The feasibility of an online universal school-based intervention to prevent alcohol and cannabis use in the United Kingdom.

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Title: The feasibility of an online universal school-based intervention to prevent alcohol and cannabis use in the United Kingdom.

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ABSRACT

Objectives: The online universal intervention, known as the *Climate Schools: Alcohol and Cannabis course*, has been found to be effective in reducing the use of alcohol and cannabis among Australian adolescents. The aim of the current study was to examine the feasibility of implementing this prevention programme in the United Kingdom (UK).

Design: A pilot study examining the feasibility of the *Climate Schools* programme in the UK was conducted with teachers and students from Year 9 classes at two secondary schools in South East London. Teachers were asked to implement the evidence-based *Climate Schools* programme over the school year with their students. The intervention consisted of two modules (each with six lessons) delivered approximately six months apart. Following completion of the intervention, students and teachers were asked to evaluate the programme.

Results: Eleven teachers and 222 students evaluated the programme. Overall the evaluations were extremely positive. Specifically, 85% of students said the information on alcohol and cannabis and how to stay safe was easy to understand, 84% said it was easy to learn, and 80% said the online cartoon-based format was an enjoyable way to learn health theory topics. All teachers said the students were able to recall the information taught, 82% said the computer component was easy to implement, and all teachers said the teacher manual was easy to use to prepare class activities. Importantly, 82% of teachers said it was likely they would use the programme in the future and recommend it to others.

Conclusions: An online universal school-based prevention programme for alcohol and cannabis use was found to be both feasible and acceptable to students and teachers in the UK. A full evaluation trial of the *Climate Schools* intervention is now required to examine its effectiveness in reducing alcohol and cannabis use amongst adolescents in the UK.

ARTICLE SUMMARY

Strengths and limitations of this study

- A pilot study examining the feasibility of the Internet-based *Climate Schools* programme in the UK was conducted with 222 students and 11 teachers at secondary schools in London.
- Student evaluations were extremely positive with approximately 85% reporting the information taught in the programme was easy to understand and learn.
- Teacher evaluations were extremely positive with all teachers reporting the students were able to recall the information and over 80% saying they would be likely to use the programme in the future and recommend it to others.
- Overall, the online school-based *Climate Schools* prevention programme was found to be both feasible and acceptable to students and teachers in the UK.
- A full evaluation trial of the *Climate Schools* intervention is now required to examine its effectiveness in the UK.

INTRODUCTION

Substance use amongst young people continues to be a serious public health concern. The 2011 European School Survey Project on Alcohol and Other Drugs (EPSAD) examined substance use in over 100,000 students from 36 European countries including the United Kingdom (UK), and found alcohol and cannabis to most commonly used licit and illicit drugs respectively (1). On average, 87% of students reported drinking alcohol at least once in their lifetime, 57% reported drinking alcohol in the past month, and 39% reported heavy episodic drinking in the past month (defined as 5 or more drinks on one occasion). Average lifetime cannabis use was 17%, with use by UK students at one in four.

The high prevalence of use amongst young people is particularly concerning considering that such behaviours are associated with significant burden of disease (2, 3), socials costs (4), and increased risk of developing substance use disorders (5, 6) and co-morbid mental health problems (7). To alleviate this burden and reduce the occurrence and cost of such problems, prevention is essential and needs to be initiated early before harmful patterns of drug use are established and begin to cause disability (8, 9).

While prevention strategies do exist, research has not been able to consistently demonstrate that universal school-based drug prevention is effective in reducing actual substance use (10-12), and to date there have been positive evaluations of effective universal interventions to prevent substance use in the UK. This is because the effectiveness of school-based prevention is often compromised by obstacles associated with programme implementation and dissemination (13, 14), and by the adoption of an abstinence- as opposed to the successful harm-minimisation approach to prevention (15-18).

The universal Internet-based *Climate Schools: Alcohol and Cannabis course* was developed to overcome these obstacles and aims to prevent alcohol and cannabis use and related harms amongst adolescents. The *Climate Schools* programme is based on the effective harm-minimisation approach to prevention and uses cartoon storylines to engage and maintain student interest (19). The programme is facilitated by the Internet which guarantees complete and consistent delivery whilst ensuring high implementation fidelity. The programme is designed to fit within the school health curriculum and be implemented to 13-14 year olds before significant exposure to alcohol and drug use occurs, and consists of two sets of six

lessons delivered approximately 6 months apart over the school year. The efficacy of the *Climate Schools* programme has been established using a cluster randomised controlled trial (RCT) in 10 secondary schools in Australia (n=764) (20, 21). Results from the RCT demonstrate that compared to the control group, students in the intervention group showed significant improvements in alcohol and cannabis knowledge, reductions in average alcohol consumption and binge drinking, and a reduction in frequency of cannabis use up to twelve months following the intervention. In addition, evaluations of the Internet-based programme by teachers and students in the trial were extremely positive. Specifically, 90% of students reported the information delivered was easy to learn and said they would like to learn other topics through this method, and all teachers rated the programme as superior to other drug prevention programs (20, 21).

Given the high prevalence of alcohol and cannabis use amongst young people along with the clear need for effective universal prevention in the UK, the aim of this study was to examine the feasibility of implementing the *Climate Schools* programme in the UK school setting. Determining the feasibility and acceptability of an intervention is an important step before evaluating its effectiveness in a new context to ensure it is relevant, suitable and easy to implement with the target audience. It was expected teachers and students in the UK who deliver and complete the *Climate Schools* programme would rate it as; 1) easy to implement and understand; 2) an interesting and enjoyable drug education programme; and 3) superior to other drug education programmes.

METHOD

Recruitment of schools

Letters outlining the aims of the study were emailed to a number of secondary schools whom had existing relationships with researchers at the Institute of Psychiatry, Kings College London. Two schools from South East London agreed to participate. All aspects of the study were approved by Kings College London Research Ethics Committee.

Participants

Passive information and consent forms were sent home to parents/guardians of all Year 9 students (13-14 year olds) from the participating schools. Only those students who received

parental consent and gave active written consent themselves were eligible to participate. In addition, active written consent was required from all teachers to participate in the study. Participants were made fully aware that they could withdraw from the study at any time without prejudice.

Procedure

Participating schools were asked to implement the *Climate Schools: Alcohol and Cannabis course* with their Year 9 classes over the school year from 2010-2011. Following completion of the intervention, teachers and students were asked to evaluate the programme through anonymous questionnaires which took approximately 10 minutes to complete. Teachers were reimbursed £20 for their time, and students from each class went into a draw to receive a £10 voucher for their time.

Intervention

The *Climate Schools: Alcohol and Cannabis course* is a universal school-based prevention programme which adopts a harm-minimisation framework. It comprises the delivery of two modules (the *Alcohol module* and the *Alcohol and Cannabis module*), delivered approximately six months apart. Each module includes six 40 minute lessons aimed at reducing alcohol and cannabis use and related harms. The first part of each lesson is a 20 minute Internet-based component completed individually online where students followed a cartoon storyline of teenagers experiencing real life situations and harms associated with alcohol and cannabis use. The cartoon storyline imparts all the core content of the programme. The second part of each lesson is an optional pre-determined activity delivered by the teacher to reinforce the information learnt in the cartoons. Teachers are provided with a teaching manual but no additional training is required in order to implement the course.

As the programme was originally developed in Australia, aspects of the programme content were adapted for the UK before implementation in schools (22, 23). These included changing standard drinks references to units of alcohol, replacing call centre and emergency numbers with their UK counterparts (e.g. 000 swapped for England emergency number of 999), and replacing Australian slang terms with more common terms used in the UK Table 1 outlines the content of each lesson. Access to the full UK version of the *Climate Schools* programme can be found online: www.climateschools.co.uk.

Table 1: Lesson content of the *Climate Schools: Alcohol and Cannabis course*

Module	Lesson	Content
Alcohol	1	Alcohol, the law and underage drinking Alcohol units Guidelines for low-risk drinking limits Identifying the number of alcohol units in alcohol beverages Societal pressures and expectations to drink alcohol
	2	Prevalence and patterns of alcohol consumption among 14-15 yr olds Alcohol-free social activities Identifying sources of pressure to drink too much alcohol Identifying the reasons teenagers choose to or not to drink alcohol Dispelling some myths about alcohol: "Coffee sobers you up"
	3	Short- and long- term consequences of drinking too much alcohol Identifying the potential for risk and harm in common teenage drinking scenarios Exploring ways to prevent alcohol related harm in common teenage drinking scenarios Identifying sources of help for teenagers
	4	Myths and facts about alcohol Advertising tactics Alcohol advertising laws Alcohol advertising and youth
	5	Drug refusal skills Ways to minimise alcohol consumption Tips to keep people safe who are drinking too much alcohol Decision-making about whether to consume alcohol with the purpose of getting drunk Examining different views on the consumption of alcohol
	6	Ways to prevent an alcohol related medical emergency Recognising the signs of an alcohol related medical emergency What to do if there is a medical emergency Who to contact if there is a medical emergency Calling the emergency number "999" The recovery position
Alcohol and Cannabis	1	Alcohol, the law and underage drinking Guidelines for low-risk drinking limits Identifying the number of in alcoholic beverages Prevalence and patterns of alcohol use among 14 – 15 year olds Acute harms/ consequences associated with alcohol use
	2	Alcohol, the law and underage drinking Identifying reasons why teenagers choose to or not to drink Alcohol-free activities Acute and chronic harms/ consequences of drinking alcohol Identifying the potential for risk and harm in common teenage

