotheses for future research, and should be interpreted with caution. Whilst the effect of the intervention on illicit substance use among students with low socio-economic status that was double that of students with high socio-economic status appears promising, it is unclear whether such a result would be substantiated in a study sufficiently powered to detect difference in outcomes within participants subgroups.

CONCLUSION

This exploratory study found negligible evidence of an intervention effect on adolescent substance use and protective factors outcomes according to student socio-demographic or substance use characteristics following implementation of a universal school-based resilience intervention. Whilst there was some evidence of a differential intervention effect on tobacco use by smokers in subgroup analysis by socio-economic status, the result should be interpreted with caution and further sufficiently powered research conducted to confirm this.

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CHAPTER 7

Association between adolescent tobacco, alcohol and illicit drug use and individual and environmental resilience protective factors

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ABSTRACT

Objectives

Research suggests individual and environmental resilience protective factors may be associated with adolescent substance use, however the associations between a broad range of such factors and use of various types of substances has not been examined. The study aimed to determine the association between a comprehensive range of adolescent individual and environmental resilience protective factors and measures of tobacco, alcohol and illicit substance use.

Design

Cross sectional study

Setting

32 Australian secondary schools

Participants

Grade 7-10 students (aged 11-17 years)

Measures

Data regarding 14 student individual and environmental resilience protective factors and seven substance use measures (tobacco, alcohol, marijuana, other illicit drug use) were obtained via an online self-report survey. Adjusted multivariate logistic regression analyses examined the association between all student resilience protective factors and seven substance use measures.

Results

Inverse univariate associations were found for 94 of 98 relationships examined (n=10,092). Multivariate analyses found: consistent inverse associations between two of 14 protective factors and all substance use measures ('goals and aspirations', 'pro-social peers'); inverse associations between four protective factors with multiple substance use measures ('home support' (5 of 7), 'school support' (3 of 7), 'self-awareness' (2 of 7), 'community meaningful participation' (2 of 7)); positive associations between two resilience protective factors with multiple measures of substance use ('community support' (3 of 7), 'peer caring

relationships' (5 of 7)); and six protective factors not to be associated with any substance use measure.

Conclusions

Despite individual relationships between the majority of resilience protective factors and substance use types, the protective benefit of such factors for adolescent substance use was limited to only a small number of such factors when considered collectively. Such results suggest interventions seeking to reduce adolescent substance use may need to target specific protective factors to address specific types of substance use.

BACKGROUND

Tobacco, alcohol and illicit substance use are responsible for more than 12% of deaths worldwide[1] and cost more than $600 billion (USD) annually in the United States[2-5] and $46.5 billion (USD) in Australia.[6] Initiation of tobacco, alcohol and illicit substance use in high-income countries primarily occurs during adolescence.[7-9] The younger the age of initiation of substance use, the greater the likelihood of ongoing use, dependence and harm in later life.[7,10-12] In the United States, United Kingdom and Australia, between 23-45% of adolescents (aged 11 to 17 years) have smoked a cigarette,[9,13,14] 43-74% have consumed an alcoholic drink,[9,13,14] 22-29% have consumed at least five alcoholic drinks on one occasion,[9,13] and between 15-40% have taken an illicit substance.[9,13,14] The prevention of substance use among adolescents is a recommended strategy for reducing substance use related harms throughout the lifecourse.[15-17]

Historically, research regarding the determinants of adolescent substance use has focused on risk factors such as access to substances, socioeconomic disadvantage and substance use by parents, peers and siblings.[18-22] More recent research has explored a range of factors that may be protective of adolescent substance use,[23] including individual factors such as self-esteem[23-26] and problem solving ability,[27] and environmental factors such as connection to school,[23,26,28-33] family,[19,23,26,28,34] and pro-social peers.[34,35] Such factors have been considered to be factors protective of an adolescents' 'resilience',[25,36-41] broadly described as a process, capacity or outcome of successfully adapting to challenging or threatening life circumstances.[42-44] As a consequence, enhancement of such protective factors is recommended as a strategy for reducing adolescent substance use.[15-17] The specific protective factors to be addressed by such interventions however are only broadly defined or are limited to a few examples in such recommendations.[15-17]

Although considerable research has been reported regarding the association between adolescent resilience protective factors and adolescent substance use,[23,27-30,32,45-65] such research using multivariate analyses have only considered a limited number of resilience protective factors (six at most[46]) or created aggregate scores of such factors,[65] with the latter precluding assessment of associations for particular factors. In such studies, inconsistency of findings is apparent in terms of both the presence and direction of the associations between resilience protective factors and substance use. For example, adolescents have been reported to be either less, more, or no more or less likely to use a substance if they have low self-esteem,[23,54,63] low school connectedness,[23,28,29,32] or low academic

aspirations.[28,47,50,58,61] Inconsistency is similarly evident between substances in their reported association with specific protective factors. For example, in one study a significant negative association was reported between educational aspirations and both alcohol and marijuana use, but not tobacco use.[50] In other studies significant negative associations have been reported between community involvement and both tobacco and marijuana use, but not alcohol use.[49] Such contrasting findings between studies may be attributable, in part, to the different measures of such factors across studies, and to the inconsistent inclusion of protective factors.

To date, no peer-reviewed study has reported the associations between a comprehensive range of adolescent individual and environmental resilience protective factors and multiple types of substance use. To address this gap and provide information that may guide future development of interventions targeting adolescent substance use, a study was conducted to determine the association between fourteen adolescent individual and environmental resilience protective factors and seven measures of tobacco, alcohol and illicit substance use in a population of Australian adolescents.

METHODS

Study design and setting

A cross sectional study was conducted in one Health District of New South Wales, Australia. The District encompasses metropolitan, regional, rural and remote areas with a population of approximately 114,000 people aged 10 to 19 years.[66] The data were collected as baseline data for a randomised controlled trial for which Human Research Ethics Committee (Hunter New England Health Ref:09/11/18/4.01; University of Newcastle Ref:H-2010-0029) and other study approvals were obtained. The methods of the larger study are described in detail elsewhere.[67]

Participants and recruitment

Secondary schools

Eligible schools were either Government or Catholic secondary schools located in a disadvantaged Local Government Area,[68] with enrolments in Grades 7 to 10 (typically aged 12 to 16 years) on one campus, and with more than 400 total student enrolments. Independent, special needs, selective, central (schools catering for children aged 4 to 18 years), boarding schools or schools that were not co-educational were ineligible.

Eligible schools were approached for study participation according to a randomly ordered list of schools. If a school declined, the next school was invited to participate until a quota of 32 schools was recruited.

Students

All students enrolled in Grade 7 (usually aged 12 to 13 years) to Grade 10 (usually aged 15 to 16 years) in the 32 selected schools were eligible to participate (n=18,310). Parents of students were mailed a study information sheet, a consent form and a reply paid envelope. Two weeks following, non-responding parents were telephoned by school-affiliated staff to prompt return of the consent form.

Data collection procedures

Students with parental consent were invited to complete a self-report anonymous web-based survey in class time (August-November 2011).

Measures

Student and school characteristics

Student age, school grade, gender, Aboriginal and Torres Strait Islander status and residential postcode were collected via the student survey.

Substance use

Students' reported tobacco, alcohol, marijuana and other illicit drug use (7 outcomes) via the web-based survey (Table 7.1). The substance use items were sourced from a national triennial survey of school students' health behaviours.[9]

Table 7.1. Student substance use and resilience protective factor items

Outcomes	Indicator	Survey item	Response options
SUBSTANCE USE			
Tobacco	Ever use	Have you ever smoked even part of a cigarette?[9]	Yes/No
	Recent use	Have you smoked a cigarette in the last week?	Yes/No

Outcomes	Indicator	Survey item	Response options
Alcohol	Ever use	Have you ever had a drink of alcohol? E.g. beer, wine or alcopops/pre-mix drinks (do not count sips or tastes)	Yes/No
	Recent use	Have you had any alcoholic drinks, such as beer, wine or alcopops/pre-mix drinks in the last week? (do not count sips or tastes)	Yes/No
	'Risky' use	In the last 4 weeks, how many times have you had 5 or more alcoholic drinks in a row?[9]	None/Once/Twice/3-6 times/7 or more times
Marijuana	Recent use	How many times in the last four weeks have you smoked or used marijuana/cannabis (grass, hash, dope, weed, mull, yarndi, ganga, pot, a bong, a joint)[9]	None/Once or twice/3-5 times/6-9 times/10-19 times/20-39 times/40 or more times
Other illicit drugs	Recent use	How many times in the last four weeks have you used any other illegal drug or pill to get "high", such as inhalants, hallucinogens (e.g. LSD, acid, trips), amphetamines (e.g. speed, ice), ecstasy, cocaine or heroin?	None/Once or twice/3-5 times/6-9 times/10-19 times/20-39 times/40 or more times
RESILIENCE PROTECTIVE FACTORS			
Individual	Cooperation and communication	2 items; e.g. "I enjoy working together with other students my age"	1: Never true, 2: True some of the time; 3: True most of the time; 4: True all of the time
	Self-efficacy	4 items; e.g. "I can do most things if I try"	As above
	Empathy	3 items; e.g. "I try to understand what other people feel and think"	As above

Outcomes	Indicator	Survey item	Response options
	Problem solving	3 items; e.g. "When I need help I find someone to talk with"	As above
	Self-awareness	3 items; e.g. "I understand why I do what I do"	As above
	Goals and aspirations	3 items; e.g. "I have goals and plans for the future"	As above
Environmental	School support	6 items; e.g. "At my school there is an adult who really cares about me"	As above
	School meaningful participation	3 items; e.g. "At my school, I help decide things like class activities or rules"	As above
	Community support	6 items; e.g. "Outside of school and home, there is an adult whom I trust"	As above
	Community meaningful participation	3 items; e.g. "I am part of clubs, sports teams, church/temple, or other groups"	As above
	Home support	6 items; e.g. "At home, there is an adult who listens to me when I have something to say"	As above
	Home meaningful participation	3 items; e.g. "I do fun things or go fun places with my parents or other adult from my home"	As above
	Peer caring relationships	3 items; e.g. "I have a friend who helps me when I'm having a hard time"	As above
	Pro-social peers	3 items; e.g. "My friends try to do what is right"	As above

Resilience protective factors

The Resilience and Youth Development module of the California Healthy Kids Survey, a measure of 14 adolescent individual and environmental resilience protective factors (termed internal and environmental assets), was used to measure protective factors (51 items: 4 point Likert scale –'1: Never true' to '4: True all of the time').[69] The survey incorporates items that addressed six individual factor subscales and eight environmental factor subscales (Table 7.1).[69] Two minor modifications were made to the survey for use in

an Australian population. First, the survey item "I plan to go to college…" was modified to state "I plan to go to university or TAFE…". Second, the response options for all of the items from the survey were modified from "Not at all true, a little true, pretty much true, very much true" to "Never true, true some of the time, true most of the time, true all of the time". Consistent with reports from the tool developers,[69] the data from the current study confirms the survey tool is an internally consistent and valid measure (Cronbach alpha coefficients for individual factor subscales: 0.55-0.81; environmental factor subscales: 0.71-0.91). Additionally, confirmatory factor analysis using data from this study demonstrates the individual and environmental subscale factor structure to be a good model fit (Comparative fit index 0.92, Standardized Root Mean Square Residual 0.04, Root Mean Square Error of Approximation 0.04, Adjusted Goodness of Fit 0.90); with such results being similar to those reported by the tool developers.[69]

Statistical analysis

Student characteristics and substance use

Participants who did not answer any substance use items (that is, they started the online survey but dropped out of the survey before getting to the substance use items) were excluded from all analyses (n=16). Participants who did not answer items for a particular substance were excluded from analyses for that particular substance. Consent and participation rates, demographic and substance use data were examined using descriptive statistics. Socio-economic status and remoteness of residential location were calculated from student-reported residential postcode using the Australia Bureau of Statistics Socio-Economic Indexes for Areas[68] and the Accessibility/Remoteness Index of Australia[70] respectively.

The response options for 'risky' alcohol use were collapsed ('none' versus 'once'/'twice'/'3-6 times'/'7 or more times'), as were the response options for marijuana and other illicit drug use ('none' versus 'once or twice'/'3-5 times'/'6-9 times'/'10-19 times'/'20-39 times'/'40 or more times').

Differences by gender and grade for each of the seven substance use outcomes were assessed through logistic regression analysis via a Generalised Estimating Equation (GEE) framework[71,72] to account for potential clustering of students within schools.

Resilience protective factors

Fourteen protective factor scores (six individual factor subscales, eight environmental factor subscales) were created. Protective factor subscale scores were calculated by averaging the responses to all items in a subscale for each student. All such scores ranged from 1 to 4.

Correlation between resilience protective factors

Correlation analysis was undertaken to determine the correlations between all individual and environmental resilience protective factors scores. Pearson correlation coefficients were calculated for each.

Associations between resilience protective factors and substance use

To examine the univariate and multivariate associations between resilience protective factors and student substance use, logistic regression analyses were conducted within a Generalised Estimating Equation (GEE) framework[71,72] to account for potential clustering of students within schools. Individual backward stepwise logistic regression models were conducted for each of the seven substance use outcomes (dependent variables) and each factor measure (independent variables: 14 protective factor subscales) to assess whether a decrease in each mean factor score was associatedunivariately with substance use (98 models). Multivariate logistic regression analyses explored the association between all individual and environmental protective factor subscales (14 in all, six individual, and eight environmental) and the seven substance use outcomes (7 models). In all models, factor score was used as a continuous variable (mean score). All models included potential demographic confounders of substance use, including: school size (400-800 medium/>800 large), school type (government/Catholic school) and student characteristics (gender, grade, remoteness of residential location, socio-economic and Aboriginal/Torres Strait Islander status). Odds ratios and 95% confidence levels were calculated for each model. In addition, the odds and probability of use of each substance was derived from the models for specific values of factors (factor score of 2 and 3), in order to calculate the difference in the probability of substance use for a one-unit change in factor score.

Missing data from substance use items were imputed using the recommended method for cross sectional data in single item measures; 'hot deck' imputation.[73] Logistic regression analyses were repeated using the imputed dataset and any differential results reported.

To account for multiple testing a criterion for statistical significance of $p \leq 0.0005$ was used (Bonferroni-corrected).

RESULTS

Sample

Of the 172 eligible secondary schools in the study area 47 schools were eligible to participate. Across the 32 participating schools (73% school consent rate), parental consent was granted for 13,440 students (73.4%) of which 10,244 students completed at least part of the student survey (participation rate: 55.9% of total enrolled students; 76.2% of students with parental consent). Those students who completed at least one substance use item (n=10,092; 55.1%) are reported in the analysis, the demographic characteristics of whom are shown in Table 7.2.

Table 7.2. Description of participating students (N=10,092)

Student demographics	Student sample N (%)	State comparison data[a] %
Gender		
Male	5066 (50.2)	51.4
Grade		
Year 7	3080 (30.5)	24.7
Year 8	2646 (26.2)	24.8
Year 9	2476 (24.5)	25.1
Year 10	1890 (18.7)	25.3
Age		
Younger than 12	11 (0.1)	0.4
12	1265 (12.5)	18.8
13	2926 (29.0)	24.9
14	2646 (26.2)	25.1
15	2215 (22.0)	24.4
16	1000 (9.9)	6.2
Older than 16	29 (0.3)	0.2
Aboriginality		
Aboriginal and/or Torres Strait Islander	1143 (11.3)	5.2
Socioeconomic status*		
Quintile 1 (most disadvantaged)	551 (5.5)	

Student demographics	Student sample N (%)	State comparison data[a] %
Quintile 2	3000 (29.7)	
Quintile 3	5334 (52.9)	
Quintile 4	1124 (11.1)	
Quintile 5 (least disadvantaged)	68 (0.7)	
Remoteness (ARIA)*		
Major Cities	4246 (42.1)	
Inner Regional	2856 (28.3)	
Outer Regional/Remote	2975 (29.5)	

*Postcode missing for 15 students therefore SES and remoteness could not be calculated; [a] State comparison data for students in Years 7 to 10 attending government and Catholic schools in 2011.[74]

Substance use

Twenty-three per cent of students had ever used tobacco and 7% had recently used tobacco, with both forms of use increasing by Grade (Table 7.3), with no difference by gender.

For alcohol use, 51%, 14% and 15% of students reported having ever used, recently used or 'risky' use of alcohol respectively. Alcohol use significantly increased by Grade across all three measures. A higher proportion of males reported use of each of the three alcohol measures.

Six percent of students reported recent marijuana use and 3% reported recent other illicit drug use. Both marijuana and other illicit drug use increased by Grade, with more males reporting use of marijuana and other illicit drugs.

Resilience protective factors

The mean scores for each measure of student resilience protective factors are shown in Table 7.4. The means varied from 2.36 (SD 0.74) to 3.42 (SD 0.75).

Correlation between resilience protective factors

Significant correlations were found between all resilience protective factor subscale scores. Little to weak positive correlations between all individual (0.25-0.53) and environmental resilience protective factor subscales were found (0.26-0.61) (see Appendix 7.1).

Table 7.3. Proportion of students reporting substance use by grade and gender (n=10,092)

Substance use	All students % (n)	Grade 7 %	Grade 8 %	Grade 9 %	Grade 10 %	*p* value	Male %	Female %	*p* value	National comparison data[e] %
Ever used tobacco	22.5 (2272)	11.2	20.0	29.8	35.0	<0.0001	23.4	21.6	0.0920	23.3%
Recent tobacco use	6.9 (700)	2.3	6.1	9.7	12.2	<0.0001	7.3	6.6	0.2724	6.7%
Ever consumed alcohol[a]	50.5 (5080)	30.3	45.5	62.8	74.6	<0.0001	54.2	46.8	<0.0001	74.0%
Recent alcohol use[b]	13.6 (1367)	5.7	10.3	18.8	24.5	<0.0001	15.9	11.3	<0.0001	13.6%
Risk alcohol use[c]	14.8 (1488)	5.2	11.6	19.4	29.0	<0.0001	16.4	13.2	<0.0001	
Recent marijuana use[d]	6.3 (630)	1.5	4.7	9.4	12.2	<0.0001	7.9	4.7	<0.0001	6.8%
Recent other illicit drug use[d]	2.6 (259)	1.0	2.3	3.5	4.4	<0.0001	3.3	1.9	<0.0001	2.9%

[a] 35 missing (n=10,057); [b] 37 missing (n=10,055); [c] 40 missing (n=10,052); [d] 66 missing (n=10,026); [e] Data from the 2011 Australian Secondary Students' Alcohol and Drug Survey (n= 26,194).[9]

Table 7.4. Student mean resilience protective factor scores

Protective factor	Protective factor score	
	Mean	Standard Deviation
INDIVIDUAL RESILIENCE PROTECTIVE FACTOR SUBSCALES		
Cooperation and communication	3.03	0.66
Empathy	2.98	0.71
Goals and aspirations	3.15	0.71
Problem solving	2.78	0.70
Self-awareness	3.07	0.70
Self-efficacy	3.03	0.53
ENVIRONMENTAL RESILIENCE PROTECTIVE FACTOR SUBSCALES		
School support	2.88	0.74
School meaningful participation	2.36	0.74
Community support	3.21	0.77
Community meaningful participation	3.02	0.85
Home support	3.38	0.61
Home meaningful participation	2.89	0.70
Pro-social peers	2.91	0.63
Peer caring relationships	3.42	0.75

Associations between resilience protective factor scores and substance use

Univariate associations

With four exceptions, all measures of substance use were inversely associated with all individual and environmental resilience protective factor subscale scores (see Table 7.5).

Table 7.5. Univariate associations between mean resilience protective factor scores and substance use[a,b]

Protective factor	Ever used tobacco OR 95% CI	Recent tobacco use OR 95% CI	Ever used alcohol[c] OR 95% CI	Recent alcohol use[d] OR 95% CI	Risk alcohol use[e] OR 95% CI	Marijuana use[f] OR 95% CI	Other illicit drug use[f] OR 95% CI
INDIVIDUAL PROTECTIVE FACTORS[f]							
Cooperation and communication	1.65*	1.81*	1.42*	1.48*	1.14*	1.79*	2.22*
	1.50-1.81	1.57-2.08	1.32-1.52	1.32-1.66	1.29-1.55	1.52-2.12	1.78-2.77
Empathy	1.35*	1.47*	1.39*	1.38*	1.40*	1.53*	2.15*
	1.23-1.49	1.24-1.73	1.29-1.50	1.23-1.55	1.26-1.54	1.31-1.79	1.68-2.75
Goals and aspirations	1.76*	2.23*	1.71*	1.73*	1.97*	1.93*	2.30*
	1.64-1.90	1.97-2.53	1.56-1.87	1.60-1.88	1.82-2.15	1.68-2.21	1.89-2.79
Problem solving	1.66*	1.75*	1.53*	1.60*	1.54*	1.95*	2.50*
	1.54-1.80	1.49-2.05	1.43-1.63	1.45-1.76	1.42-1.67	1.69-2.26	1.99-3.15
Self-awareness	1.84*	2.03*	1.58*	1.58*	1.58*	1.91*	2.18*
	1.69-2.01	1.77-2.32	1.46-1.71	1.42-1.74	1.43-1.74	1.65-2.20	1.72-2.75
Self-efficacy	1.95*	2.21*	1.65*	1.59*	1.68*	1.84*	2.56*
	1.77-2.15	1.79-2.72	1.50-1.81	1.39-1.82	1.50-1.89	1.51-2.24	1.93-3.41
ENVIRONMENTAL PROTECTIVE FACTORS[f]							
School support	1.76*	1.80*	1.73*	1.60*	1.68*	1.86*	2.11*
	1.63-1.89	1.58-2.05	1.61-1.85	1.47-1.74	1.53-1.86	1.61-2.15	1.68-2.67

Protective factor	Ever used tobacco OR 95% CI	Recent tobacco use OR 95% CI	Ever used alcohol[c] OR 95% CI	Recent alcohol use[d] OR 95% CI	Risk alcohol use[e] OR 95% CI	Marijuana use[f] OR 95% CI	Other illicit drug use[f] OR 95% CI
School meaningful participation	1.66*	1.79*	1.45*	1.45*	1.46*	1.87*	1.98*
	1.53-1.81	1.54-2.08	1.36-1.56	1.28-1.64	1.32-1.61	1.63-2.16	1.48-2.65
Community support	1.38*	1.39*	1.26*	1.27*	1.21*	1.43*	1.77*
	1.30-1.46	1.24-1.56	1.20-1.33	1.18-1.36	1.11-1.32	1.29-1.59	1.49-2.10
Community meaningful participation	1.51*	1.69*	1.27*	1.26*	1.32*	1.48*	1.69*
	1.42-1.63	1.53-1.87	1.20-1.35	1.18-1.34	1.23-1.42	1.35-1.63	1.51-1.90
Home support	2.25*	2.19*	2.21*	2.07*	2.07*	2.27*	2.63*
	2.07-2.45	1.89-2.52	2.02-2.41	1.88-2.29	1.89-2.28	1.96-2.63	2.08-3.34
Home meaningful participation	1.71*	1.81*	1.49*	1.41*	1.46*	1.84*	2.02*
	1.55-1.87	1.55-2.11	1.37-1.61	1.27-1.58	1.34-1.60	1.61-2.10	1.59-2.57
Peer caring relationships	1.14*	1.18	1.04	1.11	1.07	1.27*	1.53*
	1.07-1.22	1.06-1.32	0.98-1.10	1.01-1.22	0.99-1.16	1.13-1.43	1.28-1.77
Pro-social peers	3.19*	3.82*	2.79*	2.92*	3.15*	3.75*	4.26*
	2.85-3.58	3.20-4.56	2.51-3.10	2.58-3.30	2.76-3.59	3.32-4.23	3.41-5.31

[a] Models adjusted for school clustering, gender, grade, Aboriginal/Torres Strait Islander, socio-economic status, remoteness, school size, and school type; [b] Reported data refer to association between substance use and a one unit decrease in each mean resilience protective factor score; [c] 35 missing (n=10,057); [d] 37 missing (n=10,055); [e] 40 missing (n=10,052); [f] 66 missing (n=10,026); * $p<0.0005$.

Multivariate associations

The final multivariate model for each substance use measure contained between four and ten of the 14 resilience protective factor subscales (Table 7.6). Of the resilience protective factors that remained in each final model, the majority had an inverse association with substance use (Table 7.6).

Across all substance use models, two protective factors were found to have an inverse association with substance use ('goals and aspirations' and 'pro-social peers'). A one unit decrease in mean subscale score significantly increased the odds of smoking (both measures), having consumed alcohol (all three measures), having used marijuana or another illicit substance by between 1.20 and 1.65 times for 'goals and aspirations', and between 2.30 and 3.64 times for 'pro-social peers'.

Four resilience protective factors were inversely associated with a least one substance use measure ('home support' (5 of 7 substance use measures), 'school support' (3 of 7), 'self-awareness' (2 of 7), 'community meaningful participation' (2 of 7)). Two resilience protective factors were found to have a consistent positive association with at least one substance use measure ('community support' (3 of 7 substance use measures), 'peer caring relationships' (5 of 7)). The remaining six resilience protective factors were not associated with any substance use outcome.

Data for between 2 and 5 variables were missing for 81 of 10092 participants, with no identified pattern of missingness. Identical analyses using imputation for missing data did not show a differential pattern of results.

DISCUSSION

This study explored the associations between 14 adolescent individual and environmental resilience protective factors and seven measures of adolescent substance use. Of the 14 factors examined, six had an inverse and two had a positive association with at least one type of substance use. Of the resilience protective factors found to be inversely associated with substance use, only two were associated with all substance use measures. Such findings suggest that the protective benefit of resilience protective factors for adolescent substance use may be limited to only a small number of such factors and then, primarily, only for some substances.

Table 7.6. Multivariate associations between mean resilience protective factor scores and substance use[a]

Resilience protective factors	Tobacco - ever used tobacco OR (95% CI)	Recent tobacco use OR (95% CI)	Ever used alcohol[b] OR (95% CI)	Recent alcohol use[c] OR (95% CI)	Risk alcohol use[d] OR (95% CI)	Marijuana use[e] OR (95% CI)	Other illicit drug use[e] OR (95% CI)
INDIVIDUAL							
Goals and aspirations	1.20* (1.13-1.27)	1.54* (1.39-1.70)	1.27* (1.16-1.38)	1.29* (1.18-1.40)	1.49* (1.35-1.67)	1.31* (1.14-1.51)	1.62* (1.35-1.96)
Self-awareness	1.27* (1.14-1.40)	1.42* (1.23-1.64)	-	-	-	-	-
ENVIRONMENTAL					-		
School support	1.21* (1.11-1.31)	-	1.38* (1.26-1.51)	-	1.28* (1.15-1.42)	-	-
Community support	0.82* (1.76-0.89)	-	0.78* (0.72-0.85)	-	0.74* (0.67-0.82)	-	-
Community meaningful participation	1.17* (1.09-1.24)	1.26* (1.14-1.40)	-	-	-	-	-
Home support	1.53* (1.39-1.69)	-	1.75* (1.58-1.94)	1.60* (1.44-1.79)	1.62* (1.43-1.83)	1.43* (1.22-1.69)	-
Peer caring relationships	0.71* (0.65-0.77)	0.69* (0.61-0.78)	0.69* (0.65-0.74)	0.75* (0.67-0.83)	0.71* (0.66-0.77)	-	-
Pro-social peers	2.49* (2.24-2.77)	3.10* (2.63-3.65)	2.29* (2.08-2.52)	2.46* (2.14-2.81)	2.62* (2.26-3.04)	2.96* (2.60-3.36)	3.67* (2.93-4.60)

[a] Models adjusted for school clustering, gender, grade, Aboriginal/Torres Strait Islander, socio-economic status, remoteness, school size, and school type; [b] 35 missing (n=10,057); [c] 37 missing (n=10,055); [d] 40 missing (n=10,052); [e] 66 missing (n=10,026);* $p<0.0005$.

No previous single peer reviewed study has reported the associations between a comprehensive range of individual and environmental protective factor measures and a broad range of adolescent substance use measures. Nonetheless, the inverse associations found between eight of the individual and environmental protective factor measures and substance use are generally consistent with the direction of previous studies of single or small numbers of factors and substance use.[23,29,30,47-50,58] Similarly, the findings of no association between six such factors and substance use are consistent with previous studies.[27,48,64] In contrast, the consistent positive association found between the protective factors of 'peer caring relationships' and use of some substances, differs from a previous study that have reported no evidence of an association.[30] Whilst the reason for such contrast is unknown, it may be at least partly attributable to the different measurement of resilience protective factors and substance use between studies.[30] No previous studies could be identified that examined the association between adolescent substance use and 'community support'. Further research is required to confirm the contrasting findings, and if confirmed, to understand the mechanisms for such an association such that interventions promoting these factors do not have an untoward effect.

The findings that six factors conferred a protective benefit for adolescent substance use appear to align with models of adolescent substance use prevention, such as the social development model (grounded in Bandura's social learning theory and control theory),[19] and models of resilience,[23,25,29,36,40-44,75] which focus on individual capacities or assets, and bonding with family, school and peers as protection against the risk factors for substance use. However, despite the consistency in the direction of such associations, there was a lack of consistency of association across types of substances. For example, lower 'community meaningful participation' was only associated with tobacco use (ever and recent) and lower 'school support' only associated with some measures of tobacco (ever) and alcohol use (ever and risk). Such findings suggest the protective benefit of such factors is variable across different types of substance use, rather than being generalised. The finding of no association or a positive association between a number of resilience protective factors and substance use however may challenge such models of substance use prevention, or at least the breadth of factors described by such models.

The finding of an inverse association between some resilience protective factors and different forms of adolescent substance use suggests that interventions and programs that seek to reduce such use by increasing resilience protective factors may be more likely to be effective if they target specific protective factors to address specific types of substance use.

A number of studies have demonstrated that interventions can successfully increase resilience protective factors among young people,[76-79] including individual factors such as self-efficacy,[80] and environmental factors related to family and community connection.[77] For example, a randomised controlled trial in Hong Kong examining the efficacy of a positive youth development intervention targeting a range of resilience protective factors (including self-efficacy, beliefs in the future, bonding, and prosocial involvement) to reduce adolescent substance use, reported an increase in some targeted protective factors (such as self-efficacy and bonding) and decreases in substance use.[80] Further research is required to determine whether intervention approaches focused on the enhancement of the specific resilience protective factors found to be associated with adolescent substance use in this study have a beneficial effect on such use.

As previous research has demonstrated that risk factors such as access to substances, substance use by parents, and by peers and siblings[18-22] are associated with adolescent substance use, further research exploring the association of resilience protective factors with adolescent substance use in the context of such risk factors is warranted. Such research is needed to identify the specific set of individual and environmental resilience protective factors and risk factors that are associated with each type of adolescent substance use, the relative contribution of each factor, and to determine the consistency of association between such factors and different types of substances. Whilst some studies investigating both risk and protective factors generally have found risk factors to be stronger predictors of tobacco, alcohol and marijuana use, such studies have only examined a limited number of resilience protective factors and types of substance use.[49,81] Additionally, future research investigating the potential of such factors for prevention should be theory driven in an effort to understand the aetiology of substance use, and whether this differs by substance use type.

The findings of this study should be viewed in light of a number of the study characteristics. First, the study included a number of design strengths, including: a large sample of adolescents; use of a tool validated in an Australian adolescent population; comprehensive measurement of both individual and environmental resilience protective factors; use of multiple accepted measures of substance use; and analyses that accounted for a range of known confounders and potential clustering effects within schools. Although the study was reliant upon adolescent self-report of substance use and subject to the known limitations of self-report in this population,[81] self-report is an accepted method of measuring substance use by adolescents. To optimise validity of report, a web-based survey was utilised[82] as was

confidential participation by students, strategies that have been found to increase the validity of adolescent report of sensitive questions, such as substance use.[83]

Although a non-response bias may exist, the demographic characteristics and prevalence of adolescent substance use found in this study are consistent with those reported in Australian triennial nation-wide surveys,[9] and suggests that the likelihood of bias may be limited. The conduct of the study in one local health district of New South Wales Australia may limit the generalisability of the results to other adolescent populations, and whilst the imbalance in the proportion of Aboriginal and Torres Strait Islander and Year 10 student may be indicative of this, the impact is not known. Finally, the study is limited by its cross sectional design which does not allow for investigation of the causal pathways of the association findings. Further longitudinal and intervention-based research is required to address these questions.

AUTHORS' CONTRIBUTIONS

RKH contributed to the design of the data collection tools, monitored the data collection, led conception of the paper, cleaned and analysed the data, drafted and revised the paper. MF, JB and JW contributed to the design of the data collection tools and conception of the paper, monitored the data collection, provided critical revision and approved the final version of the paper. LW, KG and JD contributed to the critical revision of the manuscript and approved the final manuscript. CL provided statistical advice.

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COMPETING INTERESTS STATEMENT

We have read and understood BMJ policy on declaration of interests and declare that we have no competing interests.

DATA SHARING STATEMENT

Requests for additional unpublished data should be forwarded to rebecca.hodder@hnehealth.nsw.gov.au

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CHAPTER 8

Thesis findings and implications for future research and practice

The aims of this thesis were to: i) review the evidence regarding the effectiveness of universal school-based interventions that address resilience protective factors in reducing adolescent tobacco, alcohol or illicit substance use; ii) determine the effectiveness of such an intervention approach in reducing adolescent substance use by students overall and iii) by subgroups; and iv) identify the associations between individual and environmental resilience protective factors and adolescent substance use**.** This chapter provides a summary of the findings from the studies conducted to address these aims and discusses the implications of the findings in terms of future school-based adolescent substance use prevention research, policy and practice.

THESIS FINDINGS

Chapter 1: The need to prevent tobacco, alcohol and illicit substance use, and the potential for universal school-based interventions that address resilience protective factors to reduce such use by adolescents

Chapter 1 described the significant and increasing burden of tobacco, alcohol and illicit substance use and the prevalence of such use in adults, both internationally and within Australia. The chapter then focused specifically on the burden and prevalence of such substance use by adolescents. The chapter found that despite recent data suggesting substance use by adolescents is declining, a significant proportion of adolescents in high-income countries continue to use such substances. An overview of population level initiatives implemented in high-income countries and in Australia to reduce the harms associated with substance use by adults and adolescents was then presented. Initiatives were commonly found to include guidelines regarding the consumption of tobacco and alcohol, legislation to restrict substance availability or access, and national substance use prevention strategies that provide recommendations for how to prevent substance use in adolescents. Recommendations for the implementation of prevention strategies were consistently found to include a focus on: interventions in schools; a universal (whole of school/class/age group) approach to such interventions, and interventions that address the resilience of individuals and protective factors. However, a lack of guidance was evident with regard to which interventions or which specific intervention elements were recommended to be implemented by schools. A summary of evidence regarding the effectiveness of universal school-based approaches to reduce substance use generally was then presented and the potential for interventions that address resilience protective factors, indicating support for approaches that address protective factors and the potential effectiveness of interventions that seek to enhance the resilience of adolescents. The

chapter concluded with a summary of the evidence of such an intervention approach, indicating that further rigorous trials were required to determine its effectiveness.

Chapters 2 and 3: Systematic review of universal school-based interventions that address resilience protective factors in reducing adolescent tobacco, alcohol or illicit substance use

Chapters 2 and 3 described a systematic review of the effectiveness of universal school-based resilience interventions in reducing the prevalence of tobacco, alcohol or illicit substance use by adolescents. Eligible studies were peer reviewed randomized controlled trials (1994-2015) that: involved participants aged 5-18 years; reported adolescent tobacco, alcohol or illicit substance use as outcomes; and implemented a universal school-based resilience intervention (defined as an intervention that addressed both individual (e.g. self-esteem) and environmental (e.g. school connectedness) resilience protective factors regardless of the stated intervention approach). Nineteen eligible studies were identified from 16,619 records, of which 15 reported tobacco, 17 reported alcohol and 11 reported illicit substance use outcomes. Eighteen of the included studies addressed resilience protective factors amongst other factors, and one included study solely addressed resilience protective factors. Evidence of an overall intervention effect across the eligible studies was found for illicit substance use (n=10; OR: 0.78, 95% CI: 0.6-0.93, p=0.007), but not for tobacco or alcohol use. A similar result was found when studies assessed as high risk of bias were excluded and for subgroups defined by intervention characteristics (e.g. setting and follow up length). On the basis of such findings, Chapter 3 concluded that implementation of universal school-based interventions that address resilience protective factors, amongst other factors, were effective in reducing adolescent illicit substance use only, and that further research was required to determine if such an intervention approach can be effective in reducing adolescent tobacco and alcohol use.

Chapters 4 and 5: Effectiveness of a school-based universal intervention that solely addresses resilience protective factors in reducing adolescent tobacco, alcohol and illicit substance use

Chapters 4 and 5 described a cluster-randomized trial of a school-based universal resilience intervention in reducing tobacco, alcohol and illicit substance use in a population of adolescent school students. Participants in the trial were a cohort of Grade 7 (2011; aged 12-13 years) students followed up in Grade 10 (2014; aged 15-16 years) that attended one of thirty-two participating Australian secondary schools (20 intervention; 12 control). The intervention involved school staff implementing programs and initiatives designed to

promote 'resilience' protective factors of students (2012-2014). Schools were provided with the details of existing programs and resources to select from, and support to implement selected programs and initiatives. Analysis of follow up data from 2105 students (intervention=1261; control=844; 69% of baseline cohort) found no significant differences between intervention and control group students for any of the seven measures of substance use. In addition, no significant differences between intervention and control group students were found any resilience protective factor measure. It was suggested that three aspects of the intervention may have limited its effectiveness: the absence of intervention content addressing other known risk factors of substance use (e.g. substance use by parents and by peers and siblings[1-5]); the absence of a targeted intervention component delivered to students with such substance use risk factors or with lower resilience; and the real-world design of the intervention that involved schools implementing a self-selected range of publicly available programs and resources, some with limited or no evidence of effectiveness. On the basis of such findings, Chapter 5 concluded that further research is warranted to investigate the effectiveness of a universal school-based resilience intervention that also addresses substance use risk factors. Such an intervention should include a component delivered to students with elevated risk of substance use (e.g. having risk factors such as parental substance use or low levels of resilience).

Chapter 6: Differential effectiveness of a universal school-based resilience intervention in reducing adolescent substance use between subgroups defined by adolescent socio-demographic and substance use characteristics

Chapter 6 explored the differential effectiveness of the previously described resilience intervention for subgroups of students defined by socio-demographic and previous substance use characteristics. Student subgroups were defined by gender; socio-economic disadvantage (low/high); geographic location (major city/inner regional/outer regional-remote); and previous use of tobacco, alcohol or an illicit substance (non-user/user). The study adopted best practice principles for subgroup analyses including formal statistical tests of interaction. Results from 2149 students showed no differential intervention effect for any measure of substance use or resilience protective factors for any subgroup, with the exception of a single differential effect found by socio-economic status for the outcome of mean number of cigarettes smoked by recent smokers. Such results were considered to be consistent with the results for students overall described in Chapter 5, strengthening the conclusion of that study that further research is required to determine whether an augmented universal school-based resilience intervention can be effective in reducing tobacco, alcohol and illicit substance use by adolescents.

Chapter 7: The associations between individual and environmental resilience protective factors and adolescent tobacco, alcohol and illicit substance use

On the basis of the null findings of Chapters 5 and 6, Chapter 7 explored the relative strength of associations between the 14 resilience protective factors addressed by the intervention and seven measures of adolescent tobacco, alcohol and illicit substance use. Of the 14 factors examined, six were found to have an inverse and two were found to have a positive association with at least one measure of substance use. Of the resilience protective factors found to be inversely associated with substance use, only two were associated with all substance use measures ('goals and aspirations' and 'pro-social peers'). The paper concluded that the ability of resilience factors to protect against adolescent substance use may exist for only some factors. On the basis of such findings and previous research suggesting that a range of other factors (e.g. substance use by parents and by peers and siblings) are associated with an increased risk of substance use, it was suggested further research is required that explores the association between resilience protective factors and adolescent substance use, taking into account student substance use risk factors to identify which factors should be incorporated in future interventions.

IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE

Chapter 1 of this thesis identified that interventions to reduce tobacco, alcohol and illicit substance use by adolescents are required and universal school-based interventions that address adolescent resilience may have potential for reducing such use. However, the results of the systematic review (Chapters 2 and 3) were equivocal, with evidence of the effectiveness of such interventions found for reducing illicit substance use but not tobacco or alcohol use. Results from the cluster-randomised trial (Chapters 4, 5 and 6) further suggested that the school-based universal resilience intervention was not effective in reducing adolescent substance use overall or by subgroups (Chapters 5 and 6), and was not effective in increasing resilience protective factors for students overall (Chapter 5). Examination of the multivariate associations between resilience protective factors and multiple measures of adolescent substance use suggested that some resilience protective factors may be more important than others in reducing substance use. Based on such findings, and the findings of other research regarding the role of substance use specific protective and risk factors (note: protective factors for substance use may differ from protective factors for resilience, the latter being the focus of the studies conducted for this

thesis), the subsequent sections of this chapter focus on the following implications for future research and practice:

1. A need for longitudinal research studies to identify which resilience protective factors and substance use risk and protective factors should be addressed by adolescent substance use prevention programs;
2. A need for studies assessing the effectiveness of school-based substance use prevention interventions that involve a combination of both universal and targeted prevention components that address both resilience protective factors and substance use risk and protective factors;
3. A need for evidence-based policies and guidance to schools regarding the selection and implementation of evidence-based substance use prevention programs.

A need for longitudinal studies to identify which resilience protective factors and substance use risk and protective factors should be addressed by adolescent substance use prevention programs

To identify the most appropriate focus of future resilience-focused substance use prevention interventions, an examination of the relative association of various factors associated with adolescent substance use is required. A large number of factors have been reported in previous studies to either increase or decrease the likelihood of substance use by young people, a summary of which is shown in Table 8.1.[2;4;6-20] Factors found in such research to be associated with an increased risk of substance

Table 8.1. Risk and protective factors for adolescent substance use

Domain	Substance use Risk factors	Substance use Protective factors
Individual/peers	Association with friends/peers who use drugs;[2;14;22;23] Attitudes favourable to substance use, knowledge about drugs;[2;24] Delinquency such as shoplifting and gang fighting; Early and persistent problem behaviours, e.g. early initiation to substance use; General sense of hopelessness about life; Genetic predisposition: behavioural under-control; Low expectations of success; Low self-esteem; Perceptions of peer approval of drug-using behaviours; Personality: lack of social bonding, alienation, rebelliousness, resistance to authority; Physiological factors e.g. sensation-seeking, curiosity, boredom, poor impulse control; Poor social adjustment; Poor coping skills.	Affiliation with friends who model conventional behavior and adoption of conventional norms about substance use/positive peer support; Good coping styles, empathy, problem solving, internal locus of control; Intolerance of attitudes toward deviance; Moral beliefs and values; Optimism and positive orientation toward health; Perception of risk of substance use; Perception of strong anti-drug attitudes and behavior among peers; Perception of strong social controls or sanctions against transgressions; Positive relations with adults; Religious beliefs and practices; Social competence skills e.g., social interaction skills and values.
Family	Chaotic home environments; Family conflict; Low bonding, lack of mutual attachment/nurturing, poor family relationships;	Educational opportunities and social support for parents e.g. teaching parents how to discipline children and handle conflict; Parental monitoring with clear rules of conduct, parental involvement; Secure and stable family;

Domain	Substance use Risk factors	Substance use Protective factors
	Parents and/or other family members use substances or have an attitude that favours substance use; Poor/inconsistent parenting skills e.g. negative communication patterns; Unrealistically high expectations.	Strong bonds/attachments between children and their families; Strong family norms and morality; Supportive, caring parents; family harmony.
Community	Availability of substances; Exposure to violence; Extreme economic deprivation; Lack of legislation and law enforcement; Lenient laws and norms about drug and alcohol use; Neighbourhood disorganization, including war and refugee camp; Perceptions of approval of substance-using behaviours in community environments.	Access to support services; Community/cultural norms against violence and substance use; Community networking; Healthy leisure activities; Strong bonds with pro-social institutions such as religious organizations or other community groups; Strong cultural identity and ethnic pride.
School	Academic failure, poor school achievement; Low degree of commitment to school; Peer rejection in elementary grades; Poor academic adjustment and commitment; Unrealistically high expectations.	Organizational changes in schools, e.g. tutoring, improved school-faculty-community relationships, changed discipline procedures; Positive orientation toward school, sense of belonging, bonding; Positive school climate; Pro-social peer group; School norms that discourage violence and substance use; Successful school performance and recognition of achievement.

Adapted from United Nations Office on Drugs and Crime 2003.[30]

use have been termed 'risk factors', whereas those that have been found to be associated with a decreased risk of adolescent substance use have been termed 'protective factors' for substance use.[2]

For example, risk factors for the use of alcohol have been commonly reported to include use of alcohol by parents, siblings or peers,[2;14;21-23] permissive attitudes or perceptions of permissive attitudes to alcohol by parents, siblings and peers,[2;23;24] access or availability to substances,[2;21;24] and poor school achievement or low degree of commitment to school.[2;21;25] Similarly, protective factors for alcohol use by adolescents have been reported to include 'individual' factors such as self-esteem,[15;19-21] social competence skills,[2;21;24] and problem solving ability,[9;24] and pro-social peers,[10;21;26] and environmental factors such as connection to family,[2;10;19;21;24] and parental monitoring,[21;23] and connection to community and connection to school.[6;14;17-19;21;24] Whilst there is a large degree of commonality between such substance use protective factors and the resilience protective factors that were the basis of the intervention tested in this thesis (e.g. self-esteem and pro-social behaviour), there are also a number of substance use protective factors that were not incorporated in that intervention (e.g. optimism, parental monitoring, and successful school performance).

In order to understand which substance use risk and protective factors in addition to resilience protective factors should be prioritised for inclusion in future prevention interventions, an understanding of the relative strength of association between such factors and substance use is required.[2] Longitudinal prospective studies (where the same participants are followed over time), rather than cross sectional studies are best placed to examine these associations.[27;28] A recent review has addressed this question in part by narratively summarising studies that examined the longitudinal associations between adolescent substance use and substance use risk and protective factors.[21] The review found that the risk factors with the strongest association (odds ratio range: 1.64 to 4.91) with substance use were: friends use of substances; poor family management; family antisocial behaviour; low school commitment; and availability of substances. Protective factors found to have the strongest association (odds ratio range: 0.52 to 0.79) with adolescent substance use were self-esteem, peer rewards, and pro-social behaviour. However, the review did not assess the relative strength of association between the risk and protective factors and substance use, precluding an assessment of which factors should be prioritised over others for inclusion in substance use prevention interventions.

A number of individual studies of the association between risk and protective factors and substance use have suggested that a differential strength of association exists between these two types of factors, and substance use.[7;8;11;16] For example, of studies that have investigated both risk and protective factors for adolescent alcohol use, risk factors have generally been found to have a stronger association with alcohol use than protective factors.[7;8;11;16] However, such studies have either included only a limited number of risk and protective factors, or have created cumulative measures of risk and protective factors precluding the ability to determine which risk and protective factors should be included in future interventions.[29]

Such findings suggest that risk factors could be prioritised for inclusion over protective factors in the design of school-based substance use prevention programs. However, theoretical models of adolescent substance use prevention such as the Social Development Model and others propose that a need exists to address protective factors in interventions as such factors may mediate or buffer the effects of risk factors.[2;19;29;31-35] Further understanding of both the longitudinal associations, and the interaction of substance use risk and protective factors with each other, and with resilience protective factor is required to determine the potential benefit of addressing factors associated with resilience and substance use to prevent adolescent substance use.

A need for studies assessing the effectiveness of school-based substance use prevention interventions that involve a combination of both universal and targeted intervention components that address both resilience protective factors and substance use risk and protective factors

Universal and selected intervention approaches

The potential effectiveness of universal school-based interventions, generally has previously been examined in a number of Cochrane reviews. The reviews found that social competence and social influence intervention approaches that address substance use risk and protective factors are effective in reducing the prevalence of tobacco and illicit substance use.[36;37] Social competence approaches aim to help adolescents to refuse offers of tobacco, alcohol or other substances by addressing risk factors of poor personal and social skills and protective factors such as problem solving and self-esteem.[38] Social influences

approaches aim to increase adolescents' awareness and skills in identifying the social influences that might support substance use, and addressing such influences for example dealing with peer pressure and refusing offers to use substances.[38] Such findings provide evidence that universal interventions that address both substance use risk and protective factors can be effective in reducing adolescent substance use. Given this, such interventions are commonly recommended by governments and implemented by schools.[39-43]

Despite the appeal of universal school-based interventions, such an approach has two key limitations. First, universal interventions found to be effective at the whole-of-population level are not always demonstrated to be equally effective for all subgroups within a population.[44-47] For example, previous studies of effective interventions at the whole of study sample level have reported that interventions have been less effective for substance nonusers than for users.[45;48-50] Second, universal interventions when shown to be effective for a subgroup of participants have imparted only a small benefit to such participants thereby limiting their contribution to a measurable effect across a population of all students.[51] These limitations suggest that in order to enhance the likelihood of optimizing reductions in the prevalence of substance use across all students in a population, consideration should be given to the inclusion of intervention elements that are tailored to meet the particular needs of different subgroups of students, including approaches for those who are substance users or at risk of such use.

The delivery of interventions to groups of students deemed to be at higher risk of substance use has been termed a 'selective' prevention approach. In contrast, the delivery of interventions to individual students who have already initiated substance use is termed an 'indicated' prevention approach'.[38;52;53] Similar to universal interventions, selective and indicated substance use interventions are commonly recommended in international and national policies as part of a comprehensive approach to substance use prevention.[39;41;43] However, in comparison to universal interventions, relatively fewer trials of selective and indicated substance use prevention interventions have been conducted in schools. As such, the ability to identify which selective or indicated intervention elements could be implemented to enhance the impact of a school-based universal approach in reducing overall prevalence of substance use is limited. For example, a review of selective interventions delivered to students from substance-affected families identified only six school-based trials.[54] Of the two studies that assessed student substance use as an outcome, one reported no effect of the intervention and the other reported a higher frequency of alcohol use in intervention students.[54] Similarly, a Cochrane review of randomized

controlled studies examining the effectiveness of brief school-based interventions for substance using adolescents (indicated interventions) identified only six trials.[55] Interventions tested in these trials involved a combination of screening, motivational interviewing, information provision and discussion, brochures and follow up appointments. Meta-analyses found such interventions to be effective in reducing both adolescent alcohol (SMD -0.91; 95% CI -1.21 to -0.61, n = 242) and marijuana use (SMD -0.83; 95% CI -1.14 to -0.53, n = 269) compared to an assessment only control group.[55]

Combining universal and selective intervention components that include both resilience protective factors, and substance use risk and protective factors

A number of previous studies have investigated the effect of combining both universal and selective school-based interventions that address resilience protective factors to reduce adolescent substance use. For example, a cluster-randomised controlled study undertaken in 43 schools in Hong Kong examined the effectiveness of a resilience protective factor intervention combining both a universal component, and a selected intervention approach for students identified as having higher psychosocial needs. Reported overall findings included an increase in eight of the fourteen addressed resilience protective factor scores and a reduction in illegal substance use (growth curve analysis results: $\beta = -0.01$, standard error = 0.004, $p<0.05$).[56] A more recent cluster-randomised controlled study undertaken in 26 schools in Australia examined the effectiveness of a universal and a selective social influence intervention addressing substance use risk and protective factors in reducing adolescent alcohol use.[57] The four-arm study randomised schools to either a universal, selective, universal and selective, or usual care control arm.[57] The universal intervention was based on a harm minimisation approach addressing health effects, norms, refusal and harm-minimisation skills for substance use.[58] The selective intervention addressed personality-driven coping skills and was delivered to students who were defined as high risk on the basis of four personality risk factors (sensation seeking, impulsivity, anxiety sensitivity, and negative thinking).[57] Whilst results of the study showed the universal, selective, and universal and selective interventions all to be more effective than the control in reducing adolescent alcohol use (latent growth model results: universal $b = -0.38$, standard error = 0.09, $p<0.001$; selective $b = -0.36$, standard error = 0.10, $p<0.001$; combined universal and selective $b = -0.19$, standard error = 0.08, $p=0.025$), the combined universal and selective intervention was not more effective than the universal intervention.[57] The authors suggested such results may have been due to the universal intervention being effective at reducing the risk factors that the selective intervention was

designed to address. Whilst the findings of these two studies are promising, the lack of superior effect of the combined universal and selective interventions compared to the universal intervention alone in the latter study suggests a need for further research to investigate the potential of school-based interventions that combine a universal and selective approach in reducing substance use. Further the potential exists for the observed effect sizes to be enhanced through the inclusion of intervention content that addresses substance use risk and protective factors in addition to discrete resilience protective factors. However no previous studies have specifically sought to implement such an intervention approach. Further investigation of the effectiveness of interventions that include both a universal and selective intervention approach and address both substance use risk and protective factors and resilience protective factors to enhance the likelihood of a positive intervention effect on adolescent substance use is required.

A need for evidence-based policies and guidance to schools regarding the selection and implementation of evidence-based substance use prevention programs

Policies and guidelines regarding the implementation of any school-based substance use prevention intervention, whether resilience focused or otherwise, should be based on current evidence and indicate which programs should be prioritised for implementation. Whilst there is evidence from Cochrane systematic reviews for universal school-based interventions that combine a social influence and social competence approach, or a social competence approach alone,[36;37] the evidence for those focused solely on resilience to prevent adolescent substance use, as shown by the findings of this thesis, is limited. With the exception of the sole positive finding from the systematic review that universal school-based interventions that address 'resilience' protective factors as part of a broader intervention approach reduce adolescent illicit substance use (Chapter 3), this thesis provides no evidence that universal school-based interventions focused solely on resilience are effective in reducing adolescent substance use. Such findings are in contrast to guidance provided in both international and Australian national substance use prevention policies,[39-41;43] and mandated substance use prevention curriculum in New South Wales, Australia the local context in which the intervention study was undertaken. For example, the Australian National Drug Strategy 2010-2015,[43] recommends a comprehensive approach to substance use prevention based on harm minimisation that includes interventions delivered at a universal level, implemented within schools, and that address resilience and substance use protective factors.[43] This and other national policies,[39;41;43] also recommend the

implementation of targeted interventions and those that address substance use risk factors; a recommendation which is consistent with the findings of this thesis and other research.

As described in Chapter 1, no specific guidance is provided in national policies from high-income countries regarding which programs should be implemented to prevent adolescent substance use. For example, the United States National Drug Control Strategy 2013[40] provide some brief examples of risk and protective factors that could be addressed (e.g. risk factors of aggressive behaviour and drug availability, and protective factors of parental influence and academic competence) but does not provide a definitive list nor which program, evidence-based or otherwise, should be implemented to addresses such factors.

Similarly, in Australia, the Australian National Drug Strategy 2010-2015,[43] despite recommending both universal and targeted interventions, interventions that address risk and protective factors, and interventions that address the resilience of individuals, did not provide specific guidance regarding which risk and protective factors should be addressed in such interventions or how individual resilience should be addressed. The most recent Australian National Drug Strategy 2017-2026 similarly provides little guidance regarding what interventions should be implemented (Table 8.2). Within Australia, a number of other national policies and frameworks are available that provide guidance to schools regarding how to prevent substance use by adolescents (Table 8.3). These policies and frameworks include the national Principles for School Drug Education,[59] which recommend that schools implement whole-of-school and targeted drug education programs that address substance use risk and protective factors as well as the resilience of students, and that the selection of strategies should be evidence-based.

At a state-level, in New South Wales, Australia where the intervention study for this thesis was conducted, the universal delivery of 'drug education' to Years 7-10 students is mandated for delivery by schools within the Personal Development, Health and Physical Education (PDHPE) syllabus.[63] 'Drug education' is defined by the New South Wales Department of Education as involving a harm minimisation approach that "aims to promote resilience, and build on knowledge, skills, attitudes and behaviours to enable young

Table 8.2. A comparison of Australian National Drug Strategies 2010-2015 and 2017-2016

Strategy	Year published	Recommended intervention settings	Recommendations regarding prevention approach (universal, selective, indicated)	Recommendations regarding intervention content (e.g. protective factors, risk factors and resilience)
National Drug Strategy 2010-2015[43]	2011	Priority settings for preventive interventions on alcohol, tobacco and other drugs include families, educational settings and communities. Improve the application of evidence based whole-of-school drug education policies and programs.	Whole-of-population strategies for alcohol and tobacco and for those illegal drugs that are widely used. Targeted approaches to users and at-risk groups. Successfully reducing the misuse of alcohol, and the use of tobacco and other drugs requires a range of approaches across the continuum of use, from experimental to dependent use.	Work with other national policies to reduce risk factors and build protective factors, while recognising the diverse range of influences on drug use. Support efforts to promote social inclusion and resilient individuals, families and communities. Socially inclusive communities and resilient individuals and families are less likely to engage in harmful drug use. Resilient individuals can adapt to changes and negative events more easily and reduce the impacts that stressors have on their lives—and are less likely to use drugs.
National Drug Strategy 2017-2026[60]	2017	Early intervention targeting at risk groups including collaborating with the education sector to deliver early intervention through schools for at risk youth.	Targeted approaches to high prevalence population groups at increased risk of exposure to and harm from alcohol, tobacco and other drugs.	A national framework for building safe, healthy and resilient Australian communities through preventing and minimising alcohol, tobacco and other drug-related health, social and economic harms among individuals, families and communities. Programs focused on building protective factors and social engagement. Addressing underlying social, health and economic determinants of use.

Table 8.3. Guidance for schools regarding school-based substance use prevention

National/ State	Document	Guidance regarding substance use prevention
National	Principles for School Drug Education[59]	Whole school and targeted approaches Address both risk and protective factors Addresses resilience Evidence-based practice/selection of actions
NSW	Drugs in Schools Policy[61]	Intervention targets: • Meet the mandatory requirements for drug education in the Personal Development, Health and Physical Education (PDHPE) key learning area from Kindergarten to Year 10. Syllabus based on harm minimisation approach includes drug knowledge, norms, drug refusal skills; • Crossroads in Years 11/12. Prevention approach: • Universal prevention: drug education in PDHPE (Kindergarten to Year 10), Crossroads in Years 11/12; • Targeted prevention: After a drug related incident, principals are required to ensure students are assisted to overcome problems related to drug use; the student and/or the family are linked to appropriate community support services. 2.2 Safe and supportive school environment Schools play an important role in helping to prevent drug use problems amongst young people. They do this when the curriculum and student welfare strategies help to strengthen protective factors and minimise risk factors known to be associated with drug misuse by young people. Protective factors • a sense of belonging to school or other societal institutions • having at least one close relationship with a parent, teacher, relative or mentor who can provide guidance and emotional support • membership of a peer group that actively discourages drug use • a sense of self-efficacy and personal responsibility • well developed social and interpersonal skills and adequate decision-making skills • academic success and commitment to schooling. Risk factors • school failure and academic difficulties • a high rate of absenteeism and truancy • a lack of commitment to schooling • transitions to a more impersonal, more anonymous and less protected environment.

National/ State	Document	Guidance regarding substance use prevention
NSW	The Wellbeing Framework for Schools[62]	Whole-school approaches to physical health and fitness, social skills and friendship, empathy and resilience, peer support and mentoring, student leadership, citizenship and community engagement contribute to the growth of individual and collective wellbeing.
NSW	Drug Education[63]	Drug education in NSW government schools reflects the whole of government harm minimisation approach. It aims to promote resilience, and build on knowledge, skills, attitudes and behaviours to enable young people to make responsible, healthy and safe choices.
NSW	Student Welfare Policy[64]	Incorporates preventive health and social skills programs.
NSW	PDHPE Syllabus[63]	[NB. PDHPE curriculum is developed by NSW Education Standards Authority (NESA; who replaced NSW Board of Studies). NESA are responsible for setting and monitoring quality teaching, learning, assessment and school standards across all NSW public, Catholic and independent schools, including all curriculum from Kindergarten to Year 12 and developing evidence-based policy to improve student achievement and support teachers] The social and emotional wellbeing of students is also promoted when the school provides an environment that enhances the protective factors that help to build resilience and lessen the impact of adverse life events Young people who have a feeling of connectedness with parents, family and school have lower levels of smoking, drinking, other drug use, suicidal thinking, risky sexual behaviour and exposure to violence. The PDHPE curriculum plays an important role in enhancing resilience and connectedness Young people are a diverse group and their ability to adopt a healthy, active lifestyle is influenced by the social and cultural contexts within which they live. PDHPE has an important primary prevention and early intervention role in assisting all young people to manage these influences and in protecting, promoting and restoring their health

National/ State	Document	Guidance regarding substance use prevention
		In Stage 4, students learn about: • drug use – the classification of drugs, e.g. stimulants, depressants, hallucinogens – reasons people use and do not use drugs – influences on drug use – short-term and long-term effects of drugs on health and wellbeing – prevalence and patterns of adolescent drug use – legal and economic consequences – effects of other people's drug use. • exploring risk – positive and negative risk – settings or circumstances in which risk taking occurs – factors influencing risk-taking – outcomes of risk behaviour. • strategies to minimise harm – acquiring knowledge – safe attitudes, e.g. concern for others, impunity, responsibility – developing personal skills, e.g. conflict resolution, assertive behaviour, problem solving, refusal skills – safe and supportive environments, e.g. school, community, family and peer support networks – recognising, assessing and responding to risk situations. In Stage 5, students learn about: • drug use – effects on relationships – effects on community – marketing strategies and the media – influences on alcohol use and binge drinking – influences on cannabis use – polydrug use – other illicit drugs, e.g. opiates, hallucinogens, psychostimulants – consequences of illicit and unsanctioned drug use. • influences on health decision-making and risk behaviours – individual factors, e.g. values and attitudes – socio cultural factors, e.g. family, peers, gender, culture – political factors, e.g. laws and regulations – economic factors, e.g. personal and community – environmental factors, e.g. pollution, weather, built environment.

people to make responsible, healthy and safe choices".[63] The NSW PDHPE syllabus describes a focus on enhancing resilience and connectedness to prevent substance use, and includes content addressing substance use knowledge, health effects, prevalence, consequences and harm minimisation strategies.[63] Although such content aligns in part with a social influence prevention approach, its limited focus on content aligned to a social competence approach (e.g. content specifically addressing risk factors such as poor social skills, or protective factors such as self-esteem) is in contrast with current evidence from Cochrane systematic reviews that interventions combining a social influence and a social competence approach, or a social competence approach alone, are effective in reducing tobacco and illicit substance use.[36;37] The focus of the NSW PDHPE syllabus on enhancing resilience to prevent substance use is also contrary to the conclusions of this thesis.

No public data are available regarding the drug education interventions that are currently being implemented by Australian or New South Wales secondary schools, and whether or not they are evidence-based. Internationally, however it has been reported that a large proportion of schools do not implement evidence-based drug education programs and frequently develop their own teaching and learning resources. For example, a descriptive summary of substance use prevention programs implemented in United States schools between 2001 and 2007 found most programs adopted by schools were locally developed (47%), while others were commercial programs (35%) or state programs (9%).[65] Whilst the names of commercially developed or state programs were reported, the extent to which programs were evidence-based was not.[65] This is consistent with other studies that have reported that the majority of schools do not implement evidence-based programs.[38;66;67]

In NSW, schools can meet their teaching and learning obligations, such as the mandated delivery of drug education which includes a focus on enhancing resilience, by engaging external providers to deliver curriculum content.[68] Guidance regarding this is provided to schools within the Engaging External Providers for Curriculum Implementation Guidelines, which include the need to ensure external programs align with curriculum requirements.[69] Selection criteria for school principals to consider when determining whether to engage external providers include educational understanding (e.g. will it assist in capacity building of teachers), quality assurance (e.g. do providers have relevant qualifications), and policy and procedures (e.g. alignment with child protection policies and procedures).[69] There is no explicit provision in the guidelines that external programs are evidence-based. The NSW Government does however have a broad expectation that all teaching and learning

programs implemented within schools are evidence-based, including those that are resilience-focused to align with the mandated curriculum.[70]

However, a number of barriers exist for teachers in the selection and implementation of evidence-based programs. For example, a study by Powers et al that examined 51 school-based intervention programs found that high start-up costs, challenging training and staffing requirements, and a lack of easily accessible information regarding program selection and implementation were significant barriers to their implementation.[71] Within Australia it has been noted that teachers have not historically been provided with training regarding evidence-based practice generally,[72] limiting their ability to discern and select programs that are most likely to have a beneficial effect.

A need therefore exists for schools to be supported in the identification and implementation of evidence-based programs. One such approach that has been implemented to address these barriers in the United Kingdom as part of initiatives to increase evidence-based educational practice generally, includes the conduct of systematic reviews to synthesis available evidence and increase the accessibility of this information to schools.[73] Similarly, in the United States, the US Education Department has disseminated information regarding those school drug education programs that have been found to be most effective to assist schools and policy makers in making informed decisions regarding program selection.[74]

In Australia, a number of strategies have been initiated to support schools in selecting evidence-based substance use prevention programs in schools. For example, reviews of the evidence for substance use prevention programs readily available to Australian schools have been undertaken by research institutions.[75] More recently, the Australian Government Department of Health have funded the online Positive Choices drug education portal (positivechoices.org.au/resources/recommended-programs/). The portal was developed in collaboration with researchers from numerous institutions (including the National Drug Research Institute (NDRI), National Drug & Alcohol Research Centre (NDARC) and the Centre of Research Excellence in Mental Health and Substance Use (CREMS)) and provides schools with the details of evidence-based drug education resources and programs that can be implemented within classrooms. Recommended programs can be filtered by an evidence rating, ("supported by multiple published studies", "supported by one published study", "expert review", "under evaluation", "not yet evaluated"). Additionally, the portal provides schools with information regarding how each resource or program aligns with the Australian National Curriculum, however no information is provided regarding links with

the NSW drug education curriculum, including the aspects of the curriculum focused on resilience enhancement. Whilst such an initiative represents a significant advance in the provision of support to schools, the following remains unclear: what the quality or level of evidence criteria is for the evidence ratings; what is the extent to which schools in each jurisdiction are held accountable for ensuring the programs they implement are evidence-based; the extent to which the portal is actively promoted to schools; the number of schools that use the portal; and whether the implementation of evidence-based substance use prevention programs have increased as a result. Each of these questions need to be answered if the portal and the evidence-based interventions described by it are to contribute to the intended benefits of government policies and school investment in substance use prevention initiatives.

CONCLUSIONS

The findings of this thesis are equivocal with respect to whether universal school-based interventions that address resilience protective factors are effective in reducing adolescent tobacco, alcohol and illicit substance use. Findings from the systematic review suggested evidence of effect for interventions that address resilience protective factors, amongst other factors, in reducing illicit substance use, but not tobacco or alcohol. Similarly, there was no evidence of effect of the intervention that focused solely on resilience protective factors. As shown in the study of associations between resilience protective factors and adolescent substance use, only some resilience protective factors may be important for preventing adolescent substance use. Such findings broadly suggest that a universal school-based resilience intervention alone is unlikely to reduce the prevalence of adolescent substance use.

Further research is required to investigate the potential for interventions that combine resilience protective factors with substance use risk and protective factors, and for interventions that combine a universal intervention with strategies delivered to adolescents that are a greater risk or have already initiated substance use. Such evidence is essential to inform school policy and realise the potential of school-based interventions in reducing adolescent substance use. Ongoing synthesis and dissemination of current evidence regarding effective school-based substance use prevention is essential to inform curriculum development and facilitate the selection and delivery of evidence-based substance use prevention programs.

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APPENDICES

APPENDIX 2.1: Medline search strategy

Database: Ovid MEDLINE(R) 1946 to Present with Daily Update

Search Strategy:

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exp smoking/ or smoking.mp. or smoking cessation.mp. or exp smoking cessation/ or smok*.mp. or noticine.mp. or tobacco.mp. or exp tobacco/ [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

2 (prevent* or stop* or quit* or abstin* or abstain* or reduc* or "tobacco use disorder" or ex-smoker or “freedom from smoking” or anti-smok*).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] (2949486)

3 1 and 2 (75169)

4. exp ALCOHOLS/ad, ae

5. exp Alcohol Drinking/

6. exp Alcohol Abuse/

7. exp Alcohol, Ethyl/ae

8. exp Alcohol Abuse/mo, pc, rh, th

9. alcohol$.ti,ab.

10. drink$.ti,ab.

11. drunk$.ti,ab.

12. intoxicat$.ti,ab.

13 or/4-12

14 cannabis.mp. or exp Cannabis/ (11714)

15 exp Marijuana Smoking/ (2487)

16 marijuana.mp. (11285)

17 street drugs.mp. or exp Street Drugs/ (9005)

18 exp substance-related disorders

19 addict$.ab,ti

20 (abus$ or use$).ab,ti

21 morphine.ab,ti

22 exp *cannabis/ or “hashish”.mp.

23 heroin.ab,ti

24 “heroin dependence”.mp

25 exp *n-methyl-3-4-methylenedioxyamphetamine/ or “ecstasy”.mp OR MDMA“.mp

26 exp *hallucinogens/ or ”hallucinogens“.mp.

