



**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.

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08/12/2017

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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

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Chapter 7

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CO-AUTHOR STATEMENT FOR CHAPTER 6

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

Hodder RK, Freund M, Bowman J, Wolfenden L, Campbell E, Dray J, Lecathelinais C, Oldmeadow C, Attia J, Wiggers J. Differential effectiveness of a universal school-based resilience intervention in reducing substance use within student subgroups: exploratory assessment. Under editorial review with BMJOpen.

By:

- Conducting the literature search;
- Contributing to the study design, data collection and coordination of the study;
- Undertaking data analysis and interpretation;
- Drafting the manuscript.

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Megan Freund		14/09/2017
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Christophe Lecathelinais		05/10/2017
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CO-AUTHOR STATEMENT FOR CHAPTER 7

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

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.

DOI:10.1136/bmjopen-2016- 012688.

By:

- Contributing to the study design, data collection and coordination of the study;
- Led the conception of the paper, data analysis and interpretation;
- Drafting the manuscript.

Full name of co-author	Signature	Date
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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.