		drinking scenarios Exploring ways to prevent alcohol related harm in common teenage drinking scenarios e.g. Tips to keep people safe who were drinking too much alcohol and ways to minimize alcohol consumption Drug refusal skills
	3	The UK guidelines for low risk drinking limits Acute and chronic harms/ consequences of drinking alcohol What is cannabis Prevalence and patterns of cannabis use among 14 – 16 year olds Identifying reasons why teens choose to or not to use cannabis Acute harms/ consequences of using cannabis on health and well-being Varying effects of cannabis from person to person
	4	Cannabis and the law Economic consequences of using cannabis Acute and chronic harms/ consequences of using cannabis on health and well-being Varying effects of cannabis from person to person Recognizing problems associated with cannabis use Teaching and responding to risk and harm in common teenage scenarios Tips to keep people safe who are using cannabis
	5	Acute and chronic harms/ consequences of cannabis on health and well-being Relationship between cannabis use and mental illness Identifying reasons why people choose to or not to use cannabis Recognizing problems associated with cannabis use Seeking help
	6	Dealing and coping with challenging situations Effects of other people's drug use Recognizing and responding to risk and harms of cannabis Tips to help friends reduce or cease using cannabis Alternatives to using cannabis Identifying when to seek help Identifying where to seek help e.g. resources and support agencies for teenagers using cannabis (both at school and in the community)

Measures

Demographics

Demographic information was obtained including participant's age, gender as well as number of teaching years for teachers.

Programme evaluation

Students and teachers were asked to evaluate the programme using questionnaires that have been employed in the previous Australian trial of the *Climate Schools* programme (24).

Student evaluation

Students were asked to evaluate the programme by indicating on a seven point Likert scale how strongly they agreed or disagreed with 10 statements relating to content of the programme and how enjoyable and interesting they found it to be. Statements included *"The cartoon story was an enjoyable way of learning health education"*, and *"The information on alcohol and cannabis and how to stay safe was easy to understand"*.

Teacher evaluation

Teachers were asked to evaluate the programme by answering 15 questions relating to programme content, ease of implementation, and overall ratings of the programme. Thirteen questions were closed questions with fixed response categories and two were open-ended questions that asked teachers to list ways the programme could be improved in the future as well as any additional comments they had. In addition, teachers were asked to record what lessons and activities they delivered with their students.

RESULTS

Analyses

Descriptive statistics of the student and teacher data were obtained using PASW Statistics 18 and a thematic analysis of the open-ended teacher responses was performed.

Sample characteristics

Two hundred and twenty two Year 9 students, who received parental consent and consented themselves, participated in the study and completed the student evaluation questionnaire. Students ranged in age from 12-15 years with a mean age of 13.86 years (SD = 0.40) and 57% were female.

Eleven teachers who implemented the *Climate Schools* course with their students evaluated the programme. Teachers ranged in age from 24 – 54 years with a mean age of 38.11 years (SD = 10.47) and 91% were female. The average number of years teaching was 11 years (SD = 8.52).

Programme evaluation

Student evaluation

Responses to the student evaluation questionnaire are presented in Table 2. In regards to the online cartoon storyline, 80% of students agreed (either strongly, moderately or slightly) that the cartoon story was an enjoyable way of learning health education, 78% agreed it helped keep their interest while learning, 66% agreed it was relevant to experiences in their own lives and 65% reported they would like to learn other health theory topics this way. In regards to the information on alcohol and cannabis and how to stay safe, 85% of students, agreed it was easy to understand, 84% agreed it was easy to learn, and 79% agreed it was easy to remember. When asked to evaluate the optional classroom activities, 67% of students agreed the activities helped them further understand the information taught in the lesson and 60% reported the activities helped them to apply the information to their own lives. Two thirds (64%) of students reported that they planned to use the information learnt in their own lives.

Table 2: Student evaluation of the Climate Schools: Alcohol and Cannabis course (n=222)

	Strongly agree	Moderately agree	Slightly agree	Undecided	Slightly disagree	Moderately disagree	Strongly agree
1. The cartoon story was an enjoyable way of learning health education.	39.2%	23.0%	17.6%	10.8%	3.6%	2.3%	3.6%
2. The cartoon story helped keep my interest while I learned the information.	29.3%	28.8%	19.4%	12.6%	5.9%	2.3%	1.8%
3. The cartoon story was relevant to current or future experiences in my life or lives of my peers.	21.6%	19.4%	25.2%	20.3%	7.2%	3.2%	3.2%
4. The information on alcohol & cannabis and how to stay safe was easy to understand.	38.3%	27.9%	18.9%	10.4%	3.2%	0.9%	0.5%
5. The information on alcohol & cannabis and how to stay safe was easy to learn.	37.8%	28.8%	17.1%	9.0%	4.5%	1.8%	0.9%

6. The information on alcohol & cannabis and how to stay safe was easy to remember.	28.4%	30.6%	20.3%	9.5%	5.4%	4.1%	1.8%
7. I would like to learn other health theory topics through cartoon stories.	26.6%	20.3%	18%	15.8%	8.6%	3.6%	7.2%
8. The classroom activities helped me to further understand the information.	21.2%	26.6%	19.4%	17.6%	9.5%	2.3%	3.6%
9. The classroom activities helped me to apply the information I learnt in the cartoons to my own life.	21.6%	19.8%	18.9%	22.5%	9.9%	5.0%	2.3%
10. I plan to use the information I learnt in this programme in my own life.	26.1%	15.8%	21.6%	21.6%	7.7%	1.4%	5.9%

Teacher evaluation

All teachers reported implementing the programme in its entirety, including the computerised cartoon components and at least one class-based activity for each lesson. Teacher responses to the closed-ended teacher evaluation questions are summaried below.

When asked to evaluate the cartoon storyline, all teachers said the students were able to recall the information taught, the majority (91%) said the students liked the cartoons, and 82% of teachers said it held the students attention well. In regards to implementation, eighty two percent of teachers said it was easy (or very easy) to implement the computer component of the programme, one teacher said average, and one said difficult. All but one of the teachers (91%) said it was easy (or very easy) to gain access to computers at their school, and one said it was difficult. All teachers reported that it was easy (or very easy) to use the teacher manual to prepare class activities and all said the activities helped reinforce the storylines.

When asked to rate the overall programme, all except one of teachers (91%) rated it as very good, good, or average. In comparison to other drug education programmes, three quarters of teachers (73%) rated it as better (or much better) than other programmes with the remaining rating it as the same as other programmes. Importantly, eighty two percent of teachers said it was likely (or very likely) they would use the programme in the future and recommend it to others.

Two themes arose from the suggestions teachers gave to improving the programme. The first related to shortening the cartoons and/or make them more interactive in order to better hold student's attention. Specific comments around this included, *"Stories need to be shorter and more interesting", "Cartoons need to be shorter to hold the students attention", "One pupil suggested it be a talking cartoon", "Sound effects/music on the cartoon", and "The module could be more interactive"*. The second theme of suggestions related to repetition in the module due to implementing them so close together. Specific comments around this included, *"(there is) Sometimes repetition in lessons on the alcohol and cannabis modules"*, and *"When students have done the alcohol module to do the cannabis and alcohol module straight after makes some of the content a little repetitive"*. In addition, general comments from teachers regarding the programme were positive and included, *"It was fun and different from the usual, and far more interactive"* and *"On the whole a good pack to use with students"*.

DISCUSSION

Prior to evaluating an intervention in a new context it is important to ensure it is relevant, suitable and easy to implement with the target audience. The *Climate Schools* programme is a 12-lesson universal school-based intervention to prevent alcohol and cannabis use and related harms. The programme has previously been found to be effective in reducing the use of alcohol and cannabis amongst adolescents in Australia, however it is yet to be trialled internationally. This study aimed to examine the feasibility and acceptability of the online universal *Climate Schools: Alcohol and Cannabis course* in the UK.

Teachers from two schools in South East London implemented the 12-lesson programme with their Year 9 students over the year. Following completion of the intervention, students and teachers evaluated the programme to examine it's feasibility in the UK school setting. Overall, both the student and teacher evaluations of the programme were extremely positive and are consistent with the positive evaluations received from students and teachers who participated in the Australian RCT of the *Climate Schools* intervention (24).

Specifically, the majority of students who received the programme reported they enjoyed learning health education through the online cartoon-based format and said it helped keep their interest. The vast majority of students said the information on alcohol and cannabis and how to stay safe was easy to understand and easy to learn, and two thirds said they planned to use the information learnt in their own lives.

All teachers reported delivering the programme with high fidelity, in full with their students. All teachers believed students were able to recall the information taught, and the vast majority said students like the online cartoon-based format and that it held students attention well. Teachers attested to the ease of implementation of programme, rating the computer-based component as easy to implement and the teacher's manual as easy to use when preparing class activities. Importantly, four fifths of teachers reported they were likely they would use the programme in the future and recommend it to others.

The main areas and suggestions for improving the programme that arose from the evaluations were to make the storylines shorter or more interactive to better hold student's attention and to deliver the modules further apart as the students found some of the information repetitive.