27 exp *cocaine/or exp *crack cocaine/ or ”cocaine“.mp

28 exp *lysergic acid diethylamide/ or ”lsd“.mp.

29 or/14-28

30 risk-taking.mp. or exp Risk-Taking/ (23020)

31 risk behaviours.mp. (1383)

32 health risks.mp. (8865)

33 exp Health Behavior/ or health behaviours.mp. (94401)

34 or/30-33 (123513)

35 3 or 13 or 29 or 34 (4678307)

36 school.mp. or exp Schools/ (199868)

37 school health services.mp. or exp School Health Services/ (18410)

38 (school* adj3 (intervention* or program* or course* or polic* or practice* or curricul* or environment*)).mp. (15226)

39 or/36-38 (201010)

40 exp Child/ or child.mp. (1630031)

41 exp Adolescent/ or adolescent.mp. (1581151)

42 (adolescen* or student* or class*).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] (2503330)

43 (teenage* or youth).ti,ab. (43859)

44 (early adj2 adult*).ti,ab. (5053)

45 (young adj2 adult*).ti,ab. (56450)

46 exp students/ (77794)

47 (young people or youth).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] (47625)

48 or/40-47

49 exp Resilience, Psychological/

50 (resilienc* or resilient).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

51 (factor* adj (protect* or promoti* or external or internal or environment*)).mp.

52 (environmental asset* or external resource* or internal asset* or individual asset* or developmental asset*).mp.

53 (Strength* adj (based or focused)).mp.

54 emotional intelligence.mp. or exp Emotional Intelligence/ or mental health.mp. or exp Mental Health/

55 (mental wellbeing or psychological wellbeing or psychosocial or positive psychology).mp.

56 communication/ or cooperative behavior/ or self efficacy/ or empathy/ or problem solving/ or self concept/ or goals/ or "aspirations (psychology)"/ or social environment/ or self esteem/ or self confidence.mp. or self awareness.mp. or positive affect.mp.

57(community activit* or community service* or prosocial organization* or decision-making skill* or extracurricular activit* or goal direction* or meaningful participation or pro-social bonding or communication skill* or 'sense of purpose' or cognitive abilit* or executive function*).mp.

58 Adolescent Development/ or youth development.mp. or Child Development/ or positive development*.mp. or positive youth development.mp.

59 (school* adj3 (engage* or connect* or climate or environment).mp.

60 (communit* adj3 support*).mp.

61 social participation/ or family/ or parent-child relations/ or family relations/ or peer group/ or social support/ or friends/ or social environment.mp. or exp Social Environment/ or social responsiveness.mp. or social sensitivity.mp.

62 (active coping or coping skill* or adaptability or autonomy or empower*).mp.

63 pro-social peers.mp. (2)

64 (positive adj3 (peer* or friend*)).mp.

65 (life skill* or social skill*).mp.

66 interpersonal relations.mp. or exp Interpersonal Relations/

67 (emotional wellbeing or emotional competence or emotional learning or emotional regulation or emotional attachment or behavioural competence or behavioural competence or behavioural regulation or cognitive competence or cognitive functioning or moral competence or social competence or social wellbeing or social learning).mp.

68 achievement adj (academic or motivation).mp.

69 educational adj (aspiration* or achievement).mp.

70 (adult high expectation* or high adult expectation*or authoritative parent* or bonding or caring relationship* or family cohesi* or family connect* or adult mentor*).mp.

71 (parent* adj2 (authorit* or involve* or monitor* or support*).mp.

72 (hope* or 'internal locus of control' or optimism or 'perceptions of control' or responsiveness or self control or self regulation or 'sense of humour').mp.

73 (personal* adj (affect* or behavioural adjustment or behavioural adjustment or identity or interaction* or orientation toward school)).mp.

74 (religio* or spiritual* or faith).mp.
75 or/49-74
76 randomized controlled trial.pt. (367158)
77 controlled clinical trial.pt. (87691)
78 (randomised or randomized).ab. (318587)
79 clinical trials as topic.sh. (169978)
80 randomly.ab. (187790)
81 trial.ti. (115019)
82 doubleblind.ab. (151)
83 singleblind.ab. (9)
84 experiment*.mp. (1466450)
85 (pretest or pre test).mp. (9609)
86 (posttest or post test).mp. (9762)
87 (pre post or prepost).mp. (3758)
88 before after.mp. (2409)
89 (quasi-randomised or quasi-randomized or quazi-randomised or quazi-randomized).mp. (2369)
90 stepped wedge.mp. (67)
91 preference trial.mp. (41)
92 comprehensive cohort.mp. (49)
93 natural experiment.mp. (674)
94 (quasi experiment* or quazi experiment*).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] (4811)
95 (randomised encouragement trial or randomized encouragement trial).mp. (3)
96 (staggered enrolment trial or staggered enrollment trial).mp. (0)
97 (nonrandomised or non randomised or nonrandomized or non randomized).mp. (13227)
98 interrupted time series.mp. (840)
99 (time series and trial).mp. (737)
100 multiple baseline.mp. (1262)
101 regression discontinuity.mp. (39)
102 or/76-101 (2256891)
103 35 and 39 and 48 and 75 and 102 (1936)

APPENDIX 2.2: Standardised screening tool

Date: …….. **Reviewer:** ……

Trial ID:	
First Author:	
Year of Publication:	
Country of Publication:	

Study eligibility & inclusion criteria

	INCLUDE	**EXCLUDE**	
	Yes	**No**	**Unclear**
Participants - Children aged 5 to 18 years			
Outcome - tobacco use (including proportion ever smoked, frequency of smoking, number of cigarettes smoked, tobacco use in last week, current smoking status or established tobacco use) - alcohol consumption (including proportion ever consumed an alcoholic drink, alcohol use in last week, frequency of alcohol consumption, binge drinking or established alcohol use) - illicit drug use (including ever use or frequency of use of any illicit drug or a specific drug for example cannabis, amphetamines, or cocaine)			
Comparator - no intervention, usual practice, attention only or an alternate intervention			
Study design - Randomised controlled trial, cluster randomised controlled trial; - Non-randomised trials (including staggered enrolment trials, stepped wedged trials; quasi-randomised trials where group allocation is not purely random; quasi experimental trials including, non-randomised pre-post, time series/interrupted time-series trials including multiple baseline trials with independent control groups, preference trials and regression discontinuity trials; natural experiment studies)			
Intervention - universal intervention targeting at least one internal and one external resilience factor - included internal resilience factors: cooperation and communication, self-efficacy, self-esteem, empathy, problem solving, decision-making skills, autonomy, self-awareness, goals and aspirations, social and emotional skills or competence, and self-control or self-regulation - included external resilience factors: meaningful participation, high adult expectations, caring relationships and support within home, school and community environments; peer caring relationships and pro-social peers			

□ Include □ Exclude □ Obtain full text of article

APPENDIX 3.1: Final screening tool and included resilience protective factors

Study eligibility & inclusion criteria

	INCLUDE	**EXCLUDE**	
	Yes	**No**	**Unclear**
1. Participants ***- Children aged 5 to 18 years***			
2. Comparator / study design ***- a) Comparator:*** no intervention, usual practice, attention only or alternate intervention AND ***- b) Randomised controlled trial, cluster randomised controlled trial;*** OR ***- c) Non-randomised trials*** (including staggered enrolment trials, stepped wedged trials; quasi-randomised trials where group allocation is not purely random; quasi experimental trials including, non-randomised pre-post, time series/interrupted time-series trials including multiple baseline trials with independent control groups, preference trials and regression discontinuity trials; natural experiment studies)			
3. Outcome ***- a) tobacco use*** (including proportion ever smoked, frequency of smoking, number of cigarettes smoked, tobacco use in last week, current smoking status or established tobacco use) OR ***-b) alcohol consumption*** (including proportion ever consumed an alcoholic drink, alcohol use in last week, frequency of alcohol consumption, binge drinking or established alcohol use) OR ***- c) illicit drug use*** (including ever use or frequency of use of any illicit drug or a specific drug for example cannabis, amphetamines, or cocaine)			
4. Intervention ***- a) universal intervention***: delivered to a whole school population - NOT indicated or selective interventions (i.e. not high risk, although sometimes studies compare intv effect for high risk v universal)			

- include studies where school-based is combined with other intv approach i.e. family-based (do NOT include studies which are family or community only interventions) AND ***- b) at least one internal resilience factor*** AND ***- c) at least one external resilience factor*** (see following table of included internal and external resilience factors)			

Included resilience factors	Similar terms
Internal resilience factors	
Academic achievement	Cognitive ability, executive function, cognitive competence, cognitive functioning, educational achievment
Autonomy	Empowerment
Cooperation and communication	Cooperative behaviour, communication skill
Coping	Active coping, coping skills, adaptability
Empathy	
Goals and aspirations	Goal direction, sense of purpose, academic motivation, educational aspiration, hope, optimism
Moral competence	
Problem Solving/Decision-making	
Religosity	Spirituality, faith
Self control	
Self efficacy	Self concept, internal locus of control, perceptions of control, personal identity
Self esteem	Self confidence, positive affect, personal affect
Self regulation	Behavioural competence, behavioural regulation, responsiveness, behavioural adjustment
Self-awareness	
Social and emotional competence	Interpersonal relations, personal interaction, emotional wellbeing, emotional learning, emotional attachment
Social and emotional skills	Life skills, social skills, social wellbeing, social learning
External resilience factors	
Community adult high expectations	
Community caring relationships	Community support
Community meaningful participation	Community activities, community service, prosocial organisation, extracurricular activities
Community support	
Home adult high expectations	Authoritative parent, parental monitoring
Home caring relationships	Family, parent-child relations, family relations, bonding, family cohesion, family connection, adult mentor
Home meaningful participation	Meaningful participation
Home support	Parent involvement, parental support
Peer caring relationships	Social environment, social participation, peer group, social support, friends, social responsiveness, social sensitivity
Pro-social peers	Pro-social bonding, positive peer, positive friend
School adult high expectations	
School caring relationships	
School meaningful participation	School engagement, school connection, school environment, orientation toward school
School support	

Resilience factors NOT included: *Any factor that is not ameniable to school-based intervention such as demographic, community or personality characteristics.* For example: Socio-economic status, sense of humour, attractiveness, psychopathology, easy temperament, mental illness, personality traits, talents, safe neighbourhood, affordable housing

APPENDIX 3.2: Updated Medline search strategy

1 exp smoking/ or smoking.mp. or smoking cessation.mp. or exp smoking cessation/ or smok*.mp. or noticine.mp. or tobacco.mp. or exp tobacco/ [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

2 (prevent* or stop* or quit* or abstin* or abstain* or reduc* or "tobacco use disorder" or ex-smoker or “freedom from smoking” or anti-smok*).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

3 1 and 2

4. exp ALCOHOLS/ad, ae

5. exp Alcohol Drinking/

6. exp Alcohol Abuse/

7. exp Alcohol, Ethyl/ae

8. exp Alcohol Abuse/mo, pc, rh, th

9. alcohol$.ti,ab.

10. drink$.ti,ab.

11. drunk$.ti,ab.

12. intoxicat$.ti,ab.

13 or/4-12

14 cannabis.mp. or exp Cannabis/

15 exp Marijuana Smoking/

16 marijuana.mp.

17 street drugs.mp. or exp Street Drugs/

18 exp substance-related disorders

19 addict$.ab,ti

20 (abus$ or use$).ab,ti

21 morphine.ab,ti

22 exp *cannabis/ or “hashish”.mp.

23 heroin.ab,ti

24 “heroin dependence”.mp

25 exp *n-methyl-3-4-methylenedioxyamphetamine/ or “ecstasy”.mp OR MDMA“.mp

26 exp *hallucinogens/ or ”hallucinogens“.mp.

27 exp *cocaine/or exp *crack cocaine/ or ”cocaine“.mp

28 exp *lysergic acid diethylamide/ or ”lsd“.mp.

29 or/14-28

30 risk-taking.mp. or exp Risk-Taking/ or risk behaviours.mp. or health risks.mp.

31 exp Health Behavior/ or health behaviours.mp.

32 or/30-31

33 3 or 13 or 29 or 33

34 school.mp. or exp Schools/

35 school health services.mp. or exp School Health Services/

36 (school* adj3 (intervention* or program* or course* or polic* or practice* or curricul* or environment*)).mp.

37 or/34-36

38 exp Child/ or child.mp.

39 exp Adolescent/ or adolescent.mp.

40 (adolescen* or student* or class*).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

41 (teenage* or youth).ti,ab.

42 (early adj2 adult*).ti,ab.

43 (young adj2 adult*).ti,ab.

44 exp students/

45 (young people or youth).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

46 or/38-45

47 exp Resilience, Psychological/

48 (resilienc* or resilient).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

49 (factor* adj (protect* or promoti* or environmental or individual or environment*)).mp.

50 (environmental asset* or environmental resource* or individual asset* or individual asset* or developmental asset*).mp.

51 (Strength* adj (based or focused)).mp.

52 emotional intelligence.mp. or exp Emotional Intelligence/ or mental health.mp. or exp Mental Health/

53 (mental wellbeing or psychological wellbeing or psychosocial or positive psychology).mp.

54 communication/ or cooperative behavior/ or self efficacy/ or empathy/ or problem solving/ or self concept/ or goals/ or "aspirations (psychology)"/ or social environment/ or self esteem/ or self confidence.mp. or self awareness.mp. or positive affect.mp.

55 (community activit* or community service* or prosocial organization* or decision-making skill* or extracurricular activit* or goal direction* or meaningful participation or pro-social bonding or communication skill* or 'sense of purpose' or cognitive abilit* or executive function*).mp.

56 Adolescent Development/ or youth development.mp. or Child Development/ or positive development*.mp. or positive youth development.mp.

57 (school* adj3 (engage* or connect* or climate).mp.

58 (communit* adj3 support*).mp.

59 social participation/ or family/ or parent-child relations/ or family relations/ or peer group/ or social support/ or friends/ or social environment.mp. or exp Social Environment/ or social responsiveness.mp. or social sensitivity.mp.

60 (active coping or coping skill* or adaptability or autonomy or empower* or pro-social peers).mp.

61 (positive adj3 (peer* or friend*)).mp.

62 (life skill* or social skill*).mp.

63 interpersonal relations.mp. or exp Interpersonal Relations/

64 (emotional wellbeing or emotional competence or emotional learning or emotional regulation or emotional attachment or behavioural competence or behavioural competence or behavioural regulation or cognitive competence or cognitive functioning or moral competence or social competence or social wellbeing or social learning).mp.

65 achievement adj (academic or motivation).mp.

66 educational adj (aspiration* or achievement).mp.

67 (adult high expectation* or high adult expectation*or authoritative parent* or bonding or caring relationship* or family cohesi* or family connect* or adult mentor*).mp.

68 (parent* adj2 (authorit* or involve* or monitor* or support*).mp.

69 (hope* or 'individual locus of control' or optimism or 'perceptions of control' or responsiveness or self control or self regulation).mp.

70 (personal* adj (affect* or behavioural adjustment or behavioural adjustment or identity or interaction* or orientation toward school)).mp.

71 (religio* or spiritual* or faith).mp.

72 or/47-71

73 randomized controlled trial.pt.

74 controlled clinical trial.pt.

75 (randomised or randomized).ab.

76 clinical trials as topic.sh.

77 randomly.ab.

78 trial.ti.

79 doubleblind.ab.

80 singleblind.ab.

81 experiment*.mp.

82 (pretest or pre test).mp.

83 (posttest or post test).mp.

84 (pre post or prepost).mp.

85 before after.mp.

86 (quasi-randomised or quasi-randomized or quazi-randomised or quazi-randomized).mp.

87 stepped wedge.mp.

88 preference trial.mp.

89 comprehensive cohort.mp.

90 natural experiment.mp.

91 (quasi experiment* or quazi experiment*).mp. [m*p*=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]

92 (randomised encouragement trial or randomized encouragement trial).mp.

93 (staggered enrolment trial or staggered enrollment trial).mp.

94 (nonrandomised or non randomised or nonrandomized or non randomized).mp.

95 interrupted time series.mp.

96 (time series and trial).mp.

97 multiple baseline.mp.

98 regression discontinuity.mp.

99 or/73-98

100 33 and 37 and 46 and 72 and 99

APPENDIX 3.3: Characteristics of excluded studies

Study	Reason for exclusion
Abbey 2000 (44)	Outcome: No substance use outcome
Allahverdipour 2009 (45)	Study design/comparator: Quasi-experimental design
Allen 2013 (46)	Participants: No participants (description of development of an assessment tool)
Allen 2012 (47)	Study design/comparator: Focus group study design
Allen 2010 (48)	Participants: Participants were parents
Allen (no year) (49)	Study design/comparator: Non-randomised design
Almanza 2004 (50)	Study design/comparator: Quasi-experimental study design
Alonso Sanz 1998 (51)	Study design/comparator: Non-randomised design
Altobelli 2005 (52)	Full text not available
Amundsen 2010 (53)	Study design/comparator: Non-randomised design
Anderson 2004 (54)	Participants: No participants
Andrews 2014 (55)	Outcome: No substance use outcome
Anonymous 2010 (56)	Participants: No participants (description of survey tool)
Anthony 2009 (57)	Outcome: No substance use outcome
Ariza 2008 (58)	Intervention: Didn’t address individual resilience factors
Arora 2012 (59)	Intervention: Selective intervention – sample were never users only
Aseltine 2000 (60)	No full text available
Audrey 2008 (61)	Participants: Participants were staff
Audrey 2006 (62)	Intervention: Didn't address environmental resilience factors
Audrey 2004 (63)	Intervention: Didn’t address individual resilience factors
Ausems 2004 (64)	Intervention: Didn’t address individual resilience factors
Austin, A. 2004 (65)	Participants: Average age was 41 years

Study	Reason for exclusion
Austin, G. 2004 (66)	Study design/comparator: Cross sectional study design
Aveyard 2003 (67)	Intervention: Didn't address individual resilience factors
Aveyard 1999 (68)	Intervention: Didn't address individual resilience factors
Avnon 2011 (69)	Study design/comparator: No comparison group
Babar 2010 (70)	Intervention: No part of intervention was implemented in a school
Bailey 2009 (71)	Participants: No participants, commentary only
Baker 2004 (72)	Outcome: No substance use measure, only knowledge.
Balaji 2011 (73)	Participants: Mean age was 19 years
Bannink 2014 (74)	Intervention: Didn't address individual resilience factors
Bannink 2014 (75)	Intervention: Didn't address individual resilience factors
Bannink 2012 (76)	Intervention: Didn't address individual resilience factors
Barnett 2012 (77)	Intervention: Intervention not universal
Bate 2009 (78)	Intervention: Didn't address environmental resilience factors
Battistich 2005 (79)	Participants: No participants, review only
Battistich 1996 (80)	Study design/comparator: Non-randomised design
Bauermeister 2013 (81)	Study design/comparator: No comparison group
Bauman 2002 (82)	Participants: Parents not students
Bavarian 2014 (83)	Outcome: No individual measures of substance use, only composite score
Beets 2009 (84)	Outcome: Not assessed during adolescence (i.e. only Grade 5)
Bejarano 2005 (85)	Study design/comparator: Quasi-experimental study design
Bell 2005 (86)	Outcome: No substance use outcome
Benner 2008 (87)	No full text available
Bergmark 2009 (88)	Participants: No participants, book review

Study	Reason for exclusion
Bloor 1999 (89)	Intervention: Didn't address individual resilience factors
Bluthenthal 2015 (90)	Participants: No participants, commentary only
Bobrowski 2014 (91)	Full text not available
Bodin 2012 (92)	Participants: No participants, commentary only
Bodin 2011 (93)	Intervention: Not school-based
Bond 2001 (94)	Outcome: No outcome data (methodology paper)
Bonell 2010 (95)	Outcome: No substance use outcome
Bonell 2010 (96)	Outcome: No substance use outcome
Bonny 2000 (97)	Study design/comparator: No comparison group
Borzekowski 2011 (98)	Participants: Mean age of participants was 20.2 years
Bosi 2013 (99)	Intervention: Didn't address individual resilience factors
Botvin 2007 (100)	Participants: No participants, review and commentary only
Botvin 2004 (101)	Participants: No participants, review.
Botvin 2003 (102)	Intervention: Didn't address environmental resilience factors
Botvin 2001 (103)	Intervention: Didn't address environmental resilience factors
Botvin 2001 (104)	Intervention: Didn't address environmental resilience factors
Botvin 2000 (105)	Intervention: Didn't address environmental resilience factors
Botvin 1999 (106)	Intervention: Selective intervention (females only)
Botvin 1997 (107)	Intervention: Didn't address environmental resilience factors
Botvin 1995 (108)	Intervention: Didn't address environmental resilience factors
Botvin 1994 (109)	Intervention: Didn't address environmental resilience factors
Braverman 1999 (110)	Participants: No participants, descriptive paper only
Breland 2014 (111)	Study design/comparator: No comparison group

Study	Reason for exclusion
Bremberg 1994 (112)	Intervention: Targeted intervention (students selected by school counsellors)
Broning 2014 (113)	Intervention: No part of intervention was implemented in a school
Brooks 2006 (114)	Participants: No participants, commentary only
Brown 2002 (115)	Intervention: Didn't address individual resilience factors
Brown 2001 (116)	Participants: No participants, review and commentary only
Bruckner 2014 (117)	Participants: No participants, policy analysis only
Bryan 2005 (118)	Participants: No participants, commentary only
Buhler 2008 (119)	Intervention: Didn't address environmental resilience factors
Buhler 2007 (120)	Study design/comparator: Quasi-experimental study design
Butler 2013 (121)	Participants: No participants, description of policy implementation only
Byrne 2005 (122)	Intervention: Didn't address environmental resilience factors
Calafat 1995 (123)	Intervention: Didn't address environmental resilience factors
Caldwell 2012 (124)	Study design/comparator: non-randomised study design
Cameron 1999 (125)	Intervention: Didn't address resilience factors
Campbell 2008 (126)	Intervention: Didn't address individual resilience factors
Caria 2011 (127)	Intervention: Didn't address environmental resilience factors
Caria 2011 (128)	Intervention: Didn't address environmental resilience factors
Carli 2013 (129)	Intervention: Didn't address individual resilience factors
Carver 2005 (130)	Study design/comparator: Non-randomised study design
Catalano 2002 (131)	Participants: No participants, review only
Catalano 2004 (132)	Intervention: Didn't address environmental resilience factors
Catford 2001 (133)	Participants: No participants, commentary only
Cato 2006 (134)	Participants: No participants, commentary only

Study	Reason for exclusion
Cavazos-Rehg 2012 (135)	Study design/comparator: Cross sectional design
Chaikoolvatana 2013 (136)	Intervention: Didn't address individual resilience factors
Chamberlain 2013 (137)	Participants: Participants not students
Chang 2015 (138)	Study design/comparator: Non-randomised design
Charlier 2009 (139)	Participants: Not students, intervention mainly parent-focussed
Chen 2014 (140)	Intervention: Didn't address individual resilience factors
Chen 2014 (141)	Intervention: Didn't address individual resilience factors
Cherry 1998 (142)	Intervention: Selective intervention
Chitthathairatt 2004 (143)	Full text not available
Christiansen 1997 (144)	Participants: No participants, descriptive paper only
Clark 2011 (145)	Intervention: Not universal
Clark 2010 (146)	Outcome: No substance use outcome
Clayton 1996 (147)	Intervention: Didn't address environmental resilience factors
Collier 2014 (148)	Study design/comparator: No comparison group
Colnes, 2001 (149)	Intervention: Selective intervention for at-risk students
Conner 2013 (150)	Participants: No participants, protocol only
Conrod 2012 (151)	Intervention: Selective intervention
Conrod 2011 (152)	Intervention: Selective intervention
Conrod 2006 (153)	Intervention: Selective intervention (participants selected based on personality risk factors)
Corbett 2001 (154)	Participants: No participants, review only
Côté 2006 (155)	Intervention: Didn't address environmental resilience factors
Cougar Hall 2012 (156)	Participants: No participants, description of intervention only
Crone 2003 (157)	Intervention: Didn't address environmental resilience factors

Study	Reason for exclusion
Crone 2011 (158)	Intervention: Didn't address individual resilience factors
Crowley 2012 (159)	Participants: No participants, economic evaluation of a program
Cuijpers 2002 (160)	Study design/comparator: Non-randomised study design
Cunningham 2001 (161)	Study design/comparator: Non-randomised study design
Dalis, 2001(162)	Study design/comparator: Non-randomised study design
D'Amico 2005 (163)	Participants: No participants, summary of programs only
D'Amico 2002 (164)	Intervention: Didn't address individual resilience factors
De Vries 2006 (165)	Intervention: Didn't address environmental resilience factors
De Vries 2003 (166)	Intervention: Didn't address individual resilience factors
De Vries 2003 (167)	Intervention: Didn't address individual resilience factors
De Vries 1994 (168)	Intervention: Didn't address environmental resilience factors
Dedobbeleer, 2001 (169)	Study design/comparator: Non-randomised study design
Dent 2001 (170)	Intervention: Didn't address environmental resilience factors
Dent 1995 (171)	Intervention: Didn't address environmental resilience factors
DeWit 2000 (172)	Intervention: Not a universal intervention.
DiClemente 1996 (173)	Participants: No participants, descriptive paper only
Dietrich 2015 (174)	Intervention: Didn't address individual resilience factors
Dijkstra 1999 (175)	Intervention: Didn't address environmental resilience factors
Dishion 2000 (176)	Participants: No participants, descriptive paper only
Dishion 2002 (177)	Outcome: No individual measures of substance use, only composite score
Donaldson 1994 (178)	Intervention: Didn't address individual resilience factors
Donnelly 2001 (179)	Study design/comparator: Non-randomised study design
Dubas 1998 (180)	Participants: Participants were 4 years of age

Study	Reason for exclusion
Dukes 1997 (181)	Study design/comparator: Non-randomised study design
Dukes 1996 (182)	Study design/comparator: Non-randomised study design
Dukes 1995 (183)	Study design/comparator: Non-randomised study design
Dumas 1999 (184)	Intervention: Didn't address individual resilience factors
Dumas 2001 (185)	Outcome: Implementation fidelity paper, does not report relevant outcomes
Dunn 2007 (186)	Participants: No participants, book chapter only
Durlak 2011 (187)	Participants: No participants, review only
Eggert 2000 (188)	Participants: No participants, descriptive paper only
Eggert 1994 (189)	Participants: No participants, descriptive paper only
Elder 2002 (190)	Intervention: Selective intervention
Elder 1996 (191)	Intervention: Didn't address individual resilience factors
Elder 1994 (192)	Participants: Participants were teachers
Elder 1994 (193)	Intervention: Selective intervention: high-risk subsample only
Ellickson 2003 (194)	Intervention: Didn't address individual resilience factors
Emam Hadi 2008 (195)	Study design/comparator: Non-randomised study design
Emam Hadi 2014 (196)	Full text not available
English 2014 (197)	Participants: No participants, commentary only
Ennett 1994 (198)	Participants: Meta-analysis
Epstein 2008 (199)	Intervention: Didn't address any resilience factors
Espada 2012 (200)	Intervention: Didn't address any environmental resilience factors
Espada Sanchez 2010 (201)	Outcome: No substance use outcome
Fagen 2009 (202)	Outcome: No substance use outcome reported
Faggiano 2007 (203)	Intervention: Didn't address environmental resilience factors

Study	Reason for exclusion
Feinberg 2010 (204)	Study design/comparator: No comparison group
Fergus 2005 (205)	Participants: No participants, descriptive review only
Ferrer-Wreder 2010 (206)	Study design/comparator: non-randomised study
Flay 2004 (207)	Outcome: Outcome: No individual measures of substance use, only composite score
Flay 1995 (208)	Intervention: Didn't address environmental resilience factors
Flewelling 2005 (209)	Study design/comparator: Non-randomised study design
Focarile 1994 (210)	Intervention: Didn't address resilience factors
Fosco 2013 (211)	Intervention: No intervention, association paper
Fournier 2010 (212)	Intervention: No intervention, association paper
Fraguela 2003 (213)	Study design/comparator: Non-randomised study design
Fraguela 2002 (214)	Study design/comparator: Non-randomised study design
Furr-Holden 2012 (215)	Intervention: Didn't address individual resilience factors
Furr-Holden 2004 (216)	Intervention: Didn't address individual resilience factors
Furr-Holden 2003 (217)	Full text not available
Gabrhelik 2012 (218)	Intervention: Association paper only
Ganguly 2013 (219)	Participants: No participants, commentary only
García 2005 (220)	Intervention: Didn't address individual resilience factors
Gardner 1994 (221)	Participants: No participants, report only
Gerrard 2006 (222)	Intervention: Not school-based
Ghahremani 2013 (223)	Study design/comparator: Non-randomised study design
Ghosh-Dastidar 2004 (224)	Outcome: No substance use outcome
Giannotta 2014 (225)	Intervention: did not address environmental resilience factors
Gindre 1995 (226)	Full text not available

Study	Reason for exclusion
Gingiss 1994 (227)	Participants: Participants were teachers
Glanz 2007 (228)	Intervention: Didn't address individual resilience factors
Gmel 2012 (229)	Study design/comparator: Non-randomised study design
Goenka 2010 (230)	Participants: No participants, process evaluation only
Gonzales 2012 (231)	Intervention: Selective intervention (only Hispanic students were selected)
Gorini 2014 (232)	Intervention: Didn't address individual resilience factors
Gorini 2014 (233)	Intervention: Didn't address environmental resilience factors
Gorman 2003 (234)	Participants: No participants, review and commentary only
Gorman 2002 (235)	Participants: No participants, commentary only
Gorukanti 2014 (236)	Study design/comparator: Focus group study design
Grana 2010 (237)	Intervention: No intervention, association paper
Greenberg 2006 (238)	Participants: No participants, descriptive review only
Greenberg 2003 (239)	Participants: No participants, review of interventions only
Griffin 2005 (240)	Design: Descriptive paper regarding intervention development
Griffin 2004 (241)	Intervention: Didn't address environmental resilience factors
Griffin 2003 (242)	Intervention: not universal, results only for high-risk students
Conduct Problems Prevention Research Group 2000 (243)	Outcome: No substance use outcome
Gubanich 2011 (244)	Full text not available (Conference abstract only)
Guilamo-Ramos 2005 (245)	Participants: No participants, review only
Guo 2015 (246)	Intervention: Didn't address environmental resilience factors
Guo 2010 (247)	Intervention: Didn't address environmental resilience factors
Guyll 2011 (248)	Intervention: No intervention, economic analysis only
Guyll 2004 (249)	Intervention: Not delivered during school hours

Study	Reason for exclusion
Hahn 2007 (250)	Study design/comparator: Non-randomised study design
Haller 2011 (251)	Participants: Participants were family doctors
Hallfors 2006 (252)	Intervention: not universal, students at high risk for drop out were selected
Hallgren 2013 (253)	Study design/comparator: Non-randomised study design
Hallgren 2011 (254)	Intervention: Didn't address resilience factors
Hamilton 2005 (255)	Intervention: Didn't address individual resilience factors
Hanewinkel 2004 (256)	Intervention: Didn't address environmental resilience factors
Hanson 2012 (257)	Study design/comparator: Non-randomised study design
Harel 2013 (258)	Participants: No participants, commentary only
Harris 2011 (259)	Study design/comparator: Non-randomised study design
Harris 1996 (260)	Study design/comparator: No comparison group
Harvey 2004 (261)	Participants: Participants were high-risk boys only
Hastings 2002 (262)	Study design/comparator: Non-randomised study design
Hatzis 2010 (263)	Intervention: Didn't address individual resilience factors
Hawe 2015 (264)	Study design/comparator: non-randomised study design
Hawkins 2008 (265)	Participants: Participants were 24 or 27 years of age
Hawkins 2005 (266)	Participants: Participants' mean age was 21 years
Hawkins 2001 (267)	Study design/comparator: non-randomised study design
Hawkins 1999 (268)	Study design/comparator: non-randomised study design
Heather 2014 (269)	Participants: No participants, commentary only
Hecht 2010 (270)	Participants: No participants, descriptive paper only
Hecht 2008 (271)	Intervention: Didn't address environmental resilience factors
Hecht 2003 (272)	Intervention: Didn't address environmental resilience factors

Study	Reason for exclusion
Henry 2002 (273)	Intervention: Active consent paper
Hiemstra 2009 (274)	Intervention: Selective intervention – only children who haven't started smoking
Hodder 2012 (275)	Protocol paper – no data available, study ongoing.
Hollederer 2002 (276)	Full text not available
Holleran 2002 (277)	Study design/comparator: No comparison group
Hollingworth 2013 (278)	Intervention: Didn't address individual resilience factors
Hruba 2012 (279)	Study design/comparator: Non-randomised study design
Hruba 1996 (280)	Intervention: Didn't address environmental resilience factors
Huang 2012 (281)	Outcome: No relevant substance use outcome reported (only intention to use drugs)
Hudson 2011 (282)	Participants: Participants were specialist medical trainees
Hurry 1997 (283)	Intervention: Didn't address environmental resilience factors
Ialongo 1999 (284)	Outcome: No substance use outcome
Isensee 2014 (285)	Intervention: Didn't address environmental resilience factors
Isensee 2014 (286)	Intervention: Didn't address environmental resilience factors
Isensee 2012 (287)	Intervention: Didn't address individual resilience factors
Ishaak 2014 (288)	Study design/comparator: No control group, pre-experimental pre post design
Ives 1994 (289)	Participants: No participants, descriptive review only
Jay 2010 (290)	Participants: No participants, study looking at use of crisis hotline
Jimenez 2009 (291)	Intervention: Selective intervention - only students with "more permissive attitudes"
Johnson 2010 (292)	Outcome: Paper on implementation quality
Johnson 2009 (293)	Intervention: Didn't address environmental resilience factors
Johnson 2009 (294)	Intervention: Didn't address individual resilience factors
Johnson 1998 (295)	Intervention: Not school-based

Study	Reason for exclusion
Johnson 1994 (296)	Outcome: Paper on process evaluation only
Jones 1995 (297)	Outcome: No substance use outcome
Josendal 2005 (298)	Intervention: Didn't address environmental resilience factors
Josendal 2002 (299)	Full text not available
Josendal 1998 (300)	Intervention: Didn't address individual resilience factors
Jowers 2007 (301)	Study design/comparator: No comparison group
Kaminski 2002 (302)	Outcome: No substance use outcomes
Kaner 2010 (303)	Participants: No participants, commentary only
Kaplan 1996 (304)	Participants: No participants, descriptive paper only
Karnell 2006 (305)	Intervention: Didn't address individual resilience factors
Katzman 2013 (306)	Participants: No participants, commentary only
Kaufman 2014 (307)	Participants: No participants, descriptive paper only
Kaufman 1994 (308)	Intervention: Didn't address environmental resilience factors
Kaushik 2012 (309)	Intervention: Didn't address resilience factors (Conference poster abstract)
Kell 2011 (310)	Participants: No participants, review only
Kellam 1998 (311)	Intervention: Didn't address environmental resilience factors
Kennedy 2009 (312)	Outcome: No substance use outcome
Kershner 2014 (313)	Participants: Participants are facilitators of sexual health intervention
Khademi Ashkza 2011 (314)	Outcome: No substance use outcome
Klatsky 2013 (315)	Participants: No participants, commentary only
Klepp 1995 (316)	Study design/comparator: non-randomised study design
Kobayakawa Sakuma 2010 (317)	Intervention: Not universal, selective intervention (males only)
Komro 2013 (318)	Study design/comparator: non-randomised study design (Conference abstract)

Study	Reason for exclusion
Komro 2007 (319)	Study design/comparator: Observational study using control group from C-RCT
Komro 2001 (320)	Outcome: Mediation analysis no outcome data reported
Komro 1999 (321)	Outcome: No substance use measure (only intentions)
Komro 1996 (322)	Study design/comparator: non-randomised study design
Komro 1994 (323)	Intervention: Didn't address individual resilience factors
Konerding 2008 (324)	Study design/comparator: non-randomised study design
Koning 2013 (325)	Intervention: Didn't address individual resilience factors
Koning 2012 (326)	Intervention: Didn't address individual resilience factors (Abstract only)
Koning 2011 (327)	Intervention: Not universal, selective (participants who already drank weekly were excluded)
Koning 2011 (328)	Intervention: Not universal; selective intervention (excluded participants who drank heavily at baseline)
Koning 2009 (329)	Intervention: Didn't address environmental resilience factors
Koumi 2001 (330)	Intervention: Didn't address individual resilience factors
Koumi 2001 (331)	Intervention: Didn't address environmental resilience factors
Kovach Clark 2010 (332)	Intervention: Didn't address individual resilience factors
Krainuwat 2005 (333)	Full text not available
Kraus 2013 (334)	Study design/comparator: Non-randomised study design
Kreeft 2009 (335)	Outcome: No outcome data reported, methodology paper
Kreipe 2011 (336)	Participants: No participants, editorial
Kroger 2000 (337)	Study design/comparator: Non-randomised study design
Kumpfer 2002 (338)	Outcome: No substance use outcome
La Torre 2010 (339)	Intervention: Didn't address individual resilience factors
Lam 2005 (340)	Intervention: Selective intervention
Lana 2014 (341)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Langlois 1998 (342)	Study design/comparator: Non-randomised study design
Lee 2013 (343)	Outcome: No substance use outcome
Lee 2007 (344)	Intervention: Didn't address individual resilience factors
Leiva 2014 (345)	Intervention: Didn't address resilience factors
Lennox 2008 (346)	Study design/comparator: Non-randomised study design
Leslie 2011 (347)	Study design/comparator: No comparison group
Li 2003 (348)	Intervention: Intervention not universal
Liao 2013 (349)	Study design/comparator: No comparison group
Lindström 2013 (350)	Participants: No participants, letter to the editor
Lochman 2002 (351)	Intervention: Students did not receive any intervention (only parents and teachers)
LoSciuto 2004 (352)	Outcome: No substance use outcome
Lotrean 2010 (353)	Intervention: Didn't address individual resilience factors
Lowe 2012 (354)	Intervention: Selective intervention (Students with alcohol abuse)
Luna-Adame 2013 (355)	Intervention: Didn't address environmental resilience factors
Luthar 2007 (356)	Participants: No participants, descriptive paper only
Luthar 2000 (357)	Participants: No participants, descriptive paper only
Lynagh 1997 (358)	Participants: No participants, review only
Lynam 1999 (359)	Outcome: Substance only reported when participants aged 20
Lynch 2004 (360)	Study design/comparator: Non-randomised study design
Macaulay 2002 (361)	Study design/comparator: No comparison group
Mackay 1995 (362)	Study design/comparator: Non-randomised study design
Mahoney 2002 (363)	Outcome: No substance use outcome
Malmberg 2015 (364)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Malmberg 2014 (365)	Intervention: Didn't address individual resilience factors
Malmberg 2010 (366)	Intervention: Didn't address individual resilience factors
Mann 2012 (367)	Participants: No participants, commentary only
Mares 2012 (368)	Outcome: No substance use outcome
Marsiglia 2010 (369)	Intervention: Didn't address environmental resilience factors
Martin 2008 (370)	Participants: No participants, descriptive paper only
Martins 2011 (371)	Outcome: No substance use outcome
Maruska 2010 (372)	Study design/comparator: Non-randomised study design
Mason 2009 (373)	Participants: Age of participants was 22 years
Masten 2008 (374)	Participants: No participants, descriptive paper only
Masten 2009 (375)	Participants: No participants, descriptive paper only
McBride 2004 (376)	Intervention: Didn't address environmental resilience factors
McBride 2003 (377)	Study design/comparator: Non-randomised study design
McBride 2000 (378)	Study design/comparator: Non-randomised study design
McCalla 2012 (379)	Participants: No participants, descriptive paper only
McCarty 2012 (380)	Intervention: Not an intervention, association paper
McCormick 1995 (381)	Participants: No participants, diffusion of innovation theory paper
McKennitt 2012 (382)	Intervention: Not universal, selective intervention (Aboriginal students only)
McNeal 2004 (383)	Intervention: not an intervention, mediator study
Melnyk 2013 (384)	Intervention: Selective intervention – students enrolled in health education only
Menrath 2012 (385)	Study design/comparator: Non-randomised study design
Metz 2006 (386)	Intervention: Didn't address environmental resilience factors
Metz 2014 (387)	Participants: No participants, descriptive paper only

Study	Reason for exclusion
Midford 2010 (388)	Participants: No participants, review only
Midford 2014 (389)	Intervention: Didn't address individual resilience factors
Minnard 2002 (390)	Participants: No participants, descriptive paper only
Miovsky 2015 (391)	Intervention: Didn't address environmental resilience factors
Miovsky 2015 (392)	Intervention: Didn't address environmental resilience factors
Mitchell 2000 (393)	Participants: No student participants
Moberg 1998 (394)	Outcome: No substance use outcome
Mogro-Wilson 2015 (395)	Study design/comparator: Non-randomised design
Moncher 1994 (396)	Intervention: Didn't address environmental resilience factors
Moody 1995 (397)	Study design/comparator: No comparison group
Moral Jimenez 2009 (398)	Study design/comparator: Non-randomised study design
Morgan 1994 (399)	Study design/comparator: Non-randomised study design
Morgenstern 2009 (400)	Intervention: Didn't address individual resilience factors
Moyer 2010 (401)	Participants: No participants, commentary only
Muller 2008 (402)	Study design/comparator: no comparison group
Nagel 2010 (403)	Participants: No participants, process evaluation only
Natchaya 2014 (404)	Participants: No participants, descriptive paper regarding intervention development
Nemire 1999 (405)	Intervention: Selective interventions (selected students who haven't used drug)
Nettles 1994 (406)	Participants: No participants, descriptive paper only
Newton 2014 (407)	Intervention: Didn't address individual resilience factors
Newton 2012 (408)	Intervention: Didn't address individual resilience factors
Newton 2012 (409)	Intervention: Didn't address individual resilience factors
Newton 2010 (410)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Newton 2009 (411)	Intervention: Didn't address individual resilience factors
Newton 2009 (412)	Intervention: Didn't address individual resilience factors
Nilsen 2010 (413)	Participants: No participants, commentary only
Nishioka 1996 (414)	Full text not available
Noland 1998 (415)	Intervention: Didn't address environmental resilience factors
Norman 2008 (416)	Intervention: Didn't address environmental resilience factors
Nozu 2006 (417)	Study design/comparator: Non-randomised study design
Nuno-Gutierrez 2008 (418)	Study design/comparator: No comparison group
O'Brien 2010 (419)	Study design/comparator: Non-randomised study design
O'Loughlin 1998 (420)	Intervention: Didn't address environmental resilience factors
O'Donnell 1995 (421)	Study design/comparator: non-randomised study design
O'Hearn 2002 (422)	Study design/comparator: non-randomised study design
O'Leary-Barrett 2010 (423)	Intervention: Targeted intervention – students with high risk personality
O'Neill 2012 (424)	Intervention: Selective intervention- alcohol users only
O'Neill 2011 (425)	Intervention: Didn't address environmental resilience factors
Oscos-Sanchez 2014 (426)	Intervention: Didn't address environmental resilience factors (Abstract only)
Oscos-Sanchez 2012 (427)	Study design/comparator: No comparison group
Oscos-Sanchez 2012 (428)	Study design/comparator: non-randomised study design
Oscos-Sanchez 2011 (429)	Intervention: Didn't address environmental resilience factors (Abstract only)
Osgood 2013 (430)	Intervention: Didn't address environmental resilience factors
Ostaszewski 2006 (431)	Study design/comparator: Cross-sectional study
Özdemir 2012 (432)	Participants: No participants, commentary only
Paek 2013 (433)	Study design/comparator: No comparison group (Cross sectional study)

Study	Reason for exclusion
Parasuraman 2014 (434)	Study design/comparator: No comparison group
Parent 2011 (435)	Intervention: Selective intervention- intervention delivered only to those selected by the peer leaders
Park 2000 (436)	Intervention: Didn't address individual resilience factors
Paschall 2009 (437)	Study design/comparator: non-randomised study design
Patton 2000 (438)	Participants: No participants, project rationale only
Peleg 2001 (439)	Intervention: Didn't address environmental resilience factors
Pendergrass 2014 (440)	Outcome: No substance use outcome
Perry 2009 (441)	Intervention: Didn't address individual resilience factors
Perry 2007 (442)	Outcome: No substance use outcome
Perry 2000 (443)	Outcome: Process outcome measures only
Peterson 2000 (444)	Intervention: Didn't address individual resilience factors
Peterson 2000 (445)	Study design/comparator: Not RCT (design of intervention)
Pomrehn 1995 (446)	Study design/comparator: Non-randomised study design
Poulin 2005 (447)	Study design/comparator: Non-randomised study design
Prado 2007 (448)	Intervention: Not school-based
Prince 1995 (449)	Study design/comparator: Non-randomised study design
Prokhorov 2008 (450)	Intervention: Tailored intervention depending on smoking status
Raghupathy 2012 (451)	Interventions: Selective intervention; participants were American Indian students only
Raji 2014 (452)	Study design/comparator: Non-randomised design
Reddy 2002 (453)	Intervention: Didn't address individual resilience factors
Redmond 2014 (454)	Outcome: No substance use outcome
Resnicow 2010 (455)	Intervention: Didn't address environmental resilience factors
Resnicow 2008 (456)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Rew 2003 (457)	Participants: No participants, descriptive paper only
Rice 2013 (458)	Study design/comparator: No comparison group
Riggs 2009 (459)	Intervention: Didn't address individual resilience factors
Riggs 2009 (460)	Participants: Follow up in adults so participants were over 18 during follow up
Ringwalt 2009 (461)	Intervention: Didn't address individual resilience factors
Ritter 2014 (462)	Participants: No participants, commentary only
Rivis 2013 (463)	Intervention: Didn't address environmental resilience factors
Rohrbach 2007 (464)	Intervention: Didn't address individual resilience factors
Rohrbach 2010 (465)	Intervention: Didn't address environmental resilience factors
Rolf 2002 (466)	Participants: No participants, descriptive paper only
Roncarolo 2008 (467)	Study design/comparator: Non-randomised design
Roohafza 2014 (468)	Study design/comparator: No control group
Rosenbaum 1998 (469)	Study design/comparator: Non-randomised study design
Rosenbaum 1994 (470)	Study design/comparator: Non-randomised study design
Ross 2012 (471)	Study design/comparator: No comparison group
Rowland 2010 (472)	Participants: No participants, commentary only
Royse 1998 (473)	Outcome: No substance use outcome, measures attitudes only
Sack 2013 (474)	Intervention: Didn't address individual resilience factors
Saitz 2015 (475)	Participants: No participants, commentary only
Saitz 2015 (476)	Participants: No participants, commentary only
Saitz 2014 (477)	Participants: No participants, commentary only
Santi 1994 (478)	Intervention: Didn't address individual resilience factors
Saraf 2015 (479)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Savage 2014 (480)	Study design/comparator: No comparison group
Scheier 2001 (481)	Intervention: Didn’t address environmental resilience factors
Schelleman-Offermans 2014 (482)	Intervention: Didn’t address individual resilience factors
Schinke 2000 (483)	Intervention: Selective intervention (Participants selected outside schools and not all students selected)
Schofield 2003 (484)	Intervention: Didn’t address individual resilience factors
Scholz 2000 (485)	Intervention: Didn’t address individual resilience factors
Schulze 2006 (486)	Study design/comparator: Non-randomised study design
Schwinn (no year) (487)	Intervention: Not implemented in a school
Seal 2006 (488)	Study design/comparator: Non-randomised study design
Share 2004 (489)	Intervention: Didn’t address individual resilience factors
Shek 2008 (490)	Outcome: No substance use measures
Shek 2009 (491)	Outcome: No substance use measures
Shek 2010a (492)	Outcome: No substance use measures
Shek 2010b (493)	Outcome: No substance use measures
Shek 2011a (494)	Outcome: No substance use measures
Shek 2011b (495)	Outcome: No substance use measure
Shope 2001 (496)	Intervention: Didn’t address individual resilience factors
Shrier 2013 (497)	Participants: Participants' mean age was 19.2 years
Simon 2002 (498)	Outcome: No substance use outcome
Skara 2005 (499)	Outcome: No substance use outcome
Slater 2011 (500)	Intervention: Didn’t address environmental resilience factors
Slater 2006 (501)	Intervention: Didn’t address individual resilience factors
Sloboda 2009 (502)	Intervention: Didn’t address environmental resilience factors

Study	Reason for exclusion
Small 2004 (503)	Participants: No participants, descriptive paper only
Smit 2003 (504)	Intervention: Didn't address individual resilience
Smith 2004 (505)	Intervention: Didn't address environmental resilience factors
Smokowski 1998 (506)	Participants: No participants, descriptive review only
Snow 1997 (507)	Intervention: Didn't address environmental resilience factors
Snyder 2010 (508)	Outcome: No substance use measures
Solowij 2010 (509)	Participants: No participants, commentary only
Sorensen 2012 (510)	Study design/comparator: non-randomised study design
Sornpaisarn 2012 (511)	Participants: No participants, letter to the editor only
Spaeth 2010 (512)	Study design/comparator: non-randomised study design
Spoth 2013 (513)	Participants: Participants over 18 years of age
Spoth 2009 (514)	Intervention: Not delivered during school hours
Spoth 2009 (515)	Participants: Participants aged over 18 during follow up
Spoth 2008 (516)	Outcome: Prescription drug use only
Spoth 2006 (517)	Intervention: Not delivered during school hours
Spoth 2004 (518)	Intervention: Not school based, conducted outside school hours
Spoth 2003 (519)	Intervention: Not school-based
Spoth 2001 (520)	Intervention: Not delivered during school hours
Spoth 1999 (521)	Intervention: Not school-based
Spoth 1998 (522)	Outcome: No child substance use outcomes
Spoth 1996 (523)	Study design/comparator: No comparison group (Association paper)
St Pierre 2005 (524)	Study design/comparator: Non-randomised study design
St Pierre 1997 (525)	Intervention: Not school-based

Study	Reason for exclusion
Stanton 1995 (526)	Study design/comparator: No comparison group (Cross sectional study)
Starkey 2009 (527)	Intervention: No intervention; descriptive paper only
Starkey 2005 (528)	Intervention: Didn't address individual resilience factors
Stathopoulos 2013 (529)	Study design/comparator: Non-randomised study design
Stewart 2005 (530)	Participants: No participants, descriptive review of interventions only
Stigler 2011 (531)	Intervention: Didn't address individual resilience factors
Stigler 2007 (532)	Intervention: Didn't address individual resilience factors
Stigler 2006 (533)	Intervention: Not school-based
Stoiber 1998 (534)	Study design/comparator: No comparison group
Storr 2002 (535)	Intervention: Didn't address environmental resilience factors
Stucki 2014 (536)	Study design/comparator: Quasi-experimental design
Sun 2006 (537)	Participants: Only alternative high schools selected.
Sun 2007 (538)	Intervention: Selective intervention, students enrolled in particular subjects only
Sun 2008 (539)	Intervention: Didn't address environmental resilience factors
Sussman 2012 (540)	Intervention: Didn't address environmental resilience factors
Sussman 2007 (541)	Intervention: Selective intervention, students enrolled in particular subjects only
Sussman 2002 (542)	Intervention: Didn't address environmental resilience factors
Sussman 1998 (543)	Intervention: Didn't address environmental resilience factors
Sussman 1997 (544)	Intervention: Selective intervention, only students enrolled in particular subjects
Sussman 1997 (545)	Intervention: Not an intervention paper; description of intervention development
Sussman 1995 (546)	Intervention: Didn't address environmental resilience factors
Svetlak 2003 (547)	Full text not available
Sy 2008 (548)	Participants: No participants, process evaluation with teachers

Study	Reason for exclusion
Takahashi 1995 (549)	Study design/comparator: No comparison group
Tang 1997 (550)	Intervention: Didn't address individual resilience factors
Taylor 1999 (551)	Intervention: Selective intervention
Tebes 2007 (552)	Intervention not implemented in a school
Teesson 2014 (553)	Intervention: Didn't address environmental resilience factors
Teesson 2014 (554)	Intervention: Didn't address individual resilience factors
Teesson 2013 (555)	Intervention: Didn't address resilience factors
Teeson 2009 (556)	Intervention: Didn't address resilience factors (Conference abstract only)
Temple 2012 (557)	Participants: No participants, commentary only
Tessier 2008 (558)	Intervention: Didn't address environmental resilience factors
Thrush 1999 (559)	Intervention: Didn't address individual resilience factors
Tingen 2014 (560)	Intervention: Didn't address environmental resilience factors
Toumbourou 2014 (561)	Participants: Descriptive paper
Toumbourou 2002 (562)	Study design/comparator: No comparison group
Trapl 2011 (563)	Intervention: Intervention not implemented in a school
Trudeau 2012 (564)	Outcome: No substance use outcome data collected at follow up
Trudeau 2003 (565)	Intervention: Didn't address environmental resilience factors
Tucker 2009 (566)	Participants: No participants, book review only
Tuttle 2006 (567)	Intervention: Selective intervention
Ungar 2008 (568)	Participants: No participants, descriptive paper only
Unger 2001 (569)	Study design/comparator: Not randomised controlled trial
Unger 2004 (570)	Intervention: Didn't address individual resilience factors
Valdivieso López 2015 (571)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Valente 2007 (572)	Intervention: Didn't address environmental resilience factors
Valente 2007 (573)	Intervention: Didn't address environmental resilience factors
Valente 2006 (574)	Intervention: Didn't address individual resilience factors
Valentine 1998 (575)	Intervention: Selective intervention
van Lier 2011 (576)	Intervention: Didn't address individual resilience factors
van Lier 2009 (577)	Intervention: Didn't address environmental resilience factors
Van Teijlingen 1996 (578)	Study design/comparator: No comparison group
Vartiainen 2007 (579)	Intervention: Didn't address individual resilience factors
Velarde 2002 (580)	Intervention: Not implemented in a school
Velleman 2003 (581)	Participants: No participants, intervention overview only
Veltro 2015 (582)	Study design/comparator: Not a randomised control trial
Verdurmen 2014 (583)	Intervention: Didn't address individual resilience factors
Veryga 2009 (584)	Participants: No participants, commentary only
Vicary 2006 (585)	Intervention: Didn't address environmental resilience factors
Vigna-Taglianti 2014 (586)	Intervention: Didn't address environmental resilience factors
Vigna-Taglianti 2009 (587)	Intervention: Didn't address environmental resilience factors
Vincus 2010 (588)	Intervention: Didn't address individual resilience factors
Vitoria 2011 (589)	Intervention: Didn't address individual resilience factors
Vitoria 2013 (590)	Intervention: Didn't address individual resilience factors
Vogl 2014 (591)	Intervention: Didn't address individual resilience factors
Vogl 2009 (592)	Intervention: Didn't address individual resilience factors
Vuijk 2006 (593)	Participants: Retracted manuscript
Wang 2012 (594)	Intervention: Didn't address individual resilience factors

Study	Reason for exclusion
Wang 1998 (595)	Participants: No participants, descriptive paper only
Wang 1997 (596)	Participants: No participants, review / commentary only
Weichold 2015 (597)	Study design/comparator: Non-randomised design
Weichold 2012 (598)	Study design/comparator: Non-randomised design
Weichold 2012 (599)	Study design/comparator: Non-randomised design
Weichold 2006 (600)	Study design/comparator: Non-randomised design
Wen 2010 (601)	Intervention: Didn’t address individual resilience factors
Wen 2007 (602)	Unable to be translated
Wenzel 2009 (603)	Study design/comparator: Non-randomised design
Wenzel 2007 (604)	Study design/comparator: Non-randomised design
Werch 2011 (605)	Intervention: Tailored intervention, based on risk status
Werch 2010 (606)	Intervention: Didn’t address environmental resilience factors
Werch 2005 (607)	Intervention: Didn’t address individual resilience factors
Werch 2003 (608)	Intervention: Didn’t address environmental resilience factors
Werch 2002 (609)	Participants: No participants, review only
Werch 1999 (610)	Intervention: Selective intervention, only students attending a health centre were eligible
Werch 1998 (611)	Intervention: Targeted intervention, based on risk status
Wilhelmsen 1994 (612)	Intervention: Didn’t address individual resilience factors
Williams 2013 (613)	Participants: No participants, review of intervention only
Williams 2005 (614)	Intervention: Not implemented in a school
Williams 2001 (615)	Intervention: Didn’t address individual resilience factors
Williams 1995 (616)	Intervention: Didn’t address individual resilience factors
Windle 2010 (617)	Participants: No participants, review only

Study	Reason for exclusion
Winkleby 2004 (618)	Intervention: Didn't address individual resilience factors
Wong 2014 (619)	Study design/comparator: Non-randomised design
Wu 2003 (620)	Intervention: Not school-based
Wynn 2000 (621)	Intervention: Didn't address environmental resilience factors
Xu 2004 (622)	Outcome: No substance use outcome
Yabiku 2007 (623)	Intervention: Didn't address environmental resilience factors
Young 1997 (624)	Outcome: Substance use outcomes were attitudinal only
Zavela 2004 (625)	Intervention: Didn't address resilience factors
Zhang 2009 (626)	Intervention: Didn't address individual resilience factors
Zimmerman 1994 (627)	Participants: No participants, descriptive paper

APPENDIX 3.4: Characteristics of included studies

Abatemarco 2004[628, 629]

Methods	Country: Croatia Setting(s): School and family; 26 primary schools (Catering for Grades 1 to 8) in Split Program name: Project Northland Design: RCT (13 intervention schools and 13 control schools) Aim: "Project Northland is a school-based curriculum designed as a multilevel, multiyear program proven to delay the age at which young people begin drinking, reduce alcohol use among those who have already tried drinking, and limit the number of alcohol-related problems of young drinkers."
Participants	Baseline: 975 (intervention) and 976 (control) Age: not reported (Grade 6) Gender: Control: 50.3% (male); 49.4% (female); Intervention: 50.6% (male); 48.5% (female) Baseline substance use: Alcohol use: prevalence of having had 5 or more drinks in a row over the past 2 weeks: 5%; prevalence of having gotten drunk so they fell down or got sick at least once: 6%.
Interventions	Theoretical approach: Social ecological framework Prevention approach: Universal Intervention: Each year, the curriculum was translated and culturally adapted for Croatian youth. Project Northland consists of three curricular components. In the 6th grade, students work together with parents to complete fun and educational activities at home using the "Slick Tracy Home Team" curriculum. This "home team" approach provides a forum for the students and their families to begin discussions of alcohol-related issues. In 7th grade, students use the Amazing Alternatives! Curriculum. This curriculum involves eight 45-minute teacher- and peer-led classroom sessions. It is designed to teach 7th graders the skills to identify and resist influences to use alcohol and to encourage alcohol-free alternatives. Finally, as students enter their third year of the project, they experience PowerLines, which features eight 45-minute

	sessions that are part of a 4-week program designed to teach students how communities influence behaviours and how they can create changes within their communities. All the participants received each intervention component but in different Grades. Individual resilience factors targeted: problem solving- "problem solving"; social/emotional skills- "positive relations". Environmental resilience factors targeted: home meaningful participation- "parent involvement program/education"; community caring relationships- "how communities influence behaviours"; community meaningful participation: "how they can create changes within the communities" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 3 years (6th-8th Grade) Control: The control schools would receive the curriculum upon the completion of the initial intervention.	
Outcomes	Substance use outcomes reported at follow up: Lifetime use; Last 12 months; last 30 days. Follow up data extracted for main analysis (duration of follow up): Year 3 (immediate) *Alcohol use – lifetime (continuous score)* • Males: intervention mean 3.38 (SE 0.11); control mean 3.15 (SE 0.10); *p*=0.81 (p values comparing change from baseline) • Females: intervention mean 2.64 (SE 0.09); control mean 2.74 (SE 0.08); *p*=0.10 (p values comparing change from baseline) • Number analysed: 824 (intervention n=362; control n=462) Follow up data extracted for long-term subgroup analysis (durations of follow up): n/a	
Notes	Quality of intervention delivery: Not reported Study data included meta-analysis?: No, follow up outcome measures unsuitable (continuous, number of occasions).	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.

Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	High risk.	Attrition: 58% ITT: Not reported Imputation of missing: Not reported
Selective outcome reporting (reporting bias)	Unclear risk.	A trial registry and/or protocol paper could not be located. “The survey included questions concerning alcohol use, as well as tobacco and other drug use…..” However, the outcome measures relevant only to alcohol use has been reported in both papers.
Other potential study bias	High risk.	Recruitment bias: (Unclear) Unclear whether randomisation took place before or after student recruitment.

		Baseline imbalance: (Low) “The results of the pre-test showed that students in the intervention and control groups were similar, showing no statistically significant differences in demographics or responses to the pre-test.” Loss of clusters: (High) Two intervention schools dropped out during the course of the study. Incorrect analysis (adjusted for clustering): (Low) Appropriate method of analysis where clustering taken into account - “To evaluate the effect of the intervention, the intervention outcome was modelled using a mixed linear model, with random effects included to account for correlation between responses within a school."
Overall risk of bias	High risk. 4/7	

Bond 2004[630-633]

Methods	Country: Australia Setting(s): School; Government, independent and Catholic secondary schools (catering for Year 7 to Year 12) from metropolitan Melbourne and regional educational administrative districts Program Name: The Gatehouse Project Design: C-RCT (12 intervention schools and 14 control schools) Aim: “The aim of this study was to determine the effect of a multilevel school based intervention on adolescents’ emotional wellbeing and health risk behaviours.”
Participants	Baseline: 2678 (1335 Intervention; 1343 Control) Age: 13.4 years (Year 8) Gender: 46.8% M Baseline substance use: Alcohol-drinker 31%; regular drinker 5.1%; binged 12.7% Tobacco-smoker (any) 15.5%; regular 2.4%; Marijuana use-not used 86.5%; <weekly 5.2%; ≥weekly 1.6% .

Interventions	Theoretical approach: Attachment Theory Prevention approach: Universal Intervention: The curriculum implemented in Year 8 was delivered in classes over a ten week school term. It focused on cognitive and interpersonal skills underlying emotional wellbeing relevant to normal developmental experiences. Includes whole-school interventions to address protective factors in the school's social and learning environment. In Year 9 the resources provided opportunities to explore and practice strategies for managing difficult emotions. Individual resilience factors targeted: Cooperation and communication- "enhancing skills and opportunities for good communication"; social and emotional skills- "emotional well-being". Environmental resilience factors targeted: School meaningful participation- "building a sense of positive regard through valued participation in aspects of school life"; school support- "a sense of security and trust" Intervention type (as assessed by reviewers): 'resilience' Intervention duration: 3 years Control: no intervention
Outcomes	Substance use outcomes reported at follow up: Cannabis (any use, weekly use, incident use, incident weekly use); Smoking (any, regular); Drinking (any, regular, binge) Follow up data extracted for main analysis (duration of follow up): Wave 4 (immediate) *Tobacco use – past month* • Intervention 24.9%; Control 28.2%; OR: 0.91 (95% CI 0.67-1.24) *Alcohol use – past month* • Intervention 66.30%; Control 70.20%; OR: 0.96 (95% CI 0.69-1.33) *Cannabis use – last 6 months* • Intervention 18.60%; Control 21.70%; OR: 0.81 (95% CI 0.57-1.16) • Number analysed (all outcomes): intervention n= 1155; control n= 990 Long term follow up data extracted (durations of follow up): n/a
Notes	Quality of intervention delivery: One (of 24) schools didn't teach curriculum material in year 1.

	Study data included meta-analysis?: Yes – adjusted ORs (90%CIs) for past month tobacco, part month alcohol and last 6 months marijuana use	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of "simple random sampling" used to generate the random sequence of school districts is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	High risk.	Attrition: 20% attrition and differential attrition between control and intervention groups (i.e. control 26.3%, intervention 13.5%). ITT: Yes – however only 2145 of 2678 randomised students were analysed.

		Imputation of missing data: Not reported. Only 2145 of 2678 randomised students included in analysis.
Selective outcome reporting (reporting bias)	Unclear risk.	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.
Other potential study bias	Unclear risk.	Recruitment bias: (Unclear) Unclear whether randomisation took place before or after student recruitment. Baseline imbalance: (Unclear) Baseline imbalances were found for "parental separation, parental smoking, and school engagement"; "family structure, parental smoking and school engagement" were accounted for in analyses. Loss of clusters: (Low) No reported loss of clusters. Incorrect analysis: (Low) Appropriate method of analysis where clustering taken into account - "logistic regression models were fitted using robust "information-sandwich" estimates of standard errors to account for potential clustering within schools."
Overall risk of bias	High risk. 3/7	

Brown 2005[634]

Methods	Country: USA Settings: Schools and family; Public elementary schools (Catering for kindergarten to Grade 5 or 6) in a suburban school district north of Seattle, Washington. Program name: Raising Healthy Children (RHC) Design: C-RCT (5 intervention schools and 5 control schools)

	Aim: "The purpose of this study was to test the efficacy of the Raising Healthy Children intervention on rates of substance use during early-to-middle adolescence."
Participants	Baseline: 938 Age (mean age at Baseline): 7.7 years (longitudinal panel of Grades 1 and 2 students) Gender: 46% F 54% M Baseline substance use: not reported
Interventions	Theoretical approach: Social development interventions Prevention approach: Universal and selective Intervention: RHC addressed risk and protective factors in four key domains namely school, student, peer and family intervention strategies. Individual resilience factors targeted: Problem solving- "problem solving skills"; social and emotional skills- "interpersonal skills"; academic achievement- "academic performance" Environmental resilience factors targeted: School caring relationships- "bonding to school"; family caring relationships- "bonding to family" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 10 years Control: no intervention
Outcomes	Substance use outcomes reported at follow up: alcohol use; marijuana use; cigarettes use. Follow up data extracted for main analysis (duration of follow up): Grade 8 (immediate) *Alcohol- last year* • Intervention 37%; Control 40% *Marijuana- last year* • Intervention 16%; Control 18% *Tobacco- last year* • Intervention 14%; Control 13% Number analysed (all outcomes): 959

	Long term follow up data extracted (duration of follow up): Grade 10 (2 years) *Alcohol- last year* • Intervention 52%; Control 50% *Marijuana- last year* • Intervention 30%; Control 31% *Tobacco- last year* • Intervention 16%; Control 20% Number analysed (all outcomes): not reported (estimated to be n=460 based on Grade 10 sample including only 2nd grade cohort and reported to be 48% of total sample)
Notes	Quality of intervention delivery: Over 94% of eligible teachers and staff in intervention schools attended development workshops; 27% of intervention students attended at least one study club (offered twice a week during Grades 4–6), 40% attended at least one of the middle school retreats or workshops, and 51% attended at least one summer camp; about 51% of the intervention students' families voluntarily attended at least one group workshop; 35% received individual contacts and 77% received at least one middle or high school period booster workshop. Study data included meta-analysis?: Yes. Event data used with mean ICC to calculate OR for tobacco in last year, alcohol in last year, marijuana in last month

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence	Unclear risk.	Not reported.

concealment (selection bias)		
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk.	Attrition: Less than 12%. Reported no significant differences for intervention versus control groups for missing outcome data. ITT: Not reported Imputation of missing data: "…the small degree of missing outcome data, we relied on full information maximum likelihood estimation under the assumption of data MAR."
Selective outcome reporting (reporting bias)	Unclear risk.	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.
Other potential study bias	Unclear risk.	Recruitment bias: (Unclear) Unclear whether randomisation took place before or after student recruitment. Baseline imbalance: (Unclear) No information is provided to assess baseline imbalance.