Both these points should be considered and addressed prior to implanting a full scale trial of the programme in the UK. Overall, these positive evaluations attest to the feasibility and acceptability of implementing an online universal school-based prevention program for alcohol and cannabis use in the UK.

Limitations of the study should be considered when interpreting the results. As this was a pilot study aimed at examining the feasibility of the programme in the UK school setting, the numbers of schools recruited to the study was small and all schools were located in the same geographic area of South East London. To ensure the findings from this study are generalisable, it is important to evaluate the programme in a greater and more diverse range of schools across the UK. This could be achieved in conjunction with a larger RCT of the programme's effectiveness.

Conclusion

Overall, the online universal *Climate Schools: Alcohol and Cannabis course* was found to be a feasible and acceptable means of delivering drug education in the UK school system. Given these findings coupled with the positive findings from the Australian trial of the programme, the *Climate Schools* intervention has the potential to address the clear need for effective alcohol and other drug prevention in the UK. The next step is a full evaluation trial of the *Climate Schools* intervention with students in the UK to examine its effectiveness. It is expected that the *Climate Schools* programme will demonstrate similar effects in preventing the use of alcohol and cannabis amongst adolescents in the UK, as it did in Australia.

Acknowledgements

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Conflict of interest statement

NN and MT are two of the original developers of the *Climate Schools* programme. *Climate Schools* is operated on a not-for-profit basis.

Contributorship

NN, PC & MT designed the study and gained ethical approval to conduct the study in schools. NN & DR adapted the programme content for use in the UK, recruited schools, and oversaw the implementation of the programme and surveys into schools. All authors contributed to the writing of the manuscript.

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TREND Statement Checklist

Paper Section/ Topic	Item No	Descriptor	Reported? ✓	Reported? Pg #
Title and Abstract				
Title and Abstract	1	• Information on how unit were allocated to interventions	X	1-2
		• Structured abstract recommended	X	2
		• Information on target population or study sample	X	2
Introduction				
Background	2	• Scientific background and explanation of rationale	X	4-5
		• Theories used in designing behavioral interventions	X	4-5
Methods				
Participants	3	• Eligibility criteria for participants, including criteria at different levels in recruitment/sampling plan (e.g., cities, clinics, subjects)	X	5-6
		• Method of recruitment (e.g., referral, self-selection), including the sampling method if a systematic sampling plan was implemented	X	5-6
		• Recruitment setting	X	5
		• Settings and locations where the data were collected	X	5-6
Interventions	4	• Details of the interventions intended for each study condition and how and when they were actually administered, specifically including:	X	6-8
		○ Content: what was given?	X	7-8
		○ Delivery method: how was the content given?	X	6
		○ Unit of delivery: how were the subjects grouped during delivery?	X	6
		○ Deliverer: who delivered the intervention?	X	6
		○ Setting: where was the intervention delivered?	X	6
		○ Exposure quantity and duration: how many sessions or episodes or events were intended to be delivered? How long were they intended to last?	X	6
		○ Time span: how long was it intended to take to deliver the intervention to each unit?	X	6
		○ Activities to increase compliance or adherence (e.g., incentives)	X	6
Objectives	5	• Specific objectives and hypotheses	X	5
Outcomes	6	• Clearly defined primary and secondary outcome measures	X	8-9
		• Methods used to collect data and any methods used to enhance the quality of measurements	X	6
		• Information on validated instruments such as psychometric and biometric properties	X	8-9
Sample Size	7	• How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules	X	9
Assignment Method	8	• Unit of assignment (the unit being assigned to study condition, e.g., individual, group, community)	X	5-6
		• Method used to assign units to study conditions, including details of any restriction (e.g., blocking, stratification, minimization)	X	5-6
		• Inclusion of aspects employed to help minimize potential bias induced due to non-randomization (e.g., matching)	X	5-6

TREND Statement Checklist

Blinding (masking)	9	• Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to study condition assignment; if so, statement regarding how the blinding was accomplished and how it was assessed.	X	6
Unit of Analysis	10	• Description of the smallest unit that is being analyzed to assess intervention effects (e.g., individual, group, or community)	X	5-6
		• If the unit of analysis differs from the unit of assignment, the analytical method used to account for this (e.g., adjusting the standard error estimates by the design effect or using multilevel analysis)	X	9
Statistical Methods	11	• Statistical methods used to compare study groups for primary methods outcome(s), including complex methods of correlated data	X	9
		• Statistical methods used for additional analyses, such as a subgroup analyses and adjusted analysis	N/A	
		• Methods for imputing missing data, if used	N/A	
		• Statistical software or programs used	X	9
Results				
Participant flow	12	• Flow of participants through each stage of the study: enrollment, assignment, allocation, and intervention exposure, follow-up, analysis (a diagram is strongly recommended)	N/A	
		○ Enrollment: the numbers of participants screened for eligibility, found to be eligible or not eligible, declined to be enrolled, and enrolled in the study	X	9
		○ Assignment: the numbers of participants assigned to a study condition	X	9
		○ Allocation and intervention exposure: the number of participants assigned to each study condition and the number of participants who received each intervention	X	9
		○ Follow-up: the number of participants who completed the follow-up or did not complete the follow-up (i.e., lost to follow-up), by study condition	N/A	
		○ Analysis: the number of participants included in or excluded from the main analysis, by study condition	X	9
		• Description of protocol deviations from study as planned, along with reasons	N/A	
Recruitment	13	• Dates defining the periods of recruitment and follow-up	X	6
Baseline Data	14	• Baseline demographic and clinical characteristics of participants in each study condition	X	9
		• Baseline characteristics for each study condition relevant to specific disease prevention research	N/A	
		• Baseline comparisons of those lost to follow-up and those retained, overall and by study condition	N/A	
		• Comparison between study population at baseline and target population of interest	N/A	
Baseline equivalence	15	• Data on study group equivalence at baseline and statistical methods used to control for baseline differences	N/A	

TREND Statement Checklist

Numbers analyzed	16	• Number of participants (denominator) included in each analysis for each study condition, particularly when the denominators change for different outcomes; statement of the results in absolute numbers when feasible	X	9
		• Indication of whether the analysis strategy was "intention to treat" or, if not, description of how non-compliers were treated in the analyses	N/A	
Outcomes and estimation	17	• For each primary and secondary outcome, a summary of results for each estimation study condition, and the estimated effect size and a confidence interval to indicate the precision	X	10-12
		• Inclusion of null and negative findings	X	10-12
		• Inclusion of results from testing pre-specified causal pathways through which the intervention was intended to operate, if any	X	10-12
Ancillary analyses	18	• Summary of other analyses performed, including subgroup or restricted analyses, indicating which are pre-specified or exploratory	N/A	
Adverse events	19	• Summary of all important adverse events or unintended effects in each study condition (including summary measures, effect size estimates, and confidence intervals)	N/A	
DISCUSSION				
Interpretation	20	• Interpretation of the results, taking into account study hypotheses, sources of potential bias, imprecision of measures, multiplicative analyses, and other limitations or weaknesses of the study	X	13
		• Discussion of results taking into account the mechanism by which the intervention was intended to work (causal pathways) or alternative mechanisms or explanations	X	13
		• Discussion of the success of and barriers to implementing the intervention, fidelity of implementation	X	13-14
		• Discussion of research, programmatic, or policy implications	X	13-14
Generalizability	21	• Generalizability (external validity) of the trial findings, taking into account the study population, the characteristics of the intervention, length of follow-up, incentives, compliance rates, specific sites/settings involved in the study, and other contextual issues	X	14
Overall Evidence	22	• General interpretation of the results in the context of current evidence and current theory	X	13-14

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A pilot study of an online universal school-based intervention to prevent alcohol and cannabis use in the United Kingdom.

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Title: A pilot study of an online universal school-based intervention to prevent alcohol and cannabis use in the United Kingdom.

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ABSRACT

Objectives: The online universal *Climate Schools* intervention has been found to be effective in reducing the use of alcohol and cannabis among Australian adolescents. The aim of the current study was to examine the feasibility of implementing this prevention programme in the United Kingdom (UK).

Design: A pilot study examining the feasibility of the *Climate Schools* programme in the UK was conducted with teachers and students from Year 9 classes at two secondary schools in South East London. Teachers were asked to implement the evidence-based *Climate Schools* programme over the school year with their students. The intervention consisted of two modules (each with six lessons) delivered approximately six months apart. Following completion of the intervention, students and teachers were asked to evaluate the programme.

Results: Eleven teachers and 222 students from two secondary schools evaluated the programme. Overall the evaluations were extremely positive. Specifically, 85% of students said the information on alcohol and cannabis and how to stay safe was easy to understand, 84% said it was easy to learn, and 80% said the online cartoon-based format was an enjoyable way to learn health theory topics. All teachers said the students were able to recall the information taught, 82% said the computer component was easy to implement, and all teachers said the teacher manual was easy to use to prepare class activities. Importantly, 82% of teachers said it was likely they would use the programme in the future and recommend it to others.

Conclusions: The online universal *Climate Schools* prevention programme to be both feasible and acceptable to students and teachers in the UK. A full evaluation trial of the intervention is now required to examine its effectiveness in reducing alcohol and cannabis use amongst adolescents in the UK before implementation into the UK school system.

ARTICLE SUMMARY

Strengths and limitations of this study

- A pilot study examining the feasibility of the Internet-based *Climate Schools* programme in the UK was conducted with 222 students and 11 teachers at secondary schools in London.
- Student evaluations were extremely positive with approximately 85% reporting the information taught in the programme was easy to understand and learn.
- Teacher evaluations were extremely positive with all teachers reporting the students were able to recall the information and over 80% saying they would be likely to use the programme in the future and recommend it to others.
- Overall, the online school-based *Climate Schools* prevention programme was found to be both feasible and acceptable to students and teachers in the UK.
- A full evaluation trial of the *Climate Schools* intervention is now required to examine its effectiveness in the UK.

INTRODUCTION

Substance use amongst young people continues to be a serious public health concern. The 2011 European School Survey Project on Alcohol and Other Drugs (EPSAD) examined substance use in over 100,000 students from 36 European countries including the United Kingdom (UK), and found alcohol and cannabis to most commonly used licit and illicit drugs respectively (1). On average, 87% of students reported drinking alcohol at least once in their lifetime, 57% reported drinking alcohol in the past month, and 39% reported heavy episodic drinking in the past month (defined as 5 or more drinks on one occasion). Average lifetime cannabis use was 17%, with use by UK students at one in four.

The high prevalence of use amongst young people is particularly concerning considering that such behaviours are associated with significant burden of disease (2, 3), socials costs (4), and increased risk of developing substance use disorders (5, 6) and co-morbid mental health problems (7). To alleviate this burden and reduce the occurrence and cost of such problems, prevention is essential and needs to be initiated early before harmful patterns of drug use are established and begin to cause disability (8, 9).

While prevention strategies do exist, research has not been able to consistently demonstrate that universal school-based drug prevention is effective in reducing actual substance use (10-12), and to date there have been no positive evaluations of effective universal interventions to prevent substance use in the UK. This is because the effectiveness of school-based prevention is often compromised by obstacles associated with programme implementation and dissemination (13, 14), and by the adoption of an abstinence- as opposed to the successful harm-minimisation approach to prevention (15-18).

The universal Internet-based *Climate Schools: Alcohol and Cannabis course* was developed to overcome these obstacles and aims to prevent alcohol and cannabis use and related harms amongst adolescents. The *Climate Schools* programme is based on the effective harm-minimisation approach to prevention and uses cartoon storylines to engage and maintain student interest (19). The programme is facilitated by the Internet which guarantees complete and consistent delivery whilst ensuring high implementation fidelity. The programme is designed to fit within the school health curriculum and be implemented to 13-14 year olds before significant exposure to alcohol and drug use occurs, and consists of two sets of six

lessons delivered approximately 6 months apart over the school year. The efficacy of the *Climate Schools* programme has been established using a cluster randomised controlled trial (RCT) in 10 secondary schools in Australia (n=764) (20, 21). Results from the RCT demonstrate that compared to the control group, students in the intervention group showed significant improvements in alcohol and cannabis knowledge, reductions in average alcohol consumption and binge drinking, and a reduction in frequency of cannabis use up to twelve months following the intervention. In addition, evaluations of the Internet-based programme by teachers and students in the trial were extremely positive. Specifically, 90% of students reported the information delivered was easy to learn and said they would like to learn other topics through this method, and all teachers rated the programme as superior to other drug prevention programs (20, 21).

Given the high prevalence of alcohol and cannabis use amongst young people along with the clear need for effective universal prevention in the UK, the aim of this pilot study was to examine the feasibility of implementing the *Climate Schools* programme in the UK school setting. This evidence-based programme was deemed an appropriate choice for adaptation due to similarities between Australia and the UK in terms of youth drinking culture, age of initiation to substance use, and the fact that alcohol and cannabis are the most commonly used licit and illicit drugs respectively in both countries (1, 22).

Before conducting a full-scale RCT, determining the feasibility and acceptability of an intervention is an important step before evaluating its effectiveness in a new context to ensure it is relevant, suitable and easy to implement with the target audience (23-25). It was expected teachers and students in the UK who deliver and complete the *Climate Schools* programme would rate it as; 1) easy to implement and understand; 2) an interesting and enjoyable drug education programme; and 3) superior to other drug education programmes.

METHOD

Recruitment of schools

Letters outlining the aims of the study were emailed to a number of secondary schools whom had existing relationships with researchers at the Institute of Psychiatry, Kings College

London. Two schools from South East London agreed to participate. All aspects of the study were approved by Kings College London Research Ethics Committee.

Participants

Passive information and consent forms were sent home to parents/guardians of all Year 9 students (13-14 year olds) from the participating schools (N=342). Only those students whose parents did not object to them participating in the study, and gave active written consent themselves, were eligible to participate (N=222). In addition, active written consent was required from all teachers to participate in the study. Participants were made fully aware that they could withdraw from the study at any time without prejudice.

Procedure

The two participating schools were asked to implement the *Climate Schools: Alcohol and Cannabis course* with their Year 9 classes over the school year from 2010-2011. Following completion of the intervention, teachers and students were asked to evaluate the programme through anonymous questionnaires which took approximately 10 minutes to complete. Teachers were reimbursed £20 for their time, and students from each class went into a draw to receive a £10 voucher for their time.

Intervention

The *Climate Schools: Alcohol and Cannabis course* is a universal school-based prevention programme which adopts a harm-minimisation framework. It comprises the delivery of two modules (the *Alcohol module* and the *Alcohol and Cannabis module*), delivered approximately six months apart. Each module includes six 40 minute lessons aimed at reducing alcohol and cannabis use and related harms. The first part of each lesson is a 20 minute Internet-based component completed individually online where students followed a cartoon storyline of teenagers experiencing real life situations and harms associated with alcohol and cannabis use. The cartoon storyline imparts all the core content of the programme. The second part of each lesson is an optional pre-determined activity delivered by the teacher to reinforce the information learnt in the cartoons. Teachers are provided with a teaching manual but no additional training is required in order to implement the course.

As the programme was originally developed in Australia, aspects of the programme content were adapted for the UK before implementation in schools (26-27). These included changing

standard drinks references to units of alcohol, replacing call centre and emergency numbers with their UK counterparts (e.g. 000 swapped for England emergency number of 999), and replacing Australian slang terms with more common terms used in the UK. Table 1 outlines the content of each lesson. Access to the full UK version of the *Climate Schools* programme can be found online: www.climateschools.co.uk.

Table 1: Lesson content of the *Climate Schools: Alcohol and Cannabis course*

Module	Lesson	Content
Alcohol	1	Alcohol, the law and underage drinking Alcohol units Guidelines for low-risk drinking limits Identifying the number of alcohol units in alcohol beverages Societal pressures and expectations to drink alcohol
	2	Prevalence and patterns of alcohol consumption among 14-15 yr olds Alcohol-free social activities Identifying sources of pressure to drink too much alcohol Identifying the reasons teenagers choose to or not to drink alcohol Dispelling some myths about alcohol: "Coffee sobers you up"
	3	Short- and long- term consequences of drinking too much alcohol Identifying the potential for risk and harm in common teenage drinking scenarios Exploring ways to prevent alcohol related harm in common teenage drinking scenarios Identifying sources of help for teenagers
	4	Myths and facts about alcohol Advertising tactics Alcohol advertising laws Alcohol advertising and youth
	5	Drug refusal skills Ways to minimise alcohol consumption Tips to keep people safe who are drinking too much alcohol Decision-making about whether to consume alcohol with the purpose of getting drunk Examining different views on the consumption of alcohol
	6	Ways to prevent an alcohol related medical emergency Recognising the signs of an alcohol related medical emergency What to do if there is a medical emergency Who to contact if there is a medical emergency Calling the emergency number "999" The recovery position
Alcohol and	1	Alcohol, the law and underage drinking Guidelines for low-risk drinking limits

Cannabis		Identifying the number of in alcoholic beverages Prevalence and patterns of alcohol use among 14 – 15 year olds Acute harms/ consequences associated with alcohol use
	2	Alcohol, the law and underage drinking Identifying reasons why teenagers choose to or not to drink Alcohol-free activities Acute and chronic harms/ consequences of drinking alcohol Identifying the potential for risk and harm in common teenage drinking scenarios Exploring ways to prevent alcohol related harm in common teenage drinking scenarios e.g. Tips to keep people safe who were drinking too much alcohol and ways to minimize alcohol consumption Drug refusal skills
	3	The UK guidelines for low risk drinking limits Acute and chronic harms/ consequences of drinking alcohol What is cannabis Prevalence and patterns of cannabis use among 14 – 16 year olds Identifying reasons why teens choose to or not to use cannabis Acute harms/ consequences of using cannabis on health and well-being Varying effects of cannabis from person to person
	4	Cannabis and the law Economic consequences of using cannabis Acute and chronic harms/ consequences of using cannabis on health and well-being Varying effects of cannabis from person to person Recognizing problems associated with cannabis use Teaching and responding to risk and harm in common teenage scenarios Tips to keep people safe who are using cannabis
	5	Acute and chronic harms/ consequences of cannabis on health and well-being Relationship between cannabis use and mental illness Identifying reasons why people choose to or not to use cannabis Recognizing problems associated with cannabis use Seeking help
	6	Dealing and coping with challenging situations Effects of other people's drug use Recognizing and responding to risk and harms of cannabis Tips to help friends reduce or cease using cannabis Alternatives to using cannabis Identifying when to seek help Identifying where to seek help e.g. resources and support agencies for teenagers using cannabis (both at school and in the community)

Measures

Demographics

Demographic information was obtained including participant's age, gender as well as number of teaching years for teachers.