	Loss of clusters: (Low) No reported loss of clusters. Incorrect analysis: (Low) Appropriate method of analysis where clustering taken into account - "All analyses were conducted at the individual (i.e. student) level, with standard errors for intervention effects adjusted by outcome-specific design effects to account for potential clustering of students from their original school assignments."
Overall risk of bias	Low. 2/7

DeGarmo 2009[635-637]

Methods	Country: USA Setting(s): Schools and family; all public elementary schools (catering to kindergarten to Grade 5 or 6) located in high juvenile crime neighbourhoods within the Eugene-Springfield, Oregon, metropolitan area. Program name: Linking the Interests of Families and Teachers (LIFT) Design: C-RCT (6 intervention schools and 6 control schools) Aim: "The LIFT targets for change those child and parent behaviors thought to be most relevant to the development of adolescent delinquent and violent behaviors, namely child oppositional, defiant, and socially inept behavior and parent discipline and monitoring."
Participants	Baseline: 671 students (382 intervention, 289 control) Age: not reported (Grade 5) Gender: 51% F Baseline substance use: not reported.
Interventions	Theoretical approach: Coercion theory Prevention approach: Universal

	Intervention:3 components (classroom, playground, parent). 3 months of classroom and playground sessions for children; 6 weeks of sessions for families. Targets to change the behaviours in parents and children which are known to lead to the development of adolescent delinquent and violent behaviours. Individual resilience factors targeted: Social and emotional skills- "social skills", "identifying feelings"; academic achievement- "study skills component relevant to academic work…."; cooperation and communication skills- "cooperating within groups", "negotiation skills"; problem solving/decision-making- "problem-solving". Environmental resilience factors targeted: Pro-social peers- "positive peer relationship"; home caring relationships- "parents of fifth graders are taught negotiation skills", "paying attention sooner rather than later", "giving encouragement", "listening and tracking" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 3 years Control: no intervention.
Outcomes	Substance use outcomes reported at follow up: tobacco use, any alcohol use, any illicit drug use Follow up data extracted, main analysis and long-term subgroup (duration of follow up): Grade 12 (7 years) *Tobacco use initiation* • Hazard ratio: β= -0.10 (p<0.01) *Alcohol use initiation* • Hazard ration: β= -0.07 (p<0.05) *Illicit drug use initiation* • Hazard ratio: β= -0.09 (p<0.10) • Number analysed (all outcomes): 351
Notes	Quality of intervention delivery: 95% of the planned content was delivered. 93% of families received all parent training materials. Study data included meta-analysis?: No, reported data unsuitable (hazard ratio data reported which could not be transformed for synthesis in meta-analysis)
Risk of bias	

Bias	Authors' judgement	Support for judgement
Sequence generation (selection bias)	Unclear risk	Recruitment of schools was undertaken in 3 waves. There was a low risk of bias in the first wave where school principals drew a school name out of a hat. Method of random sequence generation used to select schools in the two subsequent waves of school recruitment is not reported.
Allocation sequence concealment (selection bias)	Unclear risk	Method of allocation concealment in the first wave of school recruitment is not reported, however in the subsequent 2 waves allocation to intervention and control conducted in a research centre.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk.	Attrition: 19.1% of all students. Differential attrition between treatment groups not reported. ITT: Not reported; 361 students randomised, 351 analysed. Imputation of missing data: Not reported
Selective outcome reporting (reporting bias)	Unclear risk.	Neither a study protocol or trial registry was available. Whilst published reports do not indicate which outcomes were pre-specified, outcome data for substance use in first grade that was planned was not reported due to "almost no use".

Other potential study bias	High risk.	Recruitment bias: (High) Randomisation of schools occurred prior to inviting students to participate "Once a school was chosen, either the first or the fifth grade within the school was also randomly chosen to participate." Baseline imbalance: (Unclear) No information is provided to assess baseline imbalance. Loss of clusters: (Low) No reported loss of clusters. Incorrect analysis: (Low) Appropriate method of analysis where clustering taken into account – "hierarchical Cox survival models"
Overall risk of bias	High risk. 3/7	

Eisen 2003[638-640]

Methods	Country: USA Setting(s): Schools; Middle schools (catering for Grades 6-8) selected from four school districts in Los Angeles, Washington-Baltimore, Detroit and Wayne county area districts Program name: Skills for Adolescence (SFA) Design: C-RCT (34 schools; 17 SFA schools and 17 control schools) Aim: "The overall goal was to compare the effectiveness of SFA against ''standard'' drug prevention in preventing or delaying the onset of students' tobacco, alcohol, and illegal substance use."
Participants	Baseline: 7424 Age: 11 years (Grade 6) Gender: 52% F

	Baseline substance use: lifetime alcohol use 14%; 30 days alcohol use 9.5%; 30 days cigarettes use 3.5%; 30 days marijuana use3%; 30 days cocaine/crack use 1.1%; 30 days use of any other illicit substances 2.3%
Interventions	Theoretical approach: Social influence and social cognitive Prevention approach: Universal Intervention: Use of strategies to teach social competency and refusal skills. It consists of a comprehensive 40-session (35-45 minutes per session) curriculum. Individual resilience factors targeted: Self-esteem- "self-esteem", "self-confidence"; co-operation and communication- "communicating effectively", problem solving/decision-making- "making best decisions"; social and emotional skills- "managing emotions in positive ways"; goals and aspirations- "life goal settings". Environmental resilience factors targeted: Peer caring relationships- "improving peer relationships (including resisting peer pressure)'; home caring relationships- "strengthening family bonds" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: ~1 year 40-sessions (35-40 minutes per session) of comprehensive curriculum during the 7th Grade school-year (1998-1999) Control: Usual drug education programming
Outcomes	Substance use outcomes reported at follow up: lifetime alcohol use; last 30 days alcohol use; binge drinking; lifetime cigarettes use; last 30 days cigarettes use; lifetime marijuana use; last 30 days marijuana use; lifetime use of other illicit substances; last 30 days use of other illicit substances; last 30 days cocaine/crack use. Follow up data extracted for main analysis (duration of follow up): 7th Grade (immediate): *Tobacco-prevalence lifetime* • Baseline nonusers: Intervention: 28.22%; Control: 26.69%; Difference 1.53 (95% CI- -1.24, 4.29), p-value 0.27 • Retention rate of baseline non-users (59.24%) in 7th grade and number of baseline users (n=257) was used to calculate the prevalence of all Grade 7 students *Alcohol- prevalence lifetime*

	• Baseline nonusers: Intervention: 29.61%; Control: 30.19%; Difference -0.58 (95% CI -3.11 to 4.27), p-value 0.75 • Retention rate of baseline non-users (61.4%) in 7th grade and number of baseline users (n=703) was used to calculate the prevalence of all Grade 7 students *Marijuana- prevalence lifetime* • Baseline nonusers: Intervention: 9.43%; Control: 11.76%; Difference -2.34 (95% CI -4.73 to 0.06), p-value 0.06 • Retention rate of baseline non-users (59.1%) in 7th grade and number of baseline users (n=225) was used to calculate the prevalence of all Grade 7 students Number analysed (all outcomes): "4106 to 5644 depending on outcome variable" (Number per group not reported, assumed equal sample in intervention and control and sample size to be 4106 for all outcomes) Follow up data extracted for long term follow up analysis (duration of follow up): 8th Grade (1 year) *Tobacco-lifetime* • Intervention: 28%; Control: 27.5%; Difference 0.5 (95% CI- -1.99, 2.99), p-value 0. 69 *Alcohol-lifetime* • Intervention: 66.97%; Control: 66.33%; Difference 0.64 (95% CI -2.25 to 3.53), p-value 0.66 *Marijuana- lifetime* • Intervention: 27.24%; Control: 30.50%; Difference -3.26 (95% CI -6.55 to 0), p-value 0.05 Number analysed: "5316 to 5610 depending on outcome variable" (Number per group not reported, assumed equal sample in intervention and control and sample size to be 5316 for all outcomes)
Notes	Quality of intervention delivery: Not reported Study data included meta-analysis?: Yes. Adjusted prevalence data and mean ICC used to calculate adjusted ORs for tobacco (lifetime), alcohol (lifetime), marijuana (lifetime) outcomes at both follow ups.
Risk of bias	
Bias	**Authors' judgement** **Support for judgement**

Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: 16% attrition (7th Grade), reports no differential attrition between treatment groups. ITT: Yes Imputation of missing data: not reported. 7424 students randomised, number analysed not reported
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.

Other potential study bias	Low risk	Recruitment bias: (Low) Schools and students were recruited prior to clusters being randomised. Baseline imbalance: (Low) No evidence of baseline imbalance – with intervention and control schools "equivalent with respect to self-reported drug" Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis: (Low) Appropriate method of analysis where clustering taken into account - "nested cohort design in which students at each school were followed over time as a cohort " "School was included as a random effect nested within conditions"
Overall risk of bias	Low risk 2/7	

Griffin 2009[641]

Methods	Country: USA Setting(s): School and community; Middle school (catering for Grades 6-8) in a public school system in inner-city Atlanta Program name: BRAVE (Building Resiliency and Vocational Excellence) Design: RCT (4 homeroom classrooms each year for 3 years; 2 intervention and 2 comparison) Aim: "The primary aim of the BRAVE Program was to address economic disadvantages while working to prevent involvement with alcohol, marijuana, and other drugs as well as violence."
Participants	Baseline: Not reported Age: Not reported (Grade 6) Gender: 112 F (53 intervention; 59 control); 66 M (39 intervention; 27 control)

	Baseline substance use: Smokeless tobacco 4.4% (control), 6.3% (intervention) Cigarettes smoked 6.7% (control), 9.4% (intervention) Alcohol drinking 21.1% (control), 25% (intervention) Drunk from alcohol 16.7% (control), 11.5% (intervention) Marijuana use 2.2% (control), 9.1% (intervention)
Interventions	Theoretical approach: Social learning theory Prevention approach: Universal Intervention: Curriculum-based classroom exercises; the ancillary components of the program aimed to promote student motivation to acquire adaptive skills in the targeted behavioral areas or to enhance the generalizability of skills across settings. The program operated during the school day in the course of health education class periods. The classroom-based intervention occurred within a 7–8 month period during the school year in regularly scheduled health education classroom periods. Training occurred in 90-minute in-class sessions two to three times per week for nine weeks. Participants were exposed to mentors for at least one hour per week from October through April of the school year. Individual resilience factors targeted: Goals and aspirations- “sense of purpose and future”, “goal monitoring”; autonomy- “autonomy”; social and emotional skills- “social competence” Environmental resilience factors targeted: Community caring relationships- “adult mentors” Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 7-8 months period during a school year (<1 year) Control: standard curriculum
Outcomes	Substance use outcomes reported at follow up: smokeless tobacco, cigarettes smoked, alcohol drinking, drunk from alcohol, marijuana use Follow up data extracted for main analysis/long term follow up (duration of follow up): Grade 8/Time 3 (1 year) *Tobacco- 30 days* • Intervention: 3.10%; Control: 0.00% *Alcohol- 30 days* • Intervention: 7.10%; Control: 37.50% *Marijuana- 30 days* • Intervention: 7.60%; Control: 10.90%

	Number analysed (all outcomes): Total=178 (Intervention 92; Control 86)	
Notes	Quality of intervention delivery: not reported Study data included meta-analysis?: Yes. Grade 8 event data used to calculate ORs for tobacco (30 days), alcohol (30 days), marijuana (30 days).	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk	Method of random sequence generation not reported. "The systematic random probability sampling strategy took place in the sixth grade with each student being assigned a number and then being randomly assigned to one of the 12 classes."
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: 11% attrition with no differential attrition between treatment groups

		ITT: Yes Imputation of missing data: Listwise deletion of 21 of 199 students due to incomplete data or families moving out of area.
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.
Other potential study bias	Unclear risk	n/a
Overall risk of bias	Low risk 2/7	

Guilamo-Ramos 2010[642]

Methods	Country: USA Setting(s): School and family; 6 middle schools (catering for Grades 6-8) in the Bronx and Harlem communities of New York City Program name: Linking Lives Health Education Program Design: RCT (compared two intervention arms: Raising Smoke-Free Kids and Towards no Tobacco Use, versus Towards no Tobacco Use only) Aim: "We evaluated the effectiveness of a parent-based add-on component to a school-based intervention to prevent cigarette smoking among African American and Latino middle school youths."
Participants	Baseline: 1386 mother-adolescent dyads (695 intervention; 691 control) Age: 12.1 years (Grades 6-7) Gender: 49.6%M Baseline substance use: Adolescent smoking behaviour: Ever smoked cigarettes 5.4%; Ever smoked cigarettes "regularly" not reported
Interventions	Theoretical approach: Social influence Prevention approach: Universal

	Intervention (Raising Smoke-Free Kids and Towards no Tobacco Use condition): All adolescents received the TNT intervention which consisted of 2 face-to-face sessions lasting about 2 hours. It covered components on effective listening and tobacco information, the course and consequences of tobacco use, self-esteem, being true to one's self and changing negative thoughts, effective communication, assertiveness training and refusal skills, an examination of advertising images, and social activism. The mothers in the Linking Lives Intervention; the central component focused on effective communication and parental monitoring strategies for preventing adolescent tobacco use. Individual resilience factors targeted: Self-esteem- "self-esteem"; cooperation and communication- "effective listening", "effective communication" Environmental resilience factors targeted: Peer caring relationships, home caring relationships Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: Modified "Towards No Tobacco Use" was conducted over 2 face-to-face sessions, each session lasting about 2.5 hours and on separate days. The Linking Lives Parent-Oriented Add-On Component was 9 short modules and 2 tobacco-related homework activities, for 2 days Control (Towards no Tobacco Use only): The adolescents received an adaptation of the TNT; mothers in the control condition received information on selecting a high school
Outcomes	Substance use outcomes reported at follow up: Adolescent smoking behaviour: Ever smoked cigarettes; Ever smoked cigarettes "regularly" Follow up/Long term follow up data extracted (duration of follow up): 15 months *Tobacco- lifetime* • Intervention: 5%; Control: 10%; OR: .58 (95% CI 0.36 to 0.94) Number analysed: n=1096 (Intervention n=542 mother-adolescent dyads, control n=554 mother-adolescent dyads)
Notes	Quality of intervention delivery: not reported Study data included meta-analysis?: No, sole study to compare two intervention approaches.
Risk of bias	
Bias	**Authors' judgement** **Support for judgement**

Sequence generation (selection bias)	Low risk	Random sequence was computer generated.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	High risk	Attrition: 23% in intervention and 22% control. ITT: Not reported. Imputation of missing data: Not reported. 1386 mother-adolescent dyads randomised, 1096 analysed.
Selective outcome reporting (reporting bias)	High risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified. Methods from published report indicated data was collected on both ever and regular smoking, however outcome data for regular smoking was not reported and no reason was provided for its exclusion.

Other potential study bias	High risk	"For the parents and adolescents in the TNT-only condition, 25% stated that they had given their child a handout that had been distributed solely to parents in the TNT-plus-parent condition. This represented a higher level of contamination than we had anticipated, and it worked against finding an effect for the TNT-plus-parent condition relative to the TNT-only condition….."
Overall risk of bias	High risk 5/7	

Komro 2004[643, 644]

Methods	Country: USA Setting(s): School, family and community; 61 schools in Chicago Program name: Project Northland Chicago Design: C-RCT (10 intervention units-29 schools and 12 control units-32 schools) Aim: "Project Northland Chicago aims to change the personal, social, and environmental factors that support alcohol use among young adolescents."
Participants	Baseline: 4259 Age: Not reported Gender: 50%M Baseline substance use: alcohol use 5.22 (SE=.08) [Intervention mean], 5.36 (SE=0.08) [Control mean]. Multiple drugs use 9.28 (SE=0.13) [Intervention mean], 9.48 (SE=.12) [Control mean]
Interventions	Theoretical approach: Triadic influence and Perry's planning model for adolescent health promotion programs Prevention approach: Universal Intervention: It was implemented consecutively from 6th to 8th Grade with the intervention in each year involving school, family and community components. This included 6-10 sessions of classroom curricula per year; 4 home-based sessions per year plus educational and school as well as community activities; peer leadership and youth-planned community service projects, and community organizing and environmental neighbourhood change.

	Individual resilience factors targeted: Problem solving/decision making: "Problem solving"; Social and emotional skills: "Positive relations". Environmental resilience factors targeted: Home adult expectations: "parental monitoring".Home meaningful relationships: "Family connection", "Family bonding";Community meaningful participation: "Emphasize community service to provide positive community interactions". Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 3 years (6th to 8th Grade) Control: Delayed program
Outcomes	Substance use outcomes reported at follow up: Alcohol use; multiple drug use. Follow up data extracted for main analysis (duration of follow up): T4 (spring 2005, 8th Grade immediate) *Alcohol-frequency score (continuous)* • Growth Rate- Intervention mean (SE): 0.02 (0.01); Control mean (SE): 0.03 (0.01); [p-value 0.80] Number analysed: n=5812 Long term follow up data extracted (duration of follow up): n/a
Notes	Quality of intervention delivery: Classroom curricula: % schools implemented: Slick Tracy-97% (28/29 schools); Amazing Alternatives-100% (28/28 schools); PowerLines-93% (25/27 schools). Peer leadership: % schools implemented: Slick Tracy-93% (27/29 schools); Amazing Alternatives-100% (28/28 schools); PowerLines-93% (25/27 schools). Parental involvement: Home Programs-% schools implemented: Slick Tracy Home Program-97% (28/29 schools); Amazing Alternatives Home Program-100% (28/28 schools); 'Let's Play' Game Packets-100% (27/27 schools). % Home team completion: Slick Tracy Home Program-83% (completed at least 1) (44-100%), 73% (completed 3-4) (32-100%); Amazing Alternatives Home Program: 70% (completed at least 1) (0-100%), 53% (completed 3-4) (0-93%); 'Let's Play' Game Packets-79% (completed at least 1) (21-97%); 55% (completed 3-4) (0-81%). Family fun events- % schools implemented: Slick Tracy Poster Fair (1 hour event)- 93% (27/29 schools); Amazing Alternatives! Family Fun Event (2 hour event)- 93% (26/28 schools). % students attended: Slick Tracy Poster Fair-71% (0-97%); Amazing Alternatives! Family Fun Events- 31% (0-82%). Study data included meta-analysis?: No, measures unsuitable. Continuous score of alcohol frequency reported.
Risk of bias	

Bias	Authors' judgement	Support for judgement
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	High risk	Attrition: 39%, with no differential attrition between treatment groups. ITT: Yes Imputation of missing data: Not reported
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.

Other potential study bias	Unclear risk	Recruitment bias: (Unclear) Unclear whether individuals were recruited to the trial before or after the clusters (schools and surrounding neighbourhoods) were randomised. Baseline imbalance: (Low) Authors reported no baseline imbalance between conditions. Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account "Mixed-effects regression models for repeated measures were used to test for differences between the intervention and control conditions over time…The models were estimated using maximum likelihood methods using the multi-level module in LISREL 8.72"
Overall risk of bias	High risk 3/7	

Li 2011[645, 646]

Methods	Country: USA Setting(s): School; 14 Chicago Public Schools (CPS) [elementary schools] Program name: Positive Action Program (Chicago) Design: C-RCT (7 schools-Positive Action Programme and 7 schools-Control) Aim: "This study had two major aims. The first was to replicate the existing evidence of effectiveness of the PA programme for reducing problem behaviours using the same multilevel framework and matched-pair, randomised-control design as in the Hawaii trial (Beets et al., 2008, 2009). The second aim was to examine the effectiveness of PA for problem behaviour reduction in a different population, elementary school students in a large urban school system – the Chicago Public Schools (CPS)."
Participants	Baseline: ~620 Age: not reported (3rd Grade)

	Gender: 49% F and 51% M Baseline substance use: not reported
Interventions	Theoretical approach: Grounded in the theory of self-concept and is consistent with socioecological theories such as theory of triadic influence Prevention approach: Universal Intervention: The K-8 portion of the PA program was used. The classroom curriculum consisted of over 140 15-minute, age-appropriate lessons taught 4 days every week for grades 7 and 8. The program also included teacher and staff training, approximately 4 hours in the first year and 2 hours in the subsequent years; counsellor, family, and community training; and school-wide climate development. Self-concept; positive actions for body and mind; social and emotional positive actions focusing on getting along with others; and managing, being honest with, and continually improving oneself were the six content units of the core curriculum. Individual resilience factors targeted: Self-efficacy: "self-concept"; social and emotional skills: "social and emotional positive actions focusing on getting along with others". Environmental resilience factors targeted: Community meaningful participation: "student involvement in the community"; home support: "parent-child relations"; home meaningful participation: "family involvement". Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 3 years Control: The control group schools received the PA program at the end of the trial period
Outcomes	Substance use outcomes reported at follow up: Ever smoked a cigarette; ever used alcohol (beer, wine or liquor); ever gotten drunk on alcohol; ever used marijuana; ever used any other serious drug; composite score for substance use. Follow up data extracted for main analysis/long term follow up (duration of follow up): Grade 8/Wave 8 (3 years) *Tobacco-ever* • Intervention: 20.00%; Control: 29.03%; Hedges g effect size: -0.21[p-value- <0.05] *Alcohol-ever* • Intervention: 39.43%; Control: 54.78%; Hedges g effect size: -0.35 [p-value- <0.05]

	Marijuana-ever • Intervention: 15.34%; Control: 24.36%; Hedges g effect size: -0.23 [p-value- <0.05] Number analysed (all outcomes): n=360 (intervention n=193; control n=170)	
Notes	Quality of intervention delivery: not reported Study data included meta-analysis?: Yes. Event data and reported ICC used to calculate ORs for tobacco (ever), alcohol (ever), marijuana (ever).	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.

Incomplete outcome data (attrition bias)	High risk.	Attrition: 51.6% ITT: Not reported. Imputation of missing data: No. “Missing values were handled using full information maximum likelihood estimation.”
Selective outcome reporting (reporting bias)	High risk.	A trial registry was located. However the trial registry does not specifically state what the measures for the substance use will be. As per the papers, all the relevant outcomes measures mentioned under “Measures” has been reported with the exception of the “used any more serious drug” outcome with no reason provided for its exclusion.
Other potential study bias	Unclear risk.	Recruitment bias: (Unclear) The consent was obtained from the students after the randomization was completed so they would be aware of the group that they would be allocated to. Baseline imbalance: (Low) There were no baseline imbalances on school- and student-level indicators. Loss of clusters: (Low) None reported. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account – “The small number of clusters (i.e., 14 schools) and the non-normality of the outcome variable (SU), in combination with the technical complexities of mediation testing in a multilevel modelling framework precluded a multi-level SEM analysis (Hox and Maas, 2001; Marsh et al., 2009; Muthén, 1994; Preacher, Zyphur, and Zhang, 2010; Zhang, Zyphur, and Preacher, 2009); however, low intra-class correlations (SU ICC at wave 8 = 0.029; mean SECD ICC across eight waves = 0.057), as defined by Singer and Willet (2003), indicate that this is not a serious issue.”
Overall risk of bias	High risk. 4/7	

Perry 1996[647-649]

Methods	Country: USA Setting(s): School, family and community; middle schools in 24 school districts in northeast Minnesota. Program name: Project Northland Design: C-RCT (10 school districts in intervention condition and 10 school districts in control condition) Aim: "Project Northland is a communitywide research program to prevent young adolescent alcohol use. The project was designed to test the efficacy of a multilevel, multiyear intervention program for youth."
Participants	Baseline: 2351 Age: Not reported Gender: Not reported Baseline substance use: Past month alcohol use All students: 6.9% (95% CI 5.0, 8.8); Past week alcohol use All students: 3.8% (95% CI 2.6,5.0); Cigarette use All students: 6.9% (95% CI 4.9,8.9); Smokeless tobacco use All students: 1.5% (95% CI 0.4,2.5); Marijuana use All students: 0.7% (95% CI 0,1.3)
Interventions	Theoretical approach: Not reported (Slick Tracy involved a "home team" approach. The Amazing Alternatives! Classroom Program was based on that used in a World Health Organization study and the Saving Lives Program.) Prevention approach: Universal Intervention: Sixth grade The Slick Tracy Home Team Program. Seventh grade The Amazing Alternatives! Program. Eight grade Powerlines. Programs included parent involvement/education programs, behavioural curricula, peer participation, and community task force activities. Individual resilience factors targeted: Social and emotional skills:"social-behavioural interventions ". Environmental resilience factors targeted: Home meaningful relationships: Intervention type (as assessed by reviewers): multi-dimensional"parent involvement program/education". Intervention duration: 7 years (Phase 1: Grade 6-8, interim phase: Grade 9-10, Phase 2: Grade 11-12). Control: Usual and other drug education programs

Outcomes	Substance use outcomes reported at follow up: Past month alcohol use; past week alcohol use; cigarette use; smokeless tobacco use; marijuana use; polydrug use Follow up data extracted for main analysis (duration of follow up): Phase 3 (immediate). Long term follow up data extracted (duration of follow up): Spring 1994 *Tobacco- lifetime* • Intervention: 24.80% (95% CI 20.2, 29.5) ; Control: 30.70% (95% CI 26.0, 35.4) *Alcohol-last 30 days* • Intervention: 23.6% (95% CI: 20.1, 27.1); Control: 29.20% (95% CI: 25.6, 32.8) *Marijuana- last year* • Intervention: 7.40% (95% CI: 4.4, 10.4); Control: 8.60% (95% CI: 5.5, 11.6) Number analysed (all outcomes): 1901 (not reported by group assumed equal numbers i.e. intervention n=951 and control n=951)
Notes	Quality of intervention delivery: 3 years of curriculum implementation in all intervention schools, parent participation in alcohol education activities, and participation by nearly half of the students in peer-planned alcohol free activities outside of school. Study data included meta-analysis?: Yes. Prevalence data and reported ICC used to calculate ORs for tobacco (lifetime), alcohol (last 30 days), marijuana (last year).

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.

Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	High risk	Attrition: 32%, with approximately equal attrition between treatment groups (51% v 49%). ITT: Not reported. Imputation of missing data: Not reported. Sample randomised 2351, sample analysed 3151
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.
Other potential study bias	Unclear risk	Recruitment bias: (Unclear) Unclear whether individuals were recruited to the trial before or after the clusters have been randomised. Baseline imbalance: (Unclear) Authors report evidence of baseline imbalance for alcohol use, age and ethnicity variables between groups. Analyses accounted for "race and baseline measures." Loss of clusters: (Low) No clusters were lost from the trial.

		Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account "Differences between the intervention and reference conditions were tested at baseline and at each follow up by means of mixed model regression methods (mixed model analyses of covariance), which can accommodate fixed effects, random effects, and correlated observations within assignment units found in community trial research.41The unit of randomization, the combined school district, was specified as a nested random effect"
Overall risk of bias	High risk 3/7	

Perry 2003[650-652]

Methods	Country: USA Setting(s): School and community; 24 Middle schools in Minnesota Program name: D.A.R.E. Plus Design: C-RCT (D.A.R.E Plus: schools-8; students-2221; D.A.R.E. only: schools-8; students-2226; Control: schools-8; students-1790) Aim: "The DARE PLUS project will demonstrate whether an expanded DARE at the middle/junior high school level, with supplementary components, can reduce tobacco, alcohol and marijuana use and violent behaviour among 7th and 8th grade students."
Participants	Baseline: 6237 Age: Not reported Gender: 51.6%M Baseline substance use: Alcohol use (past year prevalence) BOYS 1.31 (0.04) (control); 1.31 (0.03) (D.A.R.E); 1.29 (0.03) (D.A.R.E Plus) GIRLS 1.23 (0.03) (control); 1.27 (0.03) (D.A.R.E); 1.25 (0.03) (D.A.R.E Plus); Alcohol use (past month prevalence) BOYS 1.11 (0.02) (control); 1.10 (0.02) (D.A.R.E); 1.09 (0.02) (D.A.R.E Plus), GIRLS 1.08 (0.02) (control); 1.08 (0.02) (D.A.R.E); 1.08 (0.02) (D.A.R.E Plus); Prevalence of tobacco use (current smoker) BOYS 1.31 (0.04) (control); 1.31 (0.03) (D.A.R.E); 1.29 (0.03) (D.A.R.E Plus). GIRLS 1.31(0.07) (control); 1.35 (0.06) (D.A.R.E); 1.43 (0.06) (D.A.R.E Plus); Multiple drug use BOYS Behaviour and intentions: 25.34 (0.47) (control); 25.35 (0.46) (D.A.R.E); 25.22 (0.46) (D.A.R.E Plus), GIRLS Behaviour and intentions: 24.69 (0.53) (control); 25.03 (0.52) (D.A.R.E); 25.19 (0.52) (D.A.R.E Plus)

Interventions	Theoretical approach: "The Minnesota Drug Abuse Resistance Education (D.A.R.E) Plus project augmented the DARE curriculum with community, parent involvement, and extracurricular activity components." Prevention approach: Universal Intervention: The D.A.R.E. only condition did not meet eligibility criteria with respect to the individual/environmental protective factors, therefore only data from the D.A.R.E Plus and a control conditions were extracted. Besides the D.A.R.E curriculum, the D.A.R.E Plus intervention included a classroom-based, peer-led and parent-involvement program (called "On the VERGE"); neighbourhood action teams to address neighbourhood and school issues related to multidrug (ATOD) use and violent behaviour as well as youth-planned extracurricular activities for students. Individual resilience factors targeted: Social and emotional skills: "teach skills to…make friends". Environmental resilience factors targeted: Community participation: "neighbourhood action team", "create opportunities for adolescents for involvement in community change", "extracurricular activities" : community support: "community role models: school support: "develop supportive environment for young adolescents in school and at home"; home support: "parental involvement in 'home team' activities" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 2 years (Grades 7 to 8) Control: Received program after the study phase had concluded

Outcomes	Substance use outcomes reported at follow up: Past year alcohol use, past month alcohol use, ever drunk, current smoker
	Follow up data extracted for main analysis (duration of follow up): Grade 8 (immediate).
	Tobacco- current (continuous)
	• Growth Rate
	  ○ Boys intervention: 0.18 (SD: 0.05, p-value 0.02); Control: 0.31 (SD: 0.05, p-value 0.02)
	  ○ Girls intervention: 0.22 (SD: 0.07, p-value 0.25); Control: 0.28 (SD: 0.07, p-value 0.25)
	Alcohol- last year (continuous)
	• Growth Rate

	○ Boys intervention: 0.19 (SD: 0.03, p-value 0.04); Control: 0.26 (SD: 0.03, p-value 0.04); ○ Girls intervention: 0.23 (SD: 0.04, p-value 0.36); Control: 0.25 (SD: 0.04, p-value 0.36) Long term follow up data extracted (duration of follow up): n/a Number analysed (all outcomes): n=4743 (Intervention- D.A.R.E Plus- Boys: 1381, Girls: 1254; Control- Boys: 1093, Girls: 1015)
Notes	Quality of intervention delivery: D.A.R.E Plus "Of the 2,241 students in the overall sample, 65% participated in and/or planned at least one DARE Plus extracurricular activity. Among 1,165 boys 64% participated, and among 1,076 girls 67% participated. Participation rates for White students (n=1,462), African American students (n=179), Hispanic students (n=101), Asian American students (n=330), and American Indian students (n=78) were 68, 45, 58, 74, and 67%, respectively." Study data included meta-analysis?: No, measure unsuitable. Only continuous scores for alcohol (last year) and tobacco (current) reported.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.

assessment (detection bias)		
Incomplete outcome data (attrition bias)	Low risk.	Attrition: 16% attrition, with no differential attrition between treatment conditions for the main dependent variables. ITT: Not reported Imputation of missing data: Not reported. 4011 randomised, 4743 analysed.
Selective outcome reporting (reporting bias)	High risk.	Neither a study protocol or trial registry was available. Whilst the published papers do not report which outcomes were pre-specified, they do report the relevant "major outcomes" of the study to be tobacco, alcohol, marijuana and multidrug use. However marijuana and multidrug use are only reported as an aggregate measure of use and intentions to use, with no explanation.
Other potential study bias	Unclear risk.	Recruitment bias: (Unclear) Unclear whether randomisation took place before or after student recruitment. Baseline imbalance: (Low) Authors reported no evidence of baseline imbalance between conditions. Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account: "The 3-level, linear, random-coefficients model appropriately structures the data arising from a cluster sampling scheme and missing data."
Overall risk of bias	High risk. 3/7	

Piper 2000[653]

Methods	Country: USA

	Setting(s): School, family and community; 22 middle schools in Wisconsin Program name: Healthy for Life (HFL) Design: C-RCT (Intensive condition-7 schools; Age-appropriate condition-7 schools; Control-8 schools) Aim: "The Healthy for Life program was designed to positively influence the health behaviors of middle school students in five related areas: alcohol, tobacco and marijuana use, nutrition and sexuality."
Participants	Baseline: 2483 Age: Baseline-not reported Gender: 52% F Baseline substance use: Past month cigarette use Age Appropriate HFL: 4%; Intensive HFL: 5%; Control: 8%. Past month alcohol use Age Appropriate HFL: 9%; Intensive HFL: 9%; Control: 8%. Past month marijuana use Age Appropriate HFL: 0%; Intensive HFL: 1%; Control: 0%. Overall substance use scale Age Appropriate HFL: 16.0 (5.3); Intensive HFL: 16.1 (5.3); Control: 15.6 (2.1)
Interventions	Theoretical approach: Social influences model Prevention approach: Universal Intervention: The HFL intervention consisted of 4 components i.e. School Component, Peer Component, Family Component and Community Component. The School Component provided a 54-lesson curriculum delivered either in one sequential twelve-week block (the Intensive condition) or three four-week segments (the Age Appropriate condition) to an entire cohort of middle schoolers. The curriculum utilized teaching strategies considered most effective in the health promotion field for young adolescents to address their unique developmental and learning needs. The Peer Component went along with the School Component. Individual resilience factors targeted: Social and emotional competence: "social competency". Environmental resilience factors targeted: Home adult high expectations: "sharing of family values and ground rules"; home caring relationships: "communication between the young teens and one significant family member or other adult". Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 3 years (Grades 6-8) (*Age-Appropriate intervention arm* - 3 year duration; *Intensive intervention arm* - 12 week duration) were combined for analysis given randomised schools could select which intervention to implement).

	Control: Standard health education and prevention programs
Outcomes	Substance use outcomes reported at follow up: Past month cigarette use, past month alcohol use, past month marijuana use. Follow up data extracted for main analysis (duration of follow up): Grade 9 (1-2 year follow up) *Tobacco- last 30 days* • Intervention (Intensive arm): 22%; Intervention (age appropriate): 24% ; Control: 24% *Alcohol- last 30 days* • Intervention(Intensive): 33%; Intervention (age-appropriate): 33% ; Control: 28% *Marijuana- last 30 days* • Intervention (Intensive): 5%; Intervention (age-appropriate): 4% ; Control: 5% Number analysed (all outcomes): n=1981 (intervention n=1265, control n=716) Long term follow up data extracted (duration of follow up): Grade 10 (2-3 year follow up) *Tobacco- last 30 days* • Intervention (Intensive arm): 28%; Intervention (age appropriate): 36% ; Control: 30% *Alcohol- last 30 days* • Intervention(Intensive): 45%; Intervention (age-appropriate): 48% ; Control: 41% *Marijuana- last 30 days* • Intervention (Intensive): 8%; Intervention (age-appropriate): 12% ; Control: 10% Number analysed (all outcomes): n=1677 (intervention n=1071, control n= 606)
Notes	Quality of intervention delivery: Not reported Study data included meta-analysis?: Yes. Prevalence data and mean ICC used to calculate ORs for tobacco (last 30 days), alcohol (last 30 days), marijuana (last 30 days) outcomes. Data from both intervention arms were combined for analysis given randomisation between intervention arms was broken as schools could select which intervention approach to implement.
Risk of bias	
Bias	**Authors' judgement** **Support for judgement**

Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk	Outcome assessed via student self-report with "smoking behavior validated by assessing carbon monoxide levels" however this data is not reported. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: 20%, differential attrition between treatment groups not reported. ITT: Not reported. Imputation of missing data: Students with missing data at follow up excluded from analysis. 2483 randomised, 1656 analysed.
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.

Other potential study bias	High risk	Recruitment bias: (Low) Individuals were recruited to the trial before the clusters have been randomised. Baseline imbalance: (Low) Authors report evidence of baseline imbalance on demographic variables living with two parents, parental education and mother's full time work – all of which were included in multivariate analyses. Loss of clusters: (High) One of the 14 intervention schools dropped out after baseline data collection (as a result data from 59 students were excluded from all analyses). Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account: "design effect was taken into account in our analyses by using hierarchical linear modelling"
Overall risk of bias	High risk 3/7	

Roberts 2011[654]

Methods	Country: Australia Setting(s): School and family; Government Primary Schools in a Western Australia education district Program name: Aussie Optimism Program (AOP) Design: C-RCT (AOP training: 20 schools; Students: 736. AOP training + coaching: 22 schools; Students: 693. Control: 21 schools; students: 594) Aim: "To investigate the impact of Aussie Optimism Program (AOP) in limiting substance use in young adolescents transitioning to high school."
Participants	Baseline: 3288 Age: AOP training: 10.91 (SD: 0.32); AOP training + coaching: 10.91 (SD: 0.34); Control: 10.93 (SD: 0.33) Gender: AOP training: 368 male; 368 female. AOP training + coaching: 366 male; 327 female. Control: 304 male; 290 female

	Baseline substance use: Tobacco use 2.2% Alcohol use 11.5%
Interventions	Theoretical approach: Social and cognitive life skills Prevention approach: Universal Intervention: This was a multi-arm intervention with 2 intervention groups and a control group. Both intervention arms met the eligibility criteria for the review and the data from which were extracted. AOP incorporates social and cognitive life skills for the students. To enhance family protective factors, the parents were offered a self-directed Parents and families program. Ten SLS weekly modules delivered in Grade 6, and 10 weekly Optimistic Thinking Skills (OTS) modules in Grade 7 as part of the regular Health Education curriculum. AOP for Families and Parents was sent home to families in the second half of Grade 7. Teachers taught one 60-minute module per week. The AOP training + coaching included the same 16 hours of teacher training with the addition of four 1-hour coaching sessions per year over the two years of the program implementation. Individual resilience factors targeted: Cooperation and communication: "communication skills", Problem solving/decision making: "social problem solving"; "decision making", Coping: "coping skills", Social and emotional skills: "social skills"; "Identification of thoughts"; "Identification of feelings". Environmental resilience factors targeted: Home meaningful participation: "Working together as a family", Home caring relationships: "adolescent/parent communication" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 2 years i.e. 10 weekly modules (each) in Grade 6 and Grade 7 Control: Standard health education lessons
Outcomes	Substance use outcomes reported at follow up: Tobacco use, alcohol use Follow up data extracted for main analysis (duration of follow up): Grade 7 (immediate) *Tobacco- 30 days* • Intervention (AOP): 3.30%; Intervention (AOP+): 2.20%; Control: 2.20% *Alcohol- 30 days* • Intervention (AOP): 18.50%; Intervention (AOP+): 12.10%; Control: 17.60%

	Number analysed (all outcomes): n=1330 (intervention n=736; control n=297) Long term follow up data extracted (duration of follow up): Grade 8 (1 year follow up) *Tobacco- 30 days* • Intervention (AOP): 5.70%; Intervention (AOP+): 2.90%; Control: 6.10% *Alcohol- 30 days* • Intervention (AOP): 31.30%; Intervention (AOP+): 28.10%; Control: 34.20% Number analysed (all outcomes): n=1225 (intervention n=693 (AOP); control n=297)	
Notes	Quality of intervention delivery: "In 2003, 61 teachers in the AOP training condition implemented an average of 9.16 (SD = 2.02) SLS modules with fidelity in 2003, and 54 teachers in the training/coaching condition implemented an average of 9.24 (SD = 1.74) modules with fidelity. In 2004, 52 teachers in the AOP training condition implemented an average of 7.92 (SD = 3.25) OTS modules with fidelity and 48 teachers in the training/coaching condition implemented an average of 8.06 (SD = 3.56) modules with fidelity. There were no significant group differences in implementation dose for SLS [t(113) = −0.217, p =.83] or OTS [t(98) = −0.205, p = .84]. The dose for the self-directed P&F program was difficult to calculate as the majority of families did not return their logbooks." Study data included meta-analysis?: Yes. Given study reported results for two intervention arms and a control group, data from the control group was divided in two and split across both intervention arms for analysis. Resulting prevalence data and mean ICC was used to calculate ORs for tobacco (30 days) and alcohol (30 days) outcomes.	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence	Unclear risk.	Not reported.

concealment (selection bias)		
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: 11% (Grade 7), and similar attrition between control and intervention groups (i.e. 13% for AOP + coaching condition, 15% for AOP condition and 6% for control). ITT: Not reported. Imputation of missing data: Students with missing data excluded from analysis. 2333 students randomised, 1694 analysed.
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified.
Other potential study bias	High risk	Recruitment bias: (Unclear) Unclear whether randomisation took place before or after student recruitment. Baseline imbalance: (High) Authors report baseline imbalance between groups for child's ethnic origin, father's occupation and family status. Analyses did not account for these variables.

	Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account: "Logistic regression models were fitted for each of the two binary outcomes (smoke [yes/no]; drink [yes/no]) at post-test and follow up…Intra-school clustering was controlled by using a sandwich estimator for the standard errors"
Overall risk of bias	High risk 3/7

Shek 2012[655-657]

Methods	Country: Hong Kong Setting(s): School; 48 junior secondary schools in Hong Kong Program name: P.A.T.H.S. (Positive Adolescent Training through Holistic Social Programmes) Design: C-RCT (24 experimental schools and 24 control schools) Aim: "The present study examined the longitudinal impact of Project P.A.T.H.S. (Positive Adolescent Training through Holistic Social Programmes) on adolescent developmental outcomes in Hong Kong."
Participants	Baseline: Not reported Age: 12 Gender: 52.1%M (intervention 53.2%; control 51.0%) Baseline substance use: Alcohol use not reported; Tobacco use not reported; Ketamine use not reported; Cannabis use not reported; Organic solvent not reported; Pills (methaqualome and ecstasy use) not reported; composite score of commercially available substances (CAS) not reported; scale score of substance use not reported; IPS (use of illegal drugs: ketamine, cannabis, ecstasy, and heroin) not reported.
Interventions	Theoretical approach: Positive youth development approach Prevention approach: Universal and selective Intervention: Two tiers of programs in the project. Tier 1 program is a universal curriculum-based program developed upon 15 positive youth development constructs which included bonding, resilience, social competence, recognition of positive behaviour, emotional competence,

	cognitive competence, behavioural competence, moral competence, self-determination, self-efficacy, clear and positive identity, beliefs in the future, prosocial involvement, prosocial norms, and thriving. Tier 2 program is a selective approach targeting students who have greater psychosocial needs. Individual resilience factors targeted: Social and emotional competence: "social competence", "emotional competence";Academic achievement: "cognitive competence";Self-regulation: "behavioural competence"; Moral competence: "moral competence"; Self-efficacy: "self-efficacy"; Religiosity: "spirituality. Environmental resilience factors targeted: Pro-social peers: "pro-social involvement", "pro-social norms" Intervention duration: 3 years Intervention type (as assessed by reviewers): 'resilience' Control: Not reported
Outcomes	Substance use outcomes reported at follow up: Alcohol use; Tobacco use; Ketamine use; Cannabis use; Organic solvent; Pills (methaqualome and ecstasy use). Follow up data extracted for main analysis (duration of follow up): Wave 6 (immediate) *Cannabis use – frequency last 6 months* • Growth curve analysis: Group had a significant effect on the linear slope (β = -0.004, SE = 0.002, p = 0.04, one-tailed test) Number analysed (all outcomes): 7846 (Wave 1); 6733 (Wave 6) Long term follow up data extracted (duration of follow up): Wave 8 (2 years) *Illegal drug use – frequency last 6 months* • Growth curve analysis: Group had a significant effect on the linear slope (β = -0.01, SE = 0.004, $p < 0.05$) Number analysed (all outcomes): 7846 (Wave 1); 6492 (Wave 8)
Notes	Quality of intervention delivery: Not reported Study data included meta-analysis?: No, reported data unsuitable. No suitable data could be extracted from growth curve analysis results for synthesis in meta-analysis. Individual measures of tobacco and alcohol use were not reported (only composite measures).
Risk of bias	

Bias	Authors' judgement	Support for judgement
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk	Authors report the purpose of the study was mentioned at pre and post-test to participants, however do not report on whether participants or personnel were blind to treatment allocation. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk	Authors report the purpose of the study was mentioned at pre and post-test to participants. Outcome assessed via self-report. Reviewers deemed the measurement of all included substance use outcomes to be influenced by a lack of blinding given blinding not possible.
Incomplete outcome data (attrition bias)	High risk	Attrition: 14.2% (1113 missing at Wave 7), with differential attrition between treatment groups (26% intervention, 2% control). ITT: Not reported. Imputation of missing data: Missing data were handled via listwise deletion.

Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified. Results for all outcomes as per methods of identified papers are reported
Other potential study bias	High risk	Recruitment bias: (Unclear) Unclear whether individuals were recruited to the trial before or after the clusters were randomised. Baseline imbalance: (Low) Authors report baseline imbalance between groups for participant age. Analyses accounted for participant age. Loss of clusters: (High) Five of 24 intervention schools dropped out before follow up. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account: "Longitudinal data are considered as a two-level hierarchical model in which time is nested within individuals"
Overall risk of bias	High risk 4/7	

Shortt 2007[658, 659]

Methods	Country: Australia Setting(s): School and family; 24 Government and Catholic secondary schools (catering for Grade 7-12) in Melbourne Program name: Resilient Families Design: C-RCT (24 schools-12 intervention and 12 control; Students-1110 intervention and 1218 control) Aim: "….examine assumptions underlying the Resilient Families programme about the influence of family factors relative to peer, school and individual factors on the development of alcohol use in early secondary school…"
Participants	Baseline: 2315 Age: 12.3 (Year 7)

	Gender: 57%F Baseline substance use: Alcohol use-lifetime 33%, frequent use 26%, heavy use 9%; Lifetime cigarette smoker 8%
Interventions	Theoretical approach: Social environment intervention strategies Prevention approach: Universal Intervention: The program consists of five components; these include "Student curriculum", "Parenting Adolescents Quiz", "Parenting Adolescents: A Creative Experience" (PACE), "Building a Community of Parents", and a handbook for parents with strategies to help them help their adolescents thrive in school and life. The Curriculum consists of 45-minute sessions by teachers and focuses on communication, emotional awareness, peer-resistance skills, conflict resolution and problem-solving. Individual resilience factors targeted: Problem solving/decision-making- "problem solving". Cooperation and communication- "communication". Social and emotional skills "emotional awareness" Environmental resilience factors targeted: Home caring relationships "positive relationship between parents and their adolescents" Intervention duration: 2 years (Grade 7-8) Intervention type (as assessed by reviewers): multi-dimensional Control: Standard health education classes
Outcomes	Substance use outcomes reported at follow up: Alcohol use-lifetime, frequent use, heavy use Follow up data extracted for main analysis (duration of follow up): Wave 3-Grade 9 (immediate) *Alcohol- lifetime use* • Intervention: 71% (n=785); Control (n=872): 74%; OR: 0.78 (95% CI 0.62, 0.97) Number analysed: n=2285 (intervention n=1106, control n=1179) Long term follow up data extracted (duration of follow up): n/a
Notes	Quality of intervention delivery: "Ten schools delivered the curriculum in either Term 2, 3 or 4 during 2004 and two schools chose to implement the program with their Year 8 students during Terms 1 and 2 in 2005." "Two hundred and sixteen parents/carers from 176 families with children attending the 12 intervention schools attended a quiz." "A total of 16 PACE groups were conducted." Study data included meta-analysis?: Yes. Adjusted ORs (95% CI) were used for alcohol (lifetime) outcome.

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk	Method of random sequence generation not reported. "The approached schools were randomly sampled using a probability proportionate to grade-level size procedure from a separate project, the International Youth Development Study (IYDS) [24]."
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk	Authors report blinding of participants was not possible. Participants were likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, and blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: 2%, no differential attrition between treatment groups (intervention <1%, control 3%) ITT: Not reported. Imputation of missing data: Missing data imputed with no differential results compared with case wise deletion of missing data. 2328 randomised, 2285 analysed

Selective outcome reporting (reporting bias)	High risk	Trial registry states that past month and year tobacco, alcohol and drug use outcomes will be assessed annually. Identified studies do not report any outcomes for tobacco or drug use.
Other potential study bias	Unclear risk	Recruitment bias: (Unclear) Unclear whether individuals were recruited to the trial before or after the clusters were randomised. Baseline imbalance: (Unclear) Not reported. Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account: "Analyses used the STATA svy command to adjust for within-school clustering of classroom responses."
Overall risk of bias	High risk 3/7	

Simons-Morton 2005[660, 661]

Methods	Country: USA Site: School and family; 7 middle schools (catering for Grades 6 to 8) in one Maryland school district Program name: Going Places Program Design: C-RCT (3 intervention schools and 4 control schools) Aim: "This study evaluated the effects of a school-based intervention on growth trajectories of smoking, drinking, and antisocial behavior among early adolescents."
Participants	Baseline: 2231 Age: not reported (Grade 6) Gender: 43.2%M, 56.8%F

	Baseline substance use: Smoking stage mean 0.19 (SD: 0.60) Drinking stage mean 0.35 (SD: 0.85)
Interventions	Theoretical approach: Social cognitive theory Prevention approach: Universal Intervention: The Program includes a social skills curriculum, parent education, and school environment enhancement designed to increase academic engagement and commitment to school; alter perceptions, attitudes, and expectations about substance use and antisocial behaviour; and reduce multiple problem behaviours. The curriculum sessions focus on problem solving, self-control, communication, and conflict resolution skills. Eighteen sessions in the sixth grade, 12 in the seventh grade, and six in the eighth grade. Individual resilience factors targeted: Problem solving/decision making- "problem solving". Cooperation and communication- "communication". Self-control- "self-control". Social and emotional skills- "social skills", "conflict resolution skills". Environmental resilience factors targeted: Home support- "parental involvement" School meaningful participation- "school climate", "establish positive image for the school", "reinforce student achievement" "school engagement". Pro-social peers- "Prosocial norms". Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 3 years (Grades 6-8) Control: not reported
Outcomes	Substance use outcomes reported at follow up: Smoking stage, drinking stage Follow up data extracted for main analysis (duration of follow up): Time 4 (T4) – end Grade 8 (immediate) *Tobacco- smoking stage (continuous)* • Intervention: 0.80 (SD=1.26); Control: 0.95 (SD=1.32) *Alcohol- drinking stage (continuous)* • Intervention: 1.36 (SD= 1.38); Control: 1.32 (SD= 1.36) Number analysed (all outcomes): n= 1465 (intervention n=773, control n=692) Long term follow up data extracted (duration of follow up): Time 5 (Grade 9) *Alcohol- drinking stage (continuous)* • Intervention: 1.47 (SD= 1.40); Control: 1.51 (SD= 1.45)

	Tobacco- smoking stage (continuous) • Intervention: 0.85 (SD=1.32); Control: 1.11 (SD=1.50) Number analysed (all outcomes): n= 1465 (intervention n=773, control n=692)	
Notes	Quality of intervention delivery: "Teachers reported completing 95% of the lessons sixth grade and 84% in the seventh grade." Study data included meta-analysis?: No, measure unsuitable. Only continuous measures of tobacco (smoking stage) and alcohol (drinking stage) were reported. Results are described narratively.	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.

Incomplete outcome data (attrition bias)	High risk	Attrition: 40.8%, no differential attrition by treatment group ITT: Not reported. Imputation of missing: Students who were absent or missed an assessment were excluded from analysis. 2231 randomised, 1320 analysed.
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified. Results for all outcomes as per methods of identified papers are reported.
Other potential study bias	High risk	Recruitment bias: (High) Unclear whether schools were randomised prior to student recruitment for 1st cohort, however recruitment of 2nd cohort occurred following school randomisation. Baseline imbalance: (Low) Authors report baseline imbalance between groups for average smoking stage. Outcomes at baseline were included as covariates in analysis. Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis: (Low) Didn't account for clustering in final analyses as "smoking stage was not significantly different among schools".
Overall risk of bias	High risk 4/7	

Skarstrand 2014[662]

Methods	Country: Sweden Setting(s): Schools and family; 19 elementary schools in Stockholm municipality Program name: The Strengthening Families Programme 10–14 (SFP 10–14)

	Design: C-RCT (10 intervention schools and 9 control schools) Aim: "The overall aim of the SFP 10-14 is to delay the initiation of substance use and other problem behaviours among adolescents. The goal of each session is to reduce risk factors and to enhance protective factors on the family level as well as the individual level."
Participants	Baseline: 521 Age: 12 years (6th Grade) Gender: Boys Intervention 189 (50.9%) Control 103 (47.7%). Girls Intervention 182 (49.1%) Control 113 (52.3%) Baseline substance use: Tobacco use Intervention- 1%; Control- 3.2%; Drunkenness lifetime Intervention- 7.5%; Control- 7.1%;Drunkenness past 30 days Intervention- Mean: 0.02 (SD=0.1); Control- 0.05(0.3). Illicit drug use lifetime Intervention- 0.6%; Control- 1%;
Interventions	Theoretical approach: The SFP 10–14 (directed at children between the ages of 10–14 years and their parents) has been developed based on several theoretical models: the bio psychosocial vulnerability model, a resiliency model and a family process model linking economic stress and adolescent adjustment. Prevention approach: Universal Intervention: The Swedish version was to a large extent similar in content to the original SFP 10–14, except for some of the family session topics, which were omitted. The youth sessions included role-playing, peer resistance training and other practical skills training in a game-like fashion. The parent sessions were based on video films that illustrated typical interactions between parents and youth. Both parts of the program closed with a family session including family projects as well as festivities. In the second part, we also added some material from our own production targeted to enhance the alcohol and drug content. The program was manual and video based (parent sessions), and we translated all the materials accordingly. Individual resilience factors targeted: Co-operation and communication "communication skills"; Self-regulation: "be aware of the importance of rules and consequences"; Social and emotional skills: "ability to handle stress and to understand feelings". Environmental resilience factors targeted: Home adult high expectations: "ability to set appropriate rules and limits"; Home caring relationships: "how to be supportive…" Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 2 years

	Control: not reported.
Outcomes	Substance use outcomes reported at follow up: Tobacco use. Drunkenness lifetime. Drunkenness past 30 days. Illicit drug use lifetime. Follow up data extracted for main analysis (duration of follow up): 1-year follow up (1 year): *Tobacco- current smoker* • Intervention: 5.7% ; Control: 7.0%; OR: 1.01 (95% CI 0.36, 2.81) *Alcohol- lifetime drunkenness* • Intervention: 16.7%; Control: 13.2%; OR: 1.39 (95% CI 0.65, 2.96) *Illicit- lifetime* • Intervention: 3.8%; Control: 3.7%; OR: 1.00 (95% CI 0.32, 3.14) Number analysed (all outcomes): 508 Long term follow up data extracted (duration of follow up): 3-year follow up (3 years) *Tobacco- current smoker* • Intervention: 20.8%; Control: 16.6%; OR: 1.13 (95% CI 0.57, 2.26) *Alcohol- lifetime drunkenness* • Intervention: 49.3%; Control: 44.2%; OR: 1.00 (95% CI 0.55, 1.84) *Illicit- lifetime* • Intervention: 6.5%; Control: 7.5%; OR: 0.77 (95% CI 0.31, 1.91) Number analysed (all outcomes): 447
Notes	Quality of intervention delivery: Not reported. Study data included meta-analysis?: Yes. Adjusted ORs (95% CI) were used for tobacco (current smoker), alcohol (lifetime drunkenness) and illicit substance use (lifetime use of any illicit substance) outcomes.
Risk of bias	
Bias	**Authors' judgement** **Support for judgement**

Sequence generation (selection bias)	Unclear risk.	The method of random sequence generation is not reported.
Allocation sequence concealment (selection bias)	Unclear risk.	Not reported.
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: All participants at follow up 1:20.25% (13.74% intervention, 29.32% control. Authors report no differential attrition between treatment groups "The interaction terms between intervention condition and baseline characteristics of the students were not statistically significant for any variable (data not shown), indicating that patterns of missingness were similar across experimental conditions." ITT: Yes Imputation of missing: Yes sensitivity analysis conducted on imputed datasets.

Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified. Results for all outcomes as per methods of identified papers are reported.
Other potential study bias	Low risk	Recruitment bias: (Unclear) Unclear whether schools were randomised prior to student recruitment. Baseline imbalance: (Low) There was baseline equivalence between the intervention and control group for almost all the socio-demographic characteristics except parents' education. Models did not account for parent education. Loss of clusters: (Low) Three schools declined following randomization (1 x intv and 2 x control) but prior to baseline data collection Incorrect analysis: (Low) "Data were analysed using multilevel models with an intention-to-treat approach"
Overall risk of bias	Low risk 2/7	

Spoth 2002[663-665]

Methods	Country: USA Site: School and family; 36 middle schools (catering for Grades 6-8) in 22 contiguous counties in a Midwestern state Program name: Life Skills Training (LST) and the Strengthening Families Program: For Parents and Children 10–14 Design: C-RCT [School: 36 schools (SFP 10-14= 12 schools, LST & control= not reported)] Aim: "This study evaluated the substance initiation effects of an intervention combining family and school based competency-training intervention components."
Participants	Baseline: 1664

	Age: not reported (Grade 7) Gender: 53%M (LST+SFP-53.5%M; Control-51.7%M) Baseline substance use: Lifetime alcohol use (new users) LST + SFP 10-14: 57.5%; Control: 46.9% Lifetime cigarettes use (new users) LST + SFP 10-14: 26.9%; Control: 17% Lifetime marijuana use (new users) LST + SFP 10-14: 3%; control: 2.1%
Interventions	Theoretical approach: Strengthening Families Program: For Parents and Youth 10-14 (SFP 10-14)-biopsychosocial model and other empirically based family risk and protective factor models. Life Skills Training (LST)-social learning theory and problem behaviour theory Prevention approach: Universal Intervention: The LST only condition did not meet the eligibility criteria with respect to the environmental protective factors, therefore only data from the SFP 10-14 + LST and a control conditions were extracted. Seven SFP 10–14 program sessions were conducted in the evenings once each week for 7 consecutive weeks, youth were in the second semester of seventh grade. Each session included a separate 1-hr parent and youth skills-building curriculum, followed by a 1-hr family curriculum during which parents and youth practiced the skills learned in their sessions. Four booster sessions in the eighth grade, 1 year after the initial SFP 10–14 sessions. The LST was a 15-session program conducted during 40- to 45-min classroom periods when students were in the seventh grade. Individual resilience factors targeted: Social and emotional skills- “social skills”, “adolescent social skill development”. Self-control- “self-management” Environmental resilience factors targeted: Home caring relationships- parent-child interactions. Pro-social peers-“youth pro-social skills” Intervention type (as assessed by reviewers): multi-dimensional Intervention duration: 2 years (Intervention delivered in Grade 7 with booster sessions conducted 1 year later) Control: not reported
Outcomes	Substance use outcomes reported at follow up: Lifetime alcohol use (new users), Lifetime cigarettes use (new users), Lifetime marijuana use (new users). Follow up data extracted for main analysis (duration of follow up): Posttest (immediate) *Tobacco- prevalence* • Prevalence new users: Intervention: 12.1%; Control: 16.7%; F(1,21): 1.62

	• Prevalence of lifetime use (intervention 26.9%, control 17.0%) and number of participants at pretest (intervention=549, control=494) and posttest used to calculate prevalence of all participants at posttest *Alcohol- prevalence* • Prevalence new users: Intervention: 25.7%; Control: 36.7%; F(1,21): 4.47, p≤0.05 • Prevalence of lifetime use (intervention 57.5%, control 46.9%) and number of participants at pretest (intervention=549, control=494) and posttest (intervention= 517, control= 463) used to calculate prevalence of all participants at posttest *Marijuana- prevalence* • Prevalence new users: Intervention: 4.1%; Control: 7.9%; F(1,21): 4.84, p≤0.05 • Prevalence of lifetime use (intervention 3.0%, control 2.1%) and number of participants at pretest (intervention=549, control=494) and posttest (intervention= 517, control= 463) used to calculate prevalence of all participants at posttest Number analysed (all outcomes): 980 (517 Intervention 463 Control) Long term follow up data extracted (duration of follow up): n/a
Notes	Quality of intervention delivery: Not reported Study data included meta-analysis?: Yes. Estimated prevalence data and mean ICC used to calculate ORs for tobacco, alcohol and marijuana use. Long term follow up data was not suitable for inclusion in meta-analysis (growth curve analysis and mean initiation data reported)

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk	Method of random sequence generation not reported. "A randomised block design guided the assignment of the 36 schools to the three experimental conditions."
Allocation sequence	Low risk	Central allocation: "After we matched the schools and randomly assigned them to conditions, we contacted school officials and informed them of the experimental condition to which their schools had been assigned."

concealment (selection bias)		
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: <1% (intervention 1%, control <1%) ITT: Not reported Imputation of missing data: Not reported. 1094 randomised, 797 analysed.
Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified. Results for all outcomes as per methods of identified papers are reported.
Other potential study bias	Unclear risk	Recruitment bias: (Unclear) Unclear whether individuals were recruited to the trial before or after the clusters were randomised. Baseline imbalance: (Low) Authors report baseline imbalance between groups for proportion of dual biological parents – which was included as a covariate in all outcome analyses.

	Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account: "We used a multilevel (mixed model) analysis of covariance (using SAS Proc Mixed with restricted maximum likelihood estimation and listwise deletion of missing data)"
Overall risk of bias	Unclear risk 2/7

Spoth 2007[666-668]

Methods	Country: USA Setting(s): School and family; twenty-eight public school districts in Iowa and Pennsylvania (middle schools- catering to Grades 6-8) Program name: PROSPER (PROmoting School-community-university Partnerships to Enhance Resilience) Design: C-RCT (14 intervention and 14 control school districts) Aim: "The study's objective was to examine the effects of "real-world," community-based implementation of universal preventive interventions selected from a menu, including effects specific to higher- and lower-risk subsamples."
Participants	Baseline: 10850 (5516 Intervention; 5334 Control) Age: not reported (Grade 6) Gender: 51%F Baseline substance use: Lifetime illicit substance use index not reported; substance initiation index: gateway not reported; new user: alcohol drinking not reported; new user: drunkenness not reported; new user: cigarette use not reported; new user: marijuana use not reported; new user: inhalant use not reported; new user: methamphetamine use not reported; new user: ecstasy use not reported; past month drunkenness not reported; past month cigarette smoking not reported; past year marijuana use not reported; past year use of inhalants not reported; past year use of methamphetamines not reported; frequency of drunkenness not reported; frequency of marijuana use not reported

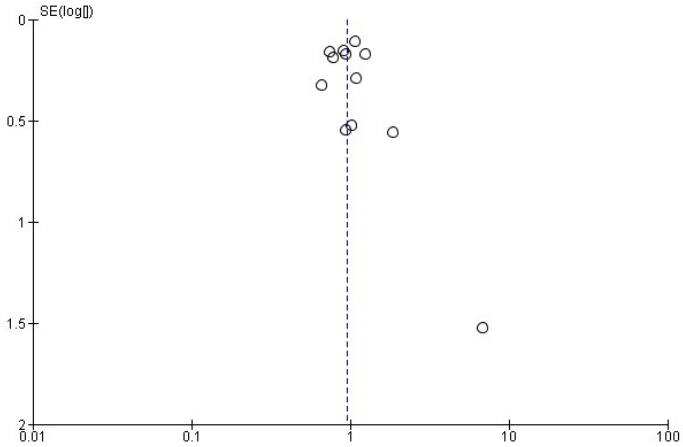
Interventions	Theoretical approach: Strengthening Families Program: For Parents and Youth 10-14 (SFP 10-14)-biopsychosocial model and other empirically based family risk and protective factor models. Life Skills Training (LST)-social learning theory and problem behaviour theory. Project ALERT health belief model, social learning model, and self-efficacy theory of behaviour change. All Stars social learning theory and problem behaviour theory Prevention approach: Universal Intervention: Community teams chose from a menu of Evidence-based Interventions (EBIs) in the first and second year of the program; they were school- and family focused interventions. All 14 teams chose SFP 10-14 in the first year and in the second year of the program LST, Project ALERT and All Stars were selected. *Strengthening Families Program* "The seven SFP 10–14 program sessions were conducted once each week for 7 consecutive weeks when the youth were in the 2nd semester of sixth grade. Each session included a separate, concurrent 1-hr parent and youth skills-building curriculum, followed by a 1-hr conjoint family curriculum in which parents and youth practiced skills learned in their separate sessions." *Life Skills Training* 15-lesson universal preventive intervention program with a design. "Students are trained in the various LST skills through the use of interactive teaching techniques, plus homework exercises and out-of-class behavioral rehearsal." *Project ALERT* "Project ALERT uses interactive teaching methods…The 11-session program was conducted during regular classroom periods when students were in seventh grade." *All Stars* "The All Stars program is interactive….is designed to reinforce positive qualities typical of adolescents at this age through strengthening five specific qualities: developing positive ideals and future aspirations, establishing positive norms, building strong personal commitments, promoting bonding with school and community organizations, and promoting positive interactions with parents. The 13-session program was conducted during regular classroom periods when students were in seventh grade." Individual resilience factors targeted: Social and emotional skills- "prosocial skills" (SFP), "promote skill development" (e.g. general social skills) (LST) Environmental resilience factors targeted: Home adult expectations- "limit setting" (SFP), Home caring relationships- "parental skills in nurturing,…and communication" (SFP), School meaningful participation- "increase student school bonding" (All Stars) Intervention duration: 2 years (Grades 6-7) Intervention type (as assessed by reviewers): multi-dimensional

	Control: Usual program
Outcomes	Substance use outcomes reported at follow up: Lifetime illicit substance use index; substance initiation index: gateway; new user: alcohol drinking; new user: drunkenness; new user: cigarette use; new user: marijuana use; new user: inhalant use; new user: methamphetamine use; new user: ecstasy use; past month drunkenness; past month cigarette smoking; past year marijuana use; past year use of inhalants; past year use of methamphetamines; Frequency of drunkenness; Frequency of marijuana use Follow up data extracted for main analysis (duration of follow up): Grade 7 (1.5 years past baseline/immediate). *Tobacco- past month user rates* • Intervention 0.0659 (0.0067); Control 0.0835 (0.008); F(1,12)= 3.48, *p*<0.10; individual effect size 0.25 *Alcohol- past month user rates* • Intervention 0.1785 (0.0111); Control 0.1929 (0.0117); F(1,12)=0.99; individual effect size 0.09 *Marijuana- past year user rates* • Intervention 0.0280 (0.004); Control 0.0481 (0.0061); F(1,12)=19.90, *p*<0.01; individual effect 0.53 Number analysed (all outcomes): 10781 (5500 Intervention, 5281 Control) Long term follow up data extracted (duration of follow up): Grade 12 (6.5 year past baseline/5 years) *Tobacco- past month* • Intervention: 0.33; Control: 0.37; F(1,72)= 3.32, *p*= 0.036; RRR 11.3% *Alcohol- past month drunkenness* • Intervention: 0.41; Control: 0.44; F(1,72)= 1.40, *p*=0.120; RRR 5.9% *Marijuana- past year* • Intervention: 0.35; Control: 0.39; F(1,72)=3.30, *p*= 0.036; RRR 8.0% Number analysed (all outcomes): 7784 (3752 Intervention, 4032 Control)
Notes	Quality of intervention delivery: Family intervention "Across both cohorts, 21.2% (N = 1,334) of families signed up and 16.9% attended at least one session (Cohort 1 = 17.5%, Cohort 2 = 16.3%)." School-based intervention "Across both cohorts, the implementation adherence rates for LST, Project Alert, and All Stars were 89%, 89%, and 91%, respectively."

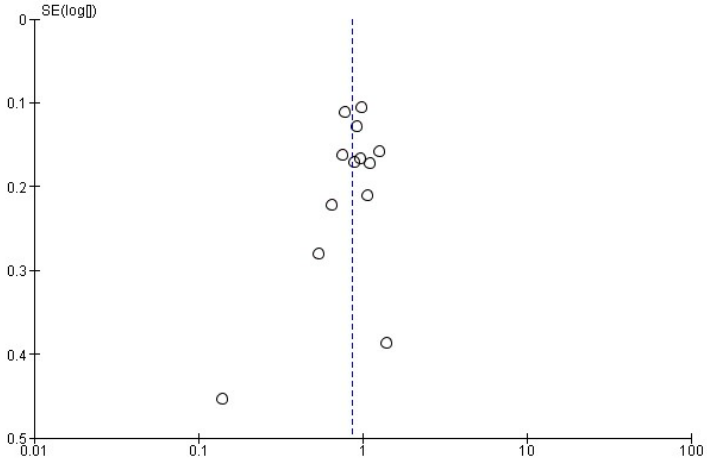
	Study data included meta-analysis?: Yes. Prevalence data at 7th and 12th grade and mean ICC used to calculate ORs for tobacco (past month), alcohol (past month drunkenness), and marijuana (past month) outcomes.	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Sequence generation (selection bias)	Unclear risk	Method of random sequence generation not reported.
Allocation sequence concealment (selection bias)	Low risk	Central allocation: "School districts were informed of their assignment to condition after they enrolled."
Blinding of participants and personnel (performance bias)	High risk.	No information is provided regarding blinding of participants or personnel. However given the nature of the intervention, likely that participants and personnel were aware of allocation to intervention group and likely to be influenced by knowledge of allocation.
Blinding of outcome assessment (detection bias)	High risk.	Outcomes were self-reported by students, therefore blinding not possible. Measurement of all included substance use outcomes likely to be influenced by a lack of blinding.
Incomplete outcome data (attrition bias)	Low risk	Attrition: 10.3%, report no differential attrition between treatment groups (9.7% intervention, 11.0% control) ITT: Yes Imputation of missing data: Not reported.