Programme evaluation

Students and teachers were asked to evaluate the programme using questionnaires that have been employed in the previous Australian trial of the *Climate Schools* programme (21).

Student evaluation

Students were asked to evaluate the programme by indicating on a seven point Likert scale how strongly they agreed or disagreed with 10 statements relating to content of the programme and how enjoyable and interesting they found it to be. Statements included *"The cartoon story was an enjoyable way of learning health education"*, and *"The information on alcohol and cannabis and how to stay safe was easy to understand"*.

Teacher evaluation

Teachers were asked to evaluate the programme by answering 15 questions relating to programme content, ease of implementation, and overall ratings of the programme. Thirteen questions were closed questions with fixed response categories and two were open-ended questions that asked teachers to list ways the programme could be improved in the future as well as any additional comments they had. In addition, teachers were asked to record what lessons and activities they delivered with their students.

RESULTS

Analyses

Descriptive statistics of the student and teacher data were obtained using PASW Statistics 18 and a descriptive quantitative analysis of the open-ended teacher responses was performed.

Sample characteristics

Two hundred and twenty two Year 9 students, who received parental consent and consented themselves, participated in the study and completed the student evaluation questionnaire.

Students ranged in age from 12-15 years with a mean age of 13.86 years (SD = 0.40) and 57% were female.

Eleven teachers who implemented the *Climate Schools* course with their students evaluated the programme. Teachers ranged in age from 24 – 54 years with a mean age of 38.11 years (SD = 10.47) and 91% were female. The average number of years teaching was 11 years (SD = 8.52).

Programme evaluation

Student evaluation

Responses to the student evaluation questionnaire are presented in Table 2. In regards to the online cartoon storyline, 80% of students agreed (either strongly, moderately or slightly) that the cartoon story was an enjoyable way of learning health education, 78% agreed it helped keep their interest while learning, 66% agreed it was relevant to experiences in their own lives and 65% reported they would like to learn other health theory topics this way. In regards to the information on alcohol and cannabis and how to stay safe, 85% of students, agreed it was easy to understand, 84% agreed it was easy to learn, and 79% agreed it was easy to remember. When asked to evaluate the optional classroom activities, 67% of students agreed the activities helped them further understand the information taught in the lesson and 60% reported the activities helped them to apply the information to their own lives. Two thirds (64%) of students reported that they planned to use the information learnt in their own lives.

Table 2: Student evaluation of the Climate Schools: Alcohol and Cannabis course (n=222)

	Strongly agree	Moderately agree	Slightly agree	Undecided	Slightly disagree	Moderately disagree	Strongly disagree
1. The cartoon story was an enjoyable way of learning health education.	39.2%	23.0%	17.6%	10.8%	3.6%	2.3%	3.6%
2. The cartoon story helped keep my interest while I learned the information.	29.3%	28.8%	19.4%	12.6%	5.9%	2.3%	1.8%
3. The cartoon story was relevant to current or future experiences in my life or lives of my peers.	21.6%	19.4%	25.2%	20.3%	7.2%	3.2%	3.2%

4. The information on alcohol & cannabis and how to stay safe was easy to understand.	38.3%	27.9%	18.9%	10.4%	3.2%	0.9%	0.5%
5. The information on alcohol & cannabis and how to stay safe was easy to learn.	37.8%	28.8%	17.1%	9.0%	4.5%	1.8%	0.9%
6. The information on alcohol & cannabis and how to stay safe was easy to remember.	28.4%	30.6%	20.3%	9.5%	5.4%	4.1%	1.8%
7. I would like to learn other health theory topics through cartoon stories.	26.6%	20.3%	18%	15.8%	8.6%	3.6%	7.2%
8. The classroom activities helped me to further understand the information.	21.2%	26.6%	19.4%	17.6%	9.5%	2.3%	3.6%
9. The classroom activities helped me to apply the information I learnt in the cartoons to my own life.	21.6%	19.8%	18.9%	22.5%	9.9%	5.0%	2.3%
10. I plan to use the information I learnt in this programme in my own life.	26.1%	15.8%	21.6%	21.6%	7.7%	1.4%	5.9%

Teacher evaluation

All teachers reported implementing the programme in its entirety, including the computerised cartoon components and at least one class-based activity for each lesson. Teacher responses to the closed-ended teacher evaluation questions are summaried below.

When asked to evaluate the cartoon storyline, all teachers said the students were able to recall the information taught, the majority (91%) said the students liked the cartoons, and 82% of teachers said it held the students attention well. In regards to implementation, eighty two percent of teachers said it was easy (or very easy) to implement the computer component of the programme, one teacher said average, and one said difficult. All but one of the teachers (91%) said it was easy (or very easy) to gain access to computers at their school, and one said it was difficult. All teachers reported that it was easy (or very easy) to use the teacher manual to prepare class activities and all said the activities helped reinforce the storylines.

When asked to rate the overall programme, all except one of teachers (91%) rated it as very good, good, or average. In comparison to other drug education programmes, three quarters of teachers (73%) rated it as better (or much better) than other programmes with the remaining rating it as the same as other programmes. Importantly, eighty two percent of teachers said it was likely (or very likely) they would use the programme in the future and recommend it to others.

Two themes arose from the suggestions teachers gave to improving the programme. The first related to shortening the cartoons and/or make them more interactive in order to better hold student's attention. Specific comments around this included, *"Stories need to be shorter and more interesting", "Cartoons need to be shorter to hold the students attention", "One pupil suggested it be a talking cartoon", "Sound effects/music on the cartoon", and "The module could be more interactive"*. The second theme of suggestions related to repetition in the module due to implementing them so close together. Specific comments around this included, *"(there is) Sometimes repetition in lessons on the alcohol and cannabis modules"*, and *"When students have done the alcohol module to do the cannabis and alcohol module straight after makes some of the content a little repetitive"*. In addition, general comments from teachers regarding the programme were positive and included, *"It was fun and different from the usual, and far more interactive"* and *"On the whole a good pack to use with students"*.

DISCUSSION

Prior to evaluating an intervention in a new context it is important to ensure it is relevant, suitable and easy to implement with the target audience (23-25). The *Climate Schools* programme is a 12-lesson universal school-based intervention to prevent alcohol and cannabis use and related harms. The programme has previously been found to be effective in reducing the use of alcohol and cannabis amongst adolescents in Australia, however it is yet to be trialled internationally. This study aimed to examine the feasibility and acceptability of the online universal *Climate Schools: Alcohol and Cannabis course* in the UK.

Teachers from two schools in South East London implemented the 12-lesson programme with their Year 9 students over the year. Following completion of the intervention, students and teachers evaluated the programme to examine it's feasibility in the UK school setting. Overall, both the student and teacher evaluations of the programme were extremely positive and are consistent with the positive evaluations received from students and teachers who participated in the Australian RCT of the *Climate Schools* intervention(21).

Specifically, the majority of students who received the programme reported they enjoyed learning health education through the online cartoon-based format and said it helped keep their interest. The vast majority of students said the information on alcohol and cannabis and how to stay safe was easy to understand and easy to learn, and two thirds said they planned to use the information learnt in their own lives.

All teachers reported delivering the programme with high fidelity, in full with their students. All teachers believed students were able to recall the information taught, and the vast majority said students like the online cartoon-based format and that it held students attention well. Teachers attested to the ease of implementation of programme, rating the computer-based component as easy to implement and the teacher's manual as easy to use when preparing class activities. Importantly, four fifths of teachers reported they were likely they would use the programme in the future and recommend it to others.

The main areas and suggestions for improving the programme that arose from students and teacher evaluations in the current study were to make the cartoon storylines shorter or more interactive in order to better hold student's attention, and to deliver the modules further apart

as the students found some of the information repetitive. Both these points should be considered and addressed prior to implementing a full-scale trial of the programme's effectiveness in the UK. Overall, these positive evaluations attest to the feasibility and acceptability of implementing an online universal school-based prevention program for alcohol and cannabis use in the UK.

Limitations of the study should be considered when interpreting the results. As this was a pilot study aimed at examining the feasibility of the programme in the UK school setting, the numbers of schools recruited to the study was small and all schools were located in the same geographic area of South East London. In addition, approximately one third of the Year 9 population did not receive consent to participate in the current study. To ensure the findings from this study are generalisable, it is important to evaluate the programme in a greater and more diverse range of students and schools across the UK. This could be achieved in conjunction with a larger RCT which is needed before any conclusions about the programme's effectiveness can be drawn. Such trial should include measures of alcohol and cannabis use, intentions to use, and attitudes and knowledge related to these substances. Such study would also benefit from separately evaluating each lesson and module rather than just the overall programme.