Selective outcome reporting (reporting bias)	Unclear risk	Neither a study protocol or trial registry was available, nor did published reports indicate which outcomes were pre-specified. Results for all outcomes as per methods of identified papers are reported with two exceptions which authors justify based on small prevalence rates. “The survey included past month and past year items for drunkenness and marijuana use. Due to small past month prevalence rates, however, only past year measures were analyzed in the current study. Similarly, the survey included an item assessing the use of methamphetamine in the past year, but the rate was less than 1% so this item was not analysed ”
Other potential study bias	Unclear risk	Recruitment bias: (Unclear) Unclear whether individuals recruited before or after randomisation of clusters. Baseline imbalance: (Low) Authors report there was no evidence of baseline imbalance between groups. Loss of clusters: (Low) No clusters were lost from the trial. Incorrect analysis (cluster): (Low) Appropriate method of analysis where clustering taken into account - “Multilevel model (two level—school and individual) analyses of covariance using SAS PROC MIXED 9.1.3”
Overall risk of bias	Unclear risk 2/7	

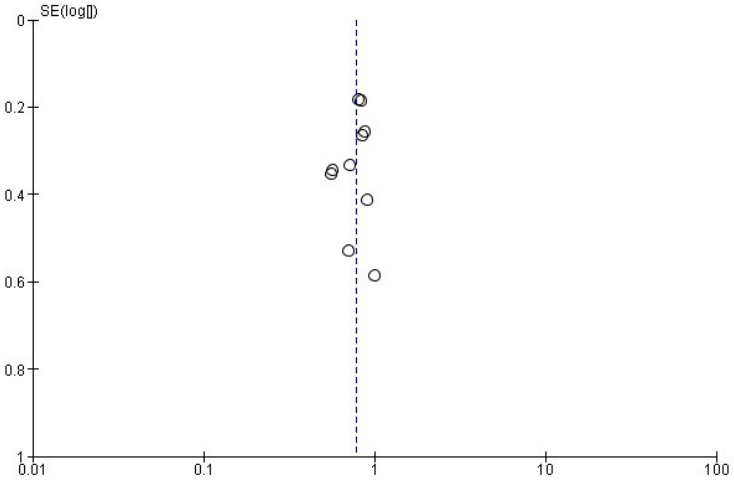
APPENDIX 3.5. Funnel plots



Tobacco use



Alcohol use

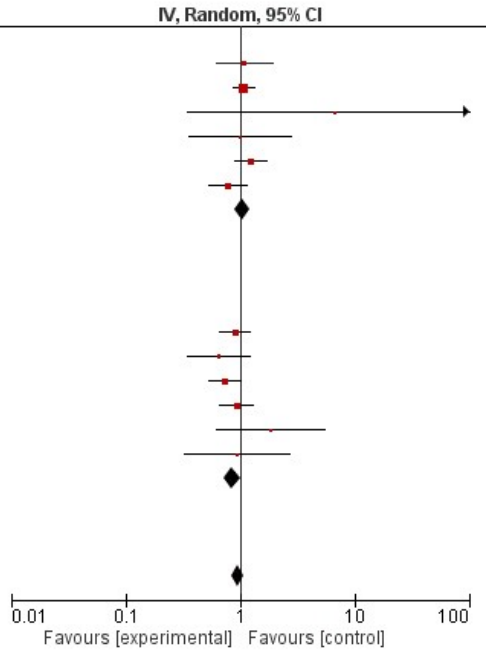


Illicit substance use

APPENDIX 3.6. Tobacco use sensitivity and subgroup analyses forest plots

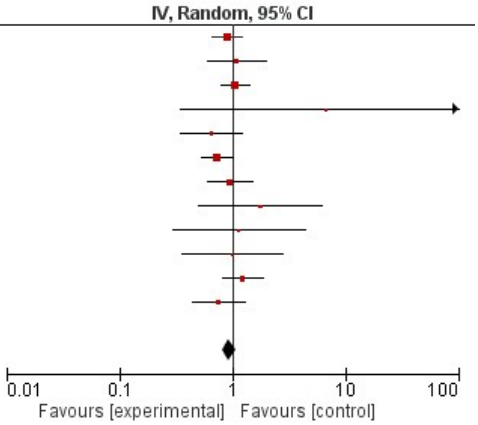
Sensitivity analysis: Excluding studies at high risk of bias

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
1.7.1 Low or unclear risk				
Brown 2005	0.0858	0.293	4.4%	1.09 [0.61, 1.93]
Eisen 2003	0.0704	0.1132	25.3%	1.07 [0.86, 1.34]
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Skärstrand 2014	0.01	0.5221	1.4%	1.01 [0.36, 2.81]
Spoth 2002	0.2146	0.1719	12.2%	1.24 [0.88, 1.74]
Spoth 2007	-0.245	0.1914	10.0%	0.78 [0.54, 1.14]
Subtotal (95% CI)			**53.5%**	**1.05 [0.90, 1.23]**
Heterogeneity: Tau² = 0.00; Chi² = 4.85, df = 5 (P = 0.43); I² = 0%				
Test for overall effect: Z = 0.64 (P = 0.52)				
1.7.2 High risk				
Bond 2004	-0.0943	0.1562	14.5%	0.91 [0.67, 1.24]
Li 2011	-0.4227	0.3233	3.7%	0.66 [0.35, 1.23]
Perry 1996	-0.3027	0.1627	13.5%	0.74 [0.54, 1.02]
Piper 2000	-0.0667	0.1704	12.4%	0.94 [0.67, 1.31]
Roberts 2011	0.6124	0.5587	1.2%	1.84 [0.62, 5.51]
Roberts 2011 AOP plus	-0.0615	0.5454	1.3%	0.94 [0.32, 2.74]
Subtotal (95% CI)			**46.5%**	**0.86 [0.72, 1.02]**
Heterogeneity: Tau² = 0.00; Chi² = 3.85, df = 5 (P = 0.57); I² = 0%				
Test for overall effect: Z = 1.75 (P = 0.08)				
Total (95% CI)			**100.0%**	**0.96 [0.85, 1.08]**
Heterogeneity: Tau² = 0.00; Chi² = 11.65, df = 11 (P = 0.39); I² = 6%				
Test for overall effect: Z = 0.71 (P = 0.48)				
Test for subgroup differences: Chi² = 2.96, df = 1 (P = 0.09), I² = 66.2%				



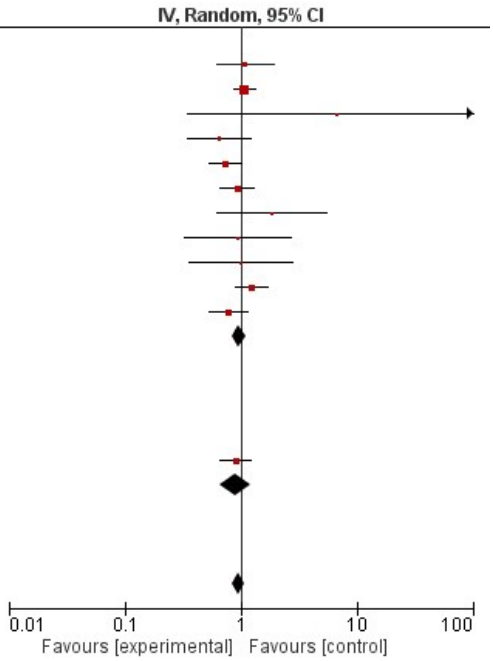
Sensitivity analysis: Maximum intra-class correlations

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
Bond 2004	-0.0943	0.1562	20.1%	0.91 [0.67, 1.24]
Brown 2005	0.0925	0.3042	5.3%	1.10 [0.60, 1.99]
Eisen 2003	0.0598	0.1547	20.5%	1.06 [0.78, 1.44]
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Li 2011	-0.4227	0.3233	4.7%	0.66 [0.35, 1.23]
Perry 1996	-0.3027	0.1627	18.5%	0.74 [0.54, 1.02]
Piper 2000	-0.0467	0.2278	9.4%	0.95 [0.61, 1.49]
Roberts 2011	0.5731	0.6474	1.2%	1.77 [0.50, 6.31]
Roberts 2011 AOP plus	0.1387	0.6834	1.0%	1.15 [0.30, 4.38]
Skärstrand 2014	0.01	0.5221	1.8%	1.01 [0.36, 2.81]
Spoth 2002	0.2053	0.2106	11.0%	1.23 [0.81, 1.86]
Spoth 2007	-0.2759	0.2794	6.3%	0.76 [0.44, 1.31]
Total (95% CI)			**100.0%**	**0.94 [0.82, 1.08]**
Heterogeneity: Tau² = 0.00; Chi² = 9.31, df = 11 (P = 0.59); I² = 0%				
Test for overall effect: Z = 0.92 (P = 0.36)				



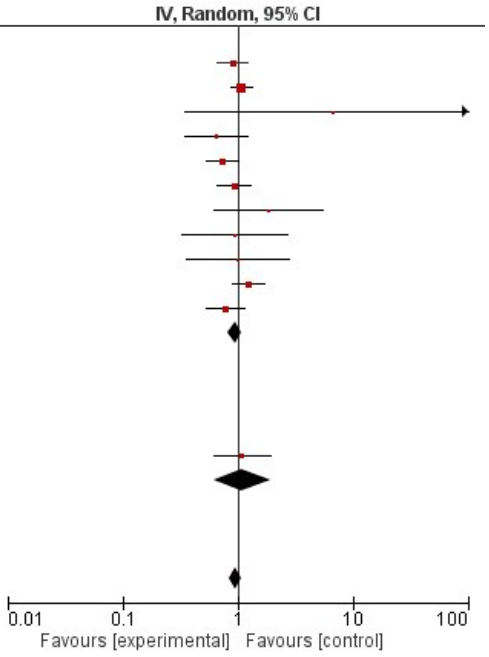
Subgroup analysis: Intervention content

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
1.2.1 Multidimensional				
Brown 2005	0.0858	0.293	4.4%	1.09 [0.61, 1.93]
Eisen 2003	0.0704	0.1132	25.3%	1.07 [0.86, 1.34]
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Li 2011	-0.4227	0.3233	3.7%	0.66 [0.35, 1.23]
Perry 1996	-0.3027	0.1627	13.5%	0.74 [0.54, 1.02]
Piper 2000	-0.0667	0.1704	12.4%	0.94 [0.67, 1.31]
Roberts 2011	0.6124	0.5587	1.2%	1.84 [0.62, 5.51]
Roberts 2011 AOP plus	-0.0615	0.5454	1.3%	0.94 [0.32, 2.74]
Skärstrand 2014	0.01	0.5221	1.4%	1.01 [0.36, 2.81]
Spoth 2002	0.2146	0.1719	12.2%	1.24 [0.88, 1.74]
Spoth 2007	-0.245	0.1914	10.0%	0.78 [0.54, 1.14]
Subtotal (95% CI)			**85.5%**	**0.96 [0.83, 1.11]**
Heterogeneity: Tau² = 0.01; Chi² = 11.52, df = 10 (P = 0.32); I² = 13%				
Test for overall effect: Z = 0.54 (P = 0.59)				
1.2.2 100% resilience				
Bond 2004	-0.0943	0.1562	14.5%	0.91 [0.67, 1.24]
Subtotal (95% CI)			**14.5%**	**0.91 [0.67, 1.24]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.60 (P = 0.55)				
Total (95% CI)			**100.0%**	**0.96 [0.85, 1.08]**
Heterogeneity: Tau² = 0.00; Chi² = 11.65, df = 11 (P = 0.39); I² = 6%				
Test for overall effect: Z = 0.71 (P = 0.48)				
Test for subgroup differences: Chi² = 0.10, df = 1 (P = 0.75), I² = 0%				



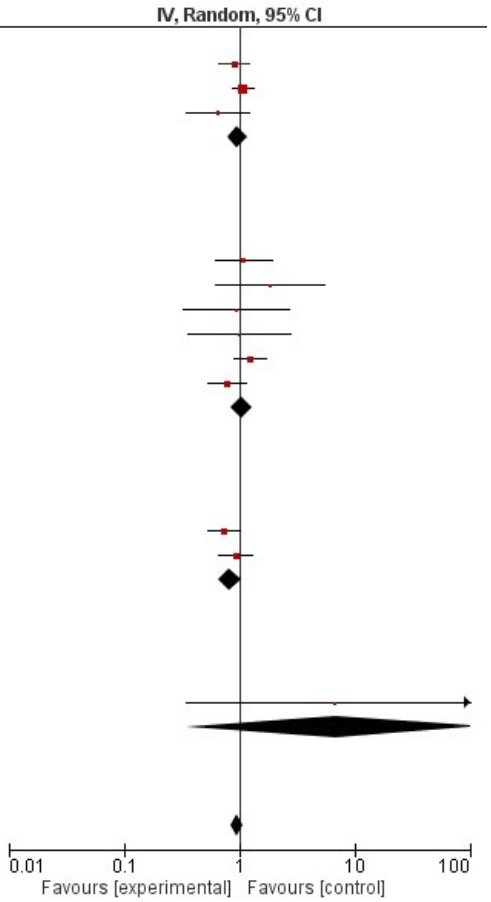
Subgroup analysis: Prevention approach

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
1.3.1 Universal				
Bond 2004	-0.0943	0.1562	14.5%	0.91 [0.67, 1.24]
Eisen 2003	0.0704	0.1132	25.3%	1.07 [0.86, 1.34]
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Li 2011	-0.4227	0.3233	3.7%	0.66 [0.35, 1.23]
Perry 1996	-0.3027	0.1627	13.5%	0.74 [0.54, 1.02]
Piper 2000	-0.0667	0.1704	12.4%	0.94 [0.67, 1.31]
Roberts 2011	0.6124	0.5587	1.2%	1.84 [0.62, 5.51]
Roberts 2011 AOP plus	-0.0615	0.5454	1.3%	0.94 [0.32, 2.74]
Skärstrand 2014	0.01	0.5221	1.4%	1.01 [0.36, 2.81]
Spoth 2002	0.2146	0.1719	12.2%	1.24 [0.88, 1.74]
Spoth 2007	-0.245	0.1914	10.0%	0.78 [0.54, 1.14]
Subtotal (95% CI)			**95.6%**	**0.95 [0.83, 1.08]**
Heterogeneity: Tau² = 0.01; Chi² = 11.45, df = 10 (P = 0.32); I² = 13%				
Test for overall effect: Z = 0.78 (P = 0.43)				
1.3.2 Universal + selective				
Brown 2005	0.0858	0.293	4.4%	1.09 [0.61, 1.93]
Subtotal (95% CI)			**4.4%**	**1.09 [0.61, 1.93]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.29 (P = 0.77)				
Total (95% CI)			**100.0%**	**0.96 [0.85, 1.08]**
Heterogeneity: Tau² = 0.00; Chi² = 11.65, df = 11 (P = 0.39); I² = 6%				
Test for overall effect: Z = 0.71 (P = 0.48)				
Test for subgroup differences: Chi² = 0.21, df = 1 (P = 0.64), I² = 0%				



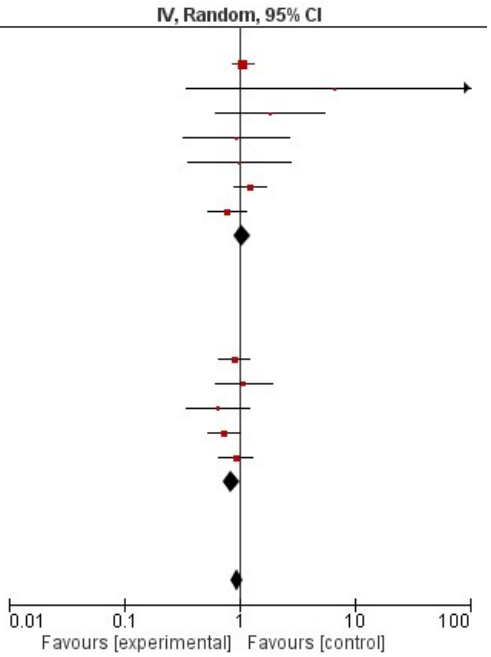
Subgroup analysis: Setting

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
1.4.1 School only				
Bond 2004	-0.0943	0.1562	14.5%	0.91 [0.67, 1.24]
Eisen 2003	0.0704	0.1132	25.3%	1.07 [0.86, 1.34]
Li 2011	-0.4227	0.3233	3.7%	0.66 [0.35, 1.23]
Subtotal (95% CI)			**43.4%**	**0.97 [0.79, 1.18]**
Heterogeneity: Tau² = 0.01; Chi² = 2.42, df = 2 (P = 0.30); I² = 17%				
Test for overall effect: Z = 0.33 (P = 0.74)				
1.4.2 School + family				
Brown 2005	0.0858	0.293	4.4%	1.09 [0.61, 1.93]
Roberts 2011	0.6124	0.5587	1.2%	1.84 [0.62, 5.51]
Roberts 2011 AOP plus	-0.0615	0.5454	1.3%	0.94 [0.32, 2.74]
Skärstrand 2014	0.01	0.5221	1.4%	1.01 [0.36, 2.81]
Spoth 2002	0.2146	0.1719	12.2%	1.24 [0.88, 1.74]
Spoth 2007	-0.245	0.1914	10.0%	0.78 [0.54, 1.14]
Subtotal (95% CI)			**30.6%**	**1.04 [0.84, 1.29]**
Heterogeneity: Tau² = 0.00; Chi² = 4.36, df = 5 (P = 0.50); I² = 0%				
Test for overall effect: Z = 0.37 (P = 0.71)				
1.4.3 School + fam + community				
Perry 1996	-0.3027	0.1627	13.5%	0.74 [0.54, 1.02]
Piper 2000	-0.0667	0.1704	12.4%	0.94 [0.67, 1.31]
Subtotal (95% CI)			**25.8%**	**0.83 [0.66, 1.04]**
Heterogeneity: Tau² = 0.00; Chi² = 1.00, df = 1 (P = 0.32); I² = 0%				
Test for overall effect: Z = 1.61 (P = 0.11)				
1.4.4 School + community				
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Subtotal (95% CI)			**0.2%**	**6.77 [0.34, 132.92]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 1.26 (P = 0.21)				
Total (95% CI)			**100.0%**	**0.96 [0.85, 1.08]**
Heterogeneity: Tau² = 0.00; Chi² = 11.65, df = 11 (P = 0.39); I² = 6%				
Test for overall effect: Z = 0.71 (P = 0.48)				
Test for subgroup differences: Chi² = 3.79, df = 3 (P = 0.29), I² = 20.8%				



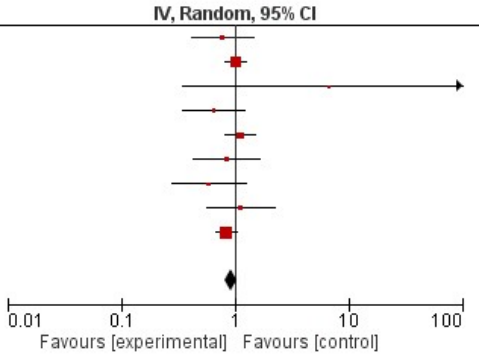
Subgroup analysis: Intervention duration

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
1.5.1 <3 years				
Eisen 2003	0.0704	0.1132	25.3%	1.07 [0.86, 1.34]
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Roberts 2011	0.6124	0.5587	1.2%	1.84 [0.62, 5.51]
Roberts 2011 AOP plus	-0.0615	0.5454	1.3%	0.94 [0.32, 2.74]
Skärstrand 2014	0.01	0.5221	1.4%	1.01 [0.36, 2.81]
Spoth 2002	0.2146	0.1719	12.2%	1.24 [0.88, 1.74]
Spoth 2007	-0.245	0.1914	10.0%	0.78 [0.54, 1.14]
Subtotal (95% CI)			**51.6%**	**1.06 [0.90, 1.24]**
Heterogeneity: Tau² = 0.00; Chi² = 5.88, df = 6 (P = 0.44); I² = 0%				
Test for overall effect: Z = 0.71 (P = 0.48)				
1.5.2 >=3 years				
Bond 2004	-0.0943	0.1562	14.5%	0.91 [0.67, 1.24]
Brown 2005	0.0858	0.293	4.4%	1.09 [0.61, 1.93]
Li 2011	-0.4227	0.3233	3.7%	0.66 [0.35, 1.23]
Perry 1996	-0.3027	0.1627	13.5%	0.74 [0.54, 1.02]
Piper 2000	-0.0667	0.1704	12.4%	0.94 [0.67, 1.31]
Subtotal (95% CI)			**48.4%**	**0.86 [0.72, 1.02]**
Heterogeneity: Tau² = 0.00; Chi² = 2.60, df = 4 (P = 0.63); I² = 0%				
Test for overall effect: Z = 1.78 (P = 0.08)				
Total (95% CI)			**100.0%**	**0.96 [0.85, 1.08]**
Heterogeneity: Tau² = 0.00; Chi² = 11.65, df = 11 (P = 0.39); I² = 6%				
Test for overall effect: Z = 0.71 (P = 0.48)				
Test for subgroup differences: Chi² = 3.17, df = 1 (P = 0.07), I² = 68.5%				



Subgroup analysis: Long term follow up

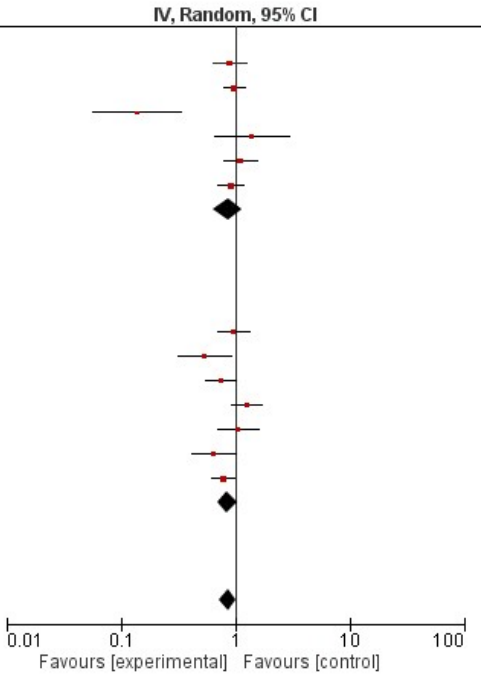
Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
Brown 2005	-0.2492	0.3167	4.0%	0.78 [0.42, 1.45]
Eisen 2003	0.0187	0.1118	32.5%	1.02 [0.82, 1.27]
Griffin 2009	1.9118	1.5194	0.2%	6.77 [0.34, 132.92]
Li 2011	-0.4227	0.3233	3.9%	0.66 [0.35, 1.23]
Piper 2000	0.1086	0.1628	15.3%	1.11 [0.81, 1.53]
Roberts 2011	-0.1663	0.3447	3.4%	0.85 [0.43, 1.66]
Roberts 2011 AOP plus	-0.5243	0.3819	2.8%	0.59 [0.28, 1.25]
Skärstrand 2014	0.1222	0.3537	3.2%	1.13 [0.56, 2.26]
Spoth 2007	-0.1756	0.1082	34.7%	0.84 [0.68, 1.04]
Total (95% CI)			**100.0%**	**0.93 [0.82, 1.05]**
Heterogeneity: Tau² = 0.00; Chi² = 7.77, df = 8 (P = 0.46); I² = 0%				
Test for overall effect: Z = 1.22 (P = 0.22)				



APPENDIX 3.7. Alcohol use sensitivity and subgroup analyses forest plots

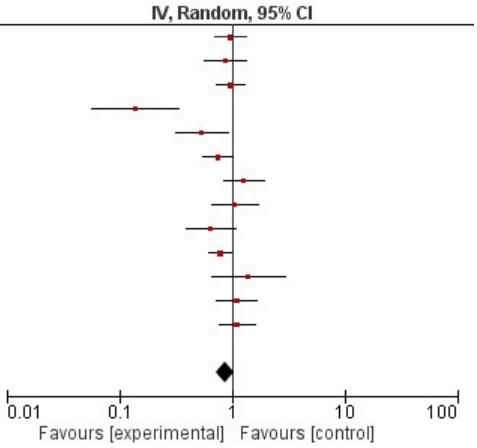
Sensitivity analysis: Excluding studies at high risk of bias

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
2.11.1 Low or unclear risk				
Brown 2005	-0.1173	0.1713	8.4%	0.89 [0.64, 1.24]
Eisen 2003	-0.0225	0.1061	10.8%	0.98 [0.79, 1.20]
Griffin 2009	-1.9735	0.4521	2.7%	0.14 [0.06, 0.34]
Skärstrand 2014	0.3293	0.3857	3.4%	1.39 [0.65, 2.96]
Spoth 2002	0.1045	0.1723	8.4%	1.11 [0.79, 1.56]
Spoth 2007	-0.0899	0.1282	10.0%	0.91 [0.71, 1.18]
Subtotal (95% CI)			**43.8%**	**0.86 [0.64, 1.16]**
Heterogeneity: Tau² = 0.09; Chi² = 20.12, df = 5 (P = 0.001); I² = 75%				
Test for overall effect: Z = 0.98 (P = 0.32)				
2.11.2 High risk				
Bond 2004	-0.0408	0.1663	8.6%	0.96 [0.69, 1.33]
Li 2011	-0.6176	0.2796	5.3%	0.54 [0.31, 0.93]
Perry 1996	-0.2882	0.1623	8.8%	0.75 [0.55, 1.03]
Piper 2000	0.2343	0.1583	8.9%	1.26 [0.93, 1.72]
Roberts 2011	0.0625	0.2102	7.1%	1.06 [0.71, 1.61]
Roberts 2011 AOP plus	-0.4291	0.2216	6.8%	0.65 [0.42, 1.01]
Shortt 2007	-0.2485	0.1112	10.7%	0.78 [0.63, 0.97]
Subtotal (95% CI)			**56.2%**	**0.85 [0.70, 1.03]**
Heterogeneity: Tau² = 0.04; Chi² = 13.24, df = 6 (P = 0.04); I² = 55%				
Test for overall effect: Z = 1.61 (P = 0.11)				
Total (95% CI)			**100.0%**	**0.86 [0.73, 1.02]**
Heterogeneity: Tau² = 0.05; Chi² = 34.24, df = 12 (P = 0.0006); I² = 65%				
Test for overall effect: Z = 1.76 (P = 0.08)				
Test for subgroup differences: Chi² = 0.00, df = 1 (P = 0.95), I² = 0%				



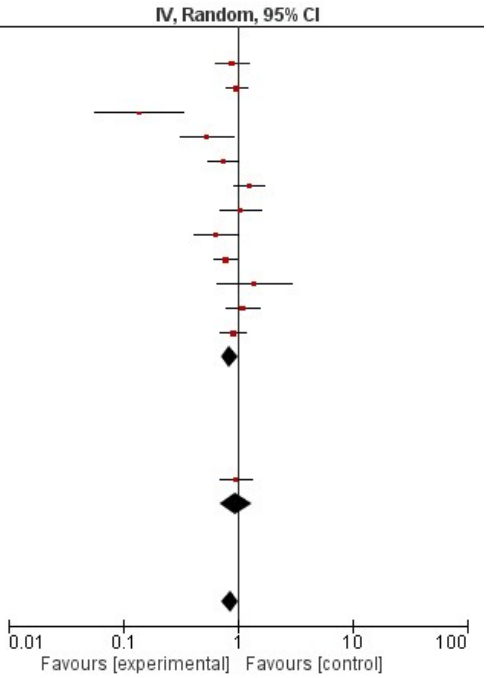
Sensitivity analysis: Maximum intra-class correlations

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
Bond 2004	-0.0408	0.1663	9.4%	0.96 [0.69, 1.33]
Brown 2005	-0.136	0.213	7.9%	0.87 [0.57, 1.33]
Eisen 2003	-0.0214	0.1464	10.1%	0.98 [0.73, 1.30]
Griffin 2009	-1.9735	0.4521	3.2%	0.14 [0.06, 0.34]
Li 2011	-0.6176	0.2796	6.1%	0.54 [0.31, 0.93]
Perry 1996	-0.2882	0.1623	9.6%	0.75 [0.55, 1.03]
Piper 2000	0.2423	0.2116	7.9%	1.27 [0.84, 1.93]
Roberts 2011	0.0617	0.2449	7.0%	1.06 [0.66, 1.72]
Roberts 2011 AOP plus	-0.4233	0.2566	6.7%	0.65 [0.40, 1.08]
Shortt 2007	-0.2485	0.1112	11.4%	0.78 [0.63, 0.97]
Skärstrand 2014	0.3293	0.3857	4.1%	1.39 [0.65, 2.96]
Spoth 2002	0.1001	0.2113	8.0%	1.11 [0.73, 1.67]
Spoth 2007	0.1024	0.1881	8.7%	1.11 [0.77, 1.60]
Total (95% CI)			**100.0%**	**0.86 [0.72, 1.03]**
Heterogeneity: Tau² = 0.06; Chi² = 31.74, df = 12 (P = 0.002); I² = 62%				
Test for overall effect: Z = 1.60 (P = 0.11)				



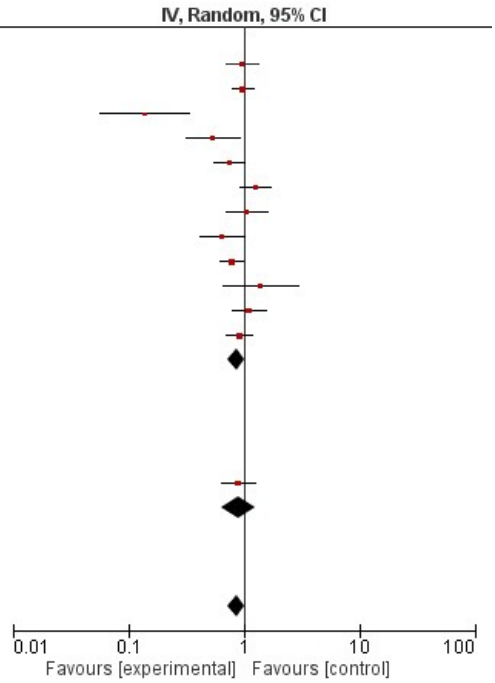
Subgroup analysis: Intervention content

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
2.2.1 Multidimensional				
Brown 2005	-0.1173	0.1713	8.4%	0.89 [0.64, 1.24]
Eisen 2003	-0.0225	0.1061	10.8%	0.98 [0.79, 1.20]
Griffin 2009	-1.9735	0.4521	2.7%	0.14 [0.06, 0.34]
Li 2011	-0.6176	0.2796	5.3%	0.54 [0.31, 0.93]
Perry 1996	-0.2882	0.1623	8.8%	0.75 [0.55, 1.03]
Piper 2000	0.2343	0.1583	8.9%	1.26 [0.93, 1.72]
Roberts 2011	0.0625	0.2102	7.1%	1.06 [0.71, 1.61]
Roberts 2011 AOP plus	-0.4291	0.2216	6.8%	0.65 [0.42, 1.01]
Shortt 2007	-0.2485	0.1112	10.7%	0.78 [0.63, 0.97]
Skärstrand 2014	0.3293	0.3857	3.4%	1.39 [0.65, 2.96]
Spoth 2002	0.1045	0.1723	8.4%	1.11 [0.79, 1.56]
Spoth 2007	-0.0899	0.1282	10.0%	0.91 [0.71, 1.18]
Subtotal (95% CI)			**91.4%**	**0.85 [0.71, 1.02]**
Heterogeneity: Tau² = 0.06; Chi² = 34.05, df = 11 (P = 0.0004); I² = 68%				
Test for overall effect: Z = 1.76 (P = 0.08)				
2.2.2 100% resilience				
Bond 2004	-0.0408	0.1663	8.6%	0.96 [0.69, 1.33]
Subtotal (95% CI)			**8.6%**	**0.96 [0.69, 1.33]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.25 (P = 0.81)				
Total (95% CI)			**100.0%**	**0.86 [0.73, 1.02]**
Heterogeneity: Tau² = 0.05; Chi² = 34.24, df = 12 (P = 0.0006); I² = 65%				
Test for overall effect: Z = 1.76 (P = 0.08)				
Test for subgroup differences: Chi² = 0.39, df = 1 (P = 0.53), I² = 0%				



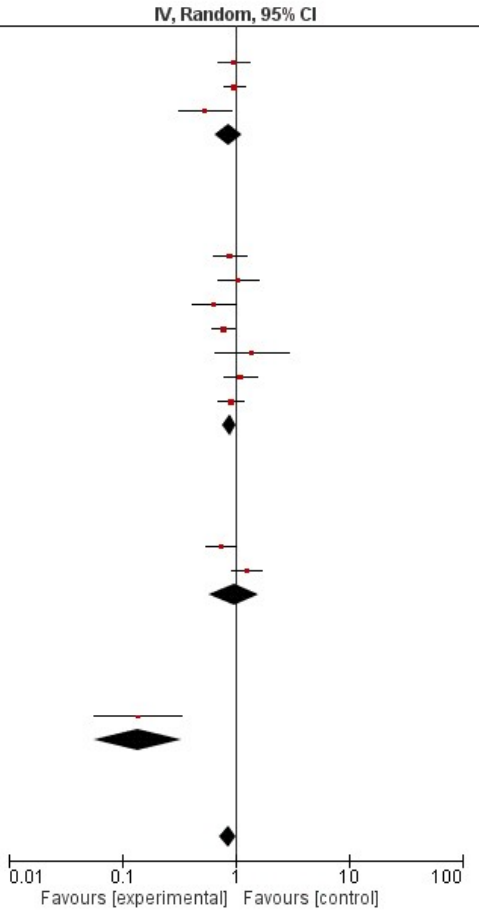
Subgroup analysis: Intervention approach

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
2.3.1 Universal				
Bond 2004	-0.0408	0.1663	8.6%	0.96 [0.69, 1.33]
Eisen 2003	-0.0225	0.1061	10.8%	0.98 [0.79, 1.20]
Griffin 2009	-1.9735	0.4521	2.7%	0.14 [0.06, 0.34]
Li 2011	-0.6176	0.2796	5.3%	0.54 [0.31, 0.93]
Perry 1996	-0.2882	0.1623	8.8%	0.75 [0.55, 1.03]
Piper 2000	0.2343	0.1583	8.9%	1.26 [0.93, 1.72]
Roberts 2011	0.0625	0.2102	7.1%	1.06 [0.71, 1.61]
Roberts 2011 AOP plus	-0.4291	0.2216	6.8%	0.65 [0.42, 1.01]
Shortt 2007	-0.2485	0.1112	10.7%	0.78 [0.63, 0.97]
Skärstrand 2014	0.3293	0.3857	3.4%	1.39 [0.65, 2.96]
Spoth 2002	0.1045	0.1723	8.4%	1.11 [0.79, 1.56]
Spoth 2007	-0.0899	0.1282	10.0%	0.91 [0.71, 1.18]
Subtotal (95% CI)			**91.6%**	**0.86 [0.72, 1.03]**
Heterogeneity: Tau² = 0.06; Chi² = 34.24, df = 11 (P = 0.0003); I² = 68%				
Test for overall effect: Z = 1.68 (P = 0.09)				
2.3.2 Universal + selective				
Brown 2005	-0.1173	0.1713	8.4%	0.89 [0.64, 1.24]
Subtotal (95% CI)			**8.4%**	**0.89 [0.64, 1.24]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.68 (P = 0.49)				
Total (95% CI)			**100.0%**	**0.86 [0.73, 1.02]**
Heterogeneity: Tau² = 0.05; Chi² = 34.24, df = 12 (P = 0.0006); I² = 65%				
Test for overall effect: Z = 1.76 (P = 0.08)				
Test for subgroup differences: Chi² = 0.03, df = 1 (P = 0.86), I² = 0%				



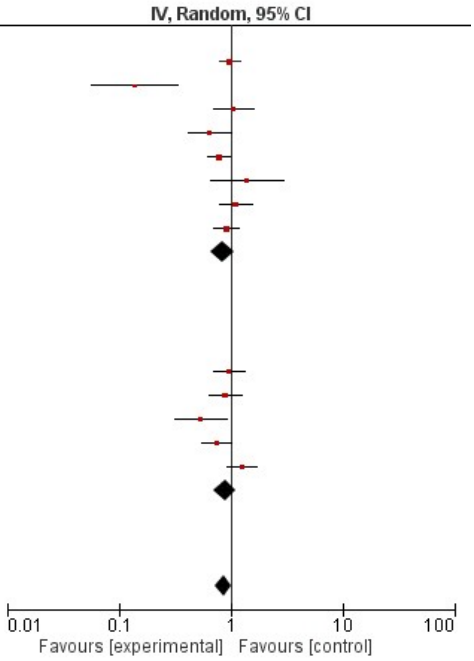
Subgroup analysis: Setting

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
2.4.1 School only				
Bond 2004	-0.0408	0.1663	8.6%	0.96 [0.69, 1.33]
Eisen 2003	-0.0225	0.1061	10.8%	0.98 [0.79, 1.20]
Li 2011	-0.6176	0.2796	5.3%	0.54 [0.31, 0.93]
Subtotal (95% CI)			**24.7%**	**0.87 [0.66, 1.15]**
Heterogeneity: Tau² = 0.03; Chi² = 4.05, df = 2 (P = 0.13); I² = 51%				
Test for overall effect: Z = 0.98 (P = 0.33)				
2.4.2 School + family				
Brown 2005	-0.1173	0.1713	8.4%	0.89 [0.64, 1.24]
Roberts 2011	0.0625	0.2102	7.1%	1.06 [0.71, 1.61]
Roberts 2011 AOP plus	-0.4291	0.2216	6.8%	0.65 [0.42, 1.01]
Shortt 2007	-0.2485	0.1112	10.7%	0.78 [0.63, 0.97]
Skärstrand 2014	0.3293	0.3857	3.4%	1.39 [0.65, 2.96]
Spoth 2002	0.1045	0.1723	8.4%	1.11 [0.79, 1.56]
Spoth 2007	-0.0899	0.1282	10.0%	0.91 [0.71, 1.18]
Subtotal (95% CI)			**54.9%**	**0.89 [0.78, 1.03]**
Heterogeneity: Tau² = 0.01; Chi² = 7.14, df = 6 (P = 0.31); I² = 16%				
Test for overall effect: Z = 1.60 (P = 0.11)				
2.4.3 School + fam + community				
Perry 1996	-0.2882	0.1623	8.8%	0.75 [0.55, 1.03]
Piper 2000	0.2343	0.1583	8.9%	1.26 [0.93, 1.72]
Subtotal (95% CI)			**17.7%**	**0.97 [0.58, 1.63]**
Heterogeneity: Tau² = 0.11; Chi² = 5.31, df = 1 (P = 0.02); I² = 81%				
Test for overall effect: Z = 0.10 (P = 0.92)				
2.4.4 School + community				
Griffin 2009	-1.9735	0.4521	2.7%	0.14 [0.06, 0.34]
Subtotal (95% CI)			**2.7%**	**0.14 [0.06, 0.34]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 4.37 (P < 0.0001)				
Total (95% CI)			**100.0%**	**0.86 [0.73, 1.02]**
Heterogeneity: Tau² = 0.05; Chi² = 34.24, df = 12 (P = 0.0006); I² = 65%				
Test for overall effect: Z = 1.76 (P = 0.08)				
Test for subgroup differences: Chi² = 16.79, df = 3 (P = 0.0008), I² = 82.1%				



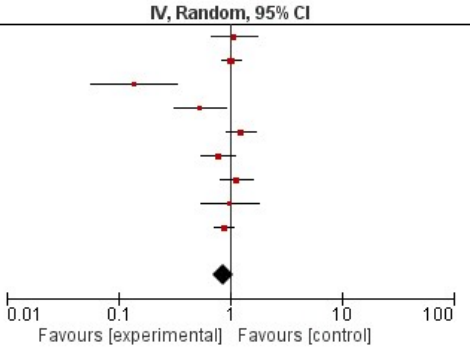
Subgroup analysis: Intervention duration

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
2.9.1 <3years				
Eisen 2003	-0.0225	0.1061	10.8%	0.98 [0.79, 1.20]
Griffin 2009	-1.9735	0.4521	2.7%	0.14 [0.06, 0.34]
Roberts 2011	0.0625	0.2102	7.1%	1.06 [0.71, 1.61]
Roberts 2011 AOP plus	-0.4291	0.2216	6.8%	0.65 [0.42, 1.01]
Shortt 2007	-0.2485	0.1112	10.7%	0.78 [0.63, 0.97]
Skärstrand 2014	0.3293	0.3857	3.4%	1.39 [0.65, 2.96]
Spoth 2002	0.1045	0.1723	8.4%	1.11 [0.79, 1.56]
Spoth 2007	-0.0899	0.1282	10.0%	0.91 [0.71, 1.18]
Subtotal (95% CI)			**60.0%**	**0.85 [0.67, 1.07]**
Heterogeneity: Tau² = 0.07; Chi² = 24.80, df = 7 (P = 0.0008); I² = 72%				
Test for overall effect: Z = 1.42 (P = 0.15)				
2.9.2 >=3 years				
Bond 2004	-0.0408	0.1663	8.6%	0.96 [0.69, 1.33]
Brown 2005	-0.1173	0.1713	8.4%	0.89 [0.64, 1.24]
Li 2011	-0.6176	0.2796	5.3%	0.54 [0.31, 0.93]
Perry 1996	-0.2882	0.1623	8.8%	0.75 [0.55, 1.03]
Piper 2000	0.2343	0.1583	8.9%	1.26 [0.93, 1.72]
Subtotal (95% CI)			**40.0%**	**0.88 [0.69, 1.13]**
Heterogeneity: Tau² = 0.04; Chi² = 9.36, df = 4 (P = 0.05); I² = 57%				
Test for overall effect: Z = 0.99 (P = 0.32)				
Total (95% CI)			**100.0%**	**0.86 [0.73, 1.02]**
Heterogeneity: Tau² = 0.05; Chi² = 34.24, df = 12 (P = 0.0006); I² = 65%				
Test for overall effect: Z = 1.76 (P = 0.08)				
Test for subgroup differences: Chi² = 0.07, df = 1 (P = 0.79), I² = 0%				



Subgroup analysis: Long term follow up

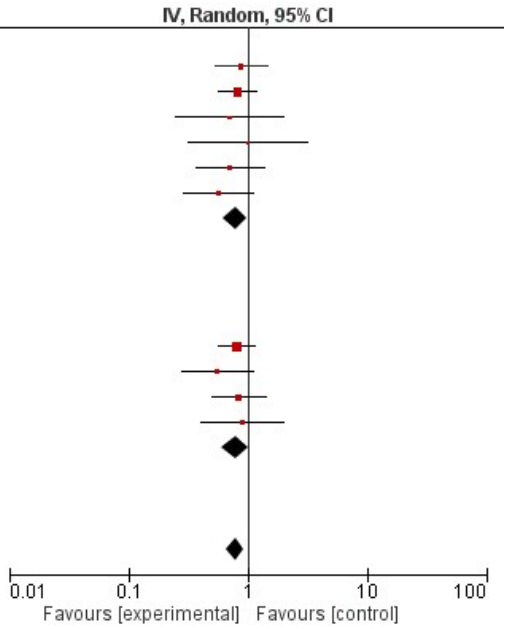
Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
Brown 2005	0.087	0.2409	10.0%	1.09 [0.68, 1.75]
Eisen 2003	0.028	0.1059	15.2%	1.03 [0.84, 1.27]
Griffin 2009	-1.9735	0.4521	4.8%	0.14 [0.06, 0.34]
Li 2011	-0.6176	0.2796	8.7%	0.54 [0.31, 0.93]
Piper 2000	0.2319	0.1516	13.4%	1.26 [0.94, 1.70]
Roberts 2011	-0.2482	0.1748	12.5%	0.78 [0.55, 1.10]
Roberts 2011 AOP plus	0.1335	0.1766	12.4%	1.14 [0.81, 1.62]
Skärstrand 2014	0	0.3111	7.8%	1.00 [0.54, 1.84]
Spoth 2007	-0.1216	0.1038	15.3%	0.89 [0.72, 1.09]
Total (95% CI)			**100.0%**	**0.87 [0.69, 1.10]**
Heterogeneity: Tau² = 0.08; Chi² = 29.40, df = 8 (P = 0.0003); I² = 73%				
Test for overall effect: Z = 1.18 (P = 0.24)				



APPENDIX 3.8. Illicit substance use sensitivity and subgroup analyses forest plots

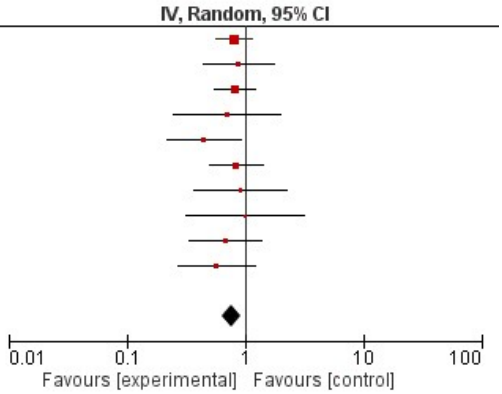
Sensitivity analysis: Excluding studies at high risk of bias

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
3.19.1 Low or unclear risk				
Brown 2005	-0.1301	0.2552	12.2%	0.88 [0.53, 1.45]
Eisen 2003	-0.1913	0.1869	22.7%	0.83 [0.57, 1.19]
Griffin 2009	-0.3502	0.5279	2.8%	0.70 [0.25, 1.98]
Skärstrand 2014	0	0.5838	2.3%	1.00 [0.32, 3.14]
Spoth 2002	-0.3379	0.3319	7.2%	0.71 [0.37, 1.37]
Spoth 2007	-0.5586	0.3453	6.7%	0.57 [0.29, 1.13]
Subtotal (95% CI)			**53.9%**	**0.78 [0.62, 1.00]**
Heterogeneity: Tau² = 0.00; Chi² = 1.40, df = 5 (P = 0.92); I² = 0%				
Test for overall effect: Z = 2.00 (P = 0.05)				
3.19.2 High risk				
Bond 2004	-0.2107	0.1832	23.6%	0.81 [0.57, 1.16]
Li 2011	-0.5812	0.3526	6.4%	0.56 [0.28, 1.12]
Perry 1996	-0.1729	0.2635	11.4%	0.84 [0.50, 1.41]
Piper 2000	-0.1047	0.4128	4.7%	0.90 [0.40, 2.02]
Subtotal (95% CI)			**46.1%**	**0.79 [0.61, 1.02]**
Heterogeneity: Tau² = 0.00; Chi² = 1.13, df = 3 (P = 0.77); I² = 0%				
Test for overall effect: Z = 1.84 (P = 0.07)				
Total (95% CI)			**100.0%**	**0.78 [0.66, 0.93]**
Heterogeneity: Tau² = 0.00; Chi² = 2.54, df = 9 (P = 0.98); I² = 0%				
Test for overall effect: Z = 2.72 (P = 0.007)				
Test for subgroup differences: Chi² = 0.00, df = 1 (P = 1.00), I² = 0%				



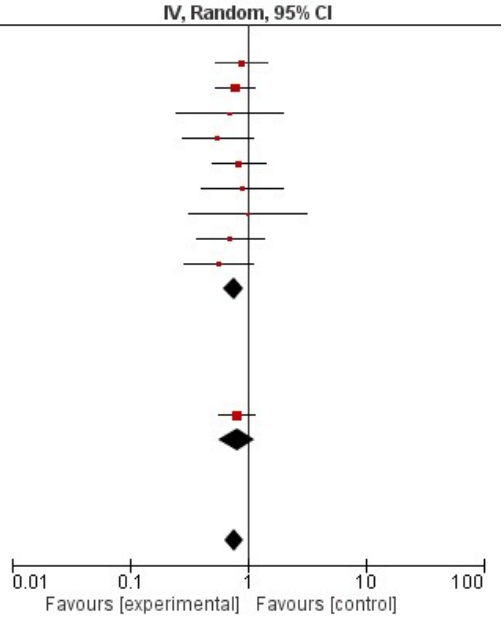
Sensitivity analysis: Maximum intra-class correlations

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
Bond 2004	-0.2107	0.1832	27.6%	0.81 [0.57, 1.16]
Brown 2005	-0.1271	0.3568	7.3%	0.88 [0.44, 1.77]
Eisen 2003	-0.1947	0.2085	21.3%	0.82 [0.55, 1.24]
Griffin 2009	-0.3502	0.5279	3.3%	0.70 [0.25, 1.98]
Li 2011	-0.8065	0.3696	6.8%	0.45 [0.22, 0.92]
Perry 1996	-0.1729	0.2635	13.3%	0.84 [0.50, 1.41]
Piper 2000	-0.0848	0.4601	4.4%	0.92 [0.37, 2.26]
Skärstrand 2014	0	0.5838	2.7%	1.00 [0.32, 3.14]
Spoth 2002	-0.3806	0.3606	7.1%	0.68 [0.34, 1.39]
Spoth 2007	-0.5538	0.3899	6.1%	0.57 [0.27, 1.23]
Total (95% CI)			**100.0%**	**0.77 [0.64, 0.93]**
Heterogeneity: Tau² = 0.00; Chi² = 3.66, df = 9 (P = 0.93); I² = 0%				
Test for overall effect: Z = 2.73 (P = 0.006)				



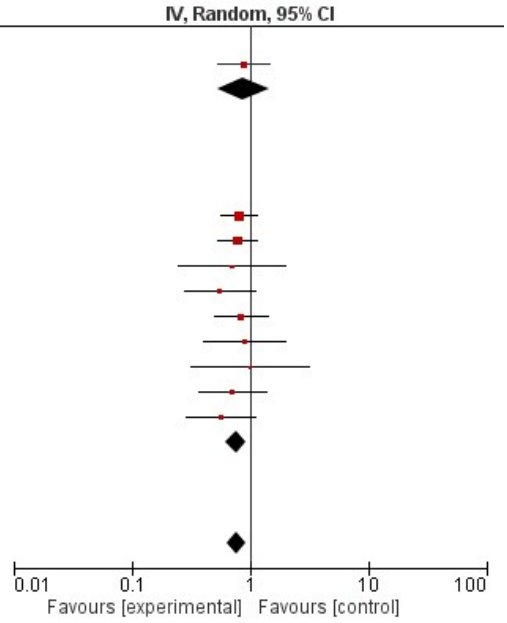
Subgroup analysis: Intervention content

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
3.2.1 Multidimensional				
Brown 2005	-0.1301	0.2552	12.6%	0.88 [0.53, 1.45]
Eisen 2003	-0.2407	0.201	20.3%	0.79 [0.53, 1.17]
Griffin 2009	-0.3502	0.5279	2.9%	0.70 [0.25, 1.98]
Li 2011	-0.5812	0.3526	6.6%	0.56 [0.28, 1.12]
Perry 1996	-0.1729	0.2635	11.8%	0.84 [0.50, 1.41]
Piper 2000	-0.1047	0.4128	4.8%	0.90 [0.40, 2.02]
Skärstrand 2014	0	0.5838	2.4%	1.00 [0.32, 3.14]
Spoth 2002	-0.3379	0.3319	7.4%	0.71 [0.37, 1.37]
Spoth 2007	-0.5586	0.3453	6.9%	0.57 [0.29, 1.13]
Subtotal (95% CI)			**75.6%**	**0.77 [0.62, 0.94]**
Heterogeneity: Tau² = 0.00; Chi² = 2.37, df = 8 (P = 0.97); I² = 0%				
Test for overall effect: Z = 2.57 (P = 0.01)				
3.2.2 100% resilience				
Bond 2004	-0.2107	0.1832	24.4%	0.81 [0.57, 1.16]
Subtotal (95% CI)			**24.4%**	**0.81 [0.57, 1.16]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 1.15 (P = 0.25)				
Total (95% CI)			**100.0%**	**0.78 [0.65, 0.93]**
Heterogeneity: Tau² = 0.00; Chi² = 2.45, df = 9 (P = 0.98); I² = 0%				
Test for overall effect: Z = 2.81 (P = 0.005)				
Test for subgroup differences: Chi² = 0.07, df = 1 (P = 0.79), I² = 0%				



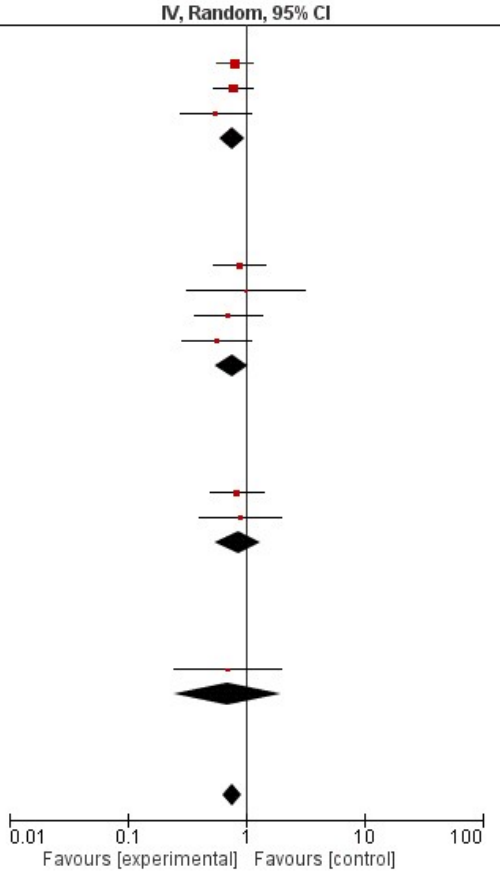
Subgroup analysis: Intervention approach

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
3.3.2 Universal + selective				
Brown 2005	-0.1301	0.2552	12.6%	0.88 [0.53, 1.45]
Subtotal (95% CI)			**12.6%**	**0.88 [0.53, 1.45]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.51 (P = 0.61)				
3.3.4 Universal				
Bond 2004	-0.2107	0.1832	24.4%	0.81 [0.57, 1.16]
Eisen 2003	-0.2407	0.201	20.3%	0.79 [0.53, 1.17]
Griffin 2009	-0.3502	0.5279	2.9%	0.70 [0.25, 1.98]
Li 2011	-0.5812	0.3526	6.6%	0.56 [0.28, 1.12]
Perry 1996	-0.1729	0.2635	11.8%	0.84 [0.50, 1.41]
Piper 2000	-0.1047	0.4128	4.8%	0.90 [0.40, 2.02]
Skärstrand 2014	0	0.5838	2.4%	1.00 [0.32, 3.14]
Spoth 2002	-0.3379	0.3319	7.4%	0.71 [0.37, 1.37]
Spoth 2007	-0.5586	0.3453	6.9%	0.57 [0.29, 1.13]
Subtotal (95% CI)			**87.4%**	**0.76 [0.63, 0.92]**
Heterogeneity: Tau² = 0.00; Chi² = 2.18, df = 8 (P = 0.98); I² = 0%				
Test for overall effect: Z = 2.81 (P = 0.005)				
Total (95% CI)			**100.0%**	**0.78 [0.65, 0.93]**
Heterogeneity: Tau² = 0.00; Chi² = 2.45, df = 9 (P = 0.98); I² = 0%				
Test for overall effect: Z = 2.81 (P = 0.005)				
Test for subgroup differences: Chi² = 0.27, df = 1 (P = 0.60), I² = 0%				



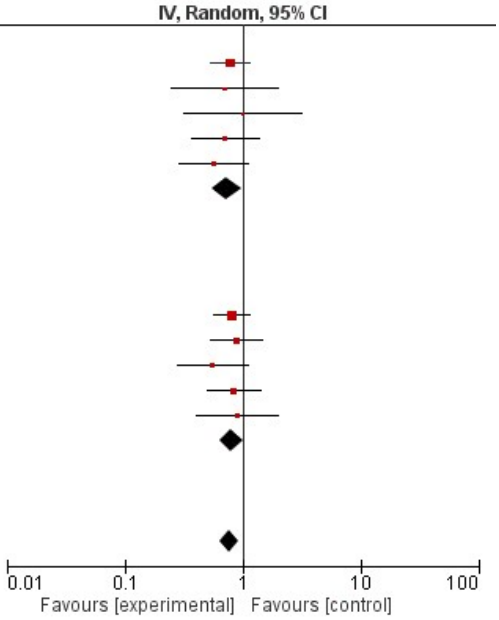
Subgroup analysis: Setting

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
3.4.1 School only				
Bond 2004	-0.2107	0.1832	24.4%	0.81 [0.57, 1.16]
Eisen 2003	-0.2407	0.201	20.3%	0.79 [0.53, 1.17]
Li 2011	-0.5812	0.3526	6.6%	0.56 [0.28, 1.12]
Subtotal (95% CI)			**51.2%**	**0.76 [0.60, 0.98]**
Heterogeneity: Tau² = 0.00; Chi² = 0.90, df = 2 (P = 0.64); I² = 0%				
Test for overall effect: Z = 2.14 (P = 0.03)				
3.4.2 School + family				
Brown 2005	-0.1301	0.2552	12.6%	0.88 [0.53, 1.45]
Skärstrand 2014	0	0.5838	2.4%	1.00 [0.32, 3.14]
Spoth 2002	-0.3379	0.3319	7.4%	0.71 [0.37, 1.37]
Spoth 2007	-0.5586	0.3453	6.9%	0.57 [0.29, 1.13]
Subtotal (95% CI)			**29.3%**	**0.76 [0.55, 1.06]**
Heterogeneity: Tau² = 0.00; Chi² = 1.25, df = 3 (P = 0.74); I² = 0%				
Test for overall effect: Z = 1.63 (P = 0.10)				
3.4.3 School + fam + community				
Perry 1996	-0.1729	0.2635	11.8%	0.84 [0.50, 1.41]
Piper 2000	-0.1047	0.4128	4.8%	0.90 [0.40, 2.02]
Subtotal (95% CI)			**16.6%**	**0.86 [0.56, 1.33]**
Heterogeneity: Tau² = 0.00; Chi² = 0.02, df = 1 (P = 0.89); I² = 0%				
Test for overall effect: Z = 0.69 (P = 0.49)				
3.4.4 School + comm				
Griffin 2009	-0.3502	0.5279	2.9%	0.70 [0.25, 1.98]
Subtotal (95% CI)			**2.9%**	**0.70 [0.25, 1.98]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.66 (P = 0.51)				
Total (95% CI)			**100.0%**	**0.78 [0.65, 0.93]**
Heterogeneity: Tau² = 0.00; Chi² = 2.45, df = 9 (P = 0.98); I² = 0%				
Test for overall effect: Z = 2.81 (P = 0.005)				
Test for subgroup differences: Chi² = 0.27, df = 3 (P = 0.97), I² = 0%				



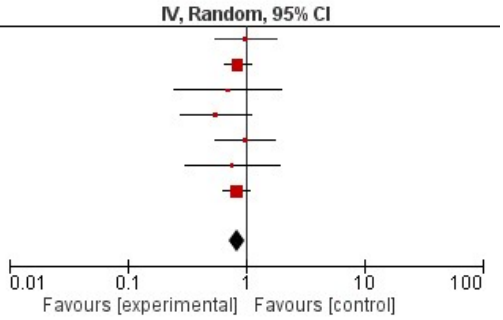
Subgroup analysis: Intervention duration

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
3.17.1 <3 years				
Eisen 2003	-0.2407	0.201	20.3%	0.79 [0.53, 1.17]
Griffin 2009	-0.3502	0.5279	2.9%	0.70 [0.25, 1.98]
Skärstrand 2014	0	0.5838	2.4%	1.00 [0.32, 3.14]
Spoth 2002	-0.3379	0.3319	7.4%	0.71 [0.37, 1.37]
Spoth 2007	-0.5586	0.3453	6.9%	0.57 [0.29, 1.13]
Subtotal (95% CI)			**39.9%**	**0.74 [0.56, 0.97]**
Heterogeneity: Tau² = 0.00; Chi² = 0.93, df = 4 (P = 0.92); I² = 0%				
Test for overall effect: Z = 2.14 (P = 0.03)				
3.17.2 >=3 years				
Bond 2004	-0.2107	0.1832	24.4%	0.81 [0.57, 1.16]
Brown 2005	-0.1301	0.2552	12.6%	0.88 [0.53, 1.45]
Li 2011	-0.5812	0.3526	6.6%	0.56 [0.28, 1.12]
Perry 1996	-0.1729	0.2635	11.8%	0.84 [0.50, 1.41]
Piper 2000	-0.1047	0.4128	4.8%	0.90 [0.40, 2.02]
Subtotal (95% CI)			**60.1%**	**0.80 [0.64, 1.01]**
Heterogeneity: Tau² = 0.00; Chi² = 1.29, df = 4 (P = 0.86); I² = 0%				
Test for overall effect: Z = 1.87 (P = 0.06)				
Total (95% CI)			**100.0%**	**0.78 [0.65, 0.93]**
Heterogeneity: Tau² = 0.00; Chi² = 2.45, df = 9 (P = 0.98); I² = 0%				
Test for overall effect: Z = 2.81 (P = 0.005)				
Test for subgroup differences: Chi² = 0.23, df = 1 (P = 0.63), I² = 0%				



Subgroup analysis: Long term follow up

Study or Subgroup	log[]	SE	Weight	IV, Random, 95% CI
Brown 2005	0	0.2998	7.6%	1.00 [0.56, 1.80]
Eisen 2003	-0.1588	0.1368	36.4%	0.85 [0.65, 1.12]
Griffin 2009	-0.3502	0.5279	2.4%	0.70 [0.25, 1.98]
Li 2011	-0.5812	0.3526	5.5%	0.56 [0.28, 1.12]
Piper 2000	-0.0104	0.2957	7.8%	0.99 [0.55, 1.77]
Skärstrand 2014	-0.2614	0.4635	3.2%	0.77 [0.31, 1.91]
Spoth 2007	-0.1776	0.1355	37.1%	0.84 [0.64, 1.09]
Total (95% CI)			**100.0%**	**0.84 [0.72, 0.99]**
Heterogeneity: Tau² = 0.00; Chi² = 2.14, df = 6 (P = 0.91); I² = 0%				
Test for overall effect: Z = 2.10 (P = 0.04)				



APPENDIX 4.1. Pilot study

Published in:

Hodder R, Daly J, Freund M, Bowman J, Hazell T, Wiggers J. A school-based resilience intervention to decrease tobacco, alcohol and marijuana use in high school students. BMC Public Health, 2011; 11:722.

Abstract

Background

Despite schools theoretically being an ideal setting for accessing adolescents and preventing initiation of substance use, there is limited evidence of effective interventions in this setting. Resilience theory provides one approach to achieving such an outcome through improving adolescent mental wellbeing and resilience. A study was undertaken to examine the potential effectiveness of such an intervention approach in improving adolescent resilience and protective factor scores; and reducing the prevalence of adolescent tobacco, alcohol and marijuana use in three high schools.

Methods

A non-controlled before and after study was undertaken. Data regarding student resilience and protective factors, and measures of tobacco, alcohol and marijuana use were collected from grade 7 to 10 students at baseline (n=1449) and one year following a three year intervention (n=1205).

Results

Significantly higher resilience and protective factors scores, and significantly lower prevalence of substance use were evident at follow up.

Conclusions

The results suggest that the intervention has the potential to increase resilience and protective factors, and to decrease the use of tobacco, alcohol and marijuana by adolescents. Further, more rigorous research is required to confirm this potential.

BACKGROUND

Tobacco, alcohol and other drug use contribute significantly to mortality and morbidity in many countries.[1,2] Tobacco use generally commences in early adolescence,[3] with earlier uptake associated with heavier smoking,[4] rapid establishment of nicotine dependence even after brief intermittent use[5] and greater difficulty in quitting in adulthood.[4] Similar to tobacco, initiation of alcohol use generally occurs in adolescence,[6] and earlier drinking experiences have been linked to alcohol dependence in adulthood.[7] The patterns of illicit substance misuse developed in youth are similarly associated with continued use into adult life.[8] Worldwide, a significant proportion of adolescents use tobacco, alcohol and marijuana, with such use being greater in older adolescent age groups.[9-12]

Schools are considered an ideal setting for programs aimed at decreasing the prevalence of health risk behaviours as: they provide access to young people at a time when they are vulnerable to emotional problems and risk taking behaviour;[13] young people spend half their waking hours at school; and the quality of experiences with teachers and peers can have a positive impact on young people's health and emotional wellbeing.[14] Despite such potential, reviews of school-based programs designed to reduce the prevalence of tobacco and alcohol use have found conflicting or little evidence of effect.[15-18] In particular, interventions focused on the provision of information (for example, interventions that only include information-giving curricula[19]) have been suggested to be ineffective.[18] A World Health Organization review of school health promotion interventions further concluded that programs promoting young people's mental wellbeing were the most likely to be effective, recommending such an approach be the focus of future studies targeting adolescent substance use.[17] The review also suggested that interventions that incorporate changes in the school curriculum, the school environment and that foster relationships between schools and their communities were the most likely to achieve a beneficial outcome, an approach known as the 'health promoting schools' framework.[17] Such a view is supported by research that identifies school culture to be a determinant of substance use.[20,21]

Resilience theory, which has arisen from the study of risk factors and their impact on positive youth development, represents one approach to improving adolescent mental wellbeing.[22-27] Whilst there is much variation in the definition of resilience, it is generally agreed that both individual as well as environmental characteristics contribute to individual resilience and are critical for positive youth development and the avoidance of risk

behaviours.[28-31] Individual characteristics, termed resilience factors, refer to the personal skills and traits of young people, and include self-esteem, empathy, help-seeking and self-awareness.[32] Whereas protective factors refer to positive influences within a young person's environment such as family, school, and community connection.[32] As associations between such characteristics and substance use have been reported,[33-35] interventions designed to increase such factors may represent a means of reducing the extent of adolescent substance use uptake.

Although a number of school-based trials have addressed resilience or protective factors to reduce substance use,[32,36-39] no controlled studies could be identified that described the effectiveness of an intervention that addressed both types of factors using the health promoting schools framework. Of the controlled trials that have incorporated a focus on either resilience or protective factors, inconsistent effects on tobacco, alcohol and marijuana use have been reported.[32,36-39] For example, in Australia, a three-year cluster randomised controlled trial involving 26 secondary schools assessed the effect of a social and school connectedness intervention on student tobacco, alcohol and marijuana use.[37] One and two year follow up data were collected for a cohort of students recruited in Grade 8. At one year follow up (students in Grade 9), a significantly greater reduction in substance use was only found for smoking,[37] whilst at two year follow up (students in Grade 10) no significant effect was found for smoking or alcohol, but a significant reduction in marijuana use was found.[40] On further subgroup examination the authors found a greater intervention effect for marijuana use in Grade 10 if students were nonsmokers in Grade 7 and for those who reported the lowest level of school engagement in Grade 8 and 9.[40] The authors concluding this type of intervention may only be effective if implemented prior to initiation to tobacco smoking and for those students considering experimentation with marijuana use who are least engaged in school.[40] This conclusion is supported by studies that have demonstrated exposure to intervention prior to target problem uptake is predictive of greater effectiveness.[41]

One non-controlled evaluation of an intervention addressing both resilience and protective factors using a health promoting schools approach has been reported.[32,38] The intervention aimed to reduce risk behaviours, including tobacco, alcohol and marijuana use, among students in fifteen non-randomly selected Australian secondary schools. Using a cross sectional design, three year follow up data were obtained from students in Grades 7 to 11.[32,38] No significant effect on substance use was found. In addition, of 30 post hoc analyses by student grade and gender, significant reductions were found in only six cases: smoking

by Grade 7 males and by Grade 8 males and females; alcohol use by Grade 7 males and Grade 8 females; and marijuana use by Grade 9 males.

A separate process evaluation was conducted after the initial non-controlled evaluation to identify factors that may have contributed to these inconsistent results. The authors identified limited uptake of the intervention by schools, in particular, a whole of school approach to intervention adoption was implemented by less than half of schools, only one-third had implemented recommended intervention planning and monitoring mechanisms, and only 20% had developed recommended relationships with external agencies.[38] Interviews with school staff identified a number of barriers to intervention implementation including: inadequate resources; inadequate levels of school staff professional development; inadequate school executive support; and the importance of funding to ensure sustainability.[38] Such barriers are consistent with those suggested by other studies to limit intervention uptake and fidelity, and hence intervention effect.[42-44] These findings, combined with those from other school-based studies which recommend comprehensive and systematic approaches to intervention implementation,[27] suggest that future interventions of this type include explicit strategies to address such barriers and foster intervention uptake and fidelity. Despite this, whilst studies addressing student resilience have since reported some adoption strategies,[37] at the time of development no studies could be located that reported explicit and comprehensive program adoption strategies.

Given the limited number of studies examining the effect of comprehensive interventions that address both resilience and protective factors on adolescent substance use, and the lack of reported studies that report the use of strategies to support the adoption of such an intervention, the aim of this pilot study was to examine the potential efficacy of a resilience-based intervention supported by adoption strategies on modifying adolescent resilience and the extent of adolescent substance use uptake.

METHODS

Design

A non-controlled repeat cross sectional study was undertaken. The intervention was implemented over 3 years in each school across Grades 7 to 10. Cross sectional data were collected prior to intervention implementation and again 12 months following completion. The outcome measures of interest were student reported resilience and protective factor scores, and tobacco, alcohol and marijuana use.

Setting and sample

Schools

Three public high schools were selected on a convenience basis. The schools were located within a 15 kilometre radius of each other in one regional area[45] of New South Wales, Australia. The region has a population of approximately 50,000 people, with an estimated 3,600 people aged 12 to 16,[46] and is ranked in the lowest quintile of socio-economic disadvantage using 2006 Australian Bureau of Statistics SEIFA Index of Relative Socio-Economic Disadvantage.[47] Ethics approval was obtained from the New South Wales Department of Health.

Students

The data were collected in August 2002 (baseline) and June 2006 (follow up). At baseline, the schools ranged in size from 593 to 1011 students. All Grade 7-10 students (aged 12-16 years) attending the three high schools were eligible to participate (2002: n=1899; 2006: n=1965). Students were blinded to the study aim of decreasing health risk behaviours.

Procedures

Recruitment and consent

An information letter and consent form were provided to each student by the school to obtain parental consent. Non-responding parents were followed up by phone to prompt return of the consent form.

Resilience and protective factor intervention

A multi-strategic intervention based upon an existing student resilience and protective factor program was implemented.[48] Data obtained from a baseline survey were used to inform the selection of resilience and protective factor intervention strategies in each of the three health promoting schools domains: curriculum, teaching and learning; ethos and environment; and partnerships and services.[17]

Curriculum, teaching and learning

Strategies involved the implementation of various curriculum materials and programs designed to enhance student resilience and protective characteristics including curriculum materials designed to enhance student communication, connectedness, empathy and self-awareness across all grade;[48] and implementation of programs targeting particular

resilience and protective factors, such as the Rock and Water Program[49] or the Resourceful Adolescent Program.[50]

Ethos and environment

Strategies involved the development and modification of school policies and programs relating to bullying to increase school connectedness, enhancement of peer support program to increase school connection and self-esteem, and student recognition programs to enhance student autonomy, goals and aspirations via acknowledgement of student achievements.

Partnerships and services

Strategies involved schools forming formal partnerships with local services to provide youth services access within school hours to enhance help seeking, initiatives to promote greater parent involvement via active engagement in school-initiated activities and promotion of links with community organizations with the school.

Strategies to enhance school intervention adoption

To maximise intervention adoption by schools the following strategies were implemented based on evidence of their effectiveness in supporting practice change in human service organizations[51] and findings from other school-based studies.[27,38,43,44]

Local consensus and adaptation

A number of strategies were implemented to ensure appropriate leadership support was available during intervention implementation, and the strategies implemented were feasible and able to be integrated within existing school systems.[43] Strategies implemented at each school included: the development of a memorandum of understanding to outlining the partnership between, and the roles of, schools and researchers;[52] formation of an advisory group to guide the intervention; establishment of core teams to implement the intervention;[53] and intervention planning workshops for school staff, parents and community members.[43]

School action plan and performance monitoring

A school action plan[54] was developed by each school based on the results of biennial student resilience and protective factors surveys. The surveys further provided a means of

monitoring and reviewing the action plan implementation and effectiveness, with schools being provided reports of their student results.

Staff training

Core staff from each school participated in annual training programs to increase their capacity to address student resilience, communication, connectedness, empathy and self-awareness.[32]

Provision of intervention implementation resources

One full time research assistant was employed for three years to support the three schools to implement the intervention. In addition, for the two initial intervention years, funding was provided to each school to facilitate teacher participation in training, planning and implementation of the intervention (AUS$4,000 and AUS$5,000 respectively per school).

Data collection

Students at each school completed a pen and paper survey conducted within class time at both baseline and follow up data collection. The survey included items addressing student resilience and protective factor characteristics, and their substance use behaviours.

Measures

Resilience and protective factor scores

The survey, based on the resilience module from the California Healthy Kids Survey,[28,32,55] included items relating to six resilience and six protective factor subscales. The six resilience factor subscales included items addressing the following: empathy (2 questions), effective help seeking (3 questions), self-esteem (3 questions), communication and cooperation (2 questions), self-awareness (2 questions), and goals and aspirations (2 questions). The six protective factor subscales included items regarding: family connection (4 questions), pro-social peers (3 questions), autonomy experience (4 questions), community connection (4 questions), school connection (4 questions), and pro-social group (3 questions). Students responded to each question using a four-point Likert scale ranging from '1 - never true', to '4 - true all of the time'. The subscales have been shown to have excellent to adequate internal reliability (resilience factors a=0.53-0.78; protective factors a=0.69-0.89)[32] and to be reliable and valid in an Australian school population.[56]

Tobacco, alcohol and marijuana use prevalence

Questions regarding student use of tobacco (3 questions), alcohol (2 questions) and marijuana (1 question) were based on items from previous surveys conducted within New South Wales secondary schools (Table 1).[10,32]

Table 1. Student health risk behaviour items

Health risk behaviours questions	Responses
TOBACCO	
Have you ever smoked even part of a cigarette?	No; Yes, just a few puffs; Yes, less than 10 cigarettes in the last 3 months; Yes, between 10 and 100 cigarettes in the last 3 months; Yes, more than 100 cigarettes in the last 3 months.[a]
In the last 3 months I have smoked one or more cigarettes on:	No days; 1 day; 2 days; 3 days; 4-5 days; 6-10 days; More than 10 days.[b]
At the present time, do you smoke cigarettes:	Daily; At least once a week; Less than once a week; Not at all.
ALCOHOL	
In the last 3 months I have had one or more drinks of *beer, wine* or *spirits* (do not count sips or tastes) on:	No days; 1 day; 2 days; 3 days; 4-5 days; 6-10 days; More than 10 days.[b]
In the last four weeks, how many times have you had 5 or more alcoholic drinks in a row?	None; Once; Twice; 3-6 times; 7 or more times.
MARIJUANA	
In the last 3 months I have used marijuana on:	No days; 1 day; 2 days; 3 days; 4-5 days; 6-10 days; More than 10 days.[b]

[a] New South Wales School Students Health Behaviour Survey[10]; [b] MindMatters Evaluation Project[32].

Student characteristics

Students were asked to specify their grade and gender.

Analysis

Sample characteristics

Student descriptive characteristics (gender and grade) at baseline and follow up were compared using Chi square analysis.

Resilience and protective factor scores

At baseline and follow up, individual student scores for each of the six resilience and six protective factor subscales were calculated by averaging responses to questions in each subscale. An overall resilience and protective factor score for each student was calculated by summing these subscale scores.

Resilience factor and protective factor scores for each school, and for all three schools combined, were calculated by averaging all individual student scores. As such scores were not normally distributed, median scores are reported, and differences between scores at baseline and follow up were examined using the Fisher Exact Test (non-parametric ANOVA).

Prevalence of tobacco, alcohol and marijuana use

Responses to the tobacco, alcohol and marijuana use items were categorised to form six outcome measures: use of tobacco, alcohol, and marijuana in the last three months (any, none); ever smoked a cigarette (yes, no); current smoking (yes, no); and consumption of five or more alcohol drinks in a row in the last four weeks (any, none). Differences between baseline and follow up in the proportion of students reporting each of the six outcomes were examined by Chi square analysis for all three schools combined, for each school separately, and by grade and gender. A significance level of $p \leq 0.01$ was used to adjust for multiple testing for substance use outcomes.[57]

All analyses were undertaken using SAS Software Version 8.2.[58]

Sample size

Allowing for a potential intra school correlation of 0.01,[59] and a response rate of 50%, a difference in resilience and protective factor scores for the three schools combined of 0.8 was estimated to be detectable based on a sample size of 900 students at the three schools at baseline and follow up (80% power, p=0.05). Using these same parameters[60] and a

baseline prevalence of 50%, a 10% difference in student reported tobacco, alcohol and marijuana use was estimated to be detectable.

Results

Student sample

At baseline and follow up, 1449 (76.3%) and 1205 (61.3%) students respectively with parental consent participated in the study (Table 2). The proportion of females (p=0.14), and the proportion of students by grade (p=0.32) who participated in follow up data collection were not significantly different to those participating at baseline. The gender and grade characteristics of participating students at both data collection points were similar to students in New South Wales public secondary schools.[61]

Table 2. Participant descriptors

Participant Descriptors	2002 n (%)	2006 n (%)	*p* value
TOTAL	1449 (76.3)	1205 (61.3)	
School			
A	425 (78.0)	331 (69.0)	0.34
B	577 (79.8)	514 (62.8)	
C	447 (70.7)	360 (54.0)	
Gender			
Female	709[c]	626[d]	0.13
Male	734	577	
Grade			
7	383[a]	318[b]	0.32
8	358	317	
9	335	298	
10	367	271	

[a] 6 students did not provide gender; [b] 2 students did not provide gender; [c] 6 students did not provide grade; [d] 1 student did not provide grade.

Intervention delivery

The intervention strategies implemented by schools differed in emphasis according to the priorities identified by each school. The total number of strategies targeting resilience and

protective factors over the three year intervention period ranged from 27 to 39 per school (School A: 6-14 per year; School B: 4-12 per year; School C: 2-17 per year). Of the strategies implemented across the three schools, 26-53% addressed the curriculum, teaching and learning domain; 31-56% ethos and environment; and 16-21% partnerships and services.

Resilience and protective factor scores

The combined median resilience factor score for the three schools at follow up (18.17) was significantly greater compared to that at baseline (18.00) ($p<0.01$). Similarly, the median protective factor score for the three schools combined at follow up (17.67) was significantly greater than that at baseline (17.25) ($p<0.01$)) (Table 3). On an individual school basis, at follow up a significantly greater median resilience factor score was evident for School A only ($p<0.01$), with a trend toward a greater resilience factor score at follow up for School B. Significantly greater median protective factor scores were evident for Schools A ($p<0.01$) and B ($p<0.05$) at follow up.

Table 3. Overall median resilience and protective factor scores

Overall factor scores	2002[a]	2006[a]	*p* value
RESILIENCE			
All schools	18.00	18.17	<0.01
School: A	17.83	18.50	<0.01
B	18.00	18.17	0.07
C	17.83	17.83	0.41
PROTECTIVE			
All schools	17.25	17.67	<0.01
School: A	17.17	17.83	0.01
B	17.33	17.75	<0.05
C	17.17	17.17	0.56

Tobacco, alcohol and marijuana use prevalence

At follow up, the proportion of all students that reported substance use for each of the 6 outcome measures was significantly lower than that at baseline (Table 4). For smoking outcomes, the proportion of students in all three schools combined who reported: ever smoking was 23.8% less ($p<0.01$); smoking in the last three months was 12.9% less ($p<0.01$); and being a current smoker was 12.0% less ($p<0.01$). The proportion of students

who reported consumption of one or more alcoholic drinks in the last 3 months was 19.2% less ($p<0.01$), and consumption of five or more drinks on one or more days was 16.4% less ($p<0.01$). Student report of marijuana use in the last 3 months was 9.5% less ($p<0.01$).

Similarly, the proportions of students in each individual school, the proportions of males and females, and the proportions of students in each grade that reported substance use for each of the six outcome measures was significantly lower at follow up than at baseline (Table 4).

DISCUSSION

This pilot study sought to describe the potential effectiveness and feasibility of a novel comprehensive resilience and protective factor-based intervention on adolescent resilience and substance use. The results suggest that the intervention approach has the potential to decrease the extent of tobacco, alcohol and marijuana use across all students. In addition, the results confirm the feasibility of implementing such an intervention inclusive of a range of explicit adoption strategies within existing school practice. Given the importance of such behaviours to adolescent, and later adult health, as well as the implications for educational practice in schools, further research involving a more rigorous controlled evaluation of the intervention is warranted to confirm this potential.

Resilience theory was first developed to explain why some disadvantaged children were able to succeed in a context of high personal and environmental risk, whereas other children did not.[22,62] Previous studies have suggested an ability to strengthen the resilience and protective factor characteristics of a number of population groups other than adolescents.[63,64] For example, a controlled trial with college students has reported 5%-10% increases in resilience following a four week intervention.[64] Similarly, in a non-controlled study implemented in primary schools, significant increases in self-esteem, and school and family connection of 23-38% were reported following a five month resilience-based intervention.[63] The findings also extend those of a non-controlled evaluation of the program that formed the basis of the intervention implemented in this study.[38] In that analysis, significant increases in school connection, autonomy experience and help-seeking among adolescents were reported, but not for self-esteem.[38] Although such studies have suggested an ability to increase student resilience and protective factor scores, the clinical significance of such increases is unknown.

Table 4. Prevalence of student tobacco, alcohol and marijuana use[a]*

	TOBACCO						ALCOHOL				MARIJUANA	
	Ever smoked[b]		Last 3 months[c]		Current smoker[d]		Last 3 months[e]		Binge drinking[f]		Last 3 months[g]	
	2002 N (%)	2006 N (%)	2002 N (%)	2006 N (%)	2002 N (%)	2006 N (%)	2002 N (%)	2006 N (%)	2002 N (%)	2006 N (%)	2002 N (%)	2006 N (%)
ALL STUDENTS												
	714 (50.6)	309 (26.8)	352 (24.9)	137 (12.0)	334 (23.2)	135 (11.2)	687 (48.7)	334 (29.5)	483 (33.8)	204 (17.4)	231 (16.3)	77 (6.8)
School												
A	212 (51.0)	103 (31.5)	102 (24.9)	48 (14.7)	100 (24.6)	42 (13.0)	194 (48.1)	94 (28.8)	143 (33.8)	61 (18.8)	68 (16.6)	23 (7.1)
B	289 (50.9)	120 (24.6)	143 (25.2)	52 (10.5)	129 (22.9)	54 (11.0)	283 (49.8)	151 (30.8)	198 (34.6)	85 (17.0)	85 (15.0)	25 (5.0)
C	213 (49.9)	86 (25.2)	107 (24.4)	37 (11.6)	105 (24.7)	39 (11.5)	210 (47.8)	89 (28.2)	142 (32.8)	58 (16.6)	78 (17.7)	29 (9.1)
Grade												
7	110 (29.2)	31 (10.6)	33 (8.8)	9 (3.1)	43 (11.3)	7 (2.2)	83 (22.1)	31 (10.8)	53 (13.9)	12 (3.9)	18 (4.8)	2 (0.7)
8	173 (50.1)	63 (20.5)	96 (27.3)	25 (8.1)	91 (25.4)	30 (9.5)	158 (45.1)	62 (20.3)	103 (29.3)	33 (10.7)	52 (14.8)	17 (5.6)
9	193 (59.4)	104 (36.2)	97 (30.0)	49 (17.3)	90 (27.0)	50 (16.8)	192 (58.9)	105 (37.6)	134 (40.5)	74 (25.3)	70 (21.4)	28 (10.0)
10	235 (65.3)	111 (41.4)	124 (34.5)	54 (20.5)	109 (29.9)	48 (17.7)	251 (70.7)	136 (51.9)	189 (52.5)	85 (31.6)	88 (24.5)	30 (11.4)
Gender												
Male	339 (47.4)	148 (27.1)	159 (22.1)	66 (12.4)	160 (21.8)	73 (12.6)	361 (50.3)	173 (32.8)	266 (36.7)	113 (20.1)	125 (17.3)	42 (7.9)
Female	375 (53.9)	161 (26.4)	188 (27.4)	71 (11.7)	174 (24.6)	62 (9.9)	318 (46.6)	159 (26.4)	217 (30.8)	91 (14.8)	102 (14.8)	34 (5.6)

* All outcomes significantly lower in 2006 compared to 2002 ($p \leq 0.01$ used due to multiple testing[45]); [a] 43-100 students answers missing per question; [b] ever smoked at least a few puffs of a cigarette; [c] smoked at least one cigarette on at least one day in the last three months; [d] currently smokes at least part of a cigarette in a week; [e] drank at least one alcoholic drink on at least one day in the last three months; [f] drank at least five alcoholic drinks on at least one day in the last four weeks; [g] used marijuana on at least one day in the last three months.

Although statistically significant, only modest improvements were found in resilience and protective factors in this study (1-2 point increase). However, such a level of improvement at a group or population level may be important from a public health perspective.[65] Further research of the effect of a resilience intervention such as that described in this study is recommended, as is research focused on the standardisation of the resilience measure in an Australian high school population.

Given the limited evidence regarding the efficacy of school-based interventions in reducing tobacco, alcohol and marijuana use, the observed differences in prevalence for all six substance use measures in this study are promising. Although the ability to compare study findings is limited due to methodological differences between studies, the observed differences in the this study appear larger than the effect sizes in previous studies where a positive outcome has been reported.[32,36,38,39] For example, in a controlled trial of a protective factor intervention designed to reduce substance use in a cohort of Grade 6 students in the USA, 2% absolute reductions in tobacco (intervention 28% vs control 30%) and marijuana use (intervention 8% vs control 10%) were observed at 3 year follow up.[39] Similarly, in a five and a half year follow up of a randomised controlled trial comparing the effects of two family and school interventions on tobacco, alcohol and marijuana use, relative reductions were reported in the prevalence of smoking of 12-21% for smoking initiation and 23% for marijuana initiation.[36] The 47-51% and 58% relative differences found in this study compare favourably to such previous study outcomes.

Similarly, despite the normal developmental trajectories of substance use[9-12] and the variable intervention exposure across grades, positive substance use results were achieved in this study across all grades, as well as all schools and both genders for all outcome measures, results that contrast with inconsistent group effects in previous resilience focused studies.[32,36-40] For example, as discussed previously, a controlled protective factor intervention in 26 Australian high schools was able to demonstrate decreases in either smoking or marijuana use at follow up, but not for others.[37,40] Similarly, a non-controlled resilience and protective factor intervention in 15 Australian high schools was able to demonstrate decreases in smoking, alcohol or marijuana use in only a limited number of grade and gender groups examined.[38]

Whilst consistent decreases in health risk behaviours were observed across all schools, the same was not evident in resilience and protective scores with one school's median score remaining unchanged (school c). Future studies are required to better determine the

association between resilience and substance use, including the changes in both and developmental influences.

The extent to which the explicit inclusion in this study of strategies that addressed both resilience and protective factors, the use of a health promoting schools approach,[21] the inclusion of strategies to enhance intervention adoption or the variable intervention dose across schools contributed to the observed outcomes that other studies have not been able to demonstrate is unknown. Further research to determine the differential contribution of such factors on 'school culture',[21] resilience and protective factors, substance use and the association between such outcomes would be of benefit.

Interpretation of the study results should be viewed in light of a number of its characteristics. First, the non-controlled study design and the use of cross sectional data preclude the drawing of causal links between the intervention and the observed outcomes. Although the design does not allow for such attribution, comparison with data from regularly conducted state-wide secondary school surveys suggest that the differences in substance use observed in this study exceed a general declining trend in use across New South Wales.[10] Based on such survey data, the absolute proportion of all 12 to 16 year old students in the state, and all such students, who reported 'ever smoking' decreased by 7% (39% to 32% for both populations) between 2002 and 2005,[10] compared to the 24% absolute difference between 2002 and 2006 observed in this study. The finding that the observed differences in substance use exceeded temporal trends at the state level strengthens the possibility that they may be attributable to the intervention.

Similarly, due to the study design it is unknown whether characteristics of the participating schools or students had an impact on the observed results. It is possible that the greater effect found in this study is due to the particularly low level of disadvantage in the community in which the schools were located. Alternatively, it has been argued that modifying health risks among disadvantaged populations is more difficult, as evidenced by their greater prevalence of health risk behaviours.[66] However the extent to which the level of disadvantage contributed to the effect sizes found is unknown.

Similarly, whilst data suggests that a proportion of students change schools each year across the state,[67] the extent to which the rates of such movement occurred in the study schools is not known. During the study period the number of students increased in two of the three schools. Whilst students leaving the school during the study period would not be expected

to have an impact on the study outcomes, the entry of new students to the schools during the study period has the potential to have had an impact due to reduced exposure to the intervention. As the effect of this would be to diminish the effect size of the intervention, the reported results could be considered to be a conservative estimate of effect.

Second, whilst the consent rates achieved in this study are typical for school-based research using active consent,[68] the risk of non-response bias has been suggested to increase substantially once participation rates fall below 80%.[69] Previous studies have reported non-responding children to have a higher prevalence of health risk behaviours,[70] whilst others report inconsistent or no differences in health risk behaviour prevalence.[71] If such an effect occurred, the potential exists that the lower the response rate at follow up may have contributed to the reduction in substance use however the extent to which this may have influenced the findings is unclear.

Third, the small number of participating schools limits the generalizabilty of the results to the broader population of schools. Additionally, the three participating schools are located within one community and the extent to which these results could be generalised to other disadvantaged schools, or the broader population of schools is unknown. Future research is required that assesses the efficacy of the intervention in both the general population and high risk populations. Similarly, future studies should include the collection of data regarding the ethnicity of students in order to examine any differential intervention effects for students of different cultural backgrounds.

Finally, as the study relied on adolescent self-report of health risk behaviours, the validity of the outcome measures is unknown.[72] Whilst a number of studies have reported that adolescent self-report of tobacco use corresponds well with biochemical markers of tobacco smoking,[73] options to increase the accuracy of self-report exist. The bogus pipeline approach,[74] and other methods of data collection, such as web based surveys, have been suggested to have higher participation rates and to increase the reporting of substance use.[75,76]

CONCLUSIONS

Despite these limitations, the results of this study confirm the feasibility, and suggest the potential, of a resilience based intervention approach with the inclusion of explicit adoption strategies, in reducing the unacceptably high tobacco, alcohol and marijuana use among

adolescents. To further investigate the potential of this approach, future research employing a more rigorous controlled research design across a larger range of schools is required. In the event that such rigorous research confirms this potential, subsequent studies seeking to establish the relative effectiveness and cost effectiveness of the intervention elements is warranted.

COMPETING INTERESTS

There are no competing interests for any of the authors of this manuscript.

AUTHORS' CONTRIBUTIONS

RKH: Performed the data analysis and drafted the manuscript. JD: Participated in the design and coordination of the study, and the critical revision of the manuscript. MF: Participated in the implementation of the intervention, helped in the drafting and participated in the critical revision of the manuscript. JB: Participated in the interpretation of the data and the critical revision of the manuscript. TH: Participated in the acquisition, analysis and interpretation of data and the critical revision of the manuscript. JW: Conceived of the study, participated in its design and coordination, helped draft the manuscript and participated in the critical revision. All authors read and approved the final manuscript.

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APPENDIX 4.2. Hunter New England Health Human Research Ethics Committee approval

18 December 2009

HUNTER NEW ENGLAND
NSW HEALTH

Dr J Wiggers
Director
Hunter New England Population Health
Wallsend

Dear Dr Wiggers,

Re: Effectiveness of a resilience intervention in reducing smoking and alcohol consumption among secondary school students (09/11/18/4.01)

HNEHREC Reference No: 09/11/18/4.01
NSW HREC Reference No: HREC/09/HNE/378

Thank you for submitting the above protocol for single ethical review. This project was first considered by the Hunter New England Human Research Ethics Committee at its meeting held on **18 November** 2009 and again on the **16 December 2009.** This Human Research Ethics Committee is constituted and operates in accordance with the National Health and Medical Research Council's *National Statement on Ethical Conduct in Human Research (2007)* (National Statement) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*. Further, this Committee has been accredited by the NSW Department of Health as a lead HREC under the model for single ethical and scientific review. The Committee's Terms of Reference are available from the Hunter New England Area Health Service website: http://www.hnehealth.nsw.gov.au/Human_Research_Ethics.

I am pleased to advise that following acceptance under delegated authourity of the requested clarifications and changes to the Parent Information Letter and Partnership Agreement by Dr Nicole Gerrand Manager, Research Ethics & Governance, the Hunter New England Human Research Ethics Committee has granted ethical approval of the above project.

The following documentation has been reviewed and approved by the Hunter New England Human Research Ethics Committee:

- The Student Information Letter (Version 2 dated 2 December 2009);
- The Staff Information Letter (Version 2 dated 2 December 2009);
- The Parent Information Letter and Consent Form (Version 3 dated 17 December 2009);
- The School Information Letter (Version 2 dated 2 December 2009);
- The Partnership Agreement 2010/2013 (Version 2 dated 17 December 2009);
- The Student Survey (Version 2 dated 2 December 2009);
- The Staff Survey (Version 2 dated 2 December 2009);
- The Parent/Carer Survey (Version 2 dated 2 December 2009); and
- The Parent Phone Prompt (Version 1 dated 2 December 2009)

For the protocol: **Effectiveness of a resilience intervention in reducing smoking and alcohol consumption among secondary school students**

Hunter New England Research Ethics & Governance Unit

(Locked Bag No 1)
(New Lambton NSW 2305)
Telephone (02) 49214 950 Facsimile (02) 49214 818
Email: hnehrec@hnehealth.nsw.gov.au
http://www.hnehealth.nsw.gov.au/Human_Research_Ethics

Approval from the Hunter New England Human Research Ethics Committee for the above protocol is given for a maximum of 3 years from the date of this letter, after which a renewal application will be required if the protocol has not been completed.

The *National Statement on Ethical Conduct in Human Research (2007)*, which the Committee is obliged to adhere to, include the requirement that the committee monitors the research protocols it has approved. In order for the Committee to fulfil this function, it requires:

- a report of the progress of the above protocol be submitted at 12 monthly intervals. Your review date is **December 2010.** A proforma for the annual report will be sent two weeks prior to the due date.
- A final report be submitted at the completion of the above protocol, that is, after data analysis has been completed and a final report compiled. A proforma for the final report will be sent two weeks prior to the due date.
- All variations or amendments to this protocol, including amendments to the Information Sheet and Consent Form, must be forwarded to and approved by the Hunter New England Human Research Ethics Committee prior to their implementation.
- The Principal Investigator will immediately report anything which might warrant review of ethical approval of the project in the specified format, including:
  - any serious or unexpected adverse events
    - Adverse events, however minor, must be recorded as observed by the Investigator or as volunteered by a participant in this protocol. Full details will be documented, whether or not the Investigator or his deputies considers the event to be related to the trial substance or procedure. These do not need to be reported to the Hunter New England Human Research Ethics Committee
    - Serious adverse events that occur during the study or within six months of completion of the trial at your site should be reported to the Manager, Research Ethics & Governance, of the Hunter New England Human Research Ethics Committee as soon as possible and at the latest within 72 hours.
    - All other safety reporting should be in accordance with the NHMRC's Safety Monitoring Position Statement – May 2009 available at http://www.nhmrc.gov.au/health_ethics/hrecs/reference/_files/090609_nhmrc_position_statement.pdf
    - Serious adverse events are defined as:
      - Causing death, life threatening or serious disability.
      - Cause or prolong hospitalisation.
      - Overdoses, cancers, congenital abnormalities whether judged to be caused by the investigational agent or new procedure or not.
  - unforeseen events that might affect continued ethical acceptability of the project.
- If for some reason the above protocol does not commence (for example it does not receive funding); is suspended or discontinued, please inform Dr Nicole Gerrand, as soon as possible.

Hunter New England Research Ethics & Governance Unit

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APPENDIX 4.3. The University of Newcastle Human Research Ethics Committee approval

HUMAN RESEARCH ETHICS COMMITTEE

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Notification of Expedited Approval

To Chief Investigator or Project Supervisor:	**Dr John Wiggers**
Cc Co-investigators / Research Students:	**Doctor Elizabeth Campbell** **Dr Luke Wolfenden** **Associate Professor Jennifer Bowman** **Ms Megan Freund** **Mrs Rebecca Hodder**
Re Protocol:	**Effectiveness of a resilience intervention in reducing smoking and alcohol consumption among secondary school students**
Date:	**05-Mar-2010**
Reference No:	**H-2010-0029**
Date of Initial Approval:	**03-Mar-2010**

Thank you for your **Initial Application** submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under **Expedited Review of External Approval** review by the Chair/Deputy Chair.

I am pleased to advise that the decision on your submission is **External HREC Approval Noted** effective **03-Mar-2010**.

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Approval will remain valid subject to the submission, and satisfactory assessment, of annual progress reports. *If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.*

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal *Certificate of Approval* will be available upon request. Your approval number is **H-2010-0029**.

If the research requires the use of an Information Statement, ensure this number is inserted at the relevant point in the Complaints paragraph prior to distribution to potential participants You may then proceed with the research.

Conditions of Approval

This approval has been granted subject to you complying with the requirements for *Monitoring of Progress*, *Reporting of Adverse Events*, and *Variations to the Approved Protocol* as detailed below.

PLEASE NOTE:
In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, or a Renewal of approval, you will apply to the External HREC for approval in the first

instance and then Register that approval with the University's HREC.

- ***Monitoring of Progress***

Other than above, the University is obliged to monitor the progress of research projects involving human participants to ensure that they are conducted according to the protocol as approved by the HREC. A progress report is required on an annual basis. Continuation of your HREC approval for this project is conditional upon receipt, and satisfactory assessment, of annual progress reports. You will be advised when a report is due.

- ***Reporting of Adverse Events***

1. It is the responsibility of the person **first named on this Approval Advice** to report adverse events.
2. Adverse events, however minor, must be recorded by the investigator as observed by the investigator or as volunteered by a participant in the research. Full details are to be documented, whether or not the investigator, or his/her deputies, consider the event to be related to the research substance or procedure.
3. Serious or unforeseen adverse events that occur during the research or within six (6) months of completion of the research, must be reported by the person first named on the Approval Advice to the (HREC) by way of the Adverse Event Report form within 72 hours of the occurrence of the event or the investigator receiving advice of the event.
4. Serious adverse events are defined as:
    - Causing death, life threatening or serious disability.
    - Causing or prolonging hospitalisation.
    - Overdoses, cancers, congenital abnormalities, tissue damage, whether or not they are judged to be caused by the investigational agent or procedure.
    - Causing psycho-social and/or financial harm. This covers everything from perceived invasion of privacy, breach of confidentiality, or the diminution of social reputation, to the creation of psychological fears and trauma.
    - Any other event which might affect the continued ethical acceptability of the project.

5. Reports of adverse events must include:
    - Participant's study identification number;
    - date of birth;
    - date of entry into the study;
    - treatment arm (if applicable);
    - date of event;
    - details of event;
    - the investigator's opinion as to whether the event is related to the research procedures; and
    - action taken in response to the event.

6. Adverse events which do not fall within the definition of serious or unexpected, including those reported from other sites involved in the research, are to be reported in detail at the time of the annual progress report to the HREC.

- ***Variations to approved protocol***

If you wish to change, or deviate from, the approved protocol, you will need to submit an *Application for Variation to Approved Human Research*. Variations may include, but are not limited to, changes or additions to investigators, study design, study population, number of participants, methods of recruitment, or participant information/consent documentation. **Variations must be approved by the (HREC) before they are implemented** except when Registering an approval of a variation from an external HREC which has been designated the lead HREC, in which case you may proceed as soon as you receive an acknowledgement of your Registration.

Linkage of ethics approval to a new Grant

HREC approvals cannot be assigned to a new grant or award (ie those that were not identified on the application for ethics approval) without confirmation of the approval from the Human Research Ethics

Officer on behalf of the HREC.

Best wishes for a successful project.

Associate Professor Alison Ferguson
Chair, Human Research Ethics Committee

For communications and enquiries:
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Linked University of Newcastle administered funding:

Funding body	Funding project title	First named investigator	Grant Ref
Project Grant	Effectiveness of resilience intervention in reducing smoking and alcohol consumption among secondary school students	Wiggers John,Henry	G0190175

APPENDIX 4.4. Aboriginal Health and Medical Research Council approval

Dear Associate Professor Wiggers
776/11 – Healthy Schools, Healthy Futures: Effectiveness of a resilience intervention in reducing smoking and alcohol consumption among secondary school students
I am pleased to advise you that the reviewers have recommended the above application for approval by the AH&MRC Ethics Committee subject to the following Standard Conditions and Special Condition of Approval being met:

"Standard Conditions of Approval (where applicable to the project)

1. *The approval is for a period from 21 March 2011 until 31 March 2012, with extension subject to providing a report on the research by 31 March 2012.*
2. *All research participants are to be provided with a relevant Participant Information Statement and Consent Form in the format provided with the application.*
3. *Copies of all signed participant consent forms must be retained and made available to the Ethics Committee on request. A request will only be made if there is a dispute or complaint in relation to a participant.*
4. *Any changes to the staffing, methodology, timeframe, or any other aspect of the research relevant to continued ethical acceptability of the project must have the prior written approval of the Ethics Committee.*
5. *The research must comply at all times with:*
   - *the* AH&MRC Guidelines for Research in Aboriginal Health- Key Principles
   - *the* National Statement on Ethical Conduct in Research Involving Humans (April 2007)*; and*
   - *the* NSW Aboriginal Health Information Guidelines.
6. *The final draft of the report from the research, and any publication or presentation prior to that report where new data or findings are presented, must be provided to the AH&MRC Ethics Committee to be reviewed for compliance with ethical and cultural criteria prior to:*
   - *any submission for publication; and/or*
   - *any dissemination of the report.*
7. *A copy of the final published version of any publication is to be provided to the AH&MRC Ethics Committee.*

Special Condition/s

8. *Before work can commence on this application, the Committee must be provided with a signed Organisational Consent Form or Letter of Support from a relevant Aboriginal Community Controlled Health Services (ACCHSs) or an alternative Aboriginal community body."*

I have drafted a letter of approval for signature by the Chairperson of the Ethics Committee, incorporating the Standard and Special Condition/s, but as she lives in the country there will be a few days in the turnaround.

On behalf of the AH&MRC Ethics Committee thank you for submitting your application for Ethics approval.

With kind regards

Robert

Robert Fritchley
Project Officer
Ethics Committee

Aboriginal Health and Medical Research Council
Level 3: 66 Wentworth Ave: Surry Hills NSW 2010 P:+61 2 9212 4777 F:+61 2 9212 7211
Postal Address: PO Box 1565 Strawberry Hills 2012
Web: www.ahmrc.org.au

Please visit the 1st Aboriginal specific gambling website
http://www.ahmrc.org.au/gambling.php

APPENDIX 4.5. New South Wales Department of Education and Training State Education Research Approval Process approval

DOC 10/175658

NSW GOVERNMENT | Education & Training

A/Prof John Wiggers
Hunter New England Population Health
Locked Bag 10
WALLSEND NSW 2287

DOC 10/175658

Dear Professor Wiggers

SERAP NUMBER 2008118

I refer to your application to conduct a research project in NSW government schools entitled "*Healthy Schools, Healthy Futures: building school capacity to address the health and wellbeing of young people*". I am pleased to advise that your application has been approved and that the approval remains valid until 29 May 2011.

You may now contact the principals of the nominated NSW government schools to seek their participation. **It is recommended that you include a copy of this letter with the documents you send.**

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Name	Approval expires
John Henry Wiggers	18/06/2011
Megan Freund	04/06/2011
Meghan Katherine Macdonald	04/06/2011
Rebecca Kate Hodder	04/06/2011

The following conditions also apply:

- Regional Directors/Principals have the right to withdraw the Region/school from the study at any time. The approval of the principal for the specific method of gathering information for the school must also be sought
- the privacy of the school and the students is to be protected
- the participation of teachers and students must be voluntary and at the school's convenience; and
- any proposal to publish the outcomes of the study should be discussed with the Manager, Schooling Research at least one month before the proposed publication proceeds.

A full list of conditions is attached.

DOC 10/175658

When your study is completed, please forward your report to the Manager, Schooling Research, Department of Education and Training, Student Engagement and Program Evaluation Bureau, Locked Bag 53, Darlinghurst, NSW 2010.

Yours sincerely

Dr Max Smith
Senior Manager
Student Engagement and Program Evaluation
5 December 2010

NSW Department of Education & Training – Student Engagement and Program Evaluation Bureau
Level 1, 1 Oxford St. Darlinghurst NSW 2010 T 9244 5619 F 9266 8233 E serap@det.nsw.edu.au

APPENDIX 4.6. Catholic Schools Offices research approvals

Recd.
21/6/10

CATHOLIC SCHOOLS OFFICE

→ MF.
5/6.

P.O. Box 636 0 125 Barney Street 34 Armidale NSW 2350 C Phone (02) 6772 7388 4 Fax (02) 6772 9285
ABN 90 702 916 776 • Email cso@arm.catholic.edu.au

15th June, 2010.

Assoc Prof John Wiggers
Director of Population Health
Hunter New England Area Health Service
Locked Bag 10
Wallsend NSW 2287

Dear John,

Further to your request to conduct research schools in the Diocese of Armidale, I am pleased to advise that approval has been granted.

The approval allows you to approach school principals and seek their involvement in your project, *Effectiveness of a Resilience Intervention in Reducing Smoking and Alcohol Consumption Among Secondary School Students.*

It should be understood that it is the prerogative of the principal to decline your invitation to be involved in this study or to withdraw from involvement at any time.

The privacy of the school and that of any school personnel or students involved in your study must, of course, be preserved at all times.

When your research has been completed, please forward a summary report of the findings and/or recommendations to the school as soon as practicable after results are to hand.

I wish you well in this undertaking.

Yours sincerely,

John M. Mula
Diocesan Director of Catholic Schools

Rebecca Hodder

From: Megan Freund
Sent: Thursday, 9 September 2010 5:16 PM
To: Rebecca Hodder
Subject: approval from Ray Collins

Hi Megan,

John Mula has been copying me in to his emails to and from you. The email sent on 11/6 to John and me did not arrive at my computer. Could you check if my name is being added to the addresses for all these emails.

Our Diocese will be going ahead with the project with one qualification if that is possible. We would like the questions in relation to sexual activity withdrawn from the survey that goes to students in our schools. Given that these questions assist in the secondary outcomes of the project it was suggested in our meeting that it would be possible to withdraw them. Our reasons for requesting the withdrawal of the questions is particularly related to possible parent concern about the nature of the questions.

Could you please let me know if there are any problems with this request?

With thanks,

Ray
Ray Collins
Director of Schools
Diocese of Maitland-Newcastle

APPENDIX 4.7. Australia and New Zealand Clinical Trials Registration

ANZCTR
Australian New Zealand Clinical Trials Registry

CREATE ACCOUNT LOGIN

DEFINITIONS HINTS AND TIPS FAQs REGISTER TRIAL MY TRIALS

Trial Review

VIEW TRIAL AT REGISTRATION VIEW HISTORY

< BACK

Trial registered on ANZCTR

Trial ID	ACTRN12611000606987
Ethics application status	Approved
Date submitted	8/06/2011
Date registered	14/06/2011
Date last updated	9/12/2013
Type of registration	Prospectively registered

Titles & IDs

Public title	Healthy Schools, Healthy Futures: a randomised controlled trial to assess the efficacy of a school-based resilience intervention to decrease tobacco and alcohol use in secondary school students
Scientific title	The effect of a school-based resilience intervention versus standard school practice on student tobacco, alcohol use levels, and mental health
Secondary ID [1]	Nil
Universal Trial Number (UTN)	U1111-1122-0591
Trial acronym	Healthy Schools, Healthy Futures
Linked study record	

Health condition

Health condition(s) or problem(s) studied:

Adolescent tobacco use

Adolescent alcohol use

Adolescent mental health

Condition category	**Condition code**
Public Health	Health promotion/education
Mental Health	Studies of normal psychology, cognitive function and behaviour

Intervention/exposure

Study type	Interventional
Description of intervention(s) / exposure	A three year resilience intervention will be implemented in each school in the intervention group inclusive of the following six intervention strategies: - Implementation of age appropriate resilience curriculum and programs targeting student resilience factors eg resilience linked to curriculum across subjects, use of existing programs such as the Resourceful Adolescent Program. - Implementation of school policies and practices that impact on student resilience factors eg modification of welfare policies to include resilience, student reward and recognition program - Modification of the physical and social environment of the school to create a safe and supportive environment where resilience is fostered eg modification of space use, student murals - Development of partnerships with local organisations and community groups to deliver resilience strategies within the school eg Salvation Army, Aboriginal Community

	- Improve access to, and promotion of, health and community services eg youth services, community health - Implementation of strategies to engage and increase participation of parents and families in school-based activities eg social events, increased opportunity to attend school events
Intervention code [1]	Prevention
Intervention code [2]	Behaviour
Intervention code [3]	Lifestyle
Comparator / control treatment	No treatment – standard school practices
Control group	Active

Outcomes

Primary outcome [1]	Tobacco use measured by adolescent self report
Timepoint [1]	At baseline (2011) and at the end of the intervention period (2014)
Primary outcome [2]	Alcohol use measured by adolescent self report
Timepoint [2]	At baseline (2011) and at the end of the intervention period (2014)
Primary outcome [3]	Primary outcome 3: Mental health measured by the youth self-report version of the Strength and Difficulties Questionnaire (SDQ).
Timepoint [3]	Timepoint: at baseline (2001) and at the end of the intervention period (2014).
Secondary outcome [1]	Resilience factors score measured by adolescent self report
Timepoint [1]	At baseline (2011) and at the end of the intervention period (2014)
Secondary outcome [2]	Marijuana use measured by adolescent self report
Timepoint [2]	At baseline (2011) and at the end of the intervention period (2014)
Secondary outcome [3]	Other drug use measured by adolescent self report
Timepoint [3]	At baseline (2011) and at the end of the intervention period (2014)
Secondary outcome [4]	Physical activity level measured by adolescent self report
Timepoint [4]	At baseline (2011) and at the end of the intervention period (2014)
Secondary outcome [5]	Consumption of fruit measured by adolescent self report
Timepoint [5]	At baseline (2011) and at the end of the intervention period (2014)
Secondary outcome [6]	Consumption of vegetables measured by adolescent self report
Timepoint [6]	At baseline (2011) and at the end of the intervention period (2014)
Secondary outcome [7]	Sexual activity measured by adolescent self report
Timepoint [7]	At baseline (2011) and at the end of the intervention period (2014)

Eligibility

Key inclusion criteria	Schools: - located in a disadvantaged area (defined by the SEIFA Index of Relative Socio-Economic Advantage/Disadvantage) - located within the HNE Area Health Service region - > 400 enrolments - enrolments in Years 7-10 - co-educational Children: - all children in Years 7-10 in participating schools
Minimum age	12 Years
Maximum age	17 Years
Gender	Both males and females
Can healthy volunteers participate?	Yes
Key exclusion criteria	Schools: The following types of schools will be excluded from the trial given their characteristics and the likelihood of a differential effects in these schools: - fully special needs schools - central schools (schools with enrolments from Kindergarten to Year 10/12) - fully selective schools - boarding schools - schools already implementing a comprehensive resilience intervention

Study design

Purpose of the study	Prevention
Allocation to intervention	Randomised controlled trial
Procedure for enrolling a subject and allocating the treatment (allocation concealment procedures)	Schools: Schools will be selected from a current list of all government and Catholic secondary schools in the study area obtained from the Department of Education and Training and from relevant regional Catholic School Offices. The order in which schools will be invited to participate will then be determined using a random number function in Microsoft Excel by an independent statistician. The principals of the first 32 randomly selected eligible secondary schools will be sent a letter informing them about the study and requesting written consent for their school to participate. Within one week from the initial information letters being sent, research staff will contact non-responding principals to answer any questions they may have and to prompt for their reply. Principals that do not reply within a further week will receive additional prompts from research staff. If a school declines to consent the next school on the list will be invited, following the same procedure above. Once 32 schools have been recruited to the study, the sample will be stratified by current receipt of National Partnership Payment funding (low socio-economic schools are provided between AUS$1,000-1,500 per student for four years to improve student wellbeing (REF)) and school size (medium sized school 400-800; large sized school >800). Twenty schools will then be randomly allocated to the intervention group and 12 to the control group by a statistician (using a random number function in SAS 9.2) using proportional random allocation. Children: Active parental consent will be required for child participation in the data collection part of the trial. In order to maximise parental consent for child participation, schools will be provided with information regarding the study to disseminate via existing school communication channels, including school newsletters, assemblies, staff meetings, and school community and parent groups. Parents will be given study information packs that include a short letter from the school principal on school letterhead, a detailed study information letter for parents, a simplified study information letter for students, a parental consent form for child participation and a reply paid envelope. Parents will be asked to return the consent form by either using the reply paid envelope, or directly to their child's school. Two weeks after distribution of the information packs, non-responding parents will be telephoned by school staff to prompt return of the child consent form.
Methods used to generate the sequence in which subjects will be randomised (sequence generation)	Eligible schools will be randomly selected from the list, and the order in which they are approached to participate will also be randomly determined (using a random number function in Excel) by a statistician.
Masking / blinding	Open (masking not used)
Who is / are masked / blinded?	
Intervention assignment	Parallel
Other design features	
Phase	Not Applicable
Type of endpoint(s)	Efficacy
Statistical methods / analysis	

Recruitment

Recruitment status	Recruiting		
Date of first participant enrolment			
Anticipated	24/07/2011	**Actual**	27/07/2011
Date of last participant enrolment			
Anticipated		**Actual**	
Date of last data collection			
Anticipated		**Actual**	
Sample size			
Target	16000	**Current**	**Final**
Recruitment in Australia			
Recruitment state(s)	NSW		
Recruitment postcode(s) [1]	2280		
Recruitment postcode(s) [2]	2281		
Recruitment postcode(s) [3]			

Recruitment postcode(s) [4]	2285
Recruitment postcode(s) [5]	2286
Recruitment postcode(s) [6]	2287
Recruitment postcode(s) [7]	2289
Recruitment postcode(s) [8]	2290
Recruitment postcode(s) [9]	2298
Recruitment postcode(s) [10]	2299
Recruitment postcode(s) [11]	2304
Recruitment postcode(s) [12]	2320
Recruitment postcode(s) [13]	2321
Recruitment postcode(s) [14]	2322
Recruitment postcode(s) [15]	2323
Recruitment postcode(s) [16]	2324
Recruitment postcode(s) [17]	2333
Recruitment postcode(s) [18]	2336
Recruitment postcode(s) [19]	2337
Recruitment postcode(s) [20]	2340
Recruitment postcode(s) [21]	2350
Recruitment postcode(s) [22]	2360
Recruitment postcode(s) [23]	2390
Recruitment postcode(s) [24]	2420
Recruitment postcode(s) [25]	2428
Recruitment postcode(s) [26]	2430

Funding & Sponsors

Funding source category [1]	Government body
Name [1]	National Health and Medical Research Council
Address [1]	GPO Box 1421 Canberra ACT 2601
Country [1]	Australia
Funding source category [2]	Charities/Societies/Foundations
Name [2]	nib Foundation
Address [2]	Locked Bag 2010 Newcastle NSW 2300
Country [2]	Australia
Funding source category [3]	Government body
Name [3]	Hunter New England Population Health
Address [3]	Locked Bag 10 Wallsend NSW 2287
Country [3]	Australia
Funding source category [4]	Other Collaborative groups
Name [4]	Hunter Medical Research Institute
Address [4]	Locked Bag 1 Hunter Region Mail Centre NSW 2310
Country [4]	Australia
Primary sponsor type	University
Name	The University of Newcastle
Address	Callaghan NSW 2308
Country	Australia
Secondary sponsor category [1]	Government body
Name [1]	Hunter New England Population Health

Address [1]	Locked Bag 10 Wallsend NSW 2287
Country [1]	Australia
Other collaborator category [1]	Other
Name [1]	New South Wales Department of Education and Communities
Address [1]	35 Bridge Street Sydney NSW 2000
Country [1]	Australia
Other collaborator category [2]	Other
Name [2]	Armidale Catholic Schools Office
Address [2]	PO Box 636 Armidale NSW 2350
Country [2]	Australia
Other collaborator category [3]	Other
Name [3]	Maitland Newcastle Catholic Schools Office
Address [3]	PO Box 714 Newcastle NSW 2300
Country [3]	Australia

Ethics approval

Ethics application status	Approved
Ethics committee name [1]	Hunter New England Human Research Ethics Committee
Ethics committee address [1]	Hunter New England Health Locked Bag 1 New Lambton NSW 2305
Ethics committee country [1]	Australia
Date submitted for ethics approval [1]	
Approval date [1]	18/12/2009
Ethics approval number [1]	09/11/18/4.01
Ethics committee name [2]	The University of Newcastle Human Research Ethics Committee
Ethics committee address [2]	Callaghan NSW 2308
Ethics committee country [2]	Australia
Date submitted for ethics approval [2]	
Approval date [2]	07/10/2010
Ethics approval number [2]	H-2010-0029
Ethics committee name [3]	Aboriginal Health and Medical Research Council of New South Wales
Ethics committee address [3]	PO Box 1565 Strawberry Hills NSW 2012
Ethics committee country [3]	Australia
Date submitted for ethics approval [3]	
Approval date [3]	14/03/2011
Ethics approval number [3]	Ref 776/11

Summary

Brief summary	A cluster randomised controlled trial study is proposed in 32 schools to test the efficacy of a comprehensive three year resilience intervention in decreasing the self reported health risk behaviours of secondary school students. Twenty schools will be randomly allocated to the intervention group and a further 12 schools randomly allocated to the control group. For evaluation purposes, web-based surveys will be conducted with a cohort of students in grade 7 attending both intervention and control schools at baseline (prior to intervention delivery), and three years after baseline data collection when the cohort are in grade 10. The surveys will include measures of self-reported health risk behaviours (including tobacco, alcohol, marijuana and other illicit drug use; nutritional intake, physical activity and sexual practices for those students in grade 10) risk of mental health problems, as well as student resilience scores. Comparisons will be made at follow up between grade 10 students in intervention and control schools to examine any differential changes in student health risk behaviours, risk of mental health problems, and resilience scores.

Trial website	
Trial related presentations / publications	Freund M, Campbell E, Wolfenden L, Bowman J, Hodder R, Gillham K, Wiggers J. Healthy Schools, Healthy Futures: implementing resilience intervention using the Health Promoting Schools framework. Australian H ealth Promoting Schools 8th National Conference; October 2010; Perth, Australia. Hodder R, Freund M, Daly J, Campbell E, Wolfenden L, Bowman J, Gillham K, Hazell T, Wiggers J. A school -based resilience intervention to decrease adolescent tobacco, alcohol and marijuana use: pilot results an d study protocol for RCT. 6th International Drugs and Young People Conference; May 2011; Melbourne Aust ralia.
Public notes	

Contacts

Principal investigator

Name	Prof John Wiggers
Address	Hunter New England Population Health Locked Bag 10 Wallsend NSW 2287
Country	Australia
Phone	+61 2 4924 6247
Fax	+61 2 4924 6209
Email	John.wiggers@hnehealth.nsw.gov.au

Contact person for public queries

Name	Prof John Wiggers
Address	Hunter New England Population Health Locked Bag 10 Wallsend NSW 2287
Country	Australia
Phone	+61 2 4924 6247
Fax	+61 2 4924 6209
Email	John.wiggers@hnehealth.nsw.gov.au

Contact person for scientific queries

Name	Prof John Wiggers
Address	Hunter New England Population Health Locked Bag 10 Wallsend NSW 2287
Country	Australia
Phone	+61 2 4924 6247
Fax	+61 2 4924 6209
Email	john.wiggers@hnehealth.nsw.gov.au

APPENDIX 4.8. Principal information letter

Direct Contact Details
Locked Bag 10
Wallsend NSW 2287
Phone (02) 4924 6477 Fax (02) 4924 6490
Email megan.freund@hnehealth.nsw.gov.au

HEALTHY SCHOOLS, HEALTHY FUTURES

Your school is invited to take part in the 'Healthy Schools, Healthy Futures' program which is being conducted by a research team from the University of Newcastle. The program focuses on enhancing student resilience and decreasing the likelihood of engaging in risky health behaviours such as cigarette smoking and drinking alcohol. This program has been trialled in three government high schools and the findings were encouraging. Results indicated a significant increase in student resilience, and significant decreases in tobacco, alcohol and other drug use. Your staff may have already attended a briefing meeting regarding the program.

To examine the effectiveness of 'Healthy Schools, Healthy Futures', the research team is undertaking a controlled study in 32 high schools and your school has been randomly selected to take part. Of the 32 participating schools, 20 schools have been randomly allocated to receive the 'Healthy Schools, Healthy Futures' intervention and another 12 schools have been randomly allocated to be control schools. The study will run in intervention schools for four years between 2011 and 2014.

To evaluate the success of the 'Healthy Schools, Healthy Futures' program we will be conducting student (Years 7-10), staff and parent surveys over the 4 years of the program. Intervention schools will be invited to participate in the student, parent, staff and school environment surveys in each year of the study. Control schools will be invited to participate in the student and school environment surveys in 2011 and again in 2014. Both intervention and control schools will be provided resources to support the implementation of the surveys and data collection. After each survey period, both intervention and control schools will be provided a report that includes aggregated data regarding their students' resilience factors, and the prevalence of student risk behaviours. The data collected in this program is also intended to be used by The University of Newcastle, and in a thesis by a PhD student, Ms Rebecca Hodder, under the supervision of Dr John Wiggers, Dr Megan Freund and Dr Jennifer Bowman.

The student surveys asks students in Year 7-10 questions about the their resilience characteristics and student health risk behaviour, such as alcohol consumption, smoking, illicit drug use, physical inactivity, poor nutrition, and for those students in Year 10, sexual practices. The student survey also asks about your child's experience of bullying and harassment and includes questions about family and friend's tobacco and alcohol use. The parent and staff surveys ask about factors contributing to the health and wellbeing of children. In addition to evaluating the outcomes of the project, the information from the student, staff, parent and school environment surveys will be used to assist intervention schools to identify, plan and implement strategies and initiatives to address health and wellbeing within the school. In addition to these surveys, some students will be asked to wear a pedometer for 7 days to confirm their reported participation in physical activity.

Intervention schools will also participate in the intervention program that is designed to increase the capacity of the schools to effectively address student resilience. It is expected such capacity will be increased through actions such as: modification of school governance processes; professional development of teachers; increased collaboration between teachers, parents, students and the wider

school community; modification of curriculum; development of curriculum resources; establishment of links with community agencies; modification of school policies and services; and monitoring performance. The research team will provide intervention schools a number of resources to support implementation of the intervention program.

Your school's participation in this study is voluntary. If you choose to participate in the study, you can withdraw at any time and a reason for withdrawal is not required. All existing data related to your school will be deleted. If you decide not participate or to withdraw from this study, it will not affect you or your school's relationship with any of the services offered by Hunter New England Area Health or the University of Newcastle.

The document attached to this letter provides further background information (pages 3-5) and also details what the program will involve for intervention schools (pages 6-9). If you would like more information about the program please contact Megan Freund, Program Manager on 4924 6374 or via e-mail Megan.Freund@hnehealth.nsw.gov.au.

After considering this information, could you please indicate whether you would like your school to participate in the program by completing the attached consent form. The completed consent form can be returned by email, mail or fax to the contact details at the top of this letter. If we have not received a completed consent form from you within 1 week, a member of the research team will contact you by phone to ensure you have received the information letter and the attached consent form.

Thank you for considering this invitation.

Yours sincerely

Dr John Wiggers
Chief Investigator
The University of Newcastle

This project has been approved by The University of Newcastle Human Research Ethics Committee: H-2010-0029, Hunter New England Human Research Ethics Committee of Hunter New England Health, Reference 09/11/18/4.01, Department of Education and Training, Reference 2008118 and Aboriginal Health and Medical Research Council of New South Wales, Reference 776/11.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to Dr Nicole Gerrand, Manager Research Ethics and Governance, Hunter New England Health, Locked Bag 1, New Lambton NSW 2305 or Telephone (02) 4921 4950, email Nicole.Gerrand@hnehealth.nsw.gov.au.

Researchers on the 'Healthy Schools, Health Futures' project: Dr John Wiggers (The University of Newcastle), Dr Elizabeth Campbell (The University of Newcastle and Hunter New England Population Health), Dr Luke Wolfenden (The University of Newcastle and the Cancer Institute), Dr Jenny Bowman (The University of Newcastle), Dr Megan Freund (The University of Newcastle)

BACKGROUND

Why address the risky health behaviours of young people?
The use of alcohol, tobacco, illicit drugs, poor levels of physical activity and nutrition, unsafe sexual practice contribute significantly to the burden of illness in young people.[1]

Smoking
Young smokers experience immediate adverse health effects such as decreased physical fitness, a higher susceptibility to respiratory illnesses, and slower lung growth.[1] In 2004, the proportion of young people who were current smokers increased with age from 8% for 12–15 year olds to 17% for 16–19 year olds.

Alcohol
High doses of alcohol severely impair brain function and can result in coma or death from direct intoxication.[1] The immediate effects of excessive alcohol consumption also include a lowering of inhibitions and impairment of motor, sensory and thought processes, which can lead to increased risk taking and hence serious injury and death.[1] In 2005, 25% of all NSW secondary school students reported consumed alcohol recently (42% for 17 year olds).[2]

Physical activity and nutrition
Lack of physical activity and poor food habits are prime contributors to obesity. Overweight and obesity impacts on young people's psychological wellbeing, and increases the risk of asthma and Type 2 diabetes.[1] Obesity in adolescence is also associated with social isolation, and lower educational and income attainment throughout life.[1] In 2004, only 46% of males and 30% of females aged 15–24 years participated in levels of physical activity at recommended levels and 26% of young people met daily fruit consumption recommendations.[1]

Unsafe sexual practice
With the commencement of sexual activities, teen pregnancies and sexually transmitted infections become primary health concerns.[3] In 2008, over one quarter of year 10 students have engaged in sexual intercourse, and the proportion of students having intercourse has increased from 35%- 40% (in students in Years 10-12) between 2002 and 2008. Despite the increase in sexual activity however, the study has found that rates of condom and other contraception use have remained steady.[3]

In addition to the short-term health effects health risk behaviours impose, such risky behaviours also contribute to the leading causes of mortality and morbidity in adults. Risk behaviours are often initiated in adolescence, and earlier the age of initiation, the greater the likelihood of later risky health behaviour.[1;4]

What the research says about improving young people's health and well-being
Research suggests that a range of factors are important in young people achieving competence, confidence and good health in adulthood.[5;6] In particular, protective and resilience factors are critical to positive youth development, protection from engaging in health risk behaviours and, increased engagement at school.[7]

Protective factors refer to positive influences within the young person's environment and surroundings that protect them from engaging in health risk behaviours. Protective factors that have been identified as being important include school connection, community connection, family connection, autonomy experience, pro-social peers and pro-social group.

Resilience factors refer to the personal skills and traits of the young person.[7] Resilience factors which have been identified as being important include empathy, self-esteem, self awareness, effective help seeking, communication and cooperation, and goals and aspirations. It is advocated that protective

and resilience factors should form the basis of programs that aim to improve the health outcomes of young people.[7;8] Programs which address resilience are particularly important in young people who experience disadvantage.[9]

Schools are a great setting to improve adolescent resilience
Schools have long been considered an ideal setting for health promotion because they provide access to young people at a time when they are vulnerable to emotional problems and risk taking behaviour that may have long lasting harmful effects.[10] Additionally, young people spend half of their waking hours at school and the quality of experiences with teachers and peers in that setting can have a huge impact on a young person's health and emotional wellbeing.[10] There is considerable evidence supporting the potential for school based interventions to produce positive health outcomes for young people.[10]

Differences in academic and behavioural outcomes between schools have been found to be more closely linked to a school's organisational and social climate rather than the characteristics and social status of students. The Health Promoting Schools (HPS) Framework takes into account the school's ethos and environment as well as its partnerships with the community and access to health services. The HPS Framework has been effective in reducing alcohol and drug use, bullying, anti-social behaviour and school suspensions; and improving adolescent social skills, self concept, resistance to peer pressure, academic achievement and attitudes to school.[11]

The HPS Framework has three overlapping domains:

- Curriculum, Teaching and Learning: the formal curriculum and how it is taught
- School Organisation, Ethos and Environment: the 'feel' of the school includes the physical and social environment, which ideally should provide a safe, fun and stimulating place for work and play
- Partnerships and Services: the mutually supportive links between schools and the wider community, like parents, local businesses, governmental and non-governmental organisations

Previous success with the program
Members of the research team and The NSW Department of Education and Training have undertaken some preliminary work on school resiliency programs based on the HPS Framework. The One Stop Shop program was undertaken between 2002 and 2006. It was a collaborative initiative coordinated by Hunter New England Population Health in partnership with three schools within one local government area, local youth services and the Hunter Institute of Mental Health.

The program aimed to improve the health and wellbeing (H&WB) of young people attending three schools. The specific objectives of the program were to:

- Increase student protective and resilience factors.
- Decrease student health risk behaviour. The health risk behaviours assessed were alcohol, tobacco and other drug use.

Intervention
A multi strategic approach was utilised to address student protective and resilience factors. In particular, within this framework, a number of broad intervention strategies were implemented including:

- A needs based approach. Student, staff and parent surveys were undertaken to inform planning.
- A local consensus and adaptation process including school and community input.
  - Establishment of core groups at each school and advisory groups.
  - Issues identification and prioritisation, H&WB planning, and collaborative review workshops.
- Staff professional development and training. Staff training will occur within schools hours.

- Funding to cover teacher release time to attend professional development and participate in H&WB planning.
- Allocation of a project officer to assist in the development and implementation of H&WB planning. The project officer was situated within one of the three schools and travelled to the other two schools on a regular basis.
- Resources and tools:
  - Database designed to collate and report student, parent and staff data
  - H&WB Action Planning Guide to support schools.

Outcomes

There was a significant increase in both protective and resilience factor scores at the One Stop Shop schools. There was also a significant decrease in risk taking behaviour at the One Stop Shop schools. In particular the prevalence of the following indicators decreased:

- ever smoking decreased by 23.8%
- smoking in the last three months decreased by 12.9%
- being a current smoker decreased by 12.0%
- consumption of one or more alcoholic drinks in the last 3 months decreased by 19.2%
- consumption of five or more drinks on one or more days decreased by 16.4%
- marijuana use in the last 3 months decreased by 9.5%

Given the success of the One Stop Shop program, the research team has received funding from the National Health and Medical Research Council of Australia and the nib Foundation to further test the effectiveness of this program. This program is now called Healthy Schools, Healthy Futures.

THE HEALTHY SCHOOLS, HEALTHY FUTURES PROGRAM

The Healthy Schools, Healthy Futures Program involves a randomized control trial of a group of secondary students in years seven through 10, from 32 schools within the Hunter New England Area Health Service of New South Wales (NSW). Schools from both the Department of Education and Training and the Catholic sector have been randomly selected to participate and randomly allocated to either an intervention or control condition, stratified by school size and geographic location (12 control, 20 intervention).

The program aims to build the sustainable capacity of each school to address student resilience. The strategies to be implemented as part of the Healthy Schools, Healthy Futures Program will be implemented using the Health Promoting School approach.[12] The Health Promoting Schools (HPS) Framework, developed by the World Health Organisation links the curriculum with the school's ethos and environment and its partnerships with the community. Implementation of the HPS Framework in the Healthy Schools, Healthy Futures Program will involve:

Curriculum, teaching and learning

- Implementation of curriculum programs that address increasing resilience
- Implementation of further curriculum programs targeting resilience and protective factors. These program may include: Resourceful Adolescent Program; Rock and Water; Friends for Youth; Aussie Optimism; Bounce Back; Adolescents Coping with Emotion and; Resilient Kids.

Ethos and environment

- Modification of school policies e.g. bullying, safe environments, & school connection.
- Implementation of peer support programs.
- Enhancement of role of School Representative Councils and students in school events

Partnerships and services

- Promotion of links with community organisations such as Aboriginal and Torres Strait Islander organisations, mental health services, and youth programs.
- Access to youth services in school hours to increase effective help seeking.
- Active engagement of parents via school-initiated activities e.g. family fun nights.

Roles and responsibilities

In order to successfully implement a comprehensive program, it is important that everyone involved is aware of, and accepts their roles and responsibilities. As such, a brief outline of the roles and responsibilities of schools, principals, school teachers, other staff members, students and the research team is provided below.

Principals

- Provide a suitable working space for the School Project Officer.
- Attend Healthy Schools Advisory Group meetings, held once per term.
- Nominate appropriate members of staff to participate in the implementation.

Schools

- Provide an appropriate work space for the School Project Officer.
- Conduct an annual School Needs Assessment to gather evidence about the needs of the school community with assistance from the School Project Officer. Online surveys have been developed to minimise the time and resource required to do this.
- Development of an implementation plan that will be endorsed by the school executive, and integrated into existing school and student welfare governance processes.

Teachers and other staff

- Participate in annual staff surveys.
- Nominated staff to attend appropriate resiliency training.
- Nominated staff to attend Core Team meetings.
- Staff to be encouraging of a school environment that is supportive of student resilience.

Students

- All students in Years 7-10 to participate in annual student surveys. The student surveys ask questions about the student's resilience and protective characteristics and student health risk behaviour, such as alcohol consumption, smoking, illicit drug use, physical inactivity, poor nutrition, and sexual practices (Year 10 only). The student survey also asks about the student's child's experience of bullying and about family and friend's tobacco and alcohol use.
- Nominated students to participate in Core Team meetings
- All students should benefit from initiatives implemented within the school regarding resiliency but this should be seen by students as usual school business.

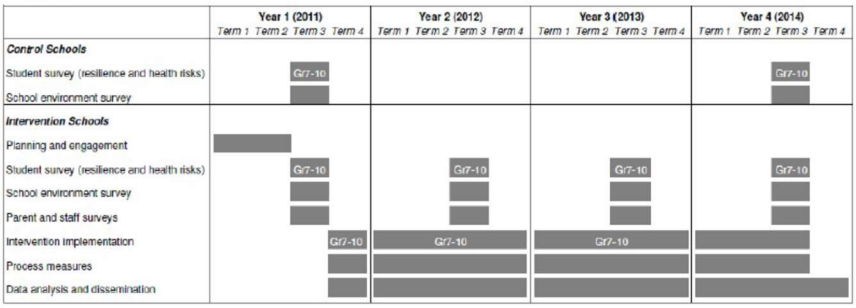
Research team

- Provide a School Project Officer to support the implementation of the program across the schools. The role of the project officer is to reduce the burden on teachers and other staff members during the planning and implementation phase.
- Provide resources for the project officer, for example laptop, mobile phone, stationery and a car allowance.
- Provide seed funding for teacher release time to attend training and participate in program planning, implementation and monitoring.
- Provide resources and tools developed in the trial of the Healthy Schools program.

The School Project Officer will undertake the following to support the schools:

- Maintain membership of School H&WB Teams and all meetings for each school each term.
- Support schools to complete an annual School Needs Assessment, including student and teacher and parent surveys. The research team will collate, analyse and report outcomes of surveys and audits to schools. This data will be provided in a form that can easily be incorporated into school reports and newsletters.
- Facilitate Workshops and Planning days relating to H&WB Planning and contribute health related expertise as appropriate.
- Collate a review of literature to assist schools to select strategies based on criteria (eg. evidence of effectiveness, culturally appropriate).
- Support the development of the school H&WB Action Plan.
- Support implementation of selected strategies, for example assist with curriculum planning.
- Circulate relevant information to schools and youth services sector, including potential funding opportunities.
- Support schools to source external funding for the implementation of school based H&WB initiatives.

Timeline



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APPENDIX 4.9. Cover letter from school principal

<Insert school letter head and details here>

YOU AND YOUR CHILD/CHILDREN ARE INVITED TO TAKE PART IN HEALTHY SCHOOLS, HEALTHY FUTURES

Healthy Schools, Healthy Futures program is a partnership between *High School* and Hunter New England Health that aims to improve the health and wellbeing of young people.

Below is some information about the program. **Please refer to the enclosed information for more detail and a permission note. *Please return the green permission note within two (2) weeks.***

Who can take part?

- Children in years 7, 8, 9 and 10 and their parents/carers.

What does the program involve?

- Students will complete a 25 minute online survey that will ask about their health behaviours. Parents/Carers need to sign the attached permission note for your child's/children's participation.
- Parents/Carers will be invited to complete a pen and paper or online survey about the things that contribute to the health and wellbeing of your child. The survey information will be sent in the mail and will take about 15 minutes to complete.
- All answers provided are confidential and individual student and parent/carer answers will not be provided to school staff, parents, or friends.

Do you or your child have to take part?

- Your child's participation in the survey is your choice and only students whose parents/carers give consent will be able to take part. Your participation in the parent/carer survey is also your choice.
- Students and parents/carers can choose to withdraw from the survey at any time.
- If you decide not to take part, you and your child will not be disadvantaged in any way.

When will the information be collected?

- The online student survey will take place in class in weeks 2 to 8 of Term 3 (24th July–9th September 2011).
- Parent/carer surveys will also be mailed out during Term 3 and you will have 2 weeks to complete it.

Follow up telephone contact

- If your child's/children's permission note has not been **returned within 2 weeks** you may receive a follow-up phone call. If you do not want to be called you, please phone 1800 770 825 and follow the prompts (this is a free call number set up for Healthy Schools, Healthy Futures).

<Insert Principal signature>
<Insert Principal name>
Principal

If you would like more information please contact your school, or Megan Freund Program Manager, Hunter New England Population Health on (02) 4924 6477.

If you would like the option to speak specifically with an Aboriginal contact person please contact: Luke Allan, Hunter New England Population Health on (02) 6764 8002 or, Michelle Fodeades, Department of Education and Training on (02) 4924 6477.

APPENDIX 4.10. Parent information letter

Hunter New England Population Health
Direct Contact Details
Phone: (02) 4924 6477 Fax: (02) 4924 6490
Email: PHEnquiries@hnehealth.nsw.gov.au

NSW GOVERNMENT | Health

'HEALTHY SCHOOLS, HEALTHY FUTURES'
PARENT/CARER INFORMATION SHEET

Please keep this sheet for your information in the future

You and your child/children are invited to take part in the 'Healthy Schools, Healthy Futures' program which is being conducted by The University of Newcastle in collaboration with Hunter New England Population Health. This program aims to improve the health and wellbeing of young people in the Hunter New England Region. The program focuses on enhancing student resilience (including the personal skills of the young person, such as communication and cooperation skills, self-esteem, empathy, problem-solving, self-awareness, and appropriate goals and aspirations) and decreasing the likelihood of engaging in risky health behaviours such as cigarette smoking and drinking alcohol.