Conclusion

Overall, the online universal *Climate Schools: Alcohol and Cannabis course* was found to be a feasible and acceptable means of delivering drug education in the UK school system. Given these findings coupled with the positive findings from the Australian trial of the programme, the *Climate Schools* intervention has the potential to address the clear need for effective alcohol and other drug prevention in the UK. Before implementation of the programme into UK schools, the next step is a full evaluation trial of the *Climate Schools* intervention with students in the UK to examine its effectiveness. It is expected that the *Climate Schools* programme will demonstrate similar effects in preventing the use of alcohol and cannabis amongst adolescents in the UK, as it did in Australia.

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Contributorship Statement

NN, PC & MT designed the study and gained ethical approval to conduct the study in schools. NN & DR adapted the programme content for use in the UK, recruited schools, and oversaw the implementation of the programme and surveys into schools. All authors contributed to the writing of the manuscript.

Conflict of interest statement

None

Data Sharing Statement

Extra data is available by emailing Nicola Newton at n.newton@unsw.edu.au

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Title: ~~The feasibility of~~A pilot study of an online universal school-based intervention to prevent alcohol and cannabis use in the United Kingdom.

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ABSRACT

Objectives: ~~The~~ The online universal *Climate Schools* intervention ~~, known as the *Climate Schools: Alcohol and Cannabis course,*~~ has been found to be effective in reducing the use of alcohol and cannabis among Australian adolescents. The aim of the current study was to examine the feasibility of implementing this prevention programme in the United Kingdom (UK).

Design: A pilot study examining the feasibility of the *Climate Schools* programme in the UK was conducted with teachers and students from Year 9 classes at two secondary schools in South East London. Teachers were asked to implement the evidence-based *Climate Schools* programme over the school year with their students. The intervention consisted of two modules (each with six lessons) delivered approximately six months apart. Following completion of the intervention, students and teachers were asked to evaluate the programme.

Results: Eleven teachers and 222 students from two secondary schools evaluated the programme. Overall the evaluations were extremely positive. Specifically, 85% of students said the information on alcohol and cannabis and how to stay safe was easy to understand, 84% said it was easy to learn, and 80% said the online cartoon-based format was an enjoyable way to learn health theory topics. All teachers said the students were able to recall the information taught, 82% said the computer component was easy to implement, and all teachers said the teacher manual was easy to use to prepare class activities. Importantly, 82% of teachers said it was likely they would use the programme in the future and recommend it to others.

Conclusions: ~~An~~ The online universal *Climate Schools* ~~school-based~~ prevention programme ~~for alcohol and cannabis use was found~~ to be both feasible and acceptable to students and teachers in ~~-~~ the UK. A full evaluation trial of the ~~*Climate Schools*~~ intervention is now required to examine its effectiveness in reducing alcohol and cannabis use amongst adolescents in the UK before implementation into the UK school system.

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ARTICLE SUMMARY

Strengths and limitations of this study

- A pilot study examining the feasibility of the Internet-based *Climate Schools* programme in the UK was conducted with 222 students and 11 teachers at secondary schools in London.
- Student evaluations were extremely positive with approximately 85% reporting the information taught in the programme was easy to understand and learn.
- Teacher evaluations were extremely positive with all teachers reporting the students were able to recall the information and over 80% saying they would be likely to use the programme in the future and recommend it to others.
- Overall, the online school-based *Climate Schools* prevention programme was found to be both feasible and acceptable to students and teachers in the UK.
- A full evaluation trial of the *Climate Schools* intervention is now required to examine its effectiveness in the UK.

INTRODUCTION

Substance use amongst young people continues to be a serious public health concern. The 2011 European School Survey Project on Alcohol and Other Drugs (EPSAD) examined substance use in over 100,000 students from 36 European countries including the United Kingdom (UK), and found alcohol and cannabis to most commonly used licit and illicit drugs respectively (1). On average, 87% of students reported drinking alcohol at least once in their lifetime, 57% reported drinking alcohol in the past month, and 39% reported heavy episodic drinking in the past month (defined as 5 or more drinks on one occasion). Average lifetime cannabis use was 17%, with use by UK students at one in four.

The high prevalence of use amongst young people is particularly concerning considering that such behaviours are associated with significant burden of disease (2, 3), socials costs (4), and increased risk of developing substance use disorders (5, 6) and co-morbid mental health problems (7). To alleviate this burden and reduce the occurrence and cost of such problems, prevention is essential and needs to be initiated early before harmful patterns of drug use are established and begin to cause disability (8, 9).

While prevention strategies do exist, research has not been able to consistently demonstrate that universal school-based drug prevention is effective in reducing actual substance use (10-12), and to date there have been no positive evaluations of effective universal interventions to prevent substance use in the UK. This is because the effectiveness of school-based prevention is often compromised by obstacles associated with programme implementation and dissemination (13, 14), and by the adoption of an abstinence- as opposed to the successful harm-minimisation approach to prevention (15-18).

The universal Internet-based *Climate Schools: Alcohol and Cannabis course* was developed to overcome these obstacles and aims to prevent alcohol and cannabis use and related harms amongst adolescents. The *Climate Schools* programme is based on the effective harm-minimisation approach to prevention and uses cartoon storylines to engage and maintain student interest (19). The programme is facilitated by the Internet which guarantees complete and consistent delivery whilst ensuring high implementation fidelity. The programme is designed to fit within the school health curriculum and be implemented to 13-14 year olds before significant exposure to alcohol and drug use occurs, and consists of two sets of six

lessons delivered approximately 6 months apart over the school year. The efficacy of the *Climate Schools* programme has been established using a cluster randomised controlled trial (RCT) in 10 secondary schools in Australia (n=764) (20, 21). Results from the RCT demonstrate that compared to the control group, students in the intervention group showed significant improvements in alcohol and cannabis knowledge, reductions in average alcohol consumption and binge drinking, and a reduction in frequency of cannabis use up to twelve months following the intervention. In addition, evaluations of the Internet-based programme by teachers and students in the trial were extremely positive. Specifically, 90% of students reported the information delivered was easy to learn and said they would like to learn other topics through this method, and all teachers rated the programme as superior to other drug prevention programs (20, 21).

Given the high prevalence of alcohol and cannabis use amongst young people along with the clear need for effective universal prevention in the UK, the aim of this pilot study was to examine the feasibility of implementing the *Climate Schools* programme in the UK school setting. This evidence-based programme was deemed an appropriate choice for adaptation due to similarities between Australia and the UK in terms of youth drinking culture, age of initiation to substance use, and the fact that alcohol and cannabis are the most commonly used licit and illicit drugs respectively in both countries (1, 22).

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Before conducting a full-scale RCT, d~~D~~etermining the feasibility and acceptability of an intervention is an important step before evaluating its effectiveness in a new context to ensure it is relevant, suitable and easy to implement with the target audience (23-25). ~~.~~ It was expected teachers and students in the UK who deliver and complete the *Climate Schools* programme would rate it as; 1) easy to implement and understand; 2) an interesting and enjoyable drug education programme; and 3) superior to other drug education programmes.

METHOD

Recruitment of schools

Letters outlining the aims of the study were emailed to a number of secondary schools whom had existing relationships with researchers at the Institute of Psychiatry, Kings College

London. Two schools from South East London agreed to participate. All aspects of the study were approved by Kings College London Research Ethics Committee.

Participants

Passive information and consent forms were sent home to parents/guardians of all Year 9 students (13-14 year olds) from the participating schools (N=342). Only those students whose parents did not object to them participating in the study, ~~received parental consent~~ and gave active written consent themselves, were eligible to participate (N=222). In addition, active written consent was required from all teachers to participate in the study. Participants were made fully aware that they could withdraw from the study at any time without prejudice.

Procedure

The two p~~P~~articipating schools were asked to implement the *Climate Schools: Alcohol and Cannabis course* with their Year 9 classes over the school year from 2010-2011. Following completion of the intervention, teachers and students were asked to evaluate the programme through anonymous questionnaires which took approximately 10 minutes to complete. Teachers were reimbursed £20 for their time, and students from each class went into a draw to receive a £10 voucher for their time.

Intervention

The *Climate Schools: Alcohol and Cannabis course* is a universal school-based prevention programme which adopts a harm-minimisation framework. It comprises the delivery of two modules (the *Alcohol module* and the *Alcohol and Cannabis module*), delivered approximately six months apart. Each module includes six 40 minute lessons aimed at reducing alcohol and cannabis use and related harms. The first part of each lesson is a 20 minute Internet-based component completed individually online where students followed a cartoon storyline of teenagers experiencing real life situations and harms associated with alcohol and cannabis use. The cartoon storyline imparts all the core content of the programme. The second part of each lesson is an optional pre-determined activity delivered by the teacher to reinforce the information learnt in the cartoons. Teachers are provided with a teaching manual but no additional training is required in order to implement the course.

As the programme was originally developed in Australia, aspects of the programme content were adapted for the UK before implementation in schools (~~22, 23~~26-27). These included

changing standard drinks references to units of alcohol, replacing call centre and emergency numbers with their UK counterparts (e.g. 000 swapped for England emergency number of 999), and replacing Australian slang terms with more common terms used in the UK. Table 1 outlines the content of each lesson. Access to the full UK version of the *Climate Schools* programme can be found online: www.climateschools.co.uk.