This program has been trialled in three government high schools and the findings were encouraging. Results indicated a significant increase in student resilience, and significant decreases in tobacco, alcohol and other drug use.

To further examine the effectiveness of 'Healthy Schools, Healthy Futures' The University of Newcastle is undertaking a controlled study in 32 high schools. Twenty schools have been randomly allocated to receive the 'Healthy Schools, Healthy Futures' intervention and the other 12 schools have been randomly allocated to be control schools. Your child's/children's school has been allocated to be an intervention school. The study will run for four years between 2011 and 2014 in the school.

To evaluate the success of the 'Healthy Schools, Healthy Futures' program we will be conducting student, staff and parent surveys over the 4 years of the program. The student surveys ask questions about the student's resilience characteristics and student health risk behaviour, such as alcohol consumption, smoking, illicit drug use, physical inactivity, poor nutrition, and for those students in Year 10, sexual practices. The student survey also asks about your child's/children's experience of bullying and harassment and includes questions about family and friend's tobacco and alcohol use. The parent and staff surveys will only be conducted in intervention schools and asks about factors contributing to the health and wellbeing of children. In addition to evaluating the outcomes of the project, the information from the student, staff and parent surveys will be used to assist intervention schools to identify, plan and implement strategies and initiatives to address health and wellbeing within the school. In addition to these surveys, some students will be asked to wear a pedometer for 7 days to confirm their reported participation in physical activity. The data collected in this program is intended to be used by The University of Newcastle and in a thesis by a PhD student, Ms Rebecca Hodder, under the supervision of Dr John Wiggers, Dr Megan Freund and Dr Jennifer Bowman.

Who can participate?
We are asking students in Years 7, 8, 9 and 10 from all over the Hunter New England Area and their parents to participate in this study. Your child's/children's school was chosen from a list of Hunter New England schools.

Do you or your child/children have to participate?
Your child's/children's participation in both the student survey and physical activity validation is entirely your choice. Only those students whose parents give their consent will be able to participate. Where

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www.hnehealth.nsw.gov.au/hneph

parent consent is given, the final decision on the day is your child's/children's. You or your child/children can decide to withdraw from the survey at anytime and a reason for withdrawal is not required. If your child/children decide to withdraw from the study then we will delete any information your child/children has provided. If you or your child/children decide to not participate or withdraw from this study at any time, it will not affect your relationship with the school or with any of the services offered by The University of Newcastle or the Hunter New England Area Health Service.

For the parent survey, your participation is also voluntary. However your opinions are valuable to us and will assist in the development of initiatives to address the health and wellbeing of students.

What do you and your child/children have to do?
Students will be asked to complete an online survey in class time which will ask about themselves and their health behaviours. The questionnaire will take approximately 25 minutes of class time for your child/children to complete.

Some students, nominated by the school, will be asked to assist with planning for the Healthy Schools, Healthy Futures program. For example students will be key participants in health and well-being planning days.

Parents of children who attend intervention schools are also asked to complete an annual survey about the factors that contribute to the health and wellbeing of their child/children annually in Year 1 (2011) through to Year 4 (2014). This includes questions about how your child/children feel at school, and how supportive and encouraging the school is to you and your child/children. The survey will take approximately 15 minutes to complete and you can either complete the survey online or in written form. A copy of the parent survey including instructions of how to access the online survey will be mailed to you during Term 3.

When will the information be collected?
Both the student and parent survey will take place in Term 3 of each year.

Who will see the information that is collected?
For both the student and parent surveys, any information provided will be treated as strictly confidential. Student names will not be recorded with the information they provide. When your child/children starts the survey he/she will log on to a web page using a unique student identification number. In this way the files containing his/her answers will be separated from the files containing his/her name. Your child's/children's identity will not be revealed to anyone other than the investigators conducting the project. All answers provided are confidential and individual student answers will not be provided to school staff, parents, or friends. Only the researchers from The University of Newcastle will have access to the student data. The student data will be stored on a secure University of Newcastle server and be kept in the strictest confidence, as required by law. The data will only be published in summary form, with no mention of particular individuals. Your child/children may be asked to complete a similar survey each year for the next three years. The survey will be available at your child's/children's school for both you and your child/children to view prior to the survey period.

For the parent survey, you or your child's/children's name will not be recorded with the information provided and your identity will not be revealed to anyone other than the investigators conducting the study. This means that neither other parents, teachers nor anyone else other than members of the research team will have access to your completed survey. The parent survey is anonymous and we will not ask for parents' names to be recorded on the surveys. Only the research team from The University of Newcastle will have access to the completed questionnaires. The paper forms will be stored in a secure facility, and any parent data from the online version of the survey stored on a secure University of Newcastle server and with both being kept in the strictest confidence, as required by law. As with the student survey, the data may be published in summary form, with no mention of particular individuals.

How will we ensure the well-being of your child/children?
This project has been approved by the Department of Education and Training and ethical clearance has been given from the Hunter New England Area Health Service and The University of Newcastle where we have made a commitment to protect the safety, privacy and self-esteem of all students. All staff will have appropriate child protection clearance and training, and teachers from the school will be with your child/children at all times to monitor their well-being.

If research staff or teachers notice that participation in the study is concerning your child/children, a teacher will speak with them privately and may decide to withdraw them from the study.

If anything about the survey is concerning you or your child/children, you and your child/children could speak about it with your school counsellor or doctor.

Feedback

A summary report of the results of the student annual survey results will be provided to your school for publication within the school newsletter. The summary report will not identify individuals. At the completion of the study all schools will be provided a report outlining the study results. Results of the study may be presented at scientific conferences and be published within scientific journals.

Consent for my child/children to participate

You are being asked to consent to you and your child's/children's participation in annual surveys from 2011 to 2014. Please read and be clear on the information provided above, and discuss the study with your child/children before making a decision. Please ask your child/children to read the enclosed student information sheet. If you would like your child/children to participate, you need to sign the attached consent form. **Please return the completed green permission note to your school within 2 weeks. If a permission note has not been received in 2 weeks**, parents will be contacted by phone to ask about their child's/children's participation in the survey. If you do not wish for your child/children to participate in the survey and you do not want to be contacted by phone to ask about their participation, you can call this toll free number **1800 770 825** where a message can be left 24 hours a day. Clearly state your first name and surname, your child's/children's first name and surname, and the name of your child's/children's school. Your name and your child's/children's name will then be withdrawn from the survey list and you will NOT be contacted by phone. Alternatively, you can tell school staff that you do not want your child/children to participate in the survey when they call you.

If you would like more information regarding this study please contact Dr Megan Freund, Program Manager at Hunter New England Population Health on (02) 4924 6477.

Thank you for considering this invitation, the information that your child/children provides will help to develop initiatives to improve the health and wellbeing of all students.

Dr John Wiggers
Director
Hunter New England Population Health

This project has been approved by Hunter New England Human Research Ethics Committee of Hunter New England Health (Ref 09/11/18/4.01), The University of Newcastle Human Research Ethics Committee (Ref H-2010-0029), Department of Education and Training (Ref 2008118) and Aboriginal Health and Medical Research Council of New South Wales (Ref 776/11).

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to Dr Nicole Gerrand, Manager Research Ethics and Governance, Hunter New England Health, Locked Bag 1, New Lambton NSW 2305 or Telephone (02) 4921 4950, email Nicole.Gerrand@hnehealth.nsw.gov.au.

Researchers on the 'Healthy Schools, Healthy Futures' project: Dr John Wiggers (Hunter New England Population Health and The University of Newcastle), Dr Elizabeth Campbell (Hunter New England Population Health and The University of Newcastle), Dr Luke Wolfenden (The University of Newcastle and the Cancer Institute), Dr Jennifer Bowman (The University of Newcastle), and Dr Megan Freund (The University of Newcastle).

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'HEALTHY SCHOOLS, HEALTHY FUTURES'
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This program has been trialled in three government high schools and the findings were encouraging. Results indicated a significant increase in student resilience, and significant decreases in tobacco, alcohol and other drug use.

To further examine the effectiveness of 'Healthy Schools, Healthy Futures', The University of Newcastle is undertaking a controlled study in 32 high schools. Twenty schools have been randomly allocated to receive the 'Healthy Schools, Healthy Futures' intervention and the other 12 schools have been randomly allocated to be control schools. Your child's/children's school has been allocated to be a control school.

To evaluate the success of the 'Healthy Schools, Healthy Futures' program we will be conducting student surveys in your child's/children's school in 2011 and 2014. The student surveys ask questions about the student's resilience characteristics and student health risk behaviour, such as alcohol consumption, smoking, illicit drug use, physical inactivity, poor nutrition, and for those students in Year 10, sexual practices. The student survey also asks about your child's/children's experience of bullying and harassment and includes questions about family and friend's tobacco and alcohol use. In addition to these surveys, some students will be asked to wear a pedometer for 7 days to confirm their reported participation in physical activity. The data collected in this program is intended to be used by The University of Newcastle and in a thesis by a PhD student, Ms Rebecca Hodder, under the supervision of Dr John Wiggers, Dr Megan Freund and Dr Jennifer Bowman.

Who can participate?
We are asking students in Years 7, 8, 9 and 10 from all over the Hunter New England Area to participate in this study. Your child's/children's school was chosen from a list of Hunter New England schools.

Does your child/children have to participate?
Your child's/children's participation in both the student survey and physical activity validation is entirely your choice. Only those students whose parents give their consent will be able to participate. Where parent consent is given, the final decision on the day is your child's/children's. If you don't want your child/children to participate, or if your child/children doesn't want to participate, you can withdraw from the survey at anytime and a reason for withdrawal will not required. In this instance, we will delete any

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information you have provided about your child/children. If you decide you don't want your child/children to participate, your child/children doesn't want to participate, or your child/children opts to withdraw from this study, it will not affect your relationship with the school or with any of the services offered by The University of Newcastle or the Hunter New England Area Health Service.

What does your child/children have to do?
Students will be asked to complete an online survey in class time which will ask about themselves and their health behaviours. The questionnaire will take approximately 25 minutes of class time for your child/children to complete.

A random sample of students will also be selected to wear a pedometer. A pedometer is a small portable device that counts each step a person takes. Using pedometers is considered a good way to do research where physical activity is of interest. Students selected to participate in the pedometer study will be provided with a pedometer that attaches to their waist-band and can be worn out of sight under a shirt or jumper. Selected students will wear the pedometer all day for seven days. Each weekday morning, the number of steps on the pedometer will be recorded, and the pedometer will be reset. As with all of the information collected in this program, the information collected from the pedometers is confidential and the student's name will not be recorded with them.

When will the information be collected?
The student surveys will take place in Term 3 of 2011 and 2014.

Who will see the information that is collected?
Any information your child/children provides as part of the student survey will be treated as strictly confidential. Student names will not be recorded with the information they provide. When your child/children starts the survey he/she will log on to a web page using a unique student identification number. In this way the files containing his/her answers will be separated from the files containing his/her name. Your child's/children's identity will not be revealed to anyone other than the investigators conducting the project. All answers provided are confidential and individual student answers will not be provided to school staff, parents, or friends. Only the researchers from The University of Newcastle will have access to the student data. The student data will be stored on a secure University of Newcastle server and be kept in the strictest confidence, as required by law. The data will only be published in summary form, with no mention of particular individuals. The survey will be available at your child's/children's school for both you and your child/children to view prior to the survey period.

How will we ensure the well-being of your child/children?
This project has been approved by the Department of Education and Training and ethical clearance has been given from the Hunter New England Area Health Service and The University of Newcastle where we have made a commitment to protect the safety, privacy and self-esteem of all students. All staff will have appropriate child protection clearance and training, and teachers from the school will be with your child/children at all times to monitor their well-being.

If research staff or teachers notice that participation in the study is concerning your child/children, a teacher will speak with them privately and may decide to withdraw them from the study.

If anything about the survey is concerning you or your child/children, you and your child/children could speak about it with your school counsellor or doctor.

Feedback
A summary report of the results of the student annual survey results will be provided to your school for publication within the school newsletter. The summary report will not identify individuals. At the completion of the study all schools will be provided a report outlining the study results. Results of the study may be presented at scientific conferences and be published within scientific journals.

Consent for my child/children to participate
You are being asked to consent to your child/children's participation in 2011 and 2014 (if your child is currently in year 7). Please read and be clear on the information provided above, and discuss the study with your child/children before making a decision. Please ask your child/children to read the enclosed

student information sheet. If you would like your child/children to participate, you need to sign the attached consent form. **Please return the completed green permission note to your school within 2 weeks. If a permission note has not been received in 2 weeks**, parents will be contacted by phone to ask about their child's/children's participation in the survey. If you do not wish for your child/children to participate in the survey and you do not want to be contacted by phone to ask about their participation, you can call this toll free number 1800 770 825 where a message can be left 24 hours a day. Clearly state your first name and surname, your child's/children's first name and surname and the name of your child/children's school. Your name and your child's/children's name will then be withdrawn from the survey list and you will NOT be contacted by phone. Alternatively, you can tell school staff that you do not want your child/children to participate in the survey when they call you.

If you would like more information regarding this study please contact Dr Megan Freund, Program Manager at Hunter New England Population Health on (02) 4924 6477.

Thankyou for considering this invitation, the information that your child/children provides will help to develop initiatives to improve the health and wellbeing of all students.

Dr John Wiggers
Director
Hunter New England Population Health

This project has been approved by Hunter New England Human Research Ethics Committee of Hunter New England Health (Ref 09/11/18/4.01), The University of Newcastle Human Research Ethics Committee (Ref H-2010-0029), Department of Education and Training (Ref 2008118) and Aboriginal Health and Medical Research Council of New South Wales (Ref 776/11).

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to Dr Nicole Gerrand, Manager Research Ethics and Governance, Hunter New England Health, Locked Bag 1, New Lambton NSW 2305 or Telephone (02) 4921 4950, email Nicole.Gerrand@hnehealth.nsw.gov.au.

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APPENDIX 4.11. Student information letter

Hunter New England Population Health
Direct Contact Details
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Email: PHEnquiries@hnehealth.nsw.gov.au

NSW GOVERNMENT | Health

'HEALTHY SCHOOLS, HEALTHY FUTURES'
INFORMATION FOR STUDENTS

Hi, we are researchers from The University of Newcastle and would like to invite you to be part of the 'Healthy Schools, Healthy Futures' survey being conducted by Dr John Wiggers from The University of Newcastle in collaboration with Hunter New England Population Health.

The survey asks about your health and wellbeing including:

- Things about you that help you cope or bounce back if you have a set back in your life (things like self-esteem, empathy, and communication),
- Things in your life which are supportive (like school, community and family),
- Risky behaviours that can harm your health (like cigarette smoking and drinking alcohol).

Your school has been picked along with other schools in the Hunter and New England area to participate and it would be great if you could help. This information will allow us to make programs to help students stay healthy and make responsible decisions about their behaviour.

What will happen?

- First, we will ask you to fill in an online survey. The survey will ask some questions about you, and how you feel about school and home. The survey will also ask about your health behaviours including questions about your diet, physical activity, sexual practices (if you are in Year 10), tobacco, alcohol and illicit drug use. The survey also asks about your experience of bullying and harassment and includes questions about family and friend's tobacco and alcohol use. The survey will take place during class time in Term 3 2011 and will take about 25 minutes to complete. You may be asked to complete the survey again over the next 3 years.
- Second, we may ask you to participate in an extra part of the study that looks at physical activity. We will ask every tenth student to wear a pedometer for 7 days and report back the information to the research team. This is voluntary and you can participate in the survey without having to complete the pedometer study.

Do I have to do the study?

- No. It is up to you. If you decide to take part you can stop at anytime. If you decide not to take part or want to stop taking part it will not affect you in anyway.
- If you decide to stop taking part you can ask that the information you provided is erased.
- Also if a teacher notices that participation in the survey is concerning you, he/she will speak with you privately and may decide to withdraw you from the study.

Health Reform Transitional Organisation Northern
Hunter New England Population Health
ABN 96 304 742 457

Locked Bag 10
Wallsend NSW 2287
Phone (02) 4924 6477 Fax (02) 4924 6490
Email PHEnquiries@hnehealth.nsw.gov.au
www.hnehealth.nsw.gov.au/hneph

- If anything about the survey is concerning you, or you are concerned about anything you read in the survey you could speak with your parents, teachers, school counsellor, head teacher welfare, doctor, another trusted adult or the Kids Helpline (Ph: 1800 55 1800).

What will happen to the information I provide?

- Your name will not be used and all your results will be kept locked away by the researchers. When you start the survey you will log on to a web page using a unique student identification number. In this way the files containing your answers will be separated from the files containing your name.
- Whilst it is necessary for your parents to give permission for you complete the survey, your answers are confidential. This means that no one will have access to your completed survey other than the members of the research team. Your parents, friends, teachers or anyone else will not be able to find out any of your answers.
- The data collected in this survey is intended to be used by The University of Newcastle and in a thesis by a PhD student, Ms Rebecca Hodder, under the supervision of Dr John Wiggers, Dr Megan Freund and Dr Jennifer Bowman.
- The information will be used to help develop programs to encourage children to make healthy choices. We will write some reports with the information, but the reports will not be about you and your name will not be included in any of the reports.

Who is conducting the study?

- The person in charge of the study is Dr John Wiggers who is Chief Investigator of the program at The University of Newcastle.

What if I want more information?

If you would like more information about the study you could speak to your parents. You can also call Dr Megan Freund, Program Manager at Hunter New England Population Health on: (02) 4924 6477.

How do I join in?

- If you think it is a good idea and you want to join the study you will need to get your parents to sign the consent form attached to your parent's information letter and give the form back to your school or return in the reply paid envelope provided.
- If you are unsure whether to join you could speak with your parents, teachers, school counsellor, head teacher welfare, doctor, or another trusted adult.

Thank you for thinking about joining the project.

Dr John Wiggers
Director
Hunter New England Population Health

This project has been approved by Hunter New England Human Research Ethics Committee of Hunter New England Health (Ref 09/11/18/4.01), The University of Newcastle Human Research Ethics Committee (Ref H-2010-0029), Department of Education and Training (Ref 2008118) and Aboriginal Health and Medical Research Council of New South Wales (Ref 776/11).

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to Dr Nicole Gerrand, Manager Research Ethics and Governance, Hunter New England Health, Locked Bag 1, New Lambton NSW 2305 or Telephone (02) 4921 4950, email Nicole.Gerrand@hnehealth.nsw.gov.au.

Researchers on the 'Healthy Schools, Healthy Futures' project: Dr John Wiggers (Hunter New England Population Health and The University of Newcastle), Dr Elizabeth Campbell (Hunter New England Population Health and The University of Newcastle), Dr Luke Wolfenden (The University of Newcastle and the Cancer Institute), Dr Jennifer Bowman (The University of Newcastle), and Dr Megan Freund (The University of Newcastle).

Hunter New England Population Health
Direct Contact Details
Phone: (02) 4924 6477 Fax: (02) 4924 6490
Email: PHEnquiries@hnehealth.nsw.gov.au

NSW GOVERNMENT | Health

'HEALTHY SCHOOLS, HEALTHY FUTURES'
INFORMATION FOR STUDENTS

Hi, we are researchers from The University of Newcastle and would like to invite you to be part of the 'Healthy Schools, Healthy Futures' survey being conducted by Dr John Wiggers from The University of Newcastle in collaboration with Hunter New England Population Health.

The survey asks about your health and wellbeing including:

- Things about you that help you cope or bounce back if you have a set back in your life (things like self-esteem, empathy, and communication),
- Things in your life which are supportive (like school, community and family),
- Risky behaviours that can harm your health (like cigarette smoking and drinking alcohol).

Your school has been picked along with other schools in the Hunter and New England area to participate and it would be great if you could help. This information will allow us to make programs to help students stay healthy and make responsible decisions about their behaviour.

What will happen?

- First, we will ask you to fill in an online survey. The survey will ask some questions about you, and how you feel about school and home. The survey will also ask about your health behaviours including questions about your diet, physical activity, sexual practices (if you are in Year 10), tobacco, alcohol and illicit drug use. The survey also asks about your experience of bullying and harassment and includes questions about family and friend's tobacco and alcohol use. The survey will take place during class time in Term 3 2011 and will take about 25 minutes to complete. You may be asked to complete the survey again in Term 3 2014.
- Second, we may ask you to participate in an extra part of the study that looks at physical activity. We will ask every tenth student to wear a pedometer for 7 days and report back the information to the research team. This is voluntary and you can participate in the survey without having to complete the pedometer study.

Do I have to do the study?

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- Also if a teacher notices that participation in the survey is concerning you, he/she will speak with you privately and may decide to withdraw you from the study.
- If anything about the survey is concerning you, or you are concerned about anything you read in the survey you could speak with your parents, teachers, school counsellor, head teacher welfare, doctor, another trusted adult or the Kids Helpline (Ph: 1800 55 1800).

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- Whilst it is necessary for your parents to give permission for you complete the survey, your answers are confidential. This means that no one will have access to your completed survey other than the members of the research team. Your parents, friends, teachers or anyone else will not be able to find out any of your answers.
- The data collected in this survey is intended to be used by The University of Newcastle and in a thesis by a PhD student, Ms Rebecca Hodder, under the supervision of Dr John Wiggers, Dr Megan Freund and Dr Jennifer Bowman.
- The information will be used to help develop programs to encourage children to make healthy choices. We will write some reports with the information, but the reports will not be about you and your name will not be included in any of the reports.

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Thank you for thinking about joining the project.

Dr John Wiggers
Director
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This project has been approved by Hunter New England Human Research Ethics Committee of Hunter New England Health (Ref 09/11/18/4.01), The University of Newcastle Human Research Ethics Committee (Ref H-2010-0029), Department of Education and Training (Ref 2008118) and Aboriginal Health and Medical Research Council of New South Wales (Ref 776/11).

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to Dr Nicole Gerrand, Manager Research Ethics and Governance, Hunter New England Health, Locked Bag 1, New Lambton NSW 2305 or Telephone (02) 4921 4950, email Nicole.Gerrand@hnehealth.nsw.gov.au.

Researchers on the 'Healthy Schools, Healthy Futures' project: Dr John Wiggers (Hunter New England Population Health and The University of Newcastle), Dr Elizabeth Campbell (Hunter New England Population Health and The University of Newcastle), Dr Luke Wolfenden (The University of Newcastle and the Cancer Institute), Dr Jennifer Bowman (The University of Newcastle), and Dr Megan Freund (The University of Newcastle).

APPENDIX 4.12. Parental consent form

NSW GOVERNMENT | Health

'HEALTHY SCHOOLS, HEALTHY FUTURES'
Consent form for student participation

Parents and students please read, and parents please sign and return this form to school within 2 weeks if you wish to participate

I have read and fully understand the contents of this information sheet. I also acknowledge that my child/children clearly understands what is required of him/her in 2011 and 2014.

I understand that consenting to participate in this study does not obligate me or my child/children to participate in any future research. I understand that I may withdraw my child/children from the study at any time. I understand that my child/children may choose to withdraw from the study at anytime and that the information that my child/children and I provide will be confidential and will be stored safely after the study is completed.

	Please tick	
I agree to give consent for my son/daughter to complete a questionnaire asking about his/her usual physical activity and eating habits; sexual practices (if in Year 10); alcohol, tobacco and illicit drug use.	**Yes** ☐	**No** ☐
I agree to give consent for my son/daughter to wear a pedometer to check their physical activity levels if randomly selected to do so.	**Yes** ☐	**No** ☐

Parent/Guardian First Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Parent/Guardian Surname: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Parent/Guardian Signature: _____ Date: _____

Son/Daughter First Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Son/Daughter Surname: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

From Year: Year 7 ☐ Year 8 ☐ Year 9 ☐ Year 10 ☐

Son/Daughter Signature: _____ Date: _____

Please return this consent form using the enclosed reply paid envelope or give to your child to return to his/her school.

Researchers on the 'Healthy Schools, Healthy Futures' project: Dr John Wiggers (The University of Newcastle), Dr Elizabeth Campbell (The University of Newcastle and Hunter New England Population Health), Dr Luke Wolfenden (The University of Newcastle and the Cancer Institute), Dr Jenny Bowman (The University of Newcastle), Dr Megan Freund (The University of Newcastle)

<School Name>

APPENDIX 4.13. Implementation guide

Healthy Schools Healthy Futures Program Guide

HMRI Hunter Medical Research Institute

NSW GOVERNMENT Health Hunter New England Local Health District

nib foundation

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

PREFACE

Welcome to the Healthy Schools, Healthy Futures Program Guide.

This Guide has been developed to provide your school with the information and resources required to implement each phase of the Healthy Schools, Healthy Futures Program.

Along with this Guide you will also be supported by a School Project Officer, a Regional School Project Coordinator, annual funding and the Healthy Schools, Healthy Futures Research Team.

This Guide will support schools through the Healthy Schools, Healthy Futures planning including the process of:

- collecting data within the schools;
- identifying the resilience needs to address within the school as well as the existing strengths to capitalise on;
- planning how to address the issues; and
- devising and implementing a plan to increase student resilience.

1 Part 1: Background

1.1 WHAT IS HEALTHY SCHOOLS, HEALTHY FUTURES?

The Healthy Schools, Healthy Futures (HSHF) program is a joint research initiative between Hunter New England Population Health and the School of Medicine and Public Health at The University of Newcastle. It is being conducted in NSW Department of Education and Communities and Catholic Schools Office high schools across the Hunter, New England and lower Mid-North Coast regions.

Aims and objectives

The aim of the HSHF research initiative is to examine the effectiveness of resilience interventions in reducing smoking and alcohol consumption in a cohort of adolescents (Years 7-10) attending high schools located in disadvantaged areas. In particular, the HSHF program aims to:

1. Increase the internal and external resilience characteristics of students; and
2. Decrease the uptake of health risk behaviours, including: tobacco, alcohol and marijuana use; poor nutrition; physical inactivity; and unsafe sexual practices (Year 10 students in government schools only).

Brief program description

The HSHF Program is based on previous pilot programs and is supported by funding from the National Health and Medical Research Council, the nib Foundation and Hunter New England Population Health.

The HSHF study is being implemented in 33 high schools (Government and Catholic schools) throughout the Hunter, New England and lower Mid-North Coast areas from 2011 to 2014. Of these schools, 21 schools have been allocated to receive the HSHF Program (intervention schools) and the remaining 12 schools have been allocated to be control schools. Data will be collected from both intervention and control schools.

The HSHF Program aims to build the sustainable capacity of each school to address students' resilience. Briefly, the implementation of the HSHF Program will involve schools implementing strategies in each of the Health Promoting Schools domains (see Figure 2, Page 8). As the needs of each school will likely differ, so will the services available to individual schools, and the strategies identified and implemented within each context.

Ethics and other research approvals

Approval to conduct the HSHF research project has been received from NSW Department of Education and Communities State Research Ethics Approval Process (SERAP), Catholic Schools Office Diocese of Armidale and Maitland-Newcastle, Hunter New England Health Human Research Ethics Committee, the University of Newcastle

Human Research Ethics Committee and the Aboriginal Health and Medical Research Council of NSW.

1.2 RESILIENCE AND ADOLESCENT HEALTH RISK BEHAVIOUR

Health risk behaviour prevalence

According to the 2007 report Young Australians: Their Health and Wellbeing, 90% of young people (those aged 12 – 24 years) rated their health as 'excellent' or 'very good' or 'good'. Despite this promising indicator, young people have not enjoyed the same improvement in health status when compared to other sections of the community. One reason for this is that the causes of ill health for most young people are social rather than biological. Young people often engage in risky behaviours such as binge drinking, dangerous driving, smoking and unprotected sex, all of which can lead to disadvantage, disability or death.

The use of alcohol, tobacco and illicit drugs contributes significantly to injury and/or disability in young people. In 2005, an average of 25% of NSW secondary school students reported that they had consumed alcohol in the past seven days, and 8% reported they had smoked a cigarette recently. Even though the prevalence of smoking by young people has decreased since 1984, the prevalence of alcohol use has remained relatively unchanged over the same time period. The proportion of young people aged 12-17 who had used an illicit drug in the previous 12 months dropped from 46% in 1996 to 38% in 2001.

There is a higher prevalence of established risk factors among young Indigenous Australians when compared with other young Australians—young Indigenous Australians are more likely to smoke, to be obese and physically inactive, to have poorer nutrition but with higher rates of substance use. It is important to remember that these higher levels of risky health behaviour sit within a broader social and economic context of disadvantage, and socioeconomic status is an important determinant of the likelihood that individuals and populations are exposed to health risk factors.

Resilience theory

Resilience is the ability of an individual to bounce-back from a negative event or experience. Studies have found that resilience is negatively associated with adolescent risk behaviours (such as alcohol, tobacco and illicit drug use, and unprotected sexual activity). Young people who report higher levels of resilience also report less engagement with risk behaviours.

Research suggests that a range of factors are important for young people to achieve competence, confidence and good health in adulthood. In particular, a range of resilience factors may be critical to positive youth development, protection from engaging in health risk behaviours, and increased engagement at school.

Resilience theory provides a framework to describe the influence of resilience on the healthy development of adolescents. Within this framework, the factors suggested to influence the healthy development of an adolescent fall into two categories, internal and external resilience factors. Internal resilience factors include the personal skills and traits of the young person, and external resilience factors include the environmental influences that provide support for young people when responding to, and making decisions, regarding life events.

Based on past studies that have sought to measure the resilience of young people, 14 internal and external factors have been identified that influence an individual's resilience (see Figure 1, Page 6).

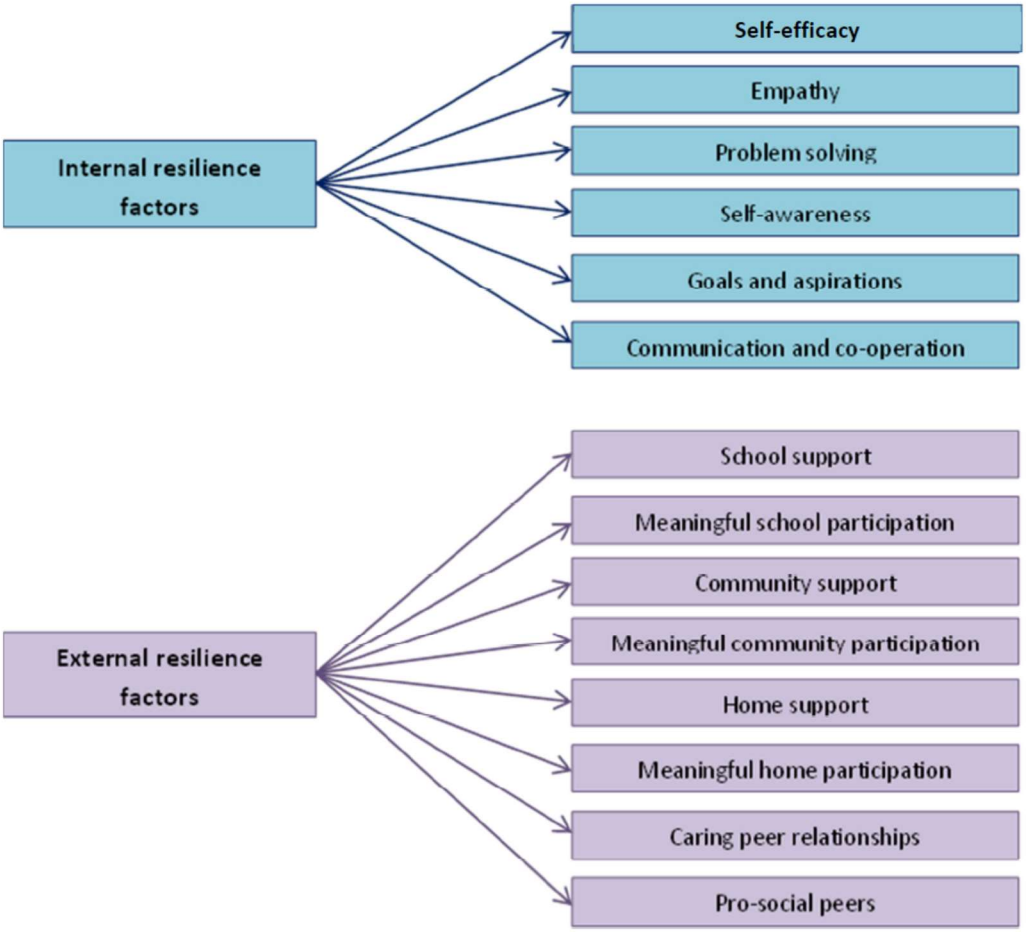

Figure 1. Internal and external resilience factors

Internal resilience factors

1. **Self-efficacy**: the belief in one's own competence, and the feeling one has the power to make a difference. It is related to task mastery, the sense of doing something well, and to having the ability to act and exert one's will. Self-efficacy is a critical component of

developing one's identity and sense of self—the major developmental task of the adolescent years.

2. **Empathy**: understanding and caring about another's experiences and feelings. Empathy is considered essential to healthy development and at the root of morality and mutual respect.
3. **Problem solving**: the ability to plan, be resourceful, think critically and reflectively, and to creatively examine multiple perspectives before making a decision or taking action.
4. **Self-awareness**: a hallmark of successful and healthy human development, and includes developing an understanding of how one's thinking influences one's behaviour, feelings, and moods, as well as an understanding of one's strengths and challenges.
5. **Goals and aspirations**: using one's dreams and plans to focus on the future, or having high expectations and hope for one's self. Goals and aspirations are an expression of the intrinsic motivation that guides human development, and reflect the search for the meaning of human life. Young people who have goals and aspirations develop a sense of deep connectedness.
6. **Communication and cooperation**: having flexibility in relationships, the ability to work effectively with others to exchange information and ideas, and express feelings and needs.

External resilience factors

1. **School support**: the supportive connections between the student and staff within the school. This includes teachers, support staff, or any other adults working within the school.
2. **Meaningful school participation**: student's engagement in meaningful activities within the school. This includes, involving students in relevant, engaging, and interesting activities with opportunities for responsibility and contribution, and is a natural outcome of high expectations.
3. **Community support**: supportive connections between the student and members of their local community. This may include coaches, instructors, program leaders, or other adults within the community with whom the student has regular contact.
4. **Meaningful community participation**: involvement of the student in relevant, engaging and interesting activities with opportunities for responsibility and contribution with the community.
5. **Home support**: supportive connections between the student and adults within their home. Home support includes establishing within the home, fair and clear rules and expectations, empowering discipline, guidance and encouraging their unique strengths and interests.
6. **Meaningful home participation**: students' engagement in meaningful home activities including involvement in relevant, engaging and interesting activities with opportunities for responsibility and contribution.
7. **Caring peer relationships**: how students relate to one another. A positive school environment depends to a great extent on creating caring, empathic student-to-student relationships.
8. **Pro-social peers**: what students' friends do and so separates pro-social or positive peers from their anti-social counterparts.

1.3 A WHOLE OF SCHOOL APPROACH TO INCREASING STUDENT RESILIENCE

Health Promoting Schools approach

The World Health Organization (1998) defines a health promoting school as 'a school that is constantly strengthening its capacity as a healthy setting for living, learning and working' (see Figure 2).

A World Health Organization review found that school-based interventions that address the school curriculum, school environment and community were the most likely to achieve a beneficial outcome. The Health Promoting Schools (HPS) framework encapsulates such an approach and is consistent with other review evidence suggesting that future studies include both individual and school-level intervention components for addressing young people's substance use. Such an approach is based on the theory that young people's behaviour is influenced in part by their social environments, including that of the school.

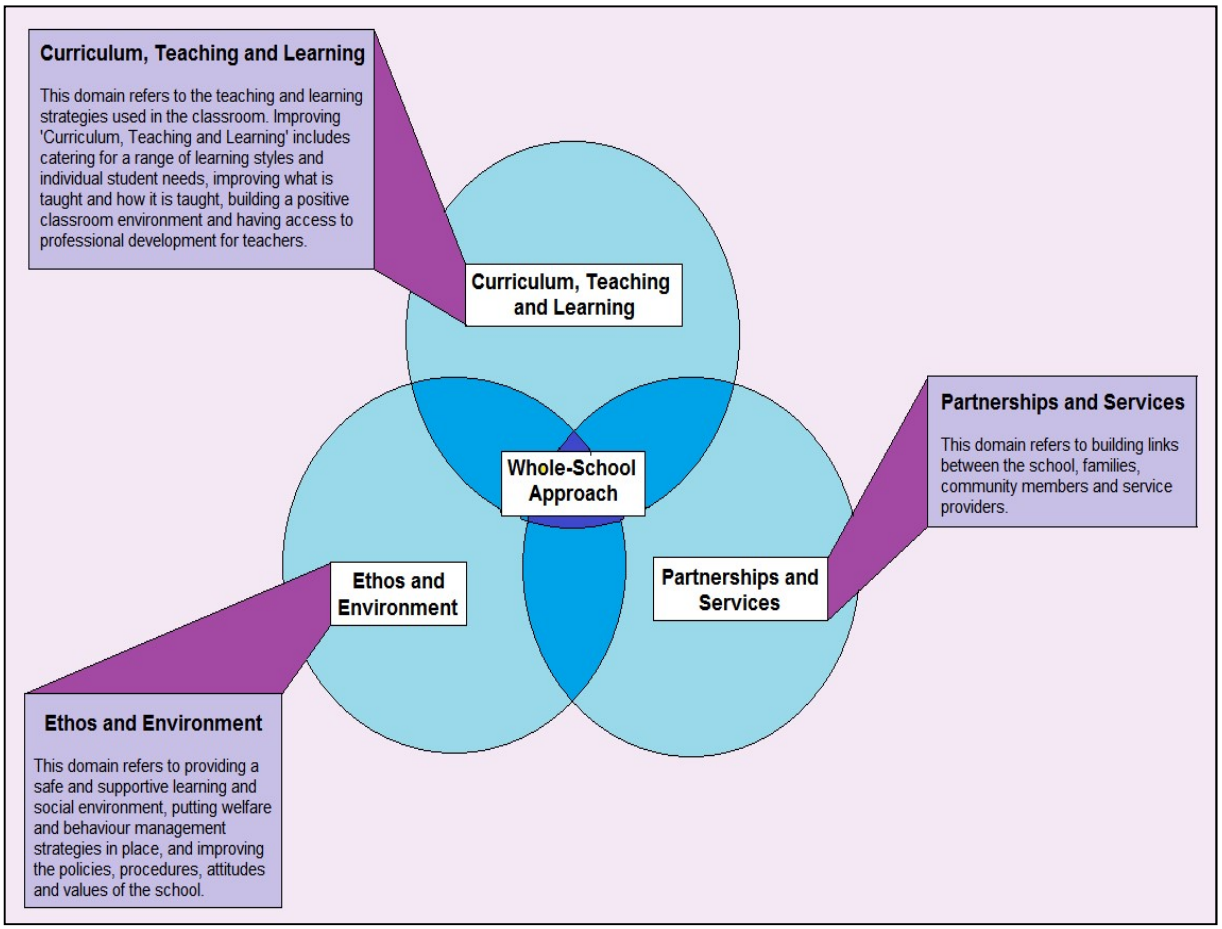

Figure 2. The Health Promoting Schools Framework

How to implement the HSHF program

The HSHF Program is implemented using a structured Planning and Implementation Cycle. This cycle includes collecting data from your school community related to student resilience, identifying priority areas within your school to target student resilience based on the HSHF Program Model, developing a School Action Plan to address the identified resilience strengths and needs, and finally the implementation of your Action Plan. Part 2 of this Program Guide provides more detailed information on how to progress through each of these steps.

Four surveys will be conducted in schools to identify and prioritise resilience issues, as well as to evaluate the success of the HSHF program, which include a Student, Staff, Parent and School Environment Survey.

Program Resources

A number of resources will be available to you each year to help your school plan and implement strategies to increase the resilience of your students.

- ***School Project Officer (SPO)***

A SPO will be allocated to your school one day a week from 2012 to 2014 to lead and support school staff in the planning, development, and implementation of the HSHF Program.

- ***Regional School Project Coordinator***

A Regional School Project Coordinator will support you, your school and your SPO to implement the HSHF Program within your existing school system and classroom practices.

- ***Funding***

All HSHF Program schools will receive $2,000 funding each year of the program (2012-2014). This funding is to be used by your school for staff training, teacher professional development, and teacher release time for teachers involved with the HSHF strategy planning implementation.

- ***Healthy Schools, Healthy Futures Program Guide (this Guide)***

This Guide contains information, tools and resources to help your school implement the HSHF Program throughout the next three years.

- ***Healthy Schools, Healthy Futures Research Team***

The HSHF Research Team comprises a Research Chair (Dr Megan Freund), Research Managers (Rebecca Hodder, Dr Libby Campbell, Milly Licata and Chris George), Research Assistants, a statistician and an administration officer. The HSHF research team will support SPOs, the Regional School Project Coordinator and schools in all aspects of implementing the program as well as data collection and analysis.

1.4 PROGRAM GOVERNANCE AND THE ROLE OF STAKEHOLDERS

Governance model

The governance model has been developed to ensure that the HSHF Project is implemented in line with established research objectives and stakeholder policies and strategic direction (see Figure 3). There are two key stakeholders in the HSHF Project: the NSW Department of Education and Communities (DEC) and the Catholic Schools Office (CSO, encompassing both the Maitland Newcastle and Armidale Catholic Schools Diocese).

As well as these groups, a large number of individuals will also be involved in the day to day running of the program within each school community. Many of these individuals (such as School Principals) will provide the essential leadership for the successful implementation of the HSHF program. The roles of the governance groups and individuals are described below.

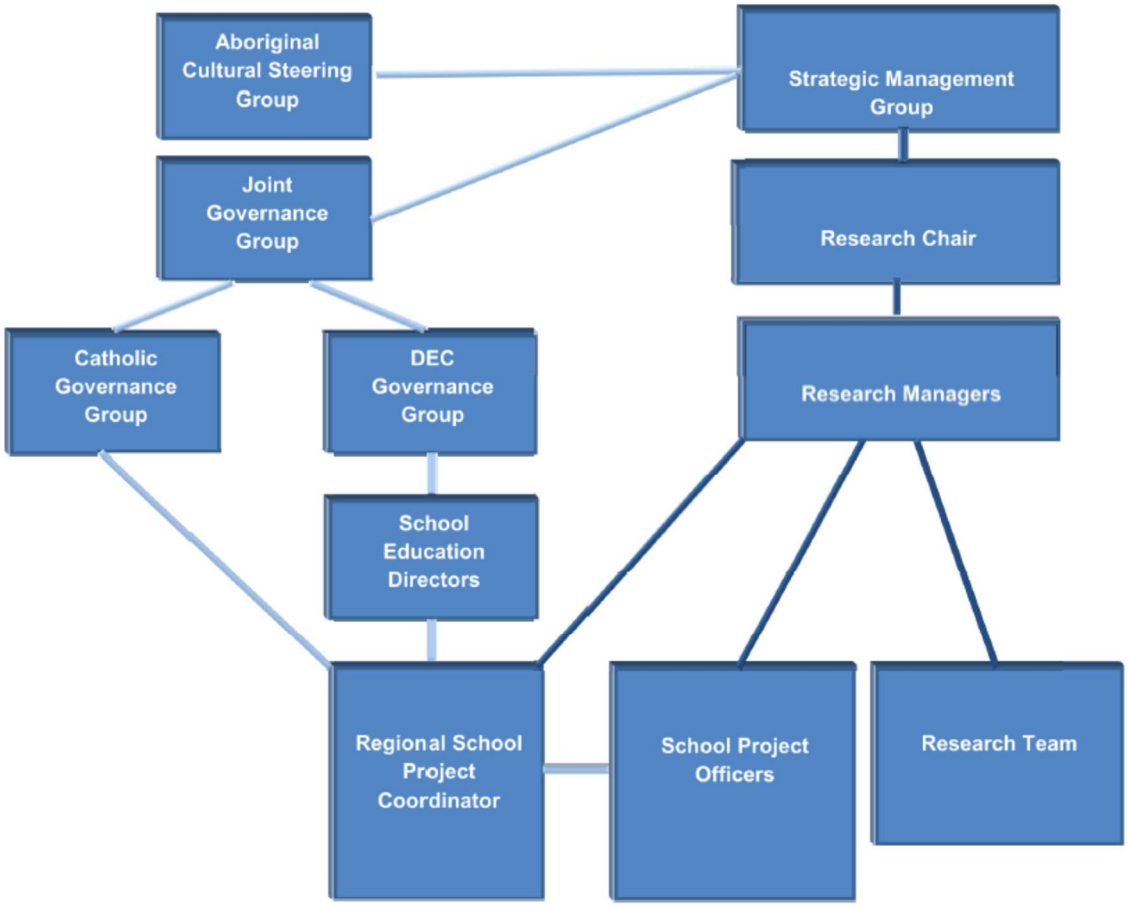

Figure 3. HSHF Governance Model

Roles and responsibilities

HSHF Aboriginal Cultural Steering Group
The role of this group is to provide advice and/or approval regarding the cultural appropriateness of the HSHF program for Aboriginal and Torres Strait Islander people. Membership of this group includes the HSHF Research Executive as well as Aboriginal representatives from the following organizations:

- Regional Aboriginal Education Consultative Groups – President's delegate (Hunter, Manning, North West 1, North West 2)
- NSW DEC – Aboriginal Education Consultant
- CSO – Aboriginal Education Consultant
- Hunter New England Health – Health Promotion Coordinator
- Hunter New England Health Aboriginal Health Unit – Representative
- Aboriginal Medical Service – Representative
- Hunter New England Aboriginal Mental Health Service – Representative
- Hunter New England Health Population Health Unit – Aboriginal Project Officers
- Indigenous Content Specialist
- HSHF Regional School Project Coordinator

HSHF Joint Governance Group
The role of this group is to ensure that HSHF Project is implemented in line with key stakeholder policies and strategic directions. Membership of this group includes the HSHF Research Executive, DEC Governance Group, CSO Governance Group, and the chair of the HSHF Aboriginal Cultural Steering Group.

HSHF CSO Governance Group
To ensure that the HSHF research project is implemented in line with CSO policies and strategic directions, and to consider broad level intervention strategies, membership of this group includes the HSHF Research Executive and representatives from both the Maitland Newcastle and Armidale CSO.

HSHF NSW DEC Governance Group
The role of this group is to ensure that HSHF is implemented in line with DEC policies and strategic directions, and to consider broad level intervention strategies. Membership includes DEC School Education Directors and representatives of the Research Team.

HSHF Regional School Project Coordinator
A Regional School Project Coordinator has been employed through Hunter New England Population Health to support the SPOs to implement the HSHF program in the 21 intervention schools, to support the data collection, and to provide advice, guidance and support to schools and school staff.

Responsibilities include:

- Supporting the SPOs to work within school systems, and to understand school and classroom practices;
- Liaising with principals to facilitate implementation of the HSHF program;

- Supporting development of school intervention strategies e.g. resilience curriculum items;
- Supporting the Research Team in implementing data collection and intervention strategies;
- Participating in risk assessments (as required) that are led by the principal, for each participating school;
- Contributing significantly to communication regarding the HSHF Program to school staff, students and to the wider school community;
- Communicating issues as appropriate to both the Research Managers and relevant School Education Directors;
- Attending School Advisory Group meetings;
- Attending School Core Team meetings to support schools and SPOs as required; and
- Participating in Program Management meetings with the Research Managers and SPOs.

SPOs

The role of the SPO is to assist each school to implement the HSHF Program. Two of the SPO positions have been filled by Aboriginal employees.

SPOs will receive support from both the HSHF Research Managers and the HSHF Regional Coordinator, to implement the Project within their allocated schools, and will be line managed by the HSHF Regional Coordinator.

Their responsibilities include (SPOs role is described in more detail throughout the Guide):

- Supporting schools to implement all aspects of the HSHF Program as described in the HSHF Program Guide;
- Contributing, under the guidance of the Research Managers, to ensuring the HSHF Program is effective and culturally acceptable, and is delivered in a manner sensitive to the cultural principles of Aboriginal and Torres Strait Islander people;
- Ensuring, under the guidance of the Research Managers, any interaction with Aboriginal and Torres Strait Islander people is culturally appropriate;
- Maintaining membership of and providing secretarial support to School Core Teams;
- Maintaining membership of other relevant groups including any established Working Groups;
- Liaising with each Working Group within the Core Team and assisting as required;
- Supporting schools to schedule and complete the school surveys (Student, Staff, Parent and School Environment). It is the role of the Research Team to collate, analyse and report outcomes of surveys to schools, however SPOs may assist with this activity;
- Facilitating Planning Workshops to support schools in identifying relevant resilience strategies to implement as part of the program;
- Supporting the development of a School Action Plan;
- Supporting schools to implement strategies as documented in the School Action Plan;
- Circulating relevant information to schools and to the youth services sector, regarding supplementary potential funding opportunities; and
- Supporting schools to source external funding for the implementation of school-based resilience initiatives.

HSHF Research Team

The research team will:

- Provide support and resources to SPOs for the successful implementation of the program across schools;
- Provide seed funding to schools for teacher release time to attend training and to participate in the program planning, implementation and monitoring;
- Provide resources and tools developed in the trial of the HSHF Program, e.g. the provision of a HSHF Program Guide; and
- Develop survey data reports of student resilience and health risk behaviours, as well as the data from the School Environment, Staff and Parent Surveys to Principals. Once approved by the principal, the data will be shared with other school staff and school community members for the purposes of school planning.

HSHF School Core Teams

Each school will be asked to form a HSHF School Core Team to implement the HSHF Program. The School Core Team at each school may comprise a Core Team Leader (possibly the Principal, Deputy Principal or Head Teacher Welfare), school staff members, Aboriginal school staff, parents/community members, community organization members and the SPO. The role of the School Core Team is to implement each stage of the HSHF program in the school (see Part 3 of the HSHF Program Guide for more information regarding the formation and role of this group).

HSHF Working Groups

School Core Teams will be encouraged to develop specific Working Groups to focus on the planning, implementation and review of particular strategies. The SPO will liaise with each Working Group and assist as required.

School Principals

In order to ensure the HSHF program is successfully implemented within each school, Principals by providing consent for their school to participate have committed to:

- Displaying support for and promoting the HSHF program to the school community including during assemblies and executive/ staff meetings;
- Providing a regular, suitable working space for the SPO;
- Considering their own participation as a member of the Core Team, or ensuring at least 1 member of the School Executive is a member of the Core Team;
- Encouraging staff to participate as members of the Core Team and if necessary, nominating individuals for tasks. Participating staff members should not all be attached to one faculty, for example, the PDHPE faculty. If it becomes obvious that a participating staff member does not wish to be involved in the program, approach the Core Team Leader to discuss the situation. If the person concerned is the Core Team Leader, approach the Principal. Negative or unhelpful Core Team members have the capacity to greatly destabilise the course and influence the success or failure of strategy development;
- Participate in the staff surveys; and
- Be encouraging of maintaining and developing a whole-school environment that supports the resilience of students.

2 Part 2: The Healthy Schools, Healthy Futures Program Model

2.1 Overview

The HSHF Program Model involves schools implementing strategies to address student resilience within each of the Health Promoting Schools domains using a whole-school approach. There are nine focus areas in total, and you will be provided with annual information regarding what is already in place, and where additional strategies may be required.

The HSHF Program Model focus areas

Curriculum, teaching and learning

1. School has resilience lessons embedded within curriculum
2. School implements resilience programs

Ethos and environment

3. School actively implements policies that impact on student resilience enhancement
4. School implements strategies to ensure the school environment is supportive for all students
5. Effective pedagogy is used within learning environments to enhance student resilience

Partnerships and services

6. Local community organizations/groups/sporting clubs students are promoted and engaged in the school
7. Health and community services are promoted and engaged in the school
8. School implements strategies to increase parental involvement in the school

HSHF Program Model

DOMAIN: Curriculum, teaching and learning strategies to address student resilience

Focus area 1: School has resilience lessons embedded within curriculum

Goal: 100% of students receive a minimum of 12 age-appropriate resilience lessons per year. Lessons are to be of 45 minute duration, delivered in each year of school (7-10) and across Key Learning Areas (that is, 9 hours per student per year)

There are a range of existing curriculum resources for use within class time to address this strategy, including the MindMatters curriculum resources, SenseAbility, the Real Game, and the Resourceful Adolescent Program (RAP).

The MindMatters resources can be integrated into existing curriculum to meet syllabus outcomes because they have been mapped for the PDHPE syllabus, and can be implemented in the English, History, Geography, Mathematics, Science, Technology, Visual Arts and Music Key Learning Areas.

SenseAbility resource – this program is divided into 7 Modules, with each Module addressing a component of resilience and providing classroom activities that are age-specific, of varying durations, and both individual and group-based. The SenseAbility resource has not yet been mapped to syllabus outcomes.
Your SPO and Regional School Project Coordinator can provide you with examples of how other schools have done this, which can also be presented to your teaching staff on request.

Focus area 2: School implements resilience programs

Goal: 100% of students receive an additional 9 hours of non-curriculum based resilience programs in each year of school chosen from a matrix of available resilience programs

There are a large number of existing programs to choose from that aim to increase student resilience, including *SenseAbility, Resourceful Adolescent Program* (RAP) and *You Can Do It!*. The HSHF Program Matrix Tool (Appendix 1) lists available evidence-based resilience programs. It includes information on the following program characteristics to assist you in deciding which programs are appropriate for your school:

- The particular resilience factors the program aims to address;
- The age group of students targeted by the program;
- The duration of the program; and
- The cost of the program.

Feasible options for how to implement this strategy within your school will be influenced by your school's needs as identified in the School Environment Survey, as well as your school's timetable/program structure. Methods of implementation could include:

- Weekly or fortnightly sessions within Mentor/DEAR/Pastoral Care (or equivalent) programs;
- Within Year meetings or assemblies;
- Integration within existing or proposed school camps and/or excursions (e.g. as a whole day or sessions over the duration of the camp/ excursion);
- Integration within existing whole-school events (e.g. community days, NAIDOC Week, Harmony Day, ANZAC Day);
- Stand-alone events (e.g. camps, excursions, day sessions, whole school events); and/or
- Integration within the sport program (e.g. during one sport session per term).

It is important to make sure that Aboriginal school staff and your local Aboriginal Education Consultative Group is involved in assisting you to select culturally appropriate resilience programs for your Aboriginal students. The Cultural Appropriateness Criteria Tool can assist schools within the HSHF Program to decide on which resilience-focused intervention program they may implement in their schools that are culturally appropriate for their Aboriginal students. The Cultural

Appropriateness Criteria Tool is close to being finalised and will be disseminated to staff in 2013.

Goal: 100% of Aboriginal students receive a resilience program in each year of school chosen from the matrix of available resilience programs (e.g. Feeling Deadly Not Shame)

There are a number of existing programs that aim to increase student resilience that have been developed specifically for Aboriginal students, including the *Feeling Deadly Not Shame* and *RAP-A Indigenous* programs. The HSHF Program Matrix Tool (Appendix 1) lists available evidence-based resilience programs.

The Cultural Appropriateness Criteria Tool can assist schools within the HSHF program to decide on which resilience focused intervention program they will implement in their schools that are culturally appropriate for their Aboriginal students. The Cultural Appropriateness Criteria Tool is close to being finalised and will be disseminated to staff in 2013.

Goal (optional): Resilience programs delivered to other sub groups of need

Within your school there may be sub groups of students who have particularly low resilience including those students who may be experiencing grief and loss issues, have a mental health diagnosis or a physical disability.

Your school could consider implementing additional resilience programs for these sub groups students if feasible and sufficient resources are identified within the school to do this. The HSHF Program Matrix Tool (Appendix 1) lists available evidence-based resilience programs.

DOMAIN: Ethos and environment strategies to address student resilience

Focus area 3: School actively implements policies that impact on student resilience enhancement

Goal: Rewards and recognition program implemented across whole school

You may already have in place within your school programs that reward or recognise students for their achievements. It is important that such programs don't focus on only rewarding academic and sporting achievements, but also reward positive student behaviour such as student resilience characteristics (for example students demonstrating good communication and cooperation skills, self-efficacy, or problem solving skills). They can be implemented across all Year levels within your school, and can be promoted at your school assemblies or in school publications. Your SPO can provide you with examples of how other schools have implemented this strategy.

Please refer to the HSHF Program Matrix Tool for a range of existing rewards and recognition programs that you could implement across your whole school.

Goal: Peer support program/peer mentoring program implemented across whole school

This strategy involves ensuring that each student cohort in your school participates in either a peer support program or peer mentoring program between Year 7 and Year 10.

There are a range of existing peer support and peer mentoring programs you could choose to implement (please refer to the HSHF Program Matrix Tool).

You could also consider developing your own strategy to support or mentor particular groups of students within your school. Your SPO can provide you with examples of how other schools have implemented this strategy.

Goal: Empowerment/leadership programs implemented across whole school

Similar to the previous goal, successful implementation of this strategy involves ensuring that each student cohort in your school participates in either a student empowerment or leadership program between Year 7 and Year 10.

There are a range of existing student empowerment or leadership programs you could choose to implement, including the MindMatters Student Empowerment Professional Development module (please refer to the HSHF Program Matrix Tool for additional programs to choose from).

You could also consider developing your own strategy for particular groups of students within your school. Your SPO can provide you with examples of how other schools have implemented this strategy.

Goal: Additional external resilience programs delivered to Aboriginal students

There are a number of existing programs that aim to increase student external resilience that have been developed specifically for Aboriginal students, including cultural leadership programs (please refer to the HSHF Program Matrix Tool for additional programs to choose from).

As with all strategies targeting Aboriginal students, it is important to make sure that Aboriginal school staff and your local Aboriginal Education Consultative Group is involved in assisting you to select culturally appropriate resilience programs for your Aboriginal students.

Focus area 4: School implements strategies to ensure the environment is supportive for all students

Goal: Evidence-based anti-bullying strategies/programs are implemented

There are a number of existing programs that aim to prevent bullying within a school environment, including Positive Behaviour for Learning (please refer to the HSHF Program Matrix Tool for additional programs to choose from).

Alternatively your school may like to develop your own anti-bullying strategies. Evidence suggests that anti-bullying programs are more effective if they are whole-of-school, and include school-wide rules and sanctions, teacher training and classroom curriculum.

Your SPO can provide you with examples of strategies to consider, including establishing safe places within your school for particular subgroups of students.

Goal: Cultural awareness strategies implemented within the school

Cultural awareness strategies implemented across the whole school have the potential to improve student feelings of being safe and supported within a school, and do not need to be restricted to Aboriginal and/or Torres Strait Islander culture. There are a number of cultural awareness strategies that schools may already have in place, including Acknowledgement of Country at school events, display of Aboriginal and Torres Strait Islander flags at the front of the school, celebration of cultural events, Aboriginal and Torres Strait Islander murals in the school, or a dedicated Aboriginal and Torres Strait Islander Education cultural room.

The School Review Checklist (Dare to Lead) can be used to identify current practices to support Aboriginal students as well as to identify additional practices that could be implemented in schools. Your SPO can assist you to complete this tool and identify possible strategies to implement.

It is important to make sure that Aboriginal school staff and your local Aboriginal Education Consultative Group are involved in selecting appropriate cultural awareness strategies to implement in your school.

Focus area 5: Effective pedagogy is used within learning environments to enhance student resilience

Goal: Teachers offered training to implement pedagogy in line with MindMatters Teaching and Learning for Engagement

The learning environment within a classroom can impact on a range of resilience characteristics including student perception of meaningful participation in school and school support.

There are a number of training opportunities in which staff can participate regarding teaching strategies which can enhance student resilience, including the MindMatters Teaching and Learning for Engagement Focus Module.

DOMAIN: Partnerships and services strategies to address student resilience

Focus area 6: Local community organizations/groups/sporting clubs promoted and engaged in the school

Goal: Local community organizations/groups/sporting clubs students can participate in are promoted and engaged within the school

There is a large number of community organizations, groups and clubs that students can participate in outside of schools hours that can enhance their perception of meaningful participation in the community, including charity organizations (such as Salvation Army, Samaritans, Wesley Mission, St Vincent De Paul, Centacare), Lions or Rotary Clubs, church groups, police youth groups, sporting clubs, Aboriginal community groups and Aboriginal Education Consultative Groups.

Involvement in these community organizations or groups can be promoted through your school via newsletters, presentations at assemblies, distribution of flyers at schools, or groups participating in school events.

You may already be aware of organizations or groups in your local community that students can participate in, however if not your SPO can assist you to identify any additional relevant organizations or groups.

Focus area 7: Access to health and community services is promoted and engaged in the school

It is important that all members of your school community are aware of the health and community services that are available to students with your local area. Examples of services could include Health Services, Youth Services, Community Health, Child and Adolescent Mental Health Service, Aboriginal Medical Services or Aboriginal Health.

Goal: Health and community services are promoted and engaged within the school

There are many ways that available health and community services could be promoted to students within a school. For example information regarding the services could be promoted via flyers, schools newsletters, on student noticeboards, groups could present at school events or assemblies, or you could consider a classroom activity where students do a scoping exercise regarding available services and present to a school assembly.

Your SPO can assist you to scope the available services in your local area and also provide additional examples of strategies other schools have implemented.

Goal: Referral pathways to services developed and promoted to the school community (including staff and parents)

It is important that both school staff and parents are aware of available health and community services available to students, as well as any referral pathways that exist for students to be able to access these services.

Schools may already have in place formal documentation that outlines referral pathways to health and community services for different student sub groups. If not then it is important to document these pathways. It is also important that all school staff are aware of these referral pathways, for example documentation provided to staff and discussed in staff meetings or staff noticeboards.

Parents can be made aware of available services and any referral pathways via information nights, flyers available at schools events including parent teacher nights, or via school newsletters.

Focus area 8: School implements strategies to increase parental involvement in school and school-based activities

Goal: Annual school events implemented to engage parents (not including parent teacher nights, presentation and award events)

One way to increase the number of parents who participate in school-based events and activities is to schedule a range of different school events based on the type of events that the parents from your school are interested in attending. Offering events both within business hours as well as outside of business hours to cater for both working and non-working parents may improve participation rates. Data will be collected via the HSHF Parent Survey to identify the types of event your parents may be interested in attending.

Examples of events could include trivia nights, working bees, cooking classes, woodwork classes, or information sessions focused specifically on enhancing student resilience. Your SPO can provide additional examples of successful events implemented other schools.

Goal: Effective parent communication strategies

Effective communication strategies with parents involve providing regular communication regarding topics of interest and using multiple methods of getting the information to parents.

For example, distributing school newsletters to parents in the mail as well as electronically via email, or providing information via school websites.

Your school could also consider obtaining mobile phone numbers for parents and sending text messages regarding important school events. Your SPO can provide you with additional examples of successful communication strategies with parents.

Goal: Articles regarding student resilience are included in parent newsletters

It is important to provide information to your parents regarding student resilience as well as your progress as part of the HSHF Program to address student resilience.

Your SPO will provide you with regular articles to include in newsletters that describe the many resilience characteristics and information about how parents can impact on these. There will be a particular focus in these articles on providing parents with information about how to addressing meaningful home participation for students and home support.

Your SPO can support your School Core Team to draft regular updates regarding your HSHF Program progress towards addressing student resilience.

3 Part 3: How to implement the Healthy Schools, Healthy Futures Program

3.1 Overview

There are a number of steps that need to be conducted to implement the HSHF program.

These steps vary slightly in each year of the program, however each year may include the following steps which are depicted in the HSHF Planning and Implementation Cycle below (see Figure 4).

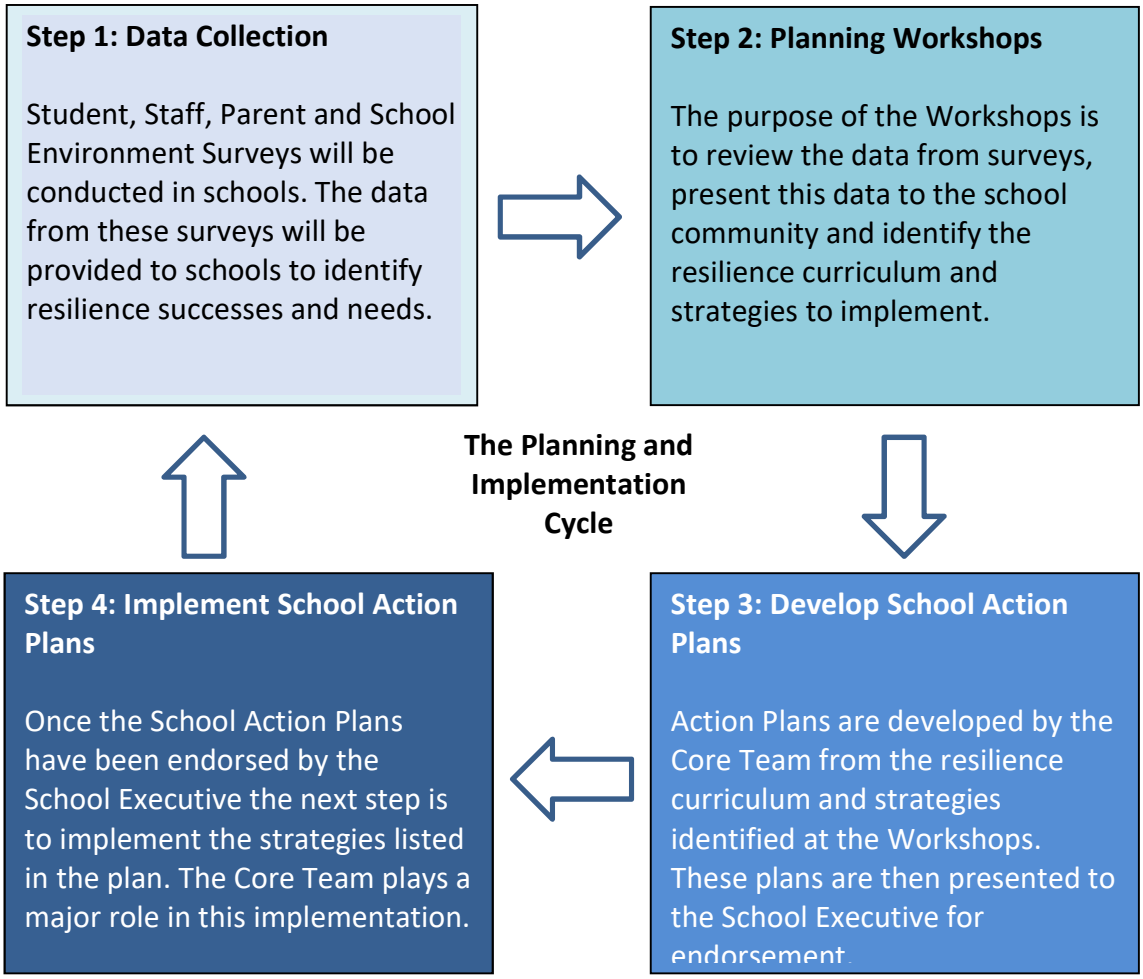

Figure 4. The HSHF Planning and Implementation Cycle

PRELIMINARY ORGANIZATION

Prior to implementing the HSHF program in your school there are three important things to do:

1. Establish your HSHF School Core Team
2. Communicate with your School Community about the HSHF program
3. Consider conducting a risk assessment

1. Establish your HSHF School Core Team

Your HSHF School Core Team, supported by your SPO, will be the driving force behind the successful implementation of the HSHF program in your school. The suggested membership and role allocation for your HSHF School Core Team is described below.

Membership

The School Core Team can sit as an independent team within your school or its role can become part of an existing team within the school, e.g., Student Welfare Team. Whatever your school's choice, it is important that your Core Team represents the expertise within the school, the diversity of the school and the wider school community.

Usually your Core Team will be made up of 8-10 individuals. Although membership will be open to all interested individuals within the school, representation from specific positions within the school is highly recommended. These people provide the required level of authority and expertise to effectively plan and implement the Healthy Schools, Healthy Futures Program.

Members who are recommended to participate in your core team include:

- Principal and/or Deputy Principal
- Faculty Head Teachers/Coordinators
- Your allocated HSHF SPO
- Aboriginal and/or Torres Strait Islander Staff member (Teaching or non-teaching)
- Head Teacher Welfare/School Counsellor (or Welfare Teacher if there is no Head Teacher Welfare position)
- Year Advisors/Coordinators
- Anti-Racism Contact Officer

Other sub groups within your school community to consider inviting representatives from:

- Students
- Parents

Responsibilities

In conjunction with the SPO and the Regional School Project Coordinator, the School Core Team should:

- Meet at least three times per term;
- Manage the HSHF Planning and Implementation Cycle;
- Develop your HSHF Action Plan;
- Drive the implementation of the Action Plan;

- Allocate funding to implement strategies within the Action Plan; and
- Monitor the implementation of the Action Plan.

2. Communicate with your School Community about the HSHF Program

In order to successfully implement HSHF as a whole of school program it is essential that everyone in your school community is informed about the school's participation in the HSHF program.

It is recommended that School Staff are informed as early as possible regarding what participation in the HSHF program involves.