Table 1: Lesson content of the *Climate Schools: Alcohol and Cannabis course*

Module	Lesson	Content
Alcohol	1	Alcohol, the law and underage drinking Alcohol units Guidelines for low-risk drinking limits Identifying the number of alcohol units in alcohol beverages Societal pressures and expectations to drink alcohol
	2	Prevalence and patterns of alcohol consumption among 14-15 yr olds Alcohol-free social activities Identifying sources of pressure to drink too much alcohol Identifying the reasons teenagers choose to or not to drink alcohol Dispelling some myths about alcohol: "Coffee sobers you up"
	3	Short- and long- term consequences of drinking too much alcohol Identifying the potential for risk and harm in common teenage drinking scenarios Exploring ways to prevent alcohol related harm in common teenage drinking scenarios Identifying sources of help for teenagers
	4	Myths and facts about alcohol Advertising tactics Alcohol advertising laws Alcohol advertising and youth
	5	Drug refusal skills Ways to minimise alcohol consumption Tips to keep people safe who are drinking too much alcohol Decision-making about whether to consume alcohol with the purpose of getting drunk Examining different views on the consumption of alcohol
	6	Ways to prevent an alcohol related medical emergency Recognising the signs of an alcohol related medical emergency What to do if there is a medical emergency Who to contact if there is a medical emergency Calling the emergency number "999" The recovery position
Alcohol and	1	Alcohol, the law and underage drinking Guidelines for low-risk drinking limits

Cannabis		Identifying the number of in alcoholic beverages Prevalence and patterns of alcohol use among 14 – 15 year olds Acute harms/ consequences associated with alcohol use
	2	Alcohol, the law and underage drinking Identifying reasons why teenagers choose to or not to drink Alcohol-free activities Acute and chronic harms/ consequences of drinking alcohol Identifying the potential for risk and harm in common teenage drinking scenarios Exploring ways to prevent alcohol related harm in common teenage drinking scenarios e.g. Tips to keep people safe who were drinking too much alcohol and ways to minimize alcohol consumption Drug refusal skills
	3	The UK guidelines for low risk drinking limits Acute and chronic harms/ consequences of drinking alcohol What is cannabis Prevalence and patterns of cannabis use among 14 – 16 year olds Identifying reasons why teens choose to or not to use cannabis Acute harms/ consequences of using cannabis on health and well-being Varying effects of cannabis from person to person
	4	Cannabis and the law Economic consequences of using cannabis Acute and chronic harms/ consequences of using cannabis on health and well-being Varying effects of cannabis from person to person Recognizing problems associated with cannabis use Teaching and responding to risk and harm in common teenage scenarios Tips to keep people safe who are using cannabis
	5	Acute and chronic harms/ consequences of cannabis on health and well-being Relationship between cannabis use and mental illness Identifying reasons why people choose to or not to use cannabis Recognizing problems associated with cannabis use Seeking help
	6	Dealing and coping with challenging situations Effects of other people's drug use Recognizing and responding to risk and harms of cannabis Tips to help friends reduce or cease using cannabis Alternatives to using cannabis Identifying when to seek help Identifying where to seek help e.g. resources and support agencies for teenagers using cannabis (both at school and in the community)

Measures

Demographics

Demographic information was obtained including participant's age, gender as well as number of teaching years for teachers.

Programme evaluation

Students and teachers were asked to evaluate the programme using questionnaires that have been employed in the previous Australian trial of the *Climate Schools* programme ~~(24).~~(21).

Student evaluation

Students were asked to evaluate the programme by indicating on a seven point Likert scale how strongly they agreed or disagreed with 10 statements relating to content of the programme and how enjoyable and interesting they found it to be. Statements included *"The cartoon story was an enjoyable way of learning health education"*, and *"The information on alcohol and cannabis and how to stay safe was easy to understand"*.

Teacher evaluation

Teachers were asked to evaluate the programme by answering 15 questions relating to programme content, ease of implementation, and overall ratings of the programme. Thirteen questions were closed questions with fixed response categories and two were open-ended questions that asked teachers to list ways the programme could be improved in the future as well as any additional comments they had. In addition, teachers were asked to record what lessons and activities they delivered with their students.

RESULTS

Analyses

Descriptive statistics of the student and teacher data were obtained using PASW Statistics 18 and a ~~thematic~~ descriptive quantitative analysis of the open-ended teacher responses was performed.

Sample characteristics

Two hundred and twenty two Year 9 students, who received parental consent and consented themselves, participated in the study and completed the student evaluation questionnaire.

Students ranged in age from 12-15 years with a mean age of 13.86 years (SD = 0.40) and 57% were female.

Eleven teachers who implemented the *Climate Schools* course with their students evaluated the programme. Teachers ranged in age from 24 – 54 years with a mean age of 38.11 years (SD = 10.47) and 91% were female. The average number of years teaching was 11 years (SD = 8.52).

Programme evaluation

Student evaluation

Responses to the student evaluation questionnaire are presented in Table 2. In regards to the online cartoon storyline, 80% of students agreed (either strongly, moderately or slightly) that the cartoon story was an enjoyable way of learning health education, 78% agreed it helped keep their interest while learning, 66% agreed it was relevant to experiences in their own lives and 65% reported they would like to learn other health theory topics this way. In regards to the information on alcohol and cannabis and how to stay safe, 85% of students, agreed it was easy to understand, 84% agreed it was easy to learn, and 79% agreed it was easy to remember. When asked to evaluate the optional classroom activities, 67% of students agreed the activities helped them further understand the information taught in the lesson and 60% reported the activities helped them to apply the information to their own lives. Two thirds (64%) of students reported that they planned to use the information learnt in their own lives.

Table 2: Student evaluation of the Climate Schools: Alcohol and Cannabis course (n=222)

	Strongly agree	Moderately agree	Slightly agree	Undecided	Slightly disagree	Moderately disagree	Strongly disagree
1. The cartoon story was an enjoyable way of learning health education.	39.2%	23.0%	17.6%	10.8%	3.6%	2.3%	3.6%
2. The cartoon story helped keep my interest while I learned the information.	29.3%	28.8%	19.4%	12.6%	5.9%	2.3%	1.8%
3. The cartoon story was relevant to current or future experiences in my life or lives of my peers.	21.6%	19.4%	25.2%	20.3%	7.2%	3.2%	3.2%

4. The information on alcohol & cannabis and how to stay safe was easy to understand.	38.3%	27.9%	18.9%	10.4%	3.2%	0.9%	0.5%
5. The information on alcohol & cannabis and how to stay safe was easy to learn.	37.8%	28.8%	17.1%	9.0%	4.5%	1.8%	0.9%
6. The information on alcohol & cannabis and how to stay safe was easy to remember.	28.4%	30.6%	20.3%	9.5%	5.4%	4.1%	1.8%
7. I would like to learn other health theory topics through cartoon stories.	26.6%	20.3%	18%	15.8%	8.6%	3.6%	7.2%
8. The classroom activities helped me to further understand the information.	21.2%	26.6%	19.4%	17.6%	9.5%	2.3%	3.6%
9. The classroom activities helped me to apply the information I learnt in the cartoons to my own life.	21.6%	19.8%	18.9%	22.5%	9.9%	5.0%	2.3%
10. I plan to use the information I learnt in this programme in my own life.	26.1%	15.8%	21.6%	21.6%	7.7%	1.4%	5.9%

Teacher evaluation

All teachers reported implementing the programme in its entirety, including the computerised cartoon components and at least one class-based activity for each lesson. Teacher responses to the closed-ended teacher evaluation questions are summaried below.

When asked to evaluate the cartoon storyline, all teachers said the students were able to recall the information taught, the majority (91%) said the students liked the cartoons, and 82% of teachers said it held the students attention well. In regards to implementation, eighty two percent of teachers said it was easy (or very easy) to implement the computer component of the programme, one teacher said average, and one said difficult. All but one of the teachers (91%) said it was easy (or very easy) to gain access to computers at their school, and one said it was difficult. All teachers reported that it was easy (or very easy) to use the teacher manual to prepare class activities and all said the activities helped reinforce the storylines.

When asked to rate the overall programme, all except one of teachers (91%) rated it as very good, good, or average. In comparison to other drug education programmes, three quarters of teachers (73%) rated it as better (or much better) than other programmes with the remaining rating it as the same as other programmes. Importantly, eighty two percent of teachers said it was likely (or very likely) they would use the programme in the future and recommend it to others.

Two themes arose from the suggestions teachers gave to improving the programme. The first related to shortening the cartoons and/or make them more interactive in order to better hold student's attention. Specific comments around this included, *"Stories need to be shorter and more interesting", "Cartoons need to be shorter to hold the students attention", "One pupil suggested it be a talking cartoon", "Sound effects/music on the cartoon", and "The module could be more interactive"*. The second theme of suggestions related to repetition in the module due to implementing them so close together. Specific comments around this included, *"(there is) Sometimes repetition in lessons on the alcohol and cannabis modules"*, and *"When students have done the alcohol module to do the cannabis and alcohol module straight after makes some of the content a little repetitive"*. In addition, general comments from teachers regarding the programme were positive and included, *"It was fun and different from the usual, and far more interactive"* and *"On the whole a good pack to use with students"*.

DISCUSSION

Prior to evaluating an intervention in a new context it is important to ensure it is relevant, suitable and easy to implement with the target audience (23-25). The *Climate Schools* programme is a 12-lesson universal school-based intervention to prevent alcohol and cannabis use and related harms. The programme has previously been found to be effective in reducing the use of alcohol and cannabis amongst adolescents in Australia, however it is yet to be trialled internationally. This study aimed to examine the feasibility and acceptability of the online universal *Climate Schools: Alcohol and Cannabis course* in the UK.