Information regarding the HSHF Program and aspects of student resilience will also be regularly provided to you by your SPO to inform your school community via inclusion in your school newsletter, or presentation by your SPO to school community groups.

Schools that have previously implemented the HSHF Program have also implemented the following communication strategies to assist in keeping their school community updated regarding their HSHF program.

HSHF Program launch

Together with your school executive and SPO your Core Team can launch the HSHF Program within your school by holding a special assembly where school staff, parents, school community members, students and local media organizations are invited, to let everyone know about your participation in the HSHF Program. Officially launching the program will help to inform students, staff, parents and the wider school community of the program and what it is all about.

School Newsletter articles

Include regular articles in the school newsletter about your HSHF Program progress.

HSHF Communication Plan

You might like to include all your planned communication with your school community in a Communication Strategy where all individuals and groups of people who need to be informed or kept in the loop regarding the HSHF Program are listed, as well as when and what you would like to share with them.

You will need to decide what information each individual/group should have access to and the methods to be used to ensure appropriate communication of that information takes place. For example, there may be information that is only suitable for HSHF Core Team members as opposed to the information that needs to be communicated with the wider school or local community.

The methods of communication that may be included in a communication plan include:

- Email;
- Schools bulletins and Newsletters; and
- School portals, such Moodle, SharePoint, Millennium.

3. Consider conducting a risk assessment

All schools should consider conducting a risk assessment prior to implementing the HSHF program to ensure that all risks for students, staff and researchers are minimised.

Your SPO or Regional School Project Coordinator can assist with this is if required.

HSHF Program milestones

There are a number of milestones to be met in each year of the HSHF program implementation based on the HSHF Planning and Implementation Cycle.

On the following pages, a yearly snapshot of these milestones is provided.

The steps required to complete each milestone are described in detail from Page 21.

Year 1 milestones (2011)				
Term	**Week**	**Step of Planning Cycle**	**Task**	**Date completed**
Term 2	Week 1	**Step 1: Data Collection**	Student/parent information for parental consent for student survey participation obtained	
	Week 1		Student survey dates for Term 3 confirmed	
	Week 2		School community informed about upcoming student survey, parent survey and parent information packs	
	Week 3		Mail out parent information packs requesting consent for participation in student survey and completion of the parent survey	
	Week 4-10		Follow up phone calls to non-responding parents for consent for student participation in the student survey	
Term 3	Week 2-10		Student survey conducted	
Term 4	Week 1-6		Parent survey mailed out to parents of Year 7-10 students	
	Week 6-10		Staff survey with all school staff	
	Week 6-10		School environment survey conducted with relevant staff	
	Week 10		Student survey data report provided	
	Week 10	**Step 2: Planning Workshops**	School Core Team formed	

Year 2 milestones (2012)				
Term	**Week**	**Step of Planning Cycle**	**Task**	**Date completed**
Term 1	Week 2-3	**Step 2: Continued**	Dates for Workshop 1 and 2 confirmed	
	Week 2-3		Relevant school staff invited to Planning Workshop 1	
	Week 2-3		School community invited to Planning Workshop 2	
	Week 4		Parent survey data report provided	
	Week 4		School environment surveys with relevant staff finalised	
	Week 5		Staff survey data report provided	
Term 2	Week 5-8		Planning Workshop 1 held	
	Week 5-8		Planning Workshop 2 held	
	Week 5-8	**Step 3: Develop Action Plan**	Appropriate strategies to address identified resilience needs of students and school community selected	
	Week 8-10		Commence drafting Action Plan based on selected resilience strategies	
Term 3	Week 1-3		Action Plan finalised	
	Week 4-6		Action Plan ratified by School Executive	
	Week 7-10	**Step 4: Implement Action Plan**	Implement resilience strategies from Action Plan	
Term 4	Week 1-10		Monitor/report on progress towards resilience strategy implementation	
	Week 1-10			
	Week 8-10	**Step 5: Planning Workshops**	Consider need for Planning Workshop 3 confirmed	
	Week 8-10		School community invited to Planning Workshop 3	

Year 3 milestones (2013)				
Term	**Week**	**Step of Planning Cycle**	**Task**	**Date completed**
Term 1	Week 1-10	**Step 6: Implement Action plan**	Implement resilience strategies from action plan	
	Week 1-10		Monitor/report on progress towards resilience strategy implementation	
Term 2	Week 1-2	**Step 7: Data Collection**	Student survey dates for Term 3 confirmed	
	Week 3-4		Inform school community about upcoming student survey	
	Week 4-10		Mail out parent information packs requesting consent for participation in student survey	
	Week 4-10		Follow up phone calls to non-responding parents for consent for student participation in the student survey	
Term 3	Week 1-10	**Step 8: Implement Action Plan**	Implement resilience strategies from action plan	
	Week 1-10		Monitor/report on progress towards resilience strategy implementation	
	Week 2-10	**Step 9: Data Collection**	Student survey conducted	
	Week 10		Student data reports received	
Term 4	Week 1-10	**Step 10: Implement Action Plan**	Implement resilience strategies from action plan	
	Week 1-10		Monitor/report on progress towards resilience strategy implementation	
	Week 1-3	**Step 11: Planning Workshops**	Dates for Workshop 3 confirmed	
	Week 4-10		Relevant school community members invited to Planning Workshop 3	
	Week 4-10		Hold Workshop 3	

Year 4 milestones (2014)				
Term	**Week**	**Step of Planning Cycle**	**Task**	**Date completed**
Term 1	Week 1-10	**Step 12: Implement Action Plan**	Implement resilience strategies from action plan	
			Monitor/report on progress towards resilience strategy implementation	
Term 2	Week 1-2	**Step 13: Data Collection**	Student survey dates for Term 3 confirmed	
	Week 2-3		School community informed about upcoming student survey, parent survey and parent information packs	
	Week 3		Mail out parent information packs requesting consent for participation in student survey and completion of the parent survey	
	Week 4-10		Follow up phone calls to non-responding parents for consent for student participation in the student survey	
Term 3	Week 1-10	**Step 14: Implement Action Plan**	Implement resilience strategies from action plan	
	Week 1-10		Report on final progress towards resilience strategy implementation	
	Week 2-8	**Step 15: Data Collection**	Final student survey conducted	
	Week 2-8		Final school environment surveys with relevant staff conducted	
	Week 2-8		Final staff survey conducted	
	Week 10		Final student, parent, staff and school environment survey data reports provided	
Term 4	Week 5-8	**Step 16: Planning Workshops**	Planning Workshop 1 held	
	Week 5-8		Planning Workshop 2 held	

	Week 5-8	**Step 17: Develop Action Plan**	Appropriate strategies to address identified resilience needs of students and school community selected	
	Week 8-10		Action Plan based on selected resilience strategies drafted	
	Week 10		Action Plan ratified by School Executive	

STEP 1: DATA COLLECTION

A key element of being able to address the resilience needs of your students is to understand what is happening locally in your school. Four surveys will be conducted to collect data regarding the potential areas of student resilience that can be enhanced within your school. The results of these surveys will be used to guide the planning of strategies to address the specific resilience needs of your students and school community.

Confidentiality of responses and anonymity of participants are key elements of the HSHF data collection protocols.

The following surveys will be conducted in designated years:

- Student Survey (see Appendix 2);
- Parent Survey (see Appendix 3);
- Staff Survey (see Appendix 4);
- School Environment Survey (see Appendix 5).

Planning and implementing the surveys
Although each survey differs in regards to their planning and implementation, there a number of aspects that are common to all surveys. These are outlined below:

Responsibility for planning the survey implementation
Each of the surveys have been developed and tested by the HSHF Research Team. It is your SPO and HSHF School Core Team's responsibility to plan the implementation of the survey. This planning should include when during the designated term the survey will be conducted, in what venue and what additional support may be required to implement the survey.

A member of the HSHF Research Team or your SPO should be present when surveys are completed as they are trained in the administration of each of the surveys.

Informing your School Community about the surveys
It is important to inform your staff, parents and students about the surveys including what the surveys are about and why they are being conducted. This should be done through your school's usual communication methods including your school newsletters, presentations at staff meetings, and school assemblies.

Analysis and report development
The HSHF Research Team will be responsible for collating and analysing the results of all four surveys each year and providing a report back to your school. The reports will identify what is working well and which areas your school might like to address.

STUDENT SURVEY: OVERVIEW AND ADMINISTRATION INSTRUCTIONS

The survey tool
The Student Survey is an online self-report survey and will ask students about their socio-demographic characteristics (including age, gender, school year, and

identification as an Aboriginal and or Torres Strait Islander), their internal and external resilience factors, a range of mental health characteristics and their health-risk behaviours (tobacco, alcohol and drug use, physical activity, nutrition, and sexual practices for students in Year 10 in government schools only), (the Student Survey is provided in Appendix 2).

Who should complete the survey?
All students in Years 7 to 10 will be invited to participate in the survey. Only those students for whom parental consent has been received will be able to participate.

It is the responsibility of your SPO and the HSHF Research Team to complete the following tasks to identify in Term 2 which students can complete the survey:

- Liaise with relevant school staff to obtain the names and parental contact details of Year 7 to 10 students to participate in the student survey. In 2011 consent will be requested from parents for the entire study, such that in 2013-2014 consent will only be requested for any new enrolments;
- Mail information packs directly to parents informing them about the student survey and requesting consent for student participation;
- Monitoring and collating returned consent forms from parents (parents are provided with a reply paid envelope to return their consent forms which are sent to Hunter New England Population Health Wallsend office for collation); and
- Prompting any non-responding parents via telephone for consent for student participation
- Informing your school regarding the final list of students for whom consent has been received and who can participate in the student survey.

Administering the survey
The student survey takes between 25 and 35 minutes to complete and is sent directly to students' school email address by members of the HSHF Research Team. Students are asked to complete the survey during class time under the guidance of members of the HSHF Research Team.

Your SPO and members of the HSHF Research Team will be responsible for administering the survey to your students.

A supervising teacher is required in each class room to maintain your school's duty of care and to monitor student behaviour.

Support is required from an IT contact within your school to assist students who do not know their school computer log-on details or are unable to log-on to their school email address.

Students can complete the online survey on either school desktop computers in computer labs, or on their school-allocated laptops in classrooms with wireless internet access.

Planning the survey implementation
Your SPO will ask you in early Term 2 to nominate a schedule for completing your student surveys during Term 3. This will include a main round of surveying as well as

some 'mop up' dates to survey any students who were not able to complete the survey in the main round of surveys.

Important things to consider when scheduling your Student Surveys:

- It is recommended that no more than 2 classes of students are scheduled at once to complete the student survey if only one IT support person is available;
- If a class is scheduled to complete the survey via school-allocated laptops it is recommended that school desktop computers are also available for those students who don't remember to bring their laptops to schools or whose laptop batteries are flat;
- For the main round of student surveys schools have previously found it easier to schedule entire classes to complete the survey at once. Depending on the number of computer labs available and students who need to complete the survey you may need to put aside between 1 and 5 days to complete the main survey round;
- For 'mop up' surveys schools have previously found it easier to book out a computer lab for a day or two depending on the size of the 'mop up' and call students out of their classes to complete the survey;
- In order to maintain the exam-like conditions for completing the survey it is recommended that only students whose parents have provided consent for them to participate in the survey are present in the survey room. So if you do schedule whole classes to complete the survey you will need to also make arrangements for any students who do not have parental consent to complete the survey; and
- In order to ensure support is available if required it is recommended that you notify your School Counsellors of the dates of your student survey and provide them with an information letter describing the content of the student survey.

Two weeks before your survey dates…The HSHF Research Team will send you a list of students whose parents we have not been able to contact. Please review this list and provide any updated contact details you are able to obtain from students.

One week before your student surveys…The HSHF Research Team will provide you with the current list of students whose parents have consented to their participation in the student survey.

On the day of surveying…Your SPO and any supporting HSHF Research Team members will have a roll-call list of all students scheduled to complete the surveys on that day so that they can mark off who has completed the survey. They will also ask you to provide your absentee lists for that day in order to mark off any students who are absent.

Informing staff and students about the survey

An information sheet has been developed to provide to staff who have been asked to assist with the supervision of classes completing the survey.

Validation of adolescent-reported physical activity and smoking

As part of the HSHF research project, a validation of self-reported physical activity and tobacco use is planned in the first (2011) and final year (2014).

For physical activity validation, consenting students attending both NSW Government and Catholic schools will be randomly selected to wear a pedometer the week before the survey.

For tobacco use, consenting students attending Catholic schools will be randomly selected to provide a saliva sample on the day of the survey to be tested for cotinine (a biomarker produced by nicotine use).

The self-reported data collected via the Student Survey regarding physical activity and smoking will then be compared to the pedometer and cotinine data to see how closely they match.

The HSHF Research Team and your SPO are responsible for selecting students to participate in the validation and collection of data from students, however school staff may be asked to assist with this.

PARENT SURVEY – OVERVIEW AND ADMINISTRATION INSTRUCTIONS

The survey tool
Parents of children who attend intervention schools are also asked to complete a survey about the factors that contribute to the health and wellbeing of their child/children. This includes questions about how the child/children feel at school, and how supportive and encouraging the school is to parents/carers and their child/children. The survey will take approximately 15 minutes to complete and can either be completed online or in written form (the parent survey is provided in Appendix 3).

Who should complete the survey?
All parents of students in Years 7-10 will be invited to participate in the survey. The parent survey provides an opportunity for parents to share their views, opinions and ideas about the school, relevant to the HSHF Program.

Informing parents
An information letter will be included with the mail-out of the survey for parents regarding the content of the survey and what the data collected will be used for.

Information on the parent survey will be provided to parents in Term 2. In addition to the information provided in this package, your school is also encouraged to promote the parent survey through a variety of other methods. These may include:

- School Newsletter;
- School Website; and/or
- School Notice Board.

Administering the survey
The distribution and collation of the parent surveys will be the responsibility of the HSHF Research Team and your SPO. Parents will be provided with a reply-paid envelope to return pen and paper versions of the survey to the HNE Population Health office for collation by the HSHF Research Team.

Schools can consider alternative methods to increase participation in the parent survey e.g. parent teacher nights.

STAFF SURVEY – OVERVIEW AND ADMINISTRATION INSTRUCTIONS

The survey tool
The staff survey is a pen and paper survey that will be completed during work time in Term 1, most likely at a whole staff meeting. Staff will be asked questions regarding factors that contribute to the health and wellbeing of the school community. Questions include those about promoting a safe and friendly environment at school, communication and participation in decision making, policy procedures, school connection, resilience and help seeking behaviour and goals and aspirations (the staff survey is provided in Appendix 4).

Who should complete the survey?
The survey will be made available to all school staff (teaching and non-teaching) regardless of whether they are full-time, part-time or casual.

Informing staff
An information letter will be distributed to all staff providing information on the survey including why the survey is being conducted and what is covered in the survey.

In addition to the information sheet, a staff information session should also be scheduled. This session may be scheduled within a staff meeting or other faculty meeting where staff can be provided with the information letter and offered the opportunity to ask questions. This session should also cover when the staff survey will be emailed to them (or if pen and paper provided to them) and when the survey needs to be completed and returned by.

Planning the survey implementation
There are a number of steps to planning the implementation of the staff survey:

- Decide on your preferred date for implementing the staff survey.
- Obtain and distribute copies of the staff survey Information letter to all staff.

SCHOOL ENVIRONMENT SURVEY – OVERVIEW AND ADMINISTRATION INSTRUCTIONS

The survey tool
The school environment survey is a semi-structured interview with school staff to review current school curriculum and practices regarding resilience interventions and strategies (the school environment survey is provided in Appendix 5).

Who should complete the survey?
The School Principal and various other staff that the School Principal nominates will be invited to participate in the survey.

Informing staff
The Principal will inform the relevant staff regarding the survey in the first instance. Your SPO will then contact staff individually to find a convenient time to conduct the survey.

Administering the survey
Your SPO will ask the School Principal to nominate relevant staff to complete the survey and will arrange individual interviews with each participating staff member.

School staff will be provided with a copy of the school environment survey prior to the interview in order to collect any relevant documents or seek information from other school staff regarding the resilience strategies that are currently in place.

STEP 2: PLANNING WORKSHOPS

The Planning Workshops help to decide what strategies your school is going to implement to address the focus areas within the HSHF Program Model.

The type of workshop to be delivered will depend on what stage your school is up to in implementing the program.

Workshop 1 – Resilience Curriculum Workshop (2012): To allow key staff representatives to review existing resilience curriculum and programs detailed in your school environment survey data report, prioritise key resilience issues as per the HSHF program model and identify strategies to address these issues over the following 2 years.

Workshop 2 – School Community Workshop (2012 and 2014): To allow representatives from the whole school community to learn about the HSHF program, the key resilience issues as per the HSHF program model and contribute to the selection of non-curriculum strategies for implementation within the school over the following 2 years.

Workshop 3 – Review and Refocusing Workshop (2013): To allow representatives from the whole school community to review progress, evaluate the success of resilience strategies implemented to date and to refocus on the areas of your action plan that have not been implemented as yet.

Workshop preparation
There a number of preparation steps consistent for all Planning Workshops. Your SPO will lead workshop preparation:

- Plan who should attend the workshop;
- Find an appropriate room to hold the workshop in. The workshop should be held on school grounds to ensure that invited staff and students are able to attend. Ensure that the location is booked well in advance so that the location can be indicated on invitations;
- Invite all proposed participants at least two weeks prior to the planned workshop date;
- Notify teaching staff if students will be attending the workshop;

- Organise a Welcome to Country or Acknowledgement of Country;
- Arrange release for teachers attending the workshop if required;
- Nominate someone to record the minutes from the workshop;
- Organise catering for participants; this may include morning tea, lunch or afternoon tea depending on the time of the workshop. You may choose to use the school canteen or it may be an opportunity for school students to gain experience or to meet course requirements by providing catering. Providing healthy food (or healthy options) is encouraged; and
- Arrange appropriate equipment to be available e.g. Laptop (containing PowerPoint) and projector or a smartboard; whiteboard and whiteboard pens; attendees list, to keep an accurate record of those that attend; and name tags (including what group the person is representing).

Planning Workshop 1 (Resilience Curriculum)

Purpose
Provides a forum for key staff representatives to review the data collected via the school environment survey regarding resilience curriculum, programs and pedagogy, identify any gaps compared to the HSHF Program Model, and prioritise strategies to address the gaps.

HSHF Program Model focus areas to be addressed

Focus area 1: School has resilience lessons embedded within curriculum

Goal: 100% of students receive at least 12 age appropriate resilience lessons. Lessons are to be of 45 minute duration, delivered in each year of school and across Key Learning Areas

Focus area 2: School implements resilience programs

Goal: 100% of students receive an additional 9 hours of resilience programs in each year of school chosen from matrix of available resilience programs
Goal: 100% of Aboriginal students receive a resilience program in each year of school chosen from matrix of available resilience programs (e.g. Feeling Deadly Not Shame)
Goal (optional): Resilience programs delivered to other sub groups of need

Focus area 6: Effective pedagogy is used within learning environments to enhance student resilience

Goal: Teachers offered training to implement pedagogy in line with MindMatters Teaching and Learning for Engagement

Implementation
Implementation of the workshop is likely to vary between schools and it is important to consult with your School Liaison Person to ensure the workshop is accommodating of the schedule of school staff. Schools may choose to use a meeting that already

occurs e.g. Executive Meeting. Alternatively, schools may choose to hold the workshop outside of existing meeting times.

Further, schools may choose to address part of the workshop in one meeting and finalise it in other forums. For example, a meeting of Head Teachers of all Key Learning Areas may be a first step to identifying what additions can be made to curriculum. Modification of curriculum content may then be progressed and finalised within faculties. Similarly, the School Executive meeting may be a first step on discussing additional resilience programs and effective pedagogy.

Participants
Participants in the Curriculum workshop can be School Executive, Year Advisors, Head Teachers, SPO, the HSHF Research Team, and Regional School Project Coordinator. It is important to include Aboriginal staff and other members of your local Aboriginal community, either in Curriculum or Community workshops.

Workshop content
- HSHF Program Model;
- Presentation of curriculum, resilience program and pedagogy gaps and successes identified by the HSHF Research Team via the school environment survey;
- Workshop how to address gaps and expand successes;
- Decide who will develop curriculum content and identify programs to address gaps and build on success; and
- Include actions in the school's Healthy Schools, Healthy Futures Action Plan.

Planning Workshop 2 (School Community)

Purpose
Provide a forum for key school community representatives to learn about the HSHF Program, the key resilience issues as per the HSHF Program model and contribute to the selection of non-curriculum strategies for implementation.

It is important to remember that it is unlikely that final strategies will result from this workshop. It is likely a number of ideas will emerge from the workshop. It is then the responsibility of the SPO and the HSHF Core Team to further develop and prioritise strategies.

HSHF Program Model focus areas to be addressed

Focus area 2: School implements resilience programs

Goal: 100% of students receive an additional 9 hours of resilience programs in each year of school chosen from matrix of available resilience programs
Goal: 100% of Aboriginal students receive a resilience program in each year of school chosen from matrix of available resilience programs (e.g. Feeling Deadly Not Shame)
Goal (optional): Resilience programs delivered to other sub groups of need

Focus area 3: School actively implements programs/practices to enhance external resilience factors

Goal: Rewards and recognition program implemented across whole school
Goal: Peer support program/Peer mentoring program implemented across whole school
Goal: Empowerment/leadership programs implemented across whole school
Goal: Additional external resilience programs delivered to Aboriginal students

Focus area 4: School implements strategies to ensure the environment is supportive

Goal: Evidence-based anti-bullying strategies/programs are implemented
Goal: Cultural awareness strategies implemented within the school

Focus area 5: Local community organizations/ groups/clubs promoted and engaged in school

Goal: Local community organizations/groups/clubs students can participate in are promoted and engaged in school

Focus area 7: Access to health and community services promoted and engaged in school

Goal: Health and community services are promoted and engaged in the school
Goal: Referral pathways to services promoted to staff and parents

Focus area 8: School implements strategies to increase parental involvement in school

Goal: Annual school events implemented to engage parents
Goal: Effective parent communication strategies
Goal: Articles regarding student resilience are included in parent newsletters

Implementation
Implementation of the workshop will occur via a meeting of school community representatives.

Participants
It is important to involve a range of school and community members to provide an opportunity for broad and inclusive consideration of possible resilience strategies to be implemented, especially given a large majority of the strategies will involve various school community representatives.

The workshop attendees should include the HSHF Core Team, SPO, HSHF Regional School Project Coordinator, HSHF Research Team, members of the school executive, both teaching and non-teaching school staff (Aboriginal and non-Aboriginal), students representatives from all Year groups, parents, representatives from local community

organizations and groups (for example youth groups and sporting groups), representatives from local health and community services, including services that work with Aboriginal youth, representatives from the local Aboriginal community (for example Aboriginal Elders), and Regional School representatives such as Deputy Principal, Behaviour Support and Welfare Consultants.

Basic agenda

- Background to HSHF Program;
- HSHF Program Model;
- Student survey outcomes (data to be presented to be approved by School Principal);
- School environment survey outcomes regarding current strategies implemented in each focus area (if available at time of workshop);
- Consider recommended resilience resources and programs; and
- Future actions to implement as part of HSHF Program.

Planning Workshop 3 (Review and Refocusing)

Purpose

To review progress, evaluate the success of resilience strategies implemented to date and to refocus on the areas of your action plan that have not been implemented as yet.

HSHF Program Model focus areas to be addressed

Focus area 1: School has resilience lessons embedded within curriculum

Goal: 100% of students receive at least 12 age appropriate resilience lessons. Lessons are to be of 45 minute duration, delivered in each year of school and across key Learning Areas

Focus area 2: School implements resilience programs

Goal: 100% of students receive an additional 9 hours of resilience programs in each year of school chosen from matrix of available resilience programs
Goal: 100% of Aboriginal students receive a resilience program in each year of school chosen from matrix of available resilience programs
Goal (optional): Resilience programs delivered to other sub groups of need

Focus area 3: School implements programs/practices to enhance external resilience factors

Goal: Rewards and recognition program implemented across whole school
Goal: Peer support program/Peer mentoring program implemented across whole school
Goal: Empowerment/leadership programs implemented across whole school
Goal: Additional external resilience programs delivered to Aboriginal students

Focus area 4: School implements strategies to ensure the environment is supportive for all students

Goal: Evidence-based anti-bullying strategies/programs are implemented
Goal: Cultural awareness strategies implemented within the school

Focus area 5: Effective pedagogy is used within learning environments to enhance student resilience

Goal: Teachers receive training and implement pedagogy in line with MindMatters Teaching and Learning for Engagement

Focus area 6: Local community organizations/ groups/clubs promoted and engaged in school

Goal: Local community organizations/groups/clubs students can participate in are promoted and engaged in the school

Focus area 7: Access to health and community services promoted and engaged in school

Goal: Health and community services are promoted and engaged in the school
Goal: Referral pathways to services promoted to staff and parents

Focus area 8: School implements strategies to increase parental involvement in school

Goal: Annual school events implemented to engage parents
Goal: Effective parent communication strategies
Goal: Articles regarding student resilience are included in parent newsletters

Implementation
Implementation of the workshop will occur via a meeting of school community representatives.

Participants
The workshops attendees should include the HSHF Core Team, SPO, HSHF Regional School Project Coordinator, HSHF Research Team, members of the school executive, both teaching and non-teaching school staff (Aboriginal and non-Aboriginal), students representatives from all Year groups, parents, representatives from local community organizations and groups (for example youth groups and sporting groups), representatives from local health and community services, including services that work with Aboriginal youth, representatives from the local Aboriginal community (for example Aboriginal Elders), and Regional School representatives such as Deputy Principal, Behaviour Support and Welfare Consultant.

Basic agenda

- Review background to HSHF Program and Program Model;
- Recap strategies selected from Workshops 1 and 2;
- Core Team presentation of selected strategy progress;
- Discussion regarding effectiveness and evaluation of implemented strategies;
- Identify outstanding strategies from school Action Plan;
- Identify any emerging resilience needs; and
- Prioritise strategies for action.

STEP 3: ACTION PLAN DEVELOPMENT

When Planning Workshops 1 and 2 have been completed, the HSHF Action Plan will be developed. Development of the Action Plan is the responsibility of the School Core Team with the support of your SPO and Regional School Project Coordinator.

You could consider establishing a working group from your School Core Team of 4-5 people including your SPO and a member of your executive to develop your Action Plan, then provide a draft to your School Core Team for an opportunity to review.

Whether as an entire School Core Team or as a working group, the team will need to work out specific details such as who will be responsible for implementing strategies, the timeframes for implementation, budget costs and realistic goals.

Writing the Healthy Schools, Healthy Futures Action Plan

An Action Plan template has been developed to use and is included as Appendix 6.

This section of the guide will provide step by step instructions for completing the action plan.

Documenting the progress of implementation is a key component of monitoring the implementation. Whenever the Action Plan or a particular strategy is discussed it should be documented. Documenting will not only help to keep your team up to date on progress, but will also help your team plan strategies for implementation next year. Also importantly, good documentation will help to keep your Core Team, Action Plan and strategies sustainable in the event that membership of your Core Team changes over the duration of the program.

There a number of key issues to consider when developing your Action Plan including:

- *Key Strategies*

  Key strategies are the planned strategies (tasks or actions), that will be implemented to address each strategic priority (resilience issue). When completing this section it is very important to be as specific as possible about a strategy so that anyone reading the Action Plan can understand what is required. This will be particularly important for sustainability and ensuring that if there is any turnover within the Core Team, any new members will be able to understand what is expected for a particular strategy.

  Key Strategies in the Action Plan are organised under the three domains of the whole-school approach. This approach recognises that to increase the

resilience and improve the health and wellbeing of your students, strategies need to be implemented in one or more of the domains that make up the whole-school approach; 1) curriculum, teaching and learning; 2) ethos and environment; 3) partnerships and services. A whole-school approach will only be achieved if strategies targeting each area are implemented.

- Objectives

The objectives that you set for each strategy are how your Core Team will measure the effectiveness of each strategy. Setting targets will encourage your school to measure outcomes and gather information that could be used to evaluate progress in other areas of welfare. Things to consider:

  - Choose objectives that can be easily measured and ideally are already being measured. Consider data from the student surveys, or data already collected within the school, such as bullying incidents.
  - If you need to devise a means of measurement or a system for recording measurement then put this in the HSHF Action Plan as a key strategy.
  - Take a baseline measurement before the implementation of tasks/activities so that it can be compared to future measurements after they have been implemented.

- *Timeframe*

The estimated date or amount of time that the Core Team anticipates each key strategy will need in order to be implemented should be recorded under each respective year for each strategy.

- *Leaders*

Who is the person(s) responsible for implementing each key strategy? Consider the following:

- Are the responsibilities shared among a large group and not allocated to one or two people?
- Has a Working Group been established for each strategy – or considered for each strategy?
- Have people outside the Core Team been allocated tasks?
- Have all the people responsible for tasks been consulted and agreed to implement tasks?

Not all strategies need to be the responsibility of school staff. Youth services or other members of the school and community may take responsibility for implementing strategies.

- *Target Group/s*

This section will be used to document who will be receiving the strategy. For example, will this particular strategy be provided to all students in all years, or only to particular groups of students such as Year 8 or Year 9 girls?

- *Frequency*

Frequency refers to how often students will receive the strategy i.e., when students will receive the strategy and for how long. An example of what information should be provided in the frequency column: 20 minutes, once a week (during English) for Term 1.

APPENDIX 4.14. Student survey

Healthy Schools, Healthy Futures

2014 Year 10 Student Survey

Your answers to this survey are completely confidential. Your parents, friends, teachers or anyone else will not be able to find out any of your answers. Only the members of the research team will have access to your answers, but they will not know your name. Please answer the questions for yourself and don't talk to anyone about your answers.
You can decide to stop taking part at any time. If anything in the survey is concerning you, please raise your hand and a member of the research team will come and talk with you. If anything about the survey is concerning you after you have finished, you could speak about it with your parents, teachers, school counsellor, doctor or call Kids Helpline on 1800 55 1800.

Please fill in the information below by writing in the space provided and ticking the box or boxes that match your answer the best.

1. How old are you today? _____

2. Which years have you have completed at this school? ***(tick all that apply)***
☐ Year 7
☐ Year 8
☐ Year 9
☐ I did not attend this school in the previous years

3. Are you male or female?
☐ Male
☐ Female

4. Are you of Aboriginal or Torres Strait Islander origin?
☐ Yes, Aboriginal origin **[continue to question 5]**
☐ Yes, Torres Strait Islander origin **[continue to question 5]**
☐ Yes, both Aboriginal and Torres Strait Islander origin **[continue to question 5]**
☐ No **[skip to question 24]**

From here on in, the term 'Aboriginal' refers to all persons identified as being of Aboriginal, Torres Strait Islander, or both Aboriginal and Torres Strait Islander origin.

Would you describe your Aboriginal community in the following way? *Please tick one answer for each question*		**A lot of the time**	**Sometimes**	**Not at all**
5.	My Aboriginal community is caring and supportive of me	☐	☐	☐
6.	My Aboriginal community has high expectations of me	☐	☐	☐
7.	My Aboriginal community encourages my participation and involvement	☐	☐	☐

8.	My Aboriginal community provides opportunities for involvement	☐	☐	☐

9. How much do you feel involved in your local Aboriginal community?

☐ I feel strongly involved
☐ I feel moderately involved
☐ I feel a little involved
☐ I don't feel involved at all

10. Do you feel connected to your Aboriginal culture?

☐ No **[skip to question 12]**
☐ Yes **[continue to question 11]**
☐ Don't know **[skip to question 12]**

11. Do you identify with a tribal group, a language, clan or mob?

☐ No
☐ Yes
☐ Don't know

For the next question, please tick all that apply.

12. In the last 12 months, have you gone to any of the following Aboriginal cultural events and community activities:…

☐ Family gatherings
☐ Ceremonies
☐ Sports carnivals
☐ Festivals or carnivals involving arts, craft, music or dance
☐ Aboriginal or Torres Strait Islander organization events or meetings
☐ Special events or days

13. In the last 12 months, how many of the above Aboriginal cultural events and community activities have you gone to?

☐ 0 events
☐ 1-5 events
☐ 6-10 events
☐ 11-20 events
☐ 20+ events

14. Have you ever been treated unfairly because you are Aboriginal?

Examples of being treated unfairly could include:

- being a target of racist names, jokes or teasing, or heard comments that rely on stereotypes of Aboriginal people
- being sworn at, verbally abused or had someone make offensive gestures because you are Aboriginal
- felt left out or avoided because you are Aboriginal
- had someone treat you as less intelligent, or inferior because you are Aboriginal
- being ignored, treated with suspicion or treated rudely because you are Aboriginal
- had your property vandalised because you are Aboriginal
- had someone spit or throw something at you, or hit you or threaten to hit you because you are Aboriginal

☐ No **[skip to question 24]**
☐ Yes **[continue to question 15]**

How often are you treated unfairly because you are Aboriginal in each of the following situations… *Please tick one answer for each question*		Never	Hardly ever	Sometimes	Often	Very often
15.	At your part time job? ☐ I don't have a part time job	☐	☐	☐	☐	☐
16.	By neighbours or when you are at somebody else's house?	☐	☐	☐	☐	☐
17.	At school?	☐	☐	☐	☐	☐
18.	While doing sport or other leisure activities?	☐	☐	☐	☐	☐
19.	By the police or security personnel?	☐	☐	☐	☐	☐
20.	By doctors, nurses or other staff at hospitals, or at the doctors?	☐	☐	☐	☐	☐
21.	By staff at restaurants, shops, in taxis or when getting any other services?	☐	☐	☐	☐	☐
22.	By other people on the street, at shopping centres, sporting events, concerts?	☐	☐	☐	☐	☐
23.	By other Aboriginal people?	☐	☐	☐	☐	☐

24. Do you feel that Aboriginal culture and community events are valued by your school?
☐ No
☐ Yes
☐ Don't know

25. Are you of any other ethnic, cultural or national origin (e.g. African-American, Canadian or Chinese)?
☐ No **[skip to question 36]**
☐ Yes **[continue to question 26]**

26. Which ethnic, cultural or national origin are you?
Please write your answer in the box below

27. Have you ever been treated unfairly because you are from another ethnic, cultural or national background?
☐ No **[skip to question 36]**
☐ Yes **[continue to question 28]**

How often are you treated unfairly because you are from another ethnic cultural or national background in each of the following situations... *Please tick one answer for each question*		Never	Hardly ever	Sometimes	Often	Very Often
28.	At your part time job? ☐ I don't have a part time job	☐	☐	☐	☐	☐
29.	By neighbours or when you are at somebody else's house?	☐	☐	☐	☐	☐
30.	At school?	☐	☐	☐	☐	☐
31.	While doing sport or other leisure activities?	☐	☐	☐	☐	☐
32.	By the police or security personnel?	☐	☐	☐	☐	☐
33.	By doctors, nurses or other staff at hospitals, or at the doctors?	☐	☐	☐	☐	☐
34.	By staff at restaurants, shops, in taxis or when getting any other services?	☐	☐	☐	☐	☐
35.	By other people on the street, at shopping centres, sporting events or concerts?	☐	☐	☐	☐	☐

36. Do you speak a language other than English at home?

☐ No

☐ Yes

37. What is the postcode where you usually live? ☐☐☐☐

38. How much pocket money did you receive last week from unpaid employment? (e.g. chores around the house)

☐ $0, I didn't receive any pocket money in the last week

☐ Less than $5

☐ $5 to $15

☐ $16 to $30

☐ More than $30

39. How much money did you earn last week from paid employment? (e.g. paper route or working at McDonalds)

☐ $0, I didn't receive any money in the last week from paid work

☐ Less than $30

☐ $30 to $50

☐ $51 to $80

☐ More than $80

These questions ask about your goals and plans for the future

		Never true	True some of the time	True most of the time	True all of the time
40.	I have goals and plans for the future	☐	☐	☐	☐
41.	I plan to carry on and finish Year 12	☐	☐	☐	☐
42.	I plan to go to university or TAFE or do some other training after high school	☐	☐	☐	☐

These next questions about your thoughts and how you find help

		Never true	True some of the time	True most of the time	True all of the time
43.	I know where to go for help with a problem	☐	☐	☐	☐
44.	I try to work out my problems by talking or writing about them	☐	☐	☐	☐
45.	When I need help I find someone to talk with	☐	☐	☐	☐
46.	I can do most things if I try	☐	☐	☐	☐
47.	I can work with someone who has different opinions to mine	☐	☐	☐	☐
48.	I can work out my own problems	☐	☐	☐	☐
49.	There are many things I do well	☐	☐	☐	☐

		Never true	True some of the time	True most of the time	True all of the time
50.	I feel bad when someone gets their feelings hurt	☐	☐	☐	☐
51.	I try to understand what other people go through	☐	☐	☐	☐
52.	I try to understand what other people feel and think	☐	☐	☐	☐

		Never true	True some of the time	True most of the time	True all of the time
53.	I enjoying working with other students my age	☐	☐	☐	☐

		Never true	True some of the time	True most of the time	True all of the time
54.	I can stand up for myself without putting others down	☐	☐	☐	☐
55.	There is a purpose to my life	☐	☐	☐	☐
56.	I understand my moods and feelings	☐	☐	☐	☐
57.	I understand why I do what I do	☐	☐	☐	☐

These questions ask about your friends

		Never true	True some of the time	True most of the time	True all of the time
58.	I have at least one friend who really cares about me	☐	☐	☐	☐
59.	I have at least one friend who talks with me about my problems	☐	☐	☐	☐
60.	I have at least one friend who helps me when I'm having a hard time	☐	☐	☐	☐
61.	My friends get into a lot of trouble	☐	☐	☐	☐
62.	My friends try to do what is right	☐	☐	☐	☐
63.	My friends do well in school	☐	☐	☐	☐

These questions ask about your parents and/or other adults in your home

		Never true	True some of the time	True most of the time	True all of the time
64.	In my home there is a parent or some other adult who expects me to follow the rules	☐	☐	☐	☐
65.	In my home there is a parent or some other adult who is interested in my school work	☐	☐	☐	☐
66.	In my home there is a parent or some other adult who believes that I will be a success	☐	☐	☐	☐

		Never true	True some of the time	True most of the time	True all of the time
67.	In my home there is a parent or some other adult who talks with me about my problems	☐	☐	☐	☐
68.	In my home there is a parent or some other adult who always wants me to do my best	☐	☐	☐	☐
69.	In my home there is a parent or some other adult who listens when I have something to say	☐	☐	☐	☐

		Never true	True some of the time	True most of the time	True all of the time
70.	I do fun things or go fun places with my parents or others	☐	☐	☐	☐
71.	I do things at home that make a difference (e.g. improve things)	☐	☐	☐	☐
72.	I help make decisions (decide what happens) with my family	☐	☐	☐	☐

These questions ask about teachers and other adults at your school

		Never true	True some of the time	True most of the time	True all of the time
73.	At my school there is a teacher or some other adult who really cares about me	☐	☐	☐	☐
74.	At my school there is a teacher or some other adult who tells me when I do a good job	☐	☐	☐	☐
75.	At my school there is a teacher or some other adult who listens when I have something to say	☐	☐	☐	☐
76.	At my school there is a teacher or some other adult who believes I will be a success	☐	☐	☐	☐
77.	At my school there is a teacher or some other adult who notices when I am not there	☐	☐	☐	☐
78.	At my school there is a teacher or some other adult who always wants me to do my best	☐	☐	☐	☐

These questions ask about what you do in school

		Never true	True some of the time	True most of the time	True all of the time
79.	I do interesting activities at school	☐	☐	☐	☐
80.	At school, I help decide things like class activities or rules	☐	☐	☐	☐
81.	I do things at my school that make a difference (e.g. improve things)	☐	☐	☐	☐

These questions ask about adults outside of your home and school

		Never true	True some of the time	True most of the time	True all of the time
82.	Outside of my home and school there is an adult who really cares about me	☐	☐	☐	☐
83.	Outside of my home and school there is an adult who tells me I do a good job	☐	☐	☐	☐
84.	Outside of my home and school there is an adult who believes I will be a success	☐	☐	☐	☐
85.	Outside of my home and school there is an adult who I trust	☐	☐	☐	☐
86.	Outside of my home and school there is an adult who notices when I am upset about something	☐	☐	☐	☐
87.	Outside of my home and school there is an adult who always wants me to do my best	☐	☐	☐	☐

		Never true	True some of the time	True most of the time	True all of the time
88.	I am part of a club, sports team, church group or am involved in another activity away from school	☐	☐	☐	☐
89.	Outside of my home and school I am involved in music, art, books and reading, sport or a hobby.	☐	☐	☐	☐
90.	Outside of my home and school I help other people	☐	☐	☐	☐

These next questions ask about your thoughts and feelings

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
91.	During the past month, how much of the time were you a happy person?	☐	☐	☐	☐	☐	☐
92.	How much of the time, during the past month, have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
93.	How much of the time, during the past month, have you been a very nervous person?	☐	☐	☐	☐	☐	☐
94.	How much of the time, during the past month, have you felt downhearted and blue?	☐	☐	☐	☐	☐	☐
95.	How much of the time, during the past month, have you felt so down in the dumps that nothing could cheer you up?	☐	☐	☐	☐	☐	☐

*For the next questions, please give your answers on the basis of how things have been for you over the last **six months.***

		Not True	Somewhat True	Certainly True
96.	I try to be nice to people. I care about their feelings	☐	☐	☐
97.	I am restless; I cannot stay still for long	☐	☐	☐
98.	I get a lot of headaches, stomach-aches and sickness	☐	☐	☐
99.	I usually share with others, for example, CDs, games, food	☐	☐	☐
100.	I get very angry and often lose my temper	☐	☐	☐
101.	I would rather be alone than with people my own age	☐	☐	☐
102.	I usually do as I am told	☐	☐	☐
103.	I worry a lot	☐	☐	☐
104.	I am helpful if someone is hurt, upset or feeling ill	☐	☐	☐
105.	I am constantly fidgeting or squirming	☐	☐	☐
106.	I have one good friend or more	☐	☐	☐
107.	I fight a lot. I can make other people do what I want	☐	☐	☐
108.	I am often unhappy, depressed or tearful	☐	☐	☐
109.	Other people my own age generally like me	☐	☐	☐
110.	I am easily distracted; I find it difficult to concentrate	☐	☐	☐
111.	I am nervous in new situations. I lose confidence easily	☐	☐	☐
112.	I am kind to younger children	☐	☐	☐
113.	I am often accused of lying or cheating	☐	☐	☐
114.	Other children or young people pick on me or bully me	☐	☐	☐

		Not True	Somewhat True	Certainly True
115.	I often volunteer to help others (parents, teachers, children)	☐	☐	☐
116.	I think before I do things	☐	☐	☐
117.	I take things that are not mine from home, school, or elsewhere	☐	☐	☐
118.	I get along better with adults than people my own age	☐	☐	☐
119.	I have many fears; I am easily scared	☐	☐	☐
120.	I finish the work I am doing, my attention is good	☐	☐	☐

121. Do you feel that you are a spiritual person?

☐ No

☐ Yes

☐ Don't know

The next questions are about harassment or bullying

Bullying is the repeated behaviour by a person or a group of people that is meant to cause distress, hurt or undue pressure. Bullying involves the abuse of power in relationships.

Bullying behaviour can be:

- *verbal* eg name calling, insults, threats
- *physical* eg hitting, tripping, spitting
- *social* eg ignoring, excluding
- *psychological* eg spreading rumours, hiding or damaging possessions, mean or nasty SMS and email messages

Harassment is any unwanted, unwelcome or uninvited behaviour which makes a person feel humiliated, intimidated or offended.

Please consider the definition above when you answer the following questions.		Strongly agree	Agree	Unsure	Disagree	Strongly disagree
122.	I believe bullying and harassment among students in class and on school grounds is low	☐	☐	☐	☐	☐

		0 times	1 time	2-3 times	4 or more
123.	During the past 12 months, how many times have you been harassed or bullied by another student or group of students from your school? **If you tick 0 times, skip to question 125.** **If you tick 1 time, 2-3 times, or 4 or more times, continue to question 124.**	☐	☐	☐	☐

124. When you were bullied in the past 12 months, from whom did you ask for help?

☐ Did not ask for help
☐ Parents/guardian
☐ Friends from my school
☐ Friends not from my school
☐ Teachers/School staff member
☐ Other family members
☐ Kids Helpline
☐ Website
☐ Other

During the past 12 months, how often did these things happen to you?		**This did not happen to me this year**	**Once or twice this year**	**About once a month this year**	**About once a week this year**	**Most days this year**
125.	A group decided to hurt me by ganging up on me	☐	☐	☐	☐	☐
126.	Someone deliberately tried to hurt me by trying to **break up a friendship** I had	☐	☐	☐	☐	☐
127.	Someone tried to **frighten** me	☐	☐	☐	☐	☐
128.	I was **hurt physically** by another student	☐	☐	☐	☐	☐
129.	I was sent **threatening emails**	☐	☐	☐	☐	☐
130.	I was sent nasty messages on the Internet, e.g., through Facebook, Instagram, Snapchat	☐	☐	☐	☐	☐
131.	I was sent nasty text messages (SMS), or prank calls to my mobile phone	☐	☐	☐	☐	☐
132.	Someone used my screen name or password, pretending to be me to hurt someone else	☐	☐	☐	☐	☐
133.	Someone sent my private emails, messages, pictures or videos to others	☐	☐	☐	☐	☐
134.	Mean or nasty comments or pictures were sent or posted about me to websites, e.g., Facebook, Instagram, Snapchat	☐	☐	☐	☐	☐
135.	Mean or nasty messages or pictures were sent about me to other students' mobile phones	☐	☐	☐	☐	☐
136.	I was deliberately ignored or left out of things over the Internet	☐	☐	☐	☐	☐
137.	I had nasty notes written and circulated about me by someone at school	☐	☐	☐	☐	☐

138. Other (please describe)

_____
_____
_____
_____

139. Do you think bullying at your school has changed in the last year?
☐ Yes – worse/more of a problem
☐ No – about the same
☐ Yes – better / less of a problem
If yes, what do you think has caused that change:

_____

140. At school work, do you consider yourself:
☐ A lot above average
☐ Above average
☐ Average
☐ Below average
☐ A lot below average

141. During the past 12 months, about how many times did you skip school or cut classes?
☐ 0 times **[skip to question 143]**
☐ 1-2 times **[continue to question 142]**
☐ A few times **[continue to question 142]**
☐ Once a month **[continue to question 142]**
☐ Once a week **[continue to question 142]**
☐ More than once a week **[continue to question 142]**

142. In the past 30 days, did you miss school for any of the following reasons? ***(tick all that apply)***
☐ Illness (feeling physically sick), including problems with breathing or your teeth
☐ Felt very sad, without hope, anxious, stressed, or angry
☐ Didn't get enough sleep
☐ Didn't feel safe at school
☐ Anticipated that you would be treated unfairly at school
☐ Had to work
☐ Had to take care of or help a family member or friend
☐ Wanted to spend time with friends who don't go to your school
☐ Wanted to use alcohol or drugs
☐ Were behind in schoolwork or weren't prepared for a test or class assignment
☐ Were bored with or uninterested in school
☐ Were suspended
☐ Other reason
☐ None of these

The next questions are about things that affect your health

143. Have you ever smoked even part of a cigarette?
☐ No **[continue to question 144]**
☐ Yes **[skip to question 145]**

144. Do you think it would be OK for you to smoke?
☐ No **[skip to question 156]**
☐ Yes **[skip to question 156]**

145. Have you smoked a cigarette in the last four weeks?
☐ No **[skip to question 154]**
☐ Yes **[continue to question 146]**

146. Have you smoked a cigarette in the last week?
☐ No **[skip to question 154]**
☐ Yes **[continue to question 147]**

This question is about the number of cigarettes you have smoked during the last week.

Starting from yesterday please write the number of cigarettes that you smoked on each day of last week. If you didn't smoke any cigarettes on a day write "0".

147. Yesterday _____
148. 2 days ago _____
149. 3 days ago _____
150. 4 days ago _____
151. 5 days ago _____
152. 6 days ago _____
153. 7 days ago _____

154. Where, or from whom, did you get your last cigarette?
☐ Parents gave it to me
☐ Brother or sister gave it to me
☐ Took from home without permission
☐ Friend gave it to me
☐ Got someone to buy it
☐ Bought it myself
☐ Other source

155. Do you think it is OK for you to smoke?
☐ No
☐ Yes

These questions ask about whether your parents/carer think it is OK for you to smoke cigarettes

156. Does your mother, father or carer smoke cigarettes?
☐ No
☐ Yes

157. Does your mother, father or carer think it is OK for you to smoke?
☐ No
☐ Yes

158. Do you have a brother or sister?
☐ No **[skip to question 161]**
☐ Yes **[continue to question 159]**

159. Does your brother or sister smoke cigarettes?
☐ No
☐ Yes

160. Does your brother or sister think it is OK for you to smoke?
☐ No
☐ Yes

161. Do your friends smoke cigarettes?
☐ No
☐ Yes

162. Do your friends think it is OK for you to smoke?
☐ No
☐ Yes

163. Do you think that your health will be damaged if you smoke cigarettes?
☐ No
☐ Yes

For each of the following statements regarding alcohol please tick the box that corresponds to your answer

164. Have you ever had a drink of alcohol? E.g. *beer, wine* or *alcopops/pre-mix drinks* (do not count sips or tastes)
☐ No **[continue to question 165]**
☐ Yes **[skip to question 166]**

165. Do you think it would be OK for you to drink alcohol?
☐ No **[skip to question 178]**
☐ Yes **[skip to question 178]**

166. Have you had any alcoholic drinks, such as *beer, wine* or *alcopops/pre-mix drinks* in the last four weeks? (do not count sips or tastes)
☐ No **[skip to question 176]**
☐ Yes **[continue to question 167]**

167. Have you had any alcoholic drinks, such as *beer, wine* or *alcopops/pre-mix drinks* in the last week? (do not count sips or tastes)
☐ No **[skip to question 175]**
☐ Yes **[continue to question 168]**

This question is about the number of alcoholic drinks you had during the last week.

Starting from yesterday please write the number of alcoholic drinks that you had on each day of last week. If you didn't have any alcoholic drinks on a day write "0".

168. Yesterday _____
169. 2 days ago _____
170. 3 days ago _____
171. 4 days ago _____
172. 5 days ago _____
173. 6 days ago _____
174. 7 days ago _____

175. In the last **4 weeks**, how many times have you had 5 or more alcoholic drinks in a row?
☐ None
☐ Once
☐ Twice
☐ 3-6 times
☐ 7 or more times

176. Where, or from whom, did you get your last alcoholic drink?
☐ Parents gave it to me
☐ Brother or sister gave it to me
☐ Took from home without permission
☐ Friend gave it to me
☐ Got someone to buy it
☐ Bought it myself
☐ Other source

177. Do you think it is OK for you to drink alcohol?
☐ No
☐ Yes

178. Does your mother, father or carer drink alcohol?
☐ No
☐ Yes

179. Does your mother, father or carer think it is OK for you to drink alcohol?
☐ No
☐ Yes

Only answer the next two questions (questions 180 and 181) if you have a brother or sister

180. Does your brother or sister drink alcohol?
☐ No
☐ Yes

181. Does your brother or sister think it is OK for you to drink alcohol?
☐ No
☐ Yes

182. Do your friends drink alcohol?
☐ No
☐ Yes

183. Do your friends think it is OK for you to drink alcohol?
☐ No
☐ Yes

184. Do you think that your health will be damaged if you drink alcohol?
☐ No
☐ Yes

These questions ask about taking illegal drugs or pills

185. Have you ever used or tried any illegal drug or pill?
☐ No **[skip to question 188]**
☐ Yes **[continue to question 186]**

How many times in the last month have you:

		None	Once or twice	3-5 times	6-9 times	10-19 times	20-39 times	40 or more times
186.	Smoked or used marijuana/cannabis (grass, hash, dope, weed, mull, yarndi, ganja, pot, a bong, a joint)	☐	☐	☐	☐	☐	☐	☐
187.	Used any other illegal drug or pill to get "high", such as inhalants (e.g. paint or thinners), hallucinogens (e.g. LSD, acid, trips), amphetamines (e.g. gas, speed, ice, goey, dexies), ecstasy (XTC, MDMA, bickies), cocaine or heroin?	☐	☐	☐	☐	☐	☐	☐

These questions ask about your sexual health practices

188. Have you ever had sexual intercourse?
☐ No **[skip to question 194]**
☐ Yes **[continue to question 189]**

189. Have you had sexual intercourse in the last year?
☐ No **[skip to question 192]**
☐ Yes **[continue to question 190]**

190. When you had sexual intercourse in the last year, how often did you use condoms?
☐ Always used condoms
☐ Sometimes used condoms
☐ Never used condoms

191. Over the last year, with how many people have you had sexual intercourse?

☐ 1 person
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 to 10 people
☐ 11 or more people

192. Have you ever been diagnosed with a sexually transmissible infection (STI)? For example Chlamydia, Hepatitis B, genital herpes

☐ No **[skip to question 194]**
☐ Yes **[continue to question 193]**

193. Which of the following STI(s) have you been diagnosed with?

☐ Human immunodeficiency virus (HIV)
☐ Genital warts
☐ Genital herpes
☐ Chlamydia
☐ Hepatitis B
☐ Gonorrhoea
☐ Human Papillomavirus (HPV)
☐ Trichomoniasis
☐ Syphilis
☐ Pubic lice or crabs
☐ Not sure what type/s
☐ Other
Please specify:_____

The following questions ask about your physical activity

194. In a usual week, do you do any ORGANISED sport or games at school, before or after school, or on the weekend?

Organised sports and games are ones in which you compete, have training or coaching sessions, and which adults may organise. They include activities like school P.E. or Sport, playing on a cricket or netball team, gymnastics or dance classes, swimming squads, or classes at a gym or fitness centre.

☐ No **[skip to question 196]**
☐ Yes **[continue to question 195]**

195. Please think about a normal week and enter in the table below:

- the sports or games you usually do (including training) *P.E. and School Sport have already been filled in for you*
- how many times per week you usually do them, and
- the usual amount of time you spend doing them

	Name of Sport/game	How many **times per week** do you do this sport or game?	On average **how long** do you play this sport or game **each time** you do it? (in minutes)
P.E.			
School Sport			
Sport or game 1			
Sport or game 2			
Sport or game 3			
Sport or game 4			
Sport or game 5			

196. In a usual week, do you do any NON-ORGANISED physical activities at school, before or after school, or on the weekend?*
Non-organised physical activities are ones that are not usually supervised by adults and do not usually involve training or competition. It includes things like skateboarding, surfing, riding a bike, walking or cycling to and from school, walking the dog, active chores or jobs you do at home or work, or casually getting together with some friends to play a game or sport after school or during recess/lunchtime.
☐ No **[skip to question 198]**
☐ Yes **[continue to question 197]**

197. Please think about a normal week and enter in the table below:
- Activities that you usually do,
- How many times each week you usually do them, and
- The usual amount of time you spend doing them

	Name of Sport/game	How many **times per week** do you do this sport or game?	On average **how long** do you play this sport or game **each time** you do it? (in minutes)
Sport or game 1			
Sport or game 2			
Sport or game 3			
Sport or game 4			
Sport or game 5			
Sport or game 6			
Sport or game 7			

The following questions ask about what you eat each day

198. How many serves of vegetables do you usually eat each day?
(One serve of vegetables is equal to one medium potato or 1/2 cup of cooked vegetables or 1 cup of salad vegetables. It does not include potato crisps or chips).
☐ Less than 1 serve
☐ 1 serve
☐ 2 serves
☐ 3 serves
☐ 4 serves
☐ 5 serves
☐ 6 serves or more
☐ I don't eat vegetables

199. How many serves of fruit do you usually eat each day?
(One serve of fruit is equal to 1 medium sized piece of fruit (e.g. apple or banana), 2 pieces of smaller fruit (e.g. kiwi fruit or apricots) or 1 cup of diced pieces/canned fruit or 4 pieces of dried fruit).
☐ Less than 1 serve
☐ 1 serve
☐ 2 serves
☐ 3 serves
☐ 4 serves
☐ 5 serves
☐ 6 serves or more
☐ I don't eat fruit

Great you have finished the survey. ☺

Please raise your hand and a research staff member will collect your survey and ensure your answers are collected and kept private.

APPENDIX 4.15. School environment survey

HEALTHY SCHOOLS HEALTHY FUTURES (HSHF) SCHOOL ENVIRONMENT SURVEY (SES) 2014
HT Faculty/Curriculum Coordinator Survey

Instruction to interviewer: Please see boxes for structured interview script.

Introduction: As part of the Healthy Schools Healthy Futures project we are conducting interviews with school staff. The purpose of the interviews is to find out about the strategies that your school has in place to increase student resilience.

It is expected that the interview for a HT Faculty/Curriculum Coordinator will take approximately 5 minutes.

For the purpose of this survey please use the definition of resilience on the information sheet emailed to you and refer back to it when answering the questions and thinking about how resilience skills may have been taught inside and outside the classroom.

Resilience is defined as the ability to bounce back from a negative event or experience by employing individual traits (internal factors) and wider social, community, and environmental supports (external factors). Internal resilience factors include self-efficacy, empathy, problem solving, self-awareness, goals and aspirations, communication and cooperation. External factors include meaningful participation in school/community/home, school/community/home support, caring peer relationships and pro-social peers.

Some survey questions may refer to 'whole of school' in which case we mean covers all Years 7-10.

Do you have any questions about this definition before we begin?

HEALTHY SCHOOLS, *HEALTHY FUTURES*

R E S I L I E N C E - I N - S C H O O L S

PART A: CURRICULUM TEACHING AND LEARNING

1. Resilience in Curriculum Content **KLA:**_____
Respondent: HT each KLA **Other respondent:**_____

This section asks about explicit instruction in skills that develop resilience within curriculum content
1a. Has any explicit instruction in skills that develop resilience been taught to Year 7 (then 8, 9 and 10) in your key learning area (KLA) this year?

Year 7 (1a1):	☐ Yes	☐ No	☐ Don't know	**If yes, *could you estimate how many hours:*____**
Year 8 (1a2):	☐ Yes	☐ No	☐ Don't know	**If yes, *could you estimate how many hours:*____**
Year 9 (1a3):	☐ Yes	☐ No	☐ Don't know	**If yes, *could you estimate how many hours:*____**
Year 10 (1a4):	☐ Yes	☐ No	☐ Don't know	**If yes, *could you estimate how many hours:*____**

1b. Which resources been used to explicitly teach resilience to any year group in your KLA, for example MindMatters?:
Interviewer: Open Q don't read responses out loud – only read out if prompting is needed.

- ☐ MindMatters
- ☐ SenseAbility
- ☐ Reach Out
- ☐ Resilience Doughnut
- ☐ Bounceback
- ☐ School developed resources

Others (please name):_____
_____

Open Q – What has your experience with the 'Healthy Schools, Health Futures' Project? Have you been aware of the project in your school and do you have any feedback about the project?

.....

HEALTHY SCHOOLS HEALTHY FUTURES (HSHF) SCHOOL ENVIRONMENT SURVEY (SES) 2014
Deputy Principal Survey

Instruction to interviewer: Please see boxes for structured interview script.

Introduction: As part of the Healthy Schools Healthy Futures project we are conducting interviews with school staff. The purpose of the interviews is to find out about the strategies that your school has in place to increase student resilience.

It is expected that the interview for a Deputy Principal will take approximately 25 minutes.

For the purpose of this survey please use the definition of resilience on the information sheet emailed to you and refer back to it when answering the questions and thinking about how resilience skills may have been taught inside and outside the classroom.

Resilience is defined as the ability to bounce back from a negative event or experience by employing individual traits (internal factors) and wider social, community, and environmental supports (external factors). Internal resilience factors include self-efficacy, empathy, problem solving, self-awareness, goals and aspirations, communication and cooperation. External factors include meaningful participation in school/community/home, school/community/home support, caring peer relationships and pro-social peers.

Some survey questions may refer to 'whole of school' in which case we mean covers all Years 7-10.

Do you have any questions about this definition before we begin?

HEALTHY SCHOOLS, *HEALTHY FUTURES*

R E S I L I E N C E - I N - S C H O O L S

PART B: ETHOS AND ENVIRONMENT DOMAIN QUESTIONS

This section asks questions about the programs or strategies your school has in place that may have had an impact on the school environment, for example recognition or anti-bullying programs.

3. Rewards and Recognition Program **Respondent:** Deputy Principal **Other respondent:_____**

3a. In what areas did your school formally recognise student achievement across the whole school in 2014 (whole school could be Year 7-10)?
For example 2 area's for reward and recognition may be behaviour and attendance – did your school formally recognise behaviour in these area's or any other area's?
As you list each I am going to ask you if the reward system was developed with student involvement and if any award recipients were nominated by students?

(Note to interviewer: tick all that apply and read out any options the interviewee doesn't list)

Rewards and Recognition Programs:	Yes	No	Was it developed with student involvement?		Were award recipients nominated by students?	
			YES	NO	YES	NO
Behaviour						
Attendance						
Citizenship						
Academic						
Sporting						
Leadership						
Consistent Effort						
Community Service						
Resilience Skills						
Interviewer: Have you implemented any others that I haven't listed? (please list below):						

3b. In which of the following ways has your school communicated student achievement to parents/carers in 2014?
Interviewer: Please read out list of options.

- ☐ Award for student to take home
- ☐ Newsletter
- ☐ Website
- ☐ Facebook
- ☐ Parent/Carer phone call
- ☐ Letter home/postcard home

Interviewer: Are there any others ways that I haven't listed?

- ☐ .....
- ☐ .....

5. **Anti-bullying Programs Respondent:** Deputy Principal **Other respondent:**_____

The next questions relate to your anti-bullying policy and strategies you may have in place.
5a. Has your anti-bullying policy been:

- ☐ Updated in the past 3 years; *or is it*
- ☐ Due for update

5b. Which of the following anti-bullying strategies were run across your whole school in 2014 (please tick)?

Interviewer: Please read out the full list of options.

- ☐ Clear school-wide definition of bullying established and communicated to the school community
- ☐ Consistent procedural steps to manage bullying clearly documented and understood by school community
- ☐ Anti-bullying policy developed in collaboration with staff, students and parents/carers
- ☐ Student involvement in devising or implementing anti-bullying rules, initiatives or programs
- ☐ Staff professional development in establishing a safe school environment (e.g. all staff undertake the National Safe Schools Framework professional learning modules)
- ☐ Effective student reporting system in place
- ☐ Reporting system in place that is anonymous
- ☐ Data on bullying prevalence collected regularly
- ☐ Data on bullying prevalence used to develop tailored and targeted programs
- ☐ Lessons on social skills, motives for bullying and effective bystander strategies taught to all students
- ☐ Mentoring and support programs available for students impacted by bullying (e.g. victims or perpetrators)
- ☐ Parent/ carer workshops/information sessions on bullying

Did you have any others in place not listed so far? (please list below):

- ☐ .....
- ☐ .....
- ☐ **None of the above.**

5c. Was a particular program resource used to develop or implement your anti-bullying strategies or programs, for example Bullying No Way?

Yes ☐ (Continue to 5d) No ☐ (Skip 5d)

5d. What resources have been used in 2014?
Interviewer: Allow interviewee to list options before reading others below.

- ☐ Cyberia
- ☐ RUOK Day
- ☐ Bullying No Way

- ☐ Tackling Violence
- ☐ RockIT
- ☐ White Ribbon initiatives
- ☐ Black Dog Institute

Other (please list below):

- ☐ …….
- ☐ …….
- ☐ …….
- ☐ …….

7. **Staff Development/Training in pedagogy for student engagement Respondent:** Deputy Principal **Other respondent:_____**

7a. This question asks about staff professional development or training your staff may have participated in.
Have any of your staff participated in professional development or training that has focused specifically on enhancing student engagement in 2014 (please tick)?
(Interviewer note: Attendance at training can be a presentation/training to all/some staff by a staff member OR a professional).
Please read out the full list of options.
For each I will ask whether all or only some staff completed the training.

Training	Attended by		
	No staff	Some staff	All staff
Creating a safe and supportive learning environment			
Providing effective and constructive feedback			
Student-centered learning			
Positive behaviour management (e.g. PBL)			
Building positive relationships			
Technology in curriculum design and learning			
Quality Teaching			
Student empowerment			

Assessment as part of the learning process			
Supporting learners with specific needs			
Training specifically for Aboriginal students around engagement.			
Aboriginal perspectives embedded in the curriculum through local consultation			
Explicit instruction in the skills that develop resilience.			
Feedback on teaching from colleagues.			
Any others that I haven't listed so far? (please list below):			

8. **Staff Mental Health and Wellbeing Respondent:** Deputy Principal **Other respondent:**_____

This section asks about mental health and wellbeing training and initiatives specifically for staff.
8a. Have your staff participated in staff mental health and wellbeing training during 2014?

Yes ☐ (go to 8b) No ☐ (go to 8c)

8b. Did your staff participate in any of the following mental health and wellbeing training programs?
Interviewer: If respondent says yes please read out the list of options and ask if attended by all school staff or only some school staff.

Training	**Attended by**		
	No staff	**Some staff**	**All staff**
Staff Matters			
Mental Health First Aid (MHFA)			
WorkON – Work place health and wellbeing course			
Expert presentation on maintaining or improving staff mental health and wellbeing e.g. Hunter Institute of Mental Health			
Any others not listed? (please list below):			

8c. Did your school implement initiatives to support staff mental health and wellbeing in 2014, for example staff morning tea or lunch at school, or GOTCHA or other forms of tangible recognition for staff?
Interviewer: allow interviewee to provide responses first before reading out any of the below options that remain not ticked.

- ☐ Health promotion programs in place to encourage positive health outcomes
- ☐ Opportunities created for staff to voice their response to change in the workplace
- ☐ Opportunities for leadership
- ☐ Health and wellbeing policy for staff in place
- ☐ Health and wellbeing materials visible in staff areas e.g. Employee Assistance Program (EAP) access details visible
- ☐ Staff newsletter that endorses health and wellbeing
- ☐ Staff morning tea/lunch at school
- ☐ Staff functions outside of school
- ☐ Staff mentoring in place
- ☐ GOTCHA or other forms of tangible recognition for staff
- ☐ Random acts of kindness for staff or similar initiatives that foster a positive work environment
- ☐ Recognition of staff contribution and achievement, either verbally or tangibly

Did you implement any other initiatives that were not listed here? please list below):

- ☐ ……
- ☐ ……

12. Parents/Carers provided information regarding student resilience

Respondent: Deputy Principal **Other respondent:**_____

This section asks about whether your school has provided information to parents/carers regarding student resilience
12a. During 2014 has information about enhancing student resilience (e.g. self-efficacy, problem-solving skills, goals and aspiration, and peer caring relationships) been provided to parents/carers?

☐ Yes (got to 12b) ☐ No (skip 12 b and 12 c)

12b. During 2014, how often was information about student resilience provided to parents/carers?

☐ Once ☐ Twice ☐ Once a term ☐ Twice a term ☐ More frequently (e.g. fortnightly/weekly)

12c. How has information about student resilience been provided to parents/carers, for example a newsletter or parent dinner?:
Interviewer: Please read out the list of options provided under each question as prompts if needed.

- ☐ School newsletter
- ☐ School website
- ☐ School Facebook page
- ☐ School phone App
- ☐ Schools events e.g. assembles, presentations, school concerts, significant occasions parents/carers are invited to attend
- ☐ P & C meetings
- ☐ Parent/carer forums
- ☐ Parent/carer information sessions
- ☐ Parent/carer dinners

Are there any other ways I haven't listed? (please list below):

- ☐ ……
- ☐ ……

Open Q – What has your experience with the 'Healthy Schools, Health Futures' Project? Have you been aware of the project in your school and do you have any feedback about the project?

……

HEALTHY SCHOOLS HEALTHY FUTURES (HSHF) SCHOOL ENVIRONMENT SURVEY (SES) 2014
Head Teacher of Welfare/Pastoral Care Coordinator Survey

Instruction to interviewer: Please see boxes for structured interview script.

Introduction: As part of the Healthy Schools Healthy Futures project we are conducting interviews with school staff. The purpose of the interviews is to find out about the strategies that your school has in place to increase student resilience.

It is expected that the interview for a Head Teacher of Welfare/Pastoral Care Coordinator will take approximately 35 minutes.

For the purpose of this survey please use the definition of resilience on the information sheet emailed to you and refer back to it when answering the questions and thinking about how resilience skills may have been taught inside and outside the classroom.

Resilience is defined as the ability to bounce back from a negative event or experience by employing individual traits (internal factors) and wider social, community, and environmental supports (external factors). Internal resilience factors include self-efficacy, empathy, problem solving, self-awareness, goals and aspirations, communication and cooperation. External factors include meaningful participation in school/community/home, school/community/home support, caring peer relationships and pro-social peers.

Some survey questions may refer to 'whole of school' in which case we mean covers all Years 7-10.

Do you have any questions about this definition before we begin?