Teachers from two schools in South East London implemented the 12-lesson programme with their Year 9 students over the year. Following completion of the intervention, students and teachers evaluated the programme to examine it's feasibility in the UK school setting. Overall, both the student and teacher evaluations of the programme were extremely positive and are consistent with the positive evaluations received from students and teachers who participated in the Australian RCT of the *Climate Schools* intervention (21). ~~(24).~~

Specifically, the majority of students who received the programme reported they enjoyed learning health education through the online cartoon-based format and said it helped keep their interest. The vast majority of students said the information on alcohol and cannabis and how to stay safe was easy to understand and easy to learn, and two thirds said they planned to use the information learnt in their own lives.

All teachers reported delivering the programme with high fidelity, in full with their students. All teachers believed students were able to recall the information taught, and the vast majority said students like the online cartoon-based format and that it held students attention well. Teachers attested to the ease of implementation of programme, rating the computer-based component as easy to implement and the teacher's manual as easy to use when preparing class activities. Importantly, four fifths of teachers reported they were likely they would use the programme in the future and recommend it to others.

The main areas and suggestions for improving the programme that arose from ~~the~~ students and teacher evaluations in the current study were to make the cartoon storylines shorter or more interactive in order to better hold student's attention, ~~-~~and to deliver the modules further

apart as the students found some of the information repetitive. Both these points should be considered and addressed prior to implementing a ~~full scale~~full-scale trial of the programme's effectiveness ~~-~~in the UK. Overall, these positive evaluations attest to the feasibility and acceptability of implementing an online universal school-based prevention program for alcohol and cannabis use in the UK.

Limitations of the study should be considered when interpreting the results. As this was a pilot study aimed at examining the feasibility of the programme in the UK school setting, the numbers of schools recruited to the study was small and all schools were located in the same geographic area of South East London. In addition, approximately one third of the Year 9 population did not receive consent to participate in the current study. To ensure the findings from this study are generalisable, it is important to evaluate the programme in a greater and more diverse range of students and schools across the UK. This could be achieved in conjunction with a larger RCT ~~of the programme's effectiveness~~which is needed before any conclusions about the programme's effectiveness can be drawn. Such trial should include measures of alcohol and cannabis use, intentions to use, and attitudes and knowledge related to these substances. Such study would also benefit from separately evaluating each lesson and module rather than just the overall programme. ~~.~~

Conclusion

Overall, the online universal *Climate Schools: Alcohol and Cannabis course* was found to be a feasible and acceptable means of delivering drug education in the UK school system. Given these findings coupled with the positive findings from the Australian trial of the programme, the *Climate Schools* intervention has the potential to address the clear need for effective alcohol and other drug prevention in the UK. Before implementation of the programme into UK schools, t~~T~~he next step is a full evaluation trial of the *Climate Schools* intervention with students in the UK to examine its effectiveness. It is expected that the *Climate Schools* programme will demonstrate similar effects in preventing the use of alcohol and cannabis amongst adolescents in the UK, as it did in Australia.

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Conflict of interest statement

NN and MT are two of the original developers of the *Climate Schools* programme. *Climate Schools* is operated on a not-for-profit basis.

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TREND Statement Checklist

Paper Section/ Topic	Item No	Descriptor	Reported? ✓	Reported? Pg #
Title and Abstract				
Title and Abstract	1	• Information on how unit were allocated to interventions	X	1-2
		• Structured abstract recommended	X	2
		• Information on target population or study sample	X	2
Introduction				
Background	2	• Scientific background and explanation of rationale	X	4-5
		• Theories used in designing behavioral interventions	X	4-5
Methods				
Participants	3	• Eligibility criteria for participants, including criteria at different levels in recruitment/sampling plan (e.g., cities, clinics, subjects)	X	5-6
		• Method of recruitment (e.g., referral, self-selection), including the sampling method if a systematic sampling plan was implemented	X	5-6
		• Recruitment setting	X	5
		• Settings and locations where the data were collected	X	5-6
Interventions	4	• Details of the interventions intended for each study condition and how and when they were actually administered, specifically including:	X	6-8
		○ Content: what was given?	X	7-8
		○ Delivery method: how was the content given?	X	6
		○ Unit of delivery: how were the subjects grouped during delivery?	X	6
		○ Deliverer: who delivered the intervention?	X	6
		○ Setting: where was the intervention delivered?	X	6
		○ Exposure quantity and duration: how many sessions or episodes or events were intended to be delivered? How long were they intended to last?	X	6
		○ Time span: how long was it intended to take to deliver the intervention to each unit?	X	6
		○ Activities to increase compliance or adherence (e.g., incentives)	X	6
Objectives	5	• Specific objectives and hypotheses	X	5
Outcomes	6	• Clearly defined primary and secondary outcome measures	X	8-9
		• Methods used to collect data and any methods used to enhance the quality of measurements	X	6
		• Information on validated instruments such as psychometric and biometric properties	X	8-9
Sample Size	7	• How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules	X	9
Assignment Method	8	• Unit of assignment (the unit being assigned to study condition, e.g., individual, group, community)	X	5-6
		• Method used to assign units to study conditions, including details of any restriction (e.g., blocking, stratification, minimization)	X	5-6
		• Inclusion of aspects employed to help minimize potential bias induced due to non-randomization (e.g., matching)	X	5-6

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Blinding (masking)	9	• Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to study condition assignment; if so, statement regarding how the blinding was accomplished and how it was assessed.	X	6
Unit of Analysis	10	• Description of the smallest unit that is being analyzed to assess intervention effects (e.g., individual, group, or community)	X	5-6
		• If the unit of analysis differs from the unit of assignment, the analytical method used to account for this (e.g., adjusting the standard error estimates by the design effect or using multilevel analysis)	X	9
Statistical Methods	11	• Statistical methods used to compare study groups for primary methods outcome(s), including complex methods of correlated data	X	9
		• Statistical methods used for additional analyses, such as a subgroup analyses and adjusted analysis	N/A	
		• Methods for imputing missing data, if used	N/A	
		• Statistical software or programs used	X	9
Results				
Participant flow	12	• Flow of participants through each stage of the study: enrollment, assignment, allocation, and intervention exposure, follow-up, analysis (a diagram is strongly recommended)	N/A	
		○ Enrollment: the numbers of participants screened for eligibility, found to be eligible or not eligible, declined to be enrolled, and enrolled in the study	X	9
		○ Assignment: the numbers of participants assigned to a study condition	X	9
		○ Allocation and intervention exposure: the number of participants assigned to each study condition and the number of participants who received each intervention	X	9
		○ Follow-up: the number of participants who completed the follow-up or did not complete the follow-up (i.e., lost to follow-up), by study condition	N/A	
		○ Analysis: the number of participants included in or excluded from the main analysis, by study condition	X	9
		• Description of protocol deviations from study as planned, along with reasons	N/A	
Recruitment	13	• Dates defining the periods of recruitment and follow-up	X	6
Baseline Data	14	• Baseline demographic and clinical characteristics of participants in each study condition	X	9
		• Baseline characteristics for each study condition relevant to specific disease prevention research	N/A	
		• Baseline comparisons of those lost to follow-up and those retained, overall and by study condition	N/A	
		• Comparison between study population at baseline and target population of interest	N/A	
Baseline equivalence	15	• Data on study group equivalence at baseline and statistical methods used to control for baseline differences	N/A	

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Numbers analyzed	16	• Number of participants (denominator) included in each analysis for each study condition, particularly when the denominators change for different outcomes; statement of the results in absolute numbers when feasible	X	9
		• Indication of whether the analysis strategy was "intention to treat" or, if not, description of how non-compliers were treated in the analyses	N/A	
Outcomes and estimation	17	• For each primary and secondary outcome, a summary of results for each estimation study condition, and the estimated effect size and a confidence interval to indicate the precision	X	10-12
		• Inclusion of null and negative findings	X	10-12
		• Inclusion of results from testing pre-specified causal pathways through which the intervention was intended to operate, if any	X	10-12
Ancillary analyses	18	• Summary of other analyses performed, including subgroup or restricted analyses, indicating which are pre-specified or exploratory	N/A	
Adverse events	19	• Summary of all important adverse events or unintended effects in each study condition (including summary measures, effect size estimates, and confidence intervals)	N/A	
DISCUSSION				
Interpretation	20	• Interpretation of the results, taking into account study hypotheses, sources of potential bias, imprecision of measures, multiplicative analyses, and other limitations or weaknesses of the study	X	13
		• Discussion of results taking into account the mechanism by which the intervention was intended to work (causal pathways) or alternative mechanisms or explanations	X	13
		• Discussion of the success of and barriers to implementing the intervention, fidelity of implementation	X	13-14
		• Discussion of research, programmatic, or policy implications	X	13-14
Generalizability	21	• Generalizability (external validity) of the trial findings, taking into account the study population, the characteristics of the intervention, length of follow-up, incentives, compliance rates, specific sites/settings involved in the study, and other contextual issues	X	14
Overall Evidence	22	• General interpretation of the results in the context of current evidence and current theory	X	13-14

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