HEALTHY SCHOOLS, *HEALTHY FUTURES*

R E S I L I E N C E - I N - S C H O O L S

2. Resilience outside the Classroom **Respondent:** HT Welfare

The next section refers to the explicit development of resilience outside of subject content, such as year days, welfare days, school excursions or student workshops. (If HT Welfare, explain each Year group will be asked about separately) [Interviewer note: please record the answer to each question in the table below]

YEAR 7:

2a. Have any school activities that explicitly develop resilience been delivered at a whole-year level to all of Year 7? (If no, go to next Year group)

2a1. If yes, could you estimate how many hours (record in table below)

2a2. Were any of the following programs delivered to Year 7, and was this to boys, girls or both? (Please read through all programs in the table)?

YEAR 8:

2b. Have any school activities that explicitly develop resilience been delivered at a whole-year level to all of Year 8? (If no, go to next Year group)

2b1. If yes, could you estimate how many hours (record in table below)

2b2. Were any of the following programs delivered to Year 8, and was this to boys, girls or both? (Please read through all programs in the table)?

YEAR 9:

2c. Have any school activities that explicitly develop resilience been delivered at a whole-year level to all of Year 9? (If no, go to Year group)

2c1. If yes, could you estimate how many hours (record in table below)

2c2. Were any of the following programs delivered to Year 9, and was this to boys, girls or both? (Please read through all programs in the table)?

YEAR 10:

2d. Have any school activities that explicitly develop resilience been delivered at a whole-year level to all of Year 10? (If no, go to next section)

2d1. If yes, could you estimate how many hours (record in table below)

2d2. Were any of the following programs delivered to Year 10, and was this to boys, girls or both? (Please read through all programs in the table)?

	YEAR 7		YEAR 8		YEAR 9		YEAR 10	
2a- 2d:	**Please tick one:** ☐Yes ☐No ☐Don't know		**Please tick one:** ☐Yes ☐No ☐Don't know		**Please tick one:** ☐Yes ☐No ☐Don't know		**Please tick one:** ☐Yes ☐No ☐Don't know	
2a1-2d1:	**Hours:……**		**Hours:……**		**Hours:……**		**Hours:……**	
2a2-2d2:	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**
Programs								
Love Bites								
Rock and Water								
SenseAbility								
MindMatters								
Bounce Back								
Resilience Doughnut								
Motivational Media								
Bamboo Theatre								
Resourceful Adolescent Program (RAP)								
(Interviewer please prompt): Were any either commercially available or school developed programs implemented? (List below)								

Respondent: HT Welfare

The next 2 questions ask about explicit instruction in resilience delivered to the whole school, by this we mean Years 7-10.
2e. Has any explicit instruction in resilience been delivered at a whole school level for example during DEAR, roll call, LAW or Pastoral Care periods?

☐ Yes ☐ No ☐ Don't know **If yes, *could you estimate how many hours:*____**

2f. Which resources were used within those periods, for example MindMatters or SenseAbility?
Interviewer: Please read first 2 options as prompts to what type of resources this includes.

- ☐ MindMatters
- ☐ SenseAbility
- ☐ Reach Out
- ☐ Resilience Doughnut
- ☐ School developed resources
- ☐ Others (please name):_____

Respondent: Year Advisor or HT Welfare **Other respondent:**_____

Respondent: HT Welfare **Other respondent:**_____

The next 2 questions ask about programs delivered to students who have been identified as requiring additional support.

2g. Have any programs including school-developed programs, that include explicit instruction in skills that develop resilience, been delivered to such groups of students (for example Seasons for Growth)?

☐ Yes (ask 2f) ☐ No

2h. Which of the following programs were implemented? (Interviewer: Please read list of programs to the interviewee)

- ☐ Rock and Water
- ☐ Resourceful Adolescent Program (RAP)
- ☐ Resilience Doughnut
- ☐ Seasons for Growth
- ☐ RAGE
- ☐ SCREAM
- ☐ Plan-it Youth
- ☐ SHINE
- ☐ STRENGTH
- ☐ Girls With A Purpose
- ☐ RUSH mentoring

(Interviewer please prompt): Were any other either commercially available or school developed programs implemented? (List below)

- ☐ .....
- ☐ .....
- ☐ .....
- ☐ .....
- ☐ .....

4. Peer Support, Empowerment and Leadership **Respondent:** HT Welfare **Other respondent:**_____

This section asks about any student peer support, empowerment or leadership programs you may have in place at your school.
4a. Which of the following peer support, empowerment and leadership programs did groups of students participate in during 2014 (please tick)?
For each I will ask you if the program was offered to all or selected students . For example did all year groups participate, and whether all students in a Year group participated or only selected students.

Interviewer Note:

- **Please read out the list of options.**
- **If the respondent asks for clarification on what is meant by all or selected students:** 'All' refers to programs that are available for all students in that Grade, whereas 'Selected' refers to programs that are only available to selected students in that Grade.)

Programs	**Program in place**		**Year 7**		**Year 8**		**Year 9**		**Year 10**	
	Yes	No	All	Selected	All	Selected	All	Selected	All	Selected
Peer support										
Peer mediation										
Peer tutoring										
Year 6-7 transition										
Student ambassadors working with feeder Primary Schools										
Preparation for senior years										
Student leadership training										
SRC										
Buddying or mentoring program										
Junior AECG										
Clontarf										
Any program in which students were active participants in all levels of planning and decision-making (e.g. participating in the development of an anti-bullying policy)										
Any program that involves school-community mentoring (e.g. opportunities for business leaders to mentor students)										

Programs	Program in place		Year 7		Year 8		Year 9		Year 10	
	Yes	No	All	Selected	All	Selected	All	Selected	All	Selected
Interviewer: Did you have any others in place not listed so far? (please list below):										

PART C: PARTNERSHIPS AND SERVICES DOMAIN QUESTIONS

5. **Respondent:** HT welfare **Other respondent:**_____

This question asks about whether your school has tried to increase student awareness of local organizations and services, for example community organizations, groups, clubs, health and community services. This could be in school newsletter, website, school notice boards, school social media websites.

9a. Charity organizations

Has your school made students aware of charity organizations, for example Red Cross and Rotary? ☐ **Yes** ☐ **No**

Interviewer: If yes which charities?

- ☐ Red cross
- ☐ Smith Family
- ☐ Rotary Club
- ☐ Lions Club
- ☐ Samaritans
- ☐ St Vincent de Paul

Any others? (please list below):

- ☐ ……
- ☐ ……

9b. Sporting/cultural Groups:

Has your school made students aware of sporting or cultural groups, for example Surf Life Saving? ☐ **Yes** ☐ **No**

Interviewer: If yes which types?

- ☐ Local sports clubs e.g. rugby league, netball
- ☐ Dancing/cultural group
- ☐ Surf Life Saving
- ☐ Scouts/Girl guides etc.
- ☐ Duke of Edinburgh

Any others? (please list below):

- ☐ .....
- ☐ .....
- ☐ .....
- ☐ .....

9c. Religious Groups

Has your school made students aware of religious groups, for example the Salvation Army? ☐ **Yes** ☐ **No**

Interviewer: If yes which groups?

- ☐ Anglicare
- ☐ Centacare
- ☐ Salvation Army
- ☐ Youth with a mission

Others?(please list below):

- ☐ .....

9d. Health and community services

Has your school made students aware of health and community services, for example Kids help line and Headspace? ☐ **Yes** ☐ **No**

Interviewer: If yes which services?

- ☐ Child and Adolescent Mental Health Services (CAMHS)
- ☐ Local Youth Services
- ☐ Kids Helpline
- ☐ Sexual Health Clinic
- ☐ Community Health
- ☐ Medicare Local
- ☐ Adolescent Family Counsellor
- ☐ Headspace
- ☐ Beyond Blue
- ☐ Life without Barriers
- ☐ PCYC
- ☐ TAFE
- ☐ Joblink
- ☐ Neighbourhood centre

Others? (please list below):

- ☐ ……

9e. Aboriginal Organizations

Has your school made students aware of Aboriginal organizations, for example the Local Aboriginal Land Council or Aboriginal Medical Service?

☐ **Yes** ☐ **No**

Interviewer: If yes which Aboriginal Organizations?

- ☐ AECG
- ☐ Local Aboriginal Land Council
- ☐ Clontarf
- ☐ Aboriginal Medical Service
- ☐ Aboriginal Health
- ☐ Aboriginal youth organizations
- ☐ Aboriginal employment service
- ☐ Aboriginal Mental Health
- ☐ Elders groups
- ☐ Aboriginal men's groups
- ☐ Aboriginal women's groups

Others? (list below)

- ☐ ……
- ☐ ……
- ☐ ……
- ☐ ……

The next question asks about active partnerships that your school has in place with local community organizations, groups, or clubs. Active partnerships are those that are ongoing and formal, (i.e. NOT informal or one-off school-community linkages).
The following question will ask about active partnerships your school may have in place with health and community services so no need to mention those here. For this question we are just interested in active partnerships with local community organizations, groups and clubs, not health services.
9f. Does your school have active partnerships in place with local community organizations, groups or clubs that support different groups within your school community?

☐ Yes (go to 9g) ☐ No (go to 9h)

9g. If yes, can you please name up to 5 partnerships you consider to be most important to your students. As you name each of them I'm going to ask you yes or no about some characteristics of the partnership.

Interviewer: What is the first partnership you would like to name? For this partnership would you say yes or no to the following characteristics being part of that partnership (repeat for all 5 partnerships).

Partner	Characteristics of partnership
1.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with the aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way
2.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership

	☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way
3.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way

4.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way
5.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour

	☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way

The next question asks about active partnerships that your school has in place with *health and community organizations* that are NOT informal or one-off school-community linkages.
9h. Does your school have active partnerships in place with health and community organizations that support different groups within your school community?

☐ Yes (go to 9i) ☐ No (skip 9i)

9i. If yes, can you please name up to 5 partnerships you consider to be most important to your students. As you name each of them I'm going to ask you yes or no about some characteristics of the partnership.

Interviewer: What is the first partnership you would like to name? For this partnership would you say yes or no to the following characteristics being part of that partnership (repeat for all 5 partnerships).

Partner	Characteristics of partnership
1.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources

	☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way
2.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way
3.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership

	☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way
4.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way

5.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way

11. Parental engagement strategies **Respondent:** HT Welfare **Other respondent:**_____

This questions asks about strategies has your school may have implemented in 2014 to engage or involve parents/carers in the school

11a. Has your school implemented any strategies regarding positive parent-teacher communication, for example positive postcards or letters sent home?

Interviewer: For questions 11a-11d, please don't read out the list of options – allow interviewee to list options first and use the options provided under each question as prompts if need.

- ☐ Positive postcards or letters sent home
- ☐ Formal commendation mailed home
- ☐ Positive phone calls
- ☐ Any others? _____

11b. Has your school implemented any strategies regarding web-based communication, for example a school or P & C Facebook Page?

- ☐ School or P&C Facebook page
- ☐ School smart phone App – with notification of school messages and events
- ☐ Parent/carer portal on website (an interactive forum, resilience-specific information, promotion of school-based and external parent/carer education workshops and seminars, relevant community organizations and services)
- ☐ SMS notification system for absent students
- ☐ Any others? _____

11c. Has your school implemented any workshops or events, for example parent and carer forum with invited guest speakers?

- ☐ Parent/carer information sessions on 'hot topics' or current school matters such as cyber safety
- ☐ Parent/carer forums with invited guest speakers
- ☐ Annual parent/carer events at school such as Mother's Day/Father's Day breakfast, Volunteers breakfast
- ☐ Whole school community events such as Christmas concerts, family trivia nights and fundraising events
- ☐ Invitations extended to Elders/parents/carers/community Figures to attend awards ceremonies, showcase events, other special/significant occasions
- ☐ Parent/carer volunteer programs and opportunities, such as tutor programs, working bees, gardening group
- ☐ Informal social and special events for parents/carers to meet teachers held on school grounds
- ☐ Parent/carer workshops at school, on topics such as parenting skills
- ☐ Family learning programs
- ☐ Any others? _____

11d. And finally, has your school implemented any strategies to involve parents/carers in school plans, processes and reform, for example parent and carer participation in policy development?

- ☐ Parent/carer school evaluation surveys and parent/carer feedback on school evaluation tools
- ☐ Parent/carer participation in policy development
- ☐ Parent/carer participation in Personal Learning Plan development
- ☐ Parents/carers and Elders invited to be panel members for mock interviews and portfolio presentations
- ☐ Parental engagement embedded in school plans
- ☐ Any others? _____

Open Q – What has your experience with the 'Healthy Schools, Health Futures' Project? Have you been aware of the project in your school and do you have any feedback about the project?

……
……
……

HEALTHY SCHOOLS HEALTHY FUTURES (HSHF) SCHOOL ENVIRONMENT SURVEY (SES) 2014
AEO/AEW/Aboriginal Education Coordinator Survey

Instruction to interviewer: Please see boxes for structured interview script.

Introduction: As part of the Healthy Schools Healthy Futures project we are conducting interviews with school staff. The purpose of the interviews is to find out about the strategies that your school has in place to increase student resilience.

It is expected that the interview for an AEO/AEW/Aboriginal Education Coordinator will take approximately 30 minutes.

For the purpose of this survey please use the definition of resilience on the information sheet emailed to you and refer back to it when answering the questions and thinking about how resilience skills may have been taught inside and outside the classroom.

Resilience is defined as the ability to bounce back from a negative event or experience by employing individual traits (internal factors) and wider social, community, and environmental supports (external factors). Internal resilience factors include self-efficacy, empathy, problem solving, self-awareness, goals and aspirations, communication and cooperation. External factors include meaningful participation in school/community/home, school/community/home support, caring peer relationships and pro-social peers.

Some survey questions may refer to 'whole of school' in which case we mean covers all Years 7-10.

Do you have any questions about this definition before we begin?

HEALTHY SCHOOLS, *HEALTHY FUTURES*

R E S I L I E N C E - I N - S C H O O L S

PART D: Aboriginal Specific Questions

CURRICULUM, TEACHING AND LEARNING DOMAIN QUESTIONS

13. Outside the Classroom (not taught in curriculum): For Aboriginal and/or Torres Strait Islander Students

Respondent: Aboriginal Education Co-ordinator or nominee **Other respondent:**_____

This question refers to the explicit development of resilience with Aboriginal students outside of subject content, such as year days, welfare days, school excursions and student workshops.
13a. Have any programs been specifically delivered to Aboriginal and/or Torres Strait Islander students that include explicit instruction in skills that develop resilience, for example Sistaspeak or Rock and Water?

☐ Yes (If yes 13b) ☐ No (continue to 13c)

13b. If yes, which of the following programs were offered to Aboriginal and/or Torres Strait Islander students. If you have run a program I will also ask you what Year groups and genders participated:
Note interviewer to clarify: For this question we are asking what programs are offered to Aboriginal and/or Torres Strait Islander students additional to any programs offered as whole school or whole year programs Aboriginal students may have participated in during 2014.

Activities/ Programs	**Year 7**		**Year 8**		**Year 9**		**Year 10**		
	Girls	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	
Aboriginal specific programs:									
Sistaspeak									
Brospeak									
Clontarf									
Feeling Deadly not Shame									
Yarning Circles									
Cultural camps/excursions									
Other (please list below):									

Activities/ Programs	Year 7		Year 8		Year 9		Year 10			
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Amended or adapted to be appropriate for Aboriginal students?	
									Yes	No
Mainstream Programs:										
Seasons for Growth										
Rock and Water										
SenseAbility										
MindMatters										
Bounce Back										
Resilience Doughnut										
Resourceful Adolescent Program (RAP)										
School developed programs (please list below):										
Other? (please list below):										

13c. How many hours of explicit instruction in resilience would you estimate Aboriginal and/or Torres Strait Islander students across Years 7-10 received during 2014 (other than taught in subject content)?
Note interviewer to again clarify: For this question we are asking what programs are offered to Aboriginal and/or Torres Strait Islander students additional to any programs offered as whole school or whole year programs during 2014.

Year 7: ☐ Yes ☐ No ☐ Don't know If yes, estimated hours:_____

Year 8: ☐ Yes ☐ No ☐ Don't know If yes, estimated hours:_____

Year 9: ☐ Yes ☐ No ☐ Don't know If yes, estimated hours:_____

Year 10: ☐ Yes ☐ No ☐ Don't know If yes, estimated hours:_____

ETHOS AND ENVIRONMENT DOMAIN QUESTIONS

6. **Peer Support, Empowerment and Leadership** **Respondent:** AEO/ AEW / Aboriginal Education Co-ordinator
   Other respondent:_____

This section asks about any student peer support, empowerment or leadership programs you may have in place at your school.
4b. Which of the following peer support, empowerment and leadership programs did Aboriginal students participate in during 2014 (please tick)?
For each I will ask you if the program was offered to all or selected students. For example did all year groups participate, and whether all students in a Year group participated or only selected students.

Interviewer Note:
- **Please read out the list of options.**
- **If the respondent asks for clarification on what is meant by all or selected students:** 'All' refers to programs that are available for all students in that Grade, whereas 'Selected' refers to programs that are only available to selected students in that Grade.)

Programs	Program in place		Year 7		Year 8		Year 9		Year 10	
	Yes	No	All	Selected	All	Selected	All	Selected	All	Selected
Peer support										
Peer mediation										
Peer tutoring										
Year 6-7 transition										
Student ambassadors working with feeder Primary Schools										
Preparation for senior years										
Student leadership training										
SRC										
Buddying or mentoring program										
Junior AECG										
Clontarf										
Any program in which students were active participants in all levels of planning and decision-making (e.g. participating in the development of an anti-bullying policy)										
Any program that involves school-community mentoring (e.g. opportunities for business leaders to mentor students)										
Interviewer: Did you have any others in place not listed so far? (please list below):										

6. **Cultural Awareness** **Respondent:** AEO/ AEW / Aboriginal Education Co-ordinator **Other respondent:**_____

The next section asks about strategies that you may have in place to address cultural awareness within your school.
6a. Has your school undertaken the Principals Australia's Dare to Lead Collegial Snapshot?

Yes ☐ No ☐

6b. If yes, in what year was it undertaken? _____

6c. Has your school implemented a whole school program that aimed to increase the cultural awareness of non-Aboriginal staff and/or students during 2014?
This could include initiatives for students such as cultural workshops, assembly addresses or cultural performances. It could also include staff professional development, engagement with AECG, or active participation in Connecting to Country.

Yes ☐ (Continue to 6d) **No** ☐ (Skip to Q7)

6d. If yes, please list the programs:

☐ .....
☐ .....
☐ .....

6e. Which Aboriginal community members or groups were consulted in developing or running the programs?
Interviewer: Please read the full list of options.

☐ AEW/ AEO in school
☐ Other Aboriginal school staff
☐ Local AECG
☐ Lands Council
☐ AMS
☐ Aboriginal Youth Service

Any others that I haven't listed so far? (please list below):

☐ .....
☐ .....
☐ .....

PARTNERSHIPS AND SERVICES DOMAIN QUESTIONS

10. Partnerships with Aboriginal and/or Torres Strait Islander Organizations

Respondent: Aboriginal Education Co-ordinator **Other respondent:**_____

10a) The next question asks about promotion of local Aboriginal and/or Torres Strait Islander organizations/groups/clubs/health and community services to raise awareness
Which of the following services has your school made Aboriginal students aware of?
Interviewer: Please read out full list of services.

- ☐ Local AECG
- ☐ Local Aboriginal Land Council
- ☐ Aboriginal Medical Service
- ☐ Child and Adolescent Mental Health Services
- ☐ Aboriginal Youth Services
- ☐ Aboriginal Health
- ☐ Aboriginal mental health
- ☐ Aboriginal employment service
- ☐ Elders Group
- ☐ Aboriginal men's groups
- ☐ Aboriginal women's groups
- ☐ Clontarf
- ☐ Kids Helpline
- ☐ Sexual Health Clinic
- ☐ Community Health
- ☐ Medicare Local
- ☐ Adolescent Family Counsellor
- ☐ Headspace
- ☐ Neighbourhood centre

- ☐ PCYC
- ☐ Joblink
- ☐ Tafe

Can you think of any others not listed here? (please list below):

- ☐ ……

The next question asks about active partnerships that your school has in place with local Aboriginal community organizations, groups, or clubs (i.e. NOT informal or one-off school-community linkages.
The following question will ask about active partnerships your school may have in place with local Aboriginal health and community services so no need to mention those here. For this question we are just interested in active partnerships with local Aboriginal community organizations, groups and clubs, not health services.
10b. Does your school have active partnerships in place with local Aboriginal community organizations, groups, or clubs that support Aboriginal parents/carers, staff and students within your school community?

☐ Yes (go to 10c) ☐ No (go to 10d)

10c. If yes, can you please name up to 5 partnerships you consider to be most important to your students. For each of them I'm going to ask you about the characteristics of the partnership.

Interviewer: What is the first partnership you would like to list? For this partnership would you say yes or no to the following characteristics being part of that partnership (repeat for all 5 partnerships).

Partner	Characteristics of partnership
1.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate

	☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
2.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected

	☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
3.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building

4.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
5.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources

	☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building

The next question asks about active partnerships that your school has in place with Aboriginal health and community organizations (i.e. NOT informal or one-off school-community linkages)
10d. Does your school have active partnerships in place with Aboriginal health and community organizations that support Aboriginal parents/carers, staff and students within your school community?

☐ Yes (go to 10e) ☐ No (skip 10e)

10e. If yes, can you please name up to 5 partnerships you consider to be most important to your students. For each of them I'm going to ask you about the characteristics of the partnership

Interviewer: What is the first partnership you would like to name? For this partnership would you say yes or no to the following characteristics being part of that partnership (repeat for all 5 partnerships).

Partner	Characteristics of partnership
1.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected

	☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
2.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
3.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff

	☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
4.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected

	☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building
5.	☐ Has a formal agreement been established on services to be provided ☐ Is the partnership consistent with aims of the School Plan ☐ Are regular meetings held to review and evaluate the working relationships to ensure it remains effective and appropriate ☐ Is information shared between the school staff member co-ordinating the partnership and other school staff ☐ Is the role of the school and the role of the service clearly defined within the partnership ☐ Is the service specifically tailored to your school community needs through local consultation ☐ Does the school supports the delivery of partner programs through assisting with coordinating space, time and resources ☐ Is sufficient resource provided e.g. budget allocated to support the partnership ☐ Are systems established to ensure continuation of the partnership if there is a change in leadership ☐ Is the partnership is a multi-year endeavour ☐ Is student and family confidentiality protected and privacy respected ☐ Are systems in place for the school to act upon any issues raised in a prompt, culturally sensitive and respectful way ☐ Has the service been introduced to Aboriginal school staff who can assist with communication and relationship building

14. Strategies for Aboriginal Parents/Carers

Respondent: Aboriginal Education Co-ordinator **Other respondent:**_____

14a. In addition to general strategies to increase parental engagement, what other strategies has your school used in 2014 to engage parents/carers of Aboriginal and/or Torres Strait Islander students specifically? Interviewer: Please read out full list of responses.

- ☐ Dedicated section in the school newsletter updating parents/carers on progress in Aboriginal Education
- ☐ Dedicated section of the school website for initiatives in Aboriginal Education
- ☐ Parents/carers and Elders invited to be panel members for mock interviews and portfolio presentations
- ☐ Invitation extended to Elders, parents/carers and community Figures to attend awards ceremonies, showcase events and other special or significant occasions
- ☐ Opportunities provided specifically for parents/ carers of Aboriginal students to meet teachers e.g. BBQ
- ☐ Alternative meeting locations provided off school grounds
- ☐ Rooms provided specifically for meetings with Aboriginal parents/carers
- ☐ Aboriginal Education Team open for parents/ carers to attend or become members
- ☐ Parent/ carer participation in Personal Learning Plan development

Any others not listed? (please list below):

- ☐ ....

Open Q – What has your experience with the 'Healthy Schools, Health Futures' Project? Have you been aware of the project in your school and do you have any feedback about the project?

.....

APPENDIX 5.1. Matrix of available programs and resources that address resilience protective factors

Matrix of programs and curriculum resources targeting student resilience

Use this guide to identify programs and curriculum resources for your school that target resilience, according to which internal and external resilience factors they influence. The guide can be used to select programs and curriculum resources based on which age groups they target; whether they involve parents/carers, or school staff; the length/duration of student participation in the program; the approximate cost; whether it has been evaluated; and whether it is considered culturally appropriate for Aboriginal and Torres Strait Islander students.

The matrix below includes only brief information to identify potential programs and resources. Additional information is located on the CD at the end of the Health & Wellbeing Guide.

Program Title	External resilience factors								Internal resilience factors						Target Group[F]							Length/ Duration (for student participation) ^ % V	Approximate Cost # $	Evaluation[Q]	Culturally Appropriate [X]
															Children (Age)					Parents/ Carers	School Staff				
	Home	School	Comm	MP- H	MP-S	MP-C	PSP	PCR	C &C	SE	E	PS	SA	G	12	13	14	15	16						
ABCD Parenting Adolescents[1]	•											•	•							•	•	n/a	$200-$500		
ACE[1]		•	•				•		•	•	•	•	•	•			•	•			•	10-15 hours	$500-$1,000	•	
Activ8! Program																									
Advocacy Project[1]		•							•	•				•				•	•		•	10-15 hours	$500-$1,000	•	
Aussie Optimism[1]	•	•					•		•	•	•	•	•	•	•	•					•	15-20 hours	$500-$1,000	•	
Behaviour Tonics[1]	•	•		•	•		•						•	•						•	•	5-10 hours	$200-$500		
Being Me: ABC Health Series[1]							•		•	•			•		•	•					•	2-5 hours	$0-$200		
beyondblue SenseAbility	•	•	•	•	•		•		•	•		•	•	•	•	•	•	•	•		•	Unspecified*	Free		
Big Night Out[1]													•			•	•	•	•		•	Unspecified*	$0-$200		
Black on Track		•	•		•	•				•			•	•	•	•	•	•	•		•	20-25 hours	$4,000+	TBA	•
BodyThink[1]										•			•		•	•	•	•			•	2-5 hours	$0-$200		
Bounce Back![1]	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	Unspecified*	$0-$200		
Boys education, boys' outcomes project[1]		•	•						•												•	n/a	$1,000-$2,000		
BRAVE[1]												•	•		•	•	•	•	•	•		10-15 hours	$0-$200		
Bright Ideas[1, 7]	•									•		•	•		•	•				•	•	10-15 hours	$1,000-$2,000	•	
Bullying. No Way! website[1]	•	•	•			•	•	•	•	•		•	•		•	•	•	•	•	•	•	Unspecified*	Free	•	
Bursting the Bubble website[1]												•	•		•	•	•	•	•	•	•	Unspecified*	Free	•	
CAPER (Child and Adolescent Psychological and Educational Resources) website[1]	•	•				•	•	•					•		•	•	•	•	•	•	•	Unspecified*	Free		
Challenges and Choices[10]		•	•	•	•	•		•	•	•			•		•	•					•	Unspecified*	Free		
Changing Minds	•		•	•	•					•	•	•	•	•	•	•	•	•	•	•	•	Unspecified*	Free		

Program Title	External resilience factors								Internal resilience factors						Target Group[F]							Length/ Duration (for student participation) ^ % V	Approximate Cost # $	Evaluation[Q]	Culturally Appropriate [X]
															Children (Age)					Parents/ Carers	School Staff				
	Home	School	Comm	MP- H	MP-S	MP-C	PSP	PCR	C &C	SE	E	PS	SA	G	12	13	14	15	16						
website[1]																									
Changing Tracks[13]						●	●	●	●	●			●		●	●	●				●	10-15 hours	$4,000+	●	
Circle of Courage[1]	●			●	●					●	●		●		●	●					●	Unspecified*	$500-$1,000		
Confident Kids[13] (Exploring Together)				●	●	●	●	●	●	●					●	●	●			●	●	15-20 hours	$500-$1,000	●	
Cool Kids[1]				●	●		●		●			●	●		●	●	●	●	●	●	●	15-20 hours	$0-$200	●	
Coolness Under Pressure[1]	●								●			●	●		●	●					●	10-15 hours	Free	●	
Dare To Lead		●	●	●	●		●			●			●		●	●	●	●	●		●	Unspecified*	Free		●
Digging Deep[1]		●				●	●	●	●				●		●	●	●	●	●		●	Unspecified*	$0-$200		
Exploring Together – Adolescent Program[1]	●	●	●	●	●		●		●	●				●	●	●	●	●	●	●	●	15-20 hours	$500-$1,000	●	●
Families and Schools Together (FAST)[1]	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●			●	●	15-20 hours	$3,000+	●	●
Feeling Deadly Not Shame	●	●	●			●	●	●	●	●		●	●		●	●	●	●	●			2-5 hours	Free		●
Fit To Lead[1]										●		●	●		●	●	●	●			●	Unspecified*	$0-$200		
Friendly Schools and Families[1]	●	●					●						●		●	●	●	●	●	●	●	Unspecified*	$200-$500		
FRIENDS For Life – For Youth[1]	●	●				●	●	●		●		●	●		●	●	●	●	●		●	10-15 hours	$500-$1,000	●	
Gatehouse Teaching Resources[14]	●	●				●	●	●	●	●	●	●	●		●	●	●	●	●		●	Unspecified*	Free	●	
Get It Together[1]		●		●	●				●				●	●	●	●	●	●	●		●	2-5 hours	$1,000-$2,000		
Girls on the Go![13]		●		●	●					●			●		●	●	●	●	●		●	30-40 hours	$1,000-$2,000		
Good Days Ahead[1]													●		●	●	●	●	●		●	Unspecified*	$1,000-$2,000		
Headroom Website[1]	●	●	●						●			●	●		●	●	●	●	●	●	●	Unspecified*	Free		
Heartmasters[1]										●	●		●	●	●	●	●				●	15-20 hours	$200-$500		
HIPP (Help Increase the Peace)[1]		●	●				●		●		●	●	●		●	●	●	●	●	●	●	20-25 hours	$0-$200	●	
Interrelate Family Centres[1]	●						●		●	●		●	●		●	●	●	●	●	●	●	Unspecified*	Unspecified*		
Just Ask website[1]									●			●			●	●	●	●	●	●	●	Unspecified*	Free		
Keep Safe Stay Cool[1]		●	●	●	●		●		●							●	●	●	●			2-5 hours	Free		
Kids Helpline Peer Skills Program[1]		●	●			●		●	●		●	●	●				●	●	●		●	10-15 hours	$200-$500		
Let's Have A Yarn with Yarn		●			●		●	●	●	●	●	●	●	●	●	●	●	●	●		●	10-15 hours	$1,000-$2,000	TBA	●
Life Whys[1]		●								●			●	●			●	●	●			2-5 hours	$500-$1,000		
Literature for Life[1]		●		●	●				●			●		●	●	●	●	●			●	Unspecified*	$0-$200		
Mental Health First Aid[1]												●	●								●	n/a	$0-$200	●	

Program Title	External resilience factors								Internal resilience factors						Target Group[F]							Length/ Duration (for student participation) ^ % V	Approximate Cost # $	Evaluation[Q]	Culturally Appropriate [X]
															Children (Age)					Parents/ Carers	School Staff				
	Home	School	Comm	MP- H	MP-S	MP-C	PSP	PCR	C &C	SE	E	PS	SA	G	12	13	14	15	16						
Mental Health First Aid for Aboriginal and Torres Strait Islander Program												•	•								•	n/a	$0-$200		•
MindMatters[1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Unspecified*	Free	•	•
Motivational Media		•			•		•	•	•	•	•	•	•	•	•	•	•	•	•			0-2 hours	$1,000-$2,000		
MPower Girls[1, 7]							•			•	•	•	•		•	•	•	•			•	5-10 hours	$0-$200		
No Blame Bullying Prevention (Support Group) Approach[1]		•					•		•		•	•	•		•	•	•	•	•		•	Unspecified*	$0-$200		
Optimistic Kids[1]	•	•		•	•				•	•		•	•	•	•	•						15-20 hours	$3,000+		
Outward Bound		•		•	•		•		•	•	•	•	•	•	•	•	•	•	•		•	40+ hours	$50,000+	•	
Parent Effectiveness Training (PET)[12]	•								•		•									•	•	n/a	$0-$200	•	
Parenting Adolescents: A Creative Experience (PACE)[1]	•									•		•	•	•	•	•	•			•		n/a	$200-$500	•	•
Parenting Wisely[1]	•								•				•							•	•	n/a	$1,000-$2,000	•	
Parents & Adolescents Changing Together (PACT)[1] (Exploring Together)	•	•		•	•		•								•	•	•			•	•	15-20 hours	$200-$500	•	•
Partners 4 Learning																					•	Unspecified*	Free		
PASSPORT Program[2]				•	•		•		•	•		•	•	•	•	•	•	•	•		•	20-30 hours	$0-$200		
Peer Mediation[1, 7]			•	•	•		•		•						•	•					•	Unspecified*	$1,000-$2,000		
Peer Support (Stride Foundation)[9]		•	•						•			•	•		•	•					•	20-30 hours	$200-$500	•	
Program Achieve[1]	•	•					•		•	•		•	•	•	•	•	•	•	•		•	20-30 hours	$1,000-$2,000	•	•
Quest 4 Values[1, 7]	•								•	•	•		•	•	•						•	40+ hours	$0-$200		
Rainbow Silver Linings Community Crisis Response Program[13]		•	•									•			•	•	•	•	•		•	5-10 hours	$200-$500		
Reach Out website[1]				•	•							•	•		•	•	•	•	•	•	•	Unspecified*	Free	•	
Resilience Education and Drug Information (REDI)[10]		•										•			•	•	•	•	•			Unspecified*	Free		
Resilient Kids[1]	•	•		•	•				•	•		•	•	•	•	•	•	•	•		•	40+ hours	$0-$200		
Resourceful Adolescent Program – Adolescent[1]		•					•			•	•	•	•		•	•	•	•			•	10-15 hours	$500-$1,000	•	•

Program Title	External resilience factors								Internal resilience factors						Target Group[F]							Length/ Duration (for student participation) ^ % V	Approximate Cost # S	Evaluation[Q]	Culturally Appropriate X
															Children (Age)					Parents/ Carers	School Staff				
	Home	School	Comm	MP- H	MP-S	MP-C	PSP	PCR	C &C	SE	E	PS	SA	G	12	13	14	15	16						
Resourceful Adolescent Program – Parent[1]	•								•	•	•	•	•							•		n/a	$500-$1,000	•	
Resourceful Adolescent Program – Parent (Indigenous)[1]	•								•	•	•	•	•							•		n/a	$500-$1,000	•	•
Resourceful Adolescent Program – Teachers[1]		•									•										•	n/a	$500-$1,000	•	
Roads To Refuge		•	•									•			•	•	•	•	•		•	5-10 hours	$0-$200		
Rock and Water[1]		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	10-15 hours	$500-$1,000	•	
Seasons for Growth[1]		•				•	•	•	•		•	•	•		•	•	•	•	•		•	5-10 hours	$500-$1,000	•	
SECOND STEP[3, 4]		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	20-30 hours	$500-$1,000	•	
Seeing Red: Girls, Boys and Anger[1]	•	•	•			•	•	•	•	•		•	•		•						•	10-15 hours	$1,000-$2,000		
Skills for Adolescence[1, 15]	•	•	•	•	•	•	•	•					•	•	•	•	•	•		•	•	30-40 hours	$200-$500	•	
Social Decision-Making and Social Problem-Solving[5, 6]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	30-40 hours	$0-$200	•	
Stop Think Do[1]		•				•		•	•				•		•	•	•	•	•	•	•	Unspecified*	$200-$500		
Stories of Us[1]						•		•	•			•	•		•	•	•	•	•		•	0-2 hours	$200-$500		
Strong, Smart & Deadly At School	•	•	•				•			•		•	•		•	•	•	•	•			30-40 hours			•
Stronger Smarter		•	•							•			•	•							•		$4,000+		•
Students Managing Anger and Resolution Together (SMART)[1]						•	•	•					•		•	•	•	•			•	5-10 hours	$200-$500		
The Alannah and Madeline Foundation[1]			•							•		•	•		•	•	•	•	•		•	Unspecified*	Free		
The P.E.A.C.E Pack. A program to reduce bullying in schools[1]	•					•	•	•				•	•		•	•	•	•	•		•	Unspecified*	$0-$200	•	
Thinking, Feeling, Behaving[1, 7]				•	•				•	•		•	•		•	•	•	•	•		•	20-30 hours	$0-$200		
Together Parenting[11] (Exploring Together)	•						•		•	•										•	•	20-30 hours	$200-$500	•	
Travellers[1]	•	•	•	•	•	•	•	•				•				•	•				•	10-15 hours	$1,000-$2,000	•	
Tribes TLC[1]	•	•	•	•	•	•		•		•	•		•	•	•	•	•	•	•		•	Unspecified*	$200-$500	•	
Triple P - Positive Parenting Program	•								•	•		•	•							•	•	n/a	$1,000-$2,000	•	

Program Title	External resilience factors								Internal resilience factors						Target Group[F]							Length/ Duration (for student participation) ^ % v	Approximate Cost # s	Evaluation[Q]	Culturally Appropriate x
															Children (Age)					Parents/ Carers	School Staff				
	Home	School	Comm	MP- H	MP-S	MP-C	PSP	PCR	C &C	SE	E	PS	SA	G	12	13	14	15	16						
(Group Teen)[1]																									
Triple P Group Indigenous Triple P[1]	•								•	•		•	•							•	•	n/a	$1,000-$2,000		•
Values Education Toolkit[1, 7]		•								•	•	•	•	•	•	•	•	•			•	Unspecified*	$0-$200		
Why Try[1]				•	•				•	•			•	•	•	•	•	•	•		•	20-30 hours	$1,000-$2,000	•	
Yellow Ribbon[1]							•					•	•		•	•	•	•	•		•	Unspecified*	Free		
You Can Do It![1]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Unspecified*	$1,000-$2,000	•	

KEY

HOME = home support (caring relationships and high expectations at home)

SCHOOL = school support (caring relationships and high expectations at school)

COMM = community support (caring relationships and high expectations in community)

MP-H = meaningful participation home

MP-S = meaningful participation school

MP-C = meaningful participation community

PSP = pro-social peers

PCR = peer caring relationships

C&C = co-operation and communication

SE = self-efficacy

E = empathy

PS = problem-solving

SA = self-awareness

G = goals and aspirations

REFERENCES

1. http://mhws.agca.com.au/

2. http://education.qld.gov.au/studentservices/protection/sel/passport-program.html

3. http://education.qld.gov.au/studentservices/protection/sel/second-step.html

4. http://www.cfchildren.org/programs/ssp/ms/

5. http://www.ubhcisweb.org/sdm/

6. http://education.qld.gov.au/studentservices/protection/sel/social-decision-making.html

7. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/01/component-2-general-2010.pdf

8. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/01/component-1-specific-2010.pdf

9. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/01/component-1-general-2010.pdf

10. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/01/component-2-specific-2010.pdf

11. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/01/component-3-specific-2010.pdf

12. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/07/Component-3-general-12.07.2010.pdf

13. http://www.kidsmatter.edu.au/wp/wp-content/uploads/2010/07/Component-3-general-12.07.2010.pdf

14. http://wellbeingaustralia.com.au/Gatehouse%20project%20resources.pdf

15. http://www.lionsclubs.org.au/lions-quest/skills%20for%20adolescence.htm

F The 'Target Group' column refers to the actual groups involved in the program/curriculum resource.
^ Where the length/duration of the program/resource is not able to be determined in hours, and is only reported in terms of lessons/class periods, the length of the lesson/class period is assumed to be 1 hour each.
% The 'Length/Duration' column refers to the dosage of program/resource that the adolescent is exposed to (for example, 12 hours indicated the adolescent receives 12 hours of the intervention). Where a program/resource is solely a parenting program, for example, the RAP-P program, and included no combined parent-adolescent component, the 'length/duration' column remained blank. Where a program/resource contains a combined parent-adolescent component that is a compulsory element of the program, the 'length/duration' column will report the program amount, in terms of hours, that the parent and the adolescent are exposed.
V 'Unspecified*' in 'Length/Duration (for students)' column = the program/resource is one of the following: the program/resources is a curriculum resource and can be used as required/needed (ie there is no specific length/duration of use); the program/resource is a website, computer program, board game or book for use by students and as such does not have a specific length/duration of use.
The approximate cost of the program is based on the following (where applicable): the cost for one school teacher to attend compulsory training, the cost of the program manual (where not included in the cost of the training) and the cost of program resources for 30 students (where not included in the cost of the training and/or the program resources are not able to be photocopied). Where a program includes a parent component, the cost of this is only included where this component is core to the program, and compulsory. The cost of the parent component is not included in the total cost where it is optional/non-compulsory.
S 'Unspecified*' in 'Approximate Cost' column = schools commonly seek out funding from external sources to run the program and thus the cost cannot be quantified; the cost of the service is set by an individual provider in a case-by-case basis and thus cannot be quantified.
Q The 'Evaluation' column refers to one of the following: a systematic review of Randomised Control Trials; a Randomised Control Trial; a pseudorandomised Randomised Control Trial (i.e. alternate allocation of some other method); a comparative study with concurrent controls (non-randomised experimental trial; cohort study; case-control study; interrupted time series with a control group); or a comparative study without concurrent controls (historical control study; two or more single arm study; interrupted time series without a parallel control group).
X The 'culturally appropriate' column refers to the following: if a program/resource has been developed especially for Indigenous adolescents, if the program/resource includes an Indigenous component, if the program/resource has been adapted for an Indigenous audience from a version originally developed for non-Indigenous persons, or if the program has been evaluated in an Indigenous population/context.
N.B. The school has access to a school counsellor.
N.B. There are 40 weeks in the school year (10 weeks/term).
N.B. Evaluations of programs and resources which involved case series with either post-test or pre-test/post-test outcomes were not deemed to be an acceptable level of evidence.

APPENDIX 5.2. Tobacco, alcohol and illicit substance use outcome measures

Outcomes	Survey item	Response options
Primary outcomes:		
Tobacco use – ever	Have you ever smoked even part of a cigarette? [1]	Yes/No
Tobacco use – recent	Have you smoked a cigarette in the last week? If yes, starting from yesterday please record the number of cigarettes that you smoked on each day of last week[1]	Yes/No 0-99
Alcohol use - ever	Have you ever had a drink of alcohol? E.g. beer, wine or alcopops/pre-mix drinks (do not count sips or tastes)	Yes/No
Alcohol use – recent	Have you had any alcoholic drinks, such as beer, wine or alcopops/pre-mix drinks in the last week? (do not count sips or tastes) If yes, starting from yesterday please record the number of alcoholic drinks that you had on each day of last week[1]	Yes/No 0-99
Alcohol use - 'risky'	In the last 4 weeks, how many times have you had 5 or more alcoholic drinks in a row? [1]	None/Once/Twice/3-6 times/7 or more times
Secondary outcomes:		
Marijuana use	How many times in the last four weeks have you smoked or used marijuana/cannabis (grass, hash, dope, weed, mull, yarndi, ganga, pot, a bong, a joint) [1]	None/Once or twice/3-5 times/6-9 times/10-19 times/20-39 times/40 or more times
Other illicit substance use	How many times in the last four weeks have you used any other illegal drug or pill to get "high", such as inhalants, hallucinogens (eg LSD, acid, trips), amphetamines (e.g. speed, ice), ecstasy, cocaine or heroin?	None/Once or twice/3-5 times/6-9 times/10-19 times/20-39 times/40 or more times
Individual protective factors[2]	Cooperation and communication subscale: 2 items; e.g. "I enjoy working together with other students my age"	1: Never true, 2: True some of the time; 3: True most of the time; 4: True all of the time
	Self-efficacy subscale: 4 items; e.g. "I can do most things if I try"	As above
	Empathy subscale: 3 items; e.g. "I try to understand what other people feel and think"	As above
	Problem solving subscale: 3 items; e.g. "When I need help I find someone to talk with"	As above
	Self-awareness subscale: 3 items; e.g. "I understand why I do what I do"	As above
	Goals and aspirations subscale: 3 items; e.g. "I have goals and plans for the future"	As above

Outcomes	Survey item	Response options
Environmental protective factors[2]	School support subscale: 6 items; e.g. “At my school there is an adult who really cares about me”	As above
	School meaningful participation subscale: 3 items; e.g. “At my school, I help decide things like class activities or rules”	As above
	Peer caring relationships subscale: 3 items; e.g. “I have a friend who helps me when I'm having a hard time”	As above

APPENDIX 5.3. Intention-to-treat sensitivity analyses

Outcome	Intervention v control	
Primary outcomes		
Substance use	OR (95% CI)	*P*
Tobacco use - ever	1.11 (0.91, 1.35)	.31
Tobacco use - recent	1.20 (0.89, 1.62)	.23
Alcohol use – ever	1.07 (0.89, 1.27)	.48
Alcohol use – recent	1.07 (0.85, 1.34)	.55
Alcohol use – 'risky'	1.03 (0.82, 1.30)	.81
Secondary outcomes		
Substance use		
Marijuana use	1.12 (0.78, 1.62)	.52
Other illicit substance use	1.27 (0.81, 2.00)	.29

APPENDIX 5.4. Individual and environmental protective factor subscales

Outcome	Control group N=844 Mean (SD)	Intervention group N=1,261 Mean (SD)	Intervention v control OR (95% CI)	*P*
Individual protective factor scores				
Cooperation and communication	2.94 (0.68)	2.94 (0.70)	0.01 (-0.08,0.10)	.78
Empathy	3.09 (0.71)	3.09 (0.74)	0.00 (-0.09,0.09)	.97
Goals and aspirations	3.29 (0.67)	3.29 (0.69)	0.00 (-0.10,0.10)	.96
Problem solving	2.73 (0.74)	2.75 (0.73)	0.03 (-0.05,0.11)	.51
Self-awareness	3.02 (0.76)	2.96 (0.75)	-0.05 (-0.13,0.04)	.31
Self-efficacy	3.06 (0.54)	3.03 (0.58)	-0.03 (-0.09,0.04)	.44
Environmental protective factor scores				
School support	2.79 (0.77)	2.79 (0.78)	-0.01 (-0.11,0.08)	.80
Meaningful school participation	2.26 (0.72)	2.23 (0.76)	-0.04 (-0.12,0.05)	.36
Peer caring relationships	3.25 (0.83)	3.25 (0.84)	0.00 (-0.09,0.09)	.99

APPENDIX 5.5. Example of strategies that intervention schools implemented

Intervention strategies by Health Promoting Schools domain	Examples of specific programs implemented in intervention schools per strategy
Curriculum, teaching and learning	
1. Age-appropriate lessons (9 hours) on individual protective factors across school subjects	MindMatters;[3] SenseAbility;[5] school-developed curriculum resources (e.g. Student activities within 'Overcoming Adversity' unit and resilience booklets).
2. Non-curriculum programs (9 hours) targeting protective factors	The Resourceful Adolescent Program;[4] SenseAbility;[5] resilience meta-language posters; random acts of kindness week.
3. Additional program targeting protective factors for Aboriginal students	Feeling Deadly Not Shame;[6] engagement with Clontarf;[7] Sista Speak; Bro Speak;[8] Aboriginal yarning groups; Stronger, Smarter program.[9]
Ethos and environment	
4. Rewards and recognition program	Formal acknowledgements of student contribution to the school outside academic and sporting achievements; encouragement of student input in recognition processes; resilience and student empowerment awards.
5. Peer support/peer mentoring programs	Peer mentoring; peer tutoring/support; peer mediation; positive relationship and year group bonding camps; Rock and Water.[10]
6. Anti-bullying programs	Buddy schemes; positive bystander programs; positive peer programs; anti-bullying day (e.g. RUOK Day); cyberbullying programs (e.g. Cyberia[11]); safe and supportive school environment (e.g. Bullying No Way[12]); Project RockIt.[13]
7. Empowerment/leadership programs	Duke of Edinburgh International Awards Youth Program;[14] Positive lifestyles program.[15]
8. Additional empowerment/leadership/mentoring programs for Aboriginal students	Outdoor learning space and Yarn space for Aboriginal students; excursions to Yamuloong Cultural Centre[16] to participate in cultural talks and learn about traditional Aboriginal culture; Dare to Lead Program;[17] Junior AECG.

Intervention strategies by Health Promoting Schools domain	Examples of specific programs implemented in intervention schools per strategy
9. Aboriginal cultural awareness strategies	Aboriginal cultural art project (e.g. Aboriginal mural in school hall); NAIDOC week formal assembly; Connect to Country; display of Acknowledgement of Country.
Partnerships and services	
10. Promotion/engagement of local community organizations/groups/clubs in school (e.g. charity organizations)	Focus on increasing quality and sustainability of partnerships, and development of effective communication strategy between schools and external partners (including local churches and sports clubs, Lions and Rotary Clubs, Samaritans, Red Cross).
11. Additional/enhanced consultation activities with Aboriginal community groups	Enhanced consultation activities with Aboriginal Health and Aboriginal parents (e.g. parent-teacher nights held at local Aboriginal Medical Services); Aboriginal Elder and community partnerships.
12. Promotion/engagement of health, community and youth services in the school	Presentations by Black Dog Institute; promotion of Headspace; Beyond Blue; Police liaison officer; Royal Life Saving NSW; the University of Newcastle.
13. Additional/enhanced Aboriginal community organizations promoted or engaged	School presence at local Aboriginal Education Consultative Group (AECG) meetings; engagement with the Polly Farmer Foundation.
14. Referral pathways to health, community and youth services developed and promoted	Schools websites and newsletters promoted links to various school-based services (e.g. School Counselling, Year Advisors, School Chaplain, Aboriginal Student Support); and other health, community and youth services (e.g. Kids Helpline, Headspace).
15. Strategies to increase parental involvement in school (e.g. school events)	Parent mentors; expert seminars for parents and school staff on supporting resilience in young people; parent community groups promoted in newsletter.
16. Information regarding student protective factors provided to parents via school newsletter	Newsletters sent home defining resilience protective factors and how to support such factors at home; provision of information via school website.

APPENDIX 5.6. School environment survey results

Intervention strategies by Health Promoting Schools domain	Outcome definition	Intervention group N=20	Control group N=12	*P* value
		% (n/N)	% (n/N)	
Curriculum, teaching and learning				
1. Age-appropriate lessons on individual protective factors across school subjects	≥9hrs classroom resilience instruction across more than 1 KLA (Year 10)*	88.2 (15/17)	54.5 (6/11)	0.08
	≥9hrs classroom resilience instruction across more than 1 KLA (Year 7-10)*	88.2 (15/17)	36.4 (4/11)	0.01
	Head Teachers using any resilience resource in curriculum (including MindMatters and SenseAbility)*	75.3 (67/89)	49.1 (27/55)	0.002
	Head Teachers using MindMatters in curriculum*	42.7 (38/89)	30.9 (17/55)	0.20
	Head Teachers using SenseAbility in curriculum*	13.5 (12/89)	0 (0/55)	0.004
2. Non-curriculum programs targeting protective factors	≥9hrs non-classroom resilience instruction (Year 10)**	87.5 (14/16)	77.8 (7/9)	0.60
	At least one resilience program/resource used outside of curriculum**	88.9 (16/18)	81.8 (9/11)	0.60
	Most used resource: MindMatters**	61.1 (11/18)	18.2 (2/11)	0.05
	Number of programs used (Mean (SD)) (Intervention n=18; control n=11)**	3.1 (1.83)	1.2 (0.87)	0.004

Intervention strategies by Health Promoting Schools domain	Outcome definition	Intervention group N=20	Control group N=12	*P* value
3. Additional program targeting protective factors for Aboriginal students	≥9hrs non-classroom resilience instruction (Year 10 Aboriginal students)***	86.7 (13/15)	100.0 (5/5)	1.0
Ethos and environment				
4. Rewards and recognition program	At least one whole school rewards/recognition program****	100 (19/19)	100 (10/10)	1.0
5. Peer support/peer mentoring programs	At least one peer support**** (either peer support or buddy program/peer mentoring across all kids in any Year group)	77.8 (14/18)	90.9 (10/11)	0.62
6. Anti-bullying programs	At least one whole school anti-bullying initiative/program****	100 (19/19)	100 (10/10)	1.0
7. Empowerment/leadership programs	At least one peer leadership training or one program that students were active participants in all levels of planning and decision making across all kids in any Year group****	83.3 (15/18)	100 (11/11)	0.27
8. Additional empowerment/leadership/mentoring programs for Aboriginal students	At least one additional program (peer support, peer leadership, peer mentoring or program that students were active participants in all levels of planning and decision making across) in any Year group for Aboriginal students)***	89.5 (17/19)	70.0 (7/10)	0.31
9. Aboriginal cultural awareness strategies (Examples: Aboriginal cultural art project	At least one cultural awareness strategy for non-Aboriginal students/staff across whole school***	89.5 (17/19)	70.0 (7/10)	0.30

Intervention strategies by Health Promoting Schools domain	Outcome definition	Intervention group N=20	Control group N=12	*P* value
Partnerships and services				
10. Promotion/engagement of local community organizations/groups/clubs in school	Partnership[a] with at least 3 community organizations**	33.4 (6/18)	18.2 (2/11)	0.67
11. Additional/enhanced consultation activities with Aboriginal community groups	Consultation in the development/running of Aboriginal cultural awareness strategies for non-Aboriginal staff/students)**	84.2 (16/19)	60.0 (6/10)	0.19
12. Promotion/engagement of health, community and youth services in the school	Partnership[a] with at least one health/community services**	61.1 (11/18)	45.5 (5/11)	0.47
13. Additional/enhanced Aboriginal community organizations promoted or engaged	Partnership[a] with at least one Aboriginal local community organization***	36.8 (7/19)	20.0 (2/10)	0.40
14. Referral pathways to health, community and youth services developed and promoted	Promotion of any health or community services at school**	100 (18/18)	100 (11/11)	1.0
15. Strategies to increase parental involvement in school	Implementation of at least 1 parent engagement strategy**	94.4 (17/18)	100.0 (11/11)	1.0
16. Information regarding student protective factors provided to parents via school newsletter	Provided information to parents at least once a term regarding enhancing student resilience****	64.7 (11/17)	44.4 (4/10)	0.42

*Informants were Head Teachers from 5 Key Learning Areas (KLAs); English, Maths, PDHPE, Science, HSIE. Schools with data from Head Teachers from 2 or more KLAs were included (n=17 intervention; n=11 control); ** Informants were Head Teachers Welfare; *** Informants were designated Aboriginal contact persons for each school. For strategy 3, 9 respondents were excluded as they were unable to estimate hours; **** Informants were Deputy Principals; [a] Key informants (Head Teacher Welfare for strategy 10 and 12, and Aboriginal contact person for strategy 13) were asked to nominate up to 5 active partnerships with organizations or services. They were asked whether or not each partnership had a range of characteristics including: a formal agreement on services provided, consistency of the partnership with aims of the School Plan, regular meetings to review and evaluate partnership, service specifically tailored to community needs, multiyear endeavour.

APPENDIX 6.1. Substance use and protective factor outcomes at baseline and follow up by intervention and control

Subgroups	TOBACCO						ALCOHOL					ILLICIT SUBSTANCES		
	N	*Recent* n (%)	*N*	*Amount* Mean (SD)	*N*	*Recent* n (%)	*N*	*'Risk'* n (%)	*N*	*Amount* Mean (SD)	*N*	*Marijuana* n (%)	*N*	*Other* n (%)
BASELINE 2011														
All students:	2105		27		2102		2102		85		2100		2100	
Intervention	1261	20 (1.6)	19	13.2 (26.2)	1260	57 (4.5)	1260	52 (4.1)	56	3.8 (7.1)	1260	14 (1.1)	1260	8 (0.6)
Control	844	10 (1.2)	8	15.3 (17.8)	842	31 (3.7)	842	25 (3.0)	29	3.7 (4.8)	840	7 (0.8)	840	4 (0.5)
Gender:														
Males	1071		16		1070		1070		62		1068		1068	
Intervention	640	12 (1.9)	11	20.5 (33.0)	640	42 (6.6)	640	39 (6.1)	41	4.1 (8.0)	640	12 (1.9)	640	7 (1.1)
Control	431	7 (1.6)	5	16.8 (21.7)	430	23 (5.4)	430	21 (4.9)	21	3.8 (4.8)	428	5 (1.2)	428	3 (0.7)
Females	1034		11		1032		1032		23		1032		1032	
Intervention	621	8 (1.3)	8	3.1 (3.6)	620	15 (2.4)	620	13 (2.1)	15	3.2 (3.8)	620	2 (0.3)	620	1 (0.2)
Control	413	3 (0.7)	3	12.7 (12.1)	412	8 (1.9)	412	4 (1.0)	8	3.3 (4.9)	412	2 (0.5)	412	1 (0.2)
Remoteness:														
Major city	1033		11		1030		1030		41		1029		1029	
Intervention	525	7 (1.3)	7	27.6 (37.1)	524	23 (4.4)	524	27 (5.2)	22	2.8 (3.3)	524	7 (1.3)	524	4 (0.8)
Control	508	6 (1.2)	4	19.3 (23.1)	506	21 (4.2)	506	18 (3.6)	19	4.3 (5.5)	505	7 (1.4)	505	4 (0.8)
Inner regional	874		13		874		874		34		873		873	
Intervention	612	11 (1.8)	10	1.1 (1.1)	612	27 (4.4)	612	20 (3.3)	27	4.0 (8.3)	612	7 (1.1)	612	4 (0.7)
Control	262	3 (1.2)	3	5.7 (7.2)	262	7 (2.7)	262	5 (1.9)	7	1.3 (0.5)	261	0 (0)	261	0 (0)
Outer regional/remote	197		3		197		197		10		197		197	
Intervention	123	2 (1.6)	2	23.5 (31.8)	123	7 (5.7)	123	5 (4.1)	7	6.3 (10.7)	123	0 (0)	123	0 (0)
Control	74	1 (1.4)	1	28.0 (0)	74	3 (4.1)	74	2 (2.7)	3	5.3 (4.7)	74	0 (0)	74	0 (0)
Disadvantage:														
Low	1239		17		1236		1236		52		1234		1234	
Intervention	705	10 (1.4)	10	8.6 (16.4)	704	34 (4.8)	704	27 (3.8)	34	3.2 (7.0)	704	7 (1.0)	704	3 (0.4)
Control	534	8 (1.5)	7	10.3 (11.8)	532	18 (3.4)	532	14 (2.6)	18	3.9 (4.7)	530	3 (0.6)	530	1 (0.2)
High	866		10		866		866		33		866		866	
Intervention	556	10 (1.8)	9	18.3 (35.5)	556	23 (4.1)	556	25 (4.5)	22	4.8 (7.3)	556	7 (1.3)	556	5 (0.9)
Control	310	2 (0.7)	1	50.0 (n/a)	310	13 (4.2)	310	11 (3.6)	11	3.2 (5.0)	310	4 (1.3)	310	3 (1.0)

Subgroups	TOBACCO				ALCOHOL						ILLICIT SUBSTANCES			
	N	*Recent* n (%)	*N*	*Amount* Mean (SD)	*N*	*Recent* n (%)	*N*	*'Risk'* n (%)	*N*	*Amount* Mean (SD)	*N*	*Marijuana* n (%)	*N*	*Other* n (%)
Baseline use:														
User	170		27		564		564		85		21		12	
Intervention	106	20 (18.9)	19	13.2 (26.2)	364	57 (15.7)	364	52 (14.3)	56	3.8 (7.1)	14	14 (100)	8	8 (100)
Control	64	10 (15.6)	8	15.3 (17.8)	200	31 (15.5)	200	25 (12.5)	29	3.7 (4.8)	7	7 (100)	4	4 (100)
FOLLOW UP 2014														
All students:	2105		201		2105		2105		375		2105		2105	
Intervention	1261	148 (11.8)	136	23.6 (33.1)	1261	261 (20.9)	1261	293 (23.6)	237	7.0 (7.8)	1261	193 (15.6)	1261	85 (6.9)
Control	844	75 (8.9)	65	25.7 (28.9)	844	156 (18.6)	844	196 (23.4)	138	7.9 (11.2)	844	115 (13.7)	844	47 (5.6)
Gender:														
Males	1061		91		1056		1054		193		1052		1052	
Intervention	632	72 (11.4)	62	28.6 (41.6)	628	142 (22.6)	627	148 (23.6)	122	8.3 (9.2)	625	107 (17.1)	625	50 (8.0)
Control	429	37 (8.6)	29	33.2 (34.5)	428	87 (20.3)	427	116 (27.2)	71	9.8 (14.2)	427	68 (15.9)	427	34 (8.0)
Females	1031		110		1026		1026		182		1024		1024	
Intervention	618	76 (12.3)	74	19.3 (23.4)	616	118 (19.2)	616	145 (23.5)	115	5.7 (5.6)	613	86 (14.0)	613	35 (5.7)
Control	413	38 (9.2)	36	19.7 (22.1)	410	69 (16.8)	410	80 (19.5)	67	5.8 (6.2)	411	47 (11.4)	411	13 (3.2)
Remoteness:														
Major city	1024		88		1017		1015		168		1012		1012	
Intervention	516	61 (11.8)	56	24.2 (32.0)	512	101 (19.7)	511	118 (23.1)	92	6.5 (8.2)	507	86 (17.0)	507	48 (9.5)
Control	508	37 (7.3)	32	17.2 (24.9)	505	84 (16.6)	504	115 (22.8)	76	7.6 (12.6)	505	61 (12.1)	505	25 (5.0)
Inner regional	870		85		868		868		172		866		866	
Intervention	610	72 (11.8)	65	23.6 (36.2)	609	141 (23.2)	609	139 (22.8)	127	6.9 (7.1)	607	93 (15.3)	607	35 (5.8)
Control	260	25 (9.6)	20	30.8 (32.3)	259	53 (20.5)	259	59 (22.8)	45	7.6 (9.5)	259	42 (16.2)	259	19 (7.3)
Outer regional/remote	197		28		196		196		35		197		197	
Intervention	123	15 (12.2)	15	20.9 (23.5)	122	18 (14.8)	122	36 (29.5)	18	10.6 (9.4)	123	14 (11.4)	123	2 (1.6)
Control	74	13 (17.6)	13	38.8 (27.8)	74	19 (25.7)	74	22 (29.7)	17	9.9 (8.6)	74	12 (16.2)	74	3 (4.1)
Disadvantage:														
Low	1236		118		1233		1233		229		1232		1232	
Intervention	704	83 (11.8)	74	19.1 (22.1)	702	153 (21.8)	702	173 (24.6)	139	6.9 (7.6)	702	113 (16.1)	702	50 (7.1)
Control	532	49 (9.2)	44	32.0 (30.9)	531	104 (19.6)	531	124 (23.4)	90	7.9 (8.5)	530	71 (13.4)	530	29 (5.5)

Subgroups	TOBACCO				ALCOHOL						ILLICIT SUBSTANCES			
	N	*Recent* n (%)	*N*	*Amount* Mean (SD)	*N*	*Recent* n (%)	*N*	*'Risk'* n (%)	*N*	*Amount* Mean (SD)	*N*	*Marijuana* n (%)	*N*	*Other* n (%)
High	856		83		849		847		146		844		844	
Intervention	546	65 (11.9)	62	28.9 (42.3)	542	107 (19.7)	541	120 (22.2)	98	7.2 (8.0)	536	80 (14.9)	536	35 (6.5)
Control	310	26 (8.4)	21	12.6 (18.8)	307	52 (16.9)	306	72 (23.5)	48	7.7 (15.1)	308	44 (14.3)	308	18 (5.8)
Baseline use:														
Non-User	1923		147		1526		1525		206		2055		2064	
Intervention	1145	109 (9.5)	100	17.3 (22.4)	886	131 (14.8)	885	153 (17.3)	121	6.2 (8.2)	1224	183 (15.0)	1230	83 (6.8)
Control	778	56 (7.2)	47	22.5 (25.3)	6402	96 (15.0)	640	109 (17.0)	85	7.3 (11.8)	831	111 (13.4)	834	47 (5.6)
User	169		54		556		555		169		21		12	
Intervention	105	39 (37.1)	36	40.9 (48.9)	358	129 (36.0)	358	140 (39.1)	116	7.8 (7.2)	14	10 (71.4)	8	2 (25.0)
Control	64	19 (29.7)	18	34.1 (36.1)	198	60 (30.3)	197	87 (44.2)	53	8.8 (10.3)	7	4 (57.1)	4	0 (0)

Subgroups	PROTECTIVE FACTORS			
	N	*Individual* Mean (SD)	*N*	*Environmental* Mean (SD)
BASELINE				
All students	2105		2105	
Intervention	1261	3.0 (0.5)	1261	3.0 (0.6)
Control	844	3.1 (0.4)	844	3.0 (0.5)
Gender				
Males	1071		1071	
Intervention	640	3.0 (0.5)	640	2.9 (0.6)
Control	431	3.0 (0.4)	431	2.9 (0.5)
Females	1034		1034	
Intervention	621	3.1 (0.5)	621	3.1 (0.5)
Control	413	3.2 (0.4)	413	3.1 (0.5)
Remoteness				
Major city	1033		1033	
Intervention	525	3.0 (0.5)	525	2.9 (0.5)
Control	508	3.1 (0.4)	508	3.0 (0.5)
Inner regional	874		874	
Intervention	612	3.1 (0.5)	612	3.0 (0.6)
Control	262	3.1 (0.4)	262	3.0 (0.5)
Outer regional/remote	197		197	
Intervention	123	3.0 (0.5)	123	3.0 (0.6)
Control	74	3.0 (0.5)	74	3.0 (0.5)
Disadvantage				
Low	1239		1239	
Intervention	705	3.0 (0.5)	705	3.0 (0.6)
Control	534	3.1 (0.5)	534	3.0 (0.5)
High	866		866	
Intervention	556	3.0 (0.5)	556	3.0 (0.5)
Control	310	3.1 (0.4)	310	3.0 (0.5)
Baseline use				
User	602		602	
Intervention	387	2.9 (0.5)	387	2.9 (0.6)
Control	215	2.9 (0.4)	215	2.8 (0.6)

Subgroups	PROTECTIVE FACTORS			
	N	*Individual* Mean (SD)	*N*	*Environmental* Mean (SD)
FOLLOW UP				
All students	2098		2101	
Intervention	1257	3.0 (0.5)	1259	2.8 (0.6)
Control	841	3.0 (0.5)	842	2.8 (0.6)
Gender				
Males	1065		1070	
Intervention	637	3.0 (0.5)	640	2.7 (0.6)
Control	428	3.0 (0.5)	430	2.7 (0.6)
Females	1033		1031	
Intervention	620	3.0 (0.5)	619	2.8 (0.6)
Control	413	3.1 (0.5)	412	2.8 (0.6)
Remoteness				
Major city	1030		1031	
Intervention	524	3.0 (0.5)	524	2.7 (0.6)

Subgroups	PROTECTIVE FACTORS			
	N	*Individual* Mean (SD)	*N*	*Environmental* Mean (SD)
Control	506	3.0 (0.5)	507	2.8 (0.6)
Inner regional	872		872	
Intervention	611	3.0 (0.5)	611	2.8 (0.6)
Control	261	2.8 (0.6)	261	2.7 (0.6)
Outer regional/remote	195		197	
Intervention	121	3.0 (0.5)	123	2.8 (0.6)
Control	74	2.8 (0.5)	74	2.7 (0.6)
Disadvantage				
Low	1236		1237	
Intervention	703	3.0 (0.5)	704	2.8 (0.6)
Control	533	3.0 (0.5)	533	2.8 (0.6)
High	862		864	
Intervention	554	3.0 (0.5)	555	2.7 (0.6)
Control	308	3.1 (0.5)	309	2.8 (0.6)
Baseline use				
Non-User	1500		1500	
Intervention	873	3.1 (0.5)	872	2.8 (0.6)
Control	627	3.1 (0.5)	628	2.8 (0.6)
User	598		601	
Intervention	384	2.9 (0.5)	387	2.7 (0.6)
Control	214	2.9 (0.5)	214	2.6 (0.6)

APPENDIX 7.1. Correlations between all resilience protective factor subscale scores

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cooperation and communication (1)	1.00													
Empathy (2)	0.48*	1.00												
Goals and aspirations (3)	0.30*	0.39*	1.00											
Problem solving (4)	0.43*	0.38*	0.31*	1.00										
Self-awareness (5)	0.45*	0.25*	0.30*	0.44*	1.00									
Self-efficacy (6)	0.48*	0.32*	0.37*	0.42*	0.53*	1.00								
School support (7)							1.00							
School meaningful participation (8)							0.58*	1.00						
Community support (9)							0.53*	0.42*	1.00					
Community meaningful participation (10)							0.36*	0.41*	0.42*	1.00				
Home support (11)							0.50*	0.38*	0.52*	0.38*	1.00			
Home meaningful participation (12)							0.48*	0.53*	0.50*	0.41*	0.61*	1.00		
Pro-social peers (13)							0.35*	0.30*	0.29*	0.26*	0.38*	0.32*	1.00	
Peer caring relationships (14)							0.33*	0.26*	0.40*	0.26*	0.36*	0.34*	0.30*	1.00

* $p<0.0001$.