The Gatehouse Project: can a multilevel school intervention affect emotional wellbeing and health risk behaviours?

Lyndal Bond, George Patton, Sara Glover, John B Carlin, Helen Butler, Lyndal Thomas, Glenn Bowes

Study objective: The aim of this study was to determine the effect of a multilevel school based intervention on adolescents' emotional wellbeing and health risk behaviours.

Design: School based cluster randomised controlled trial. Students were surveyed using laptop computers, twice in the first year of intervention and annually thereafter for a further two years.

Setting: Secondary schools.

Participants: 2678 year 8 students (74%) participated in the first wave of data collection. Attrition across the waves was less than 3%, 8%, and 10% respectively with no differential response rate between intervention and control groups at the subsequent waves (98% v 96%, 92% v 92%, and 90% v 89% respectively).

Main results: A comparatively consistent 3% to 5% risk difference was found between intervention and control students for any drinking, any and regular smoking, and friends' alcohol and tobacco use across the three waves of follow up. The largest effect was a reduction in the reporting of regular smoking by those in the intervention group (OR 0.57, 0.62, and 0.72 at waves 2, 3, and 4 respectively). There was no significant effect of the intervention on depressive symptoms, and social and school relationships.

Conclusions: While further research is required to determine fully the processes of change, this study shows that a focus on general cognitive skills and positive changes to the social environment of the school can have a substantial impact on important health risk behaviours.

Schools have long been recognised as important settings for health promotion and health education. Placing health promotion in schools has been seen as attractive for two reasons: schools present an efficient method of obtaining the attention of the majority of young people and they are the major setting in which formal education takes place. Beyond providing a site for health promotion, however, schools also form a central role in adolescents' social lives. Health promotion and health education have paid little attention to this except in terms of identifying the need to give adolescents skills to resist peer pressure to be involved in risky behaviours. Such a focus has failed to take into account the impact of school as a social institution on young people's achievements and behaviour.

More than 40 years of educational and behavioural research has consistently shown that school organisational climate is associated with educational achievement. Furthermore, the impact of the school environment goes beyond that of academic achievement, with research also showing associations with adolescent health and health risk behaviours.

The Health Promoting Schools framework, developed in 1995 by WHO, recognised the relation between a young person's health and wellbeing and the quality of the social environment. This framework offers an approach to school based health promotion, emphasising the importance of multilevel community health programmes in schools.

Programmes of school change such as the Manitoba School Improvement Program (MSIP) and the Comer Schools Project have moved some way to addressing the issues of whole school change and school climate. These programmes identify several steps required to implement whole school change, recognising the complexity of schools and the time taken to implement change. While promising and well evaluated in terms of the process of implementation, these programmes have not been subjected to rigorous controlled trials. The focus and the evaluation of these programmes have only been focused on assessing the impact on engagement with learning and academic achievement. Thus, despite the attractiveness of the idea of Health Promoting Schools, there has not yet been a randomised controlled trial of a more comprehensive school based health promotion strategy.

The Gatehouse Project

The Gatehouse Project was developed to address some of the limitations in earlier school health promotion work, building on whole school change programmes. In line with the Health Promoting Schools framework, the Gatehouse Project is a primary prevention programme, which includes both institutional and individual focused components to promote the emotional and behavioural wellbeing of young people in secondary schools. The intervention was based on an understanding of risk processes for adolescent mental health and risk behaviours that derive from social environments. The major aims were to increase levels of emotional wellbeing and reduce rates of substance use, known to be related to emotional wellbeing.

Recognising the importance of healthy attachments, the project's conceptual framework identified three priority areas for action: building a sense of security and trust; increasing skills and opportunities for good communication; and building a sense of positive regard through valued participation in aspects of school life.

The aim of this paper was to examine the effect on mental health and health risk behaviour outcomes of this school based preventive intervention, which began when students were in their second year of secondary school (13–14 years of age).
METHODS

Sample

A cluster randomised controlled design was used for the allocation of secondary education districts to intervention or control status. In metropolitan Melbourne, 12 districts were sampled from two education regions with probability proportional to the number of secondary schools (including government, independent, and Catholic schools) and randomly allocated as intervention or control status. Using simple random sampling, 12 schools were selected from the “intervention” districts and 12 from the “control” districts. Eight country schools were randomly drawn from four regional districts. Twenty six (12 intervention and 14 control) of the 32 schools agreed to participate (fig 1). Reasons for non-participation were refusal (n = 1), involvement in another programme (n = 2), and imminent school closure or merger (n = 3). These schools were not substantially different from those agreeing to participate in terms of disadvantage or size.

Supervised by the research team, students completed a self administered questionnaire at school using laptop computers four times: twice in 1997 at the beginning and end of the participants’ second year of secondary school (year 8) and at the end of year 9 (1998) and year 10 (1999). Absent students were surveyed at school at a later date or by telephone (6%). Telephone interviews were also completed with students who had left the project schools (4%) for the subsequent waves of data collection.

Ethics approval was obtained from the Royal Children’s Hospital Ethics in Human Research Committee, the Department of Education and Training, and the Catholic Education Office. Student participation in the survey was voluntary and written parental consent was required.

Multilevel intervention

Whole school

The key elements of the whole school component were the establishment and support of a school based adolescent health team; the identification of risk and protective factors in each school’s social and learning environment from student surveys; and, using these data, the identification of effective strategies to address these issues (see Patton et al for more details).

Teaching resources

Implementation of the curriculum component began in the second term of the school year and focused initially on students in the second year of secondary school (year 8, mean age 14 years).

The teaching resources were designed to allow students to explore a range of common social settings where young people might experience difficult or conflicting emotional responses and to develop and practise strategies for dealing with these. The materials were designed to be taught over a 10 week period in English, health and/or personal development classes. Resources for year 9, implemented in the following year, were designed to provide more opportunities to explore and practise key strategies for managing difficult emotions.

Role of school liaison (intervention) team and professional development

The role of the school liaison team was to provide professional development and ongoing support for the schools during the implementation of the intervention (see Bond et al for further details). Members of the school liaison team had extensive experience working in the education system(s) and they worked intensively with two to four intervention schools each. Most of the professional development was done in schools during weekly meetings with the teams and/or specific teachers.

Measures

Four waves of student data were collected. Baseline data were collected at the beginning of year 8, and subsequent surveys were undertaken at the end of years 8, 9, and 10.

Information on implementation and process were collected throughout the study period.

Mental health status—self reported anxiety/depressive symptoms

Mental health status was evaluated using a computerised version of the clinical interview schedule—revised (CIS-R), a structured psychiatric interview for non-clinical populations. It has been used as a criterion measure for the definition of caseness in teenagers, and has an ease of
Table 1 Baseline comparisons of sociodemographic, school and social relationships, depressive symptoms, substance use, and antisocial behaviour (see text for definitions)

<table>
<thead>
<tr>
<th></th>
<th>Control 1343 n (%)*</th>
<th>Intervention 1335 n (%)*</th>
<th>Total 2678 n (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>623 (46.4)</td>
<td>629 (47.1)</td>
<td>1252 (46.8)</td>
</tr>
<tr>
<td>female</td>
<td>761 (53.6)</td>
<td>706 (52.9)</td>
<td>1467 (53.2)</td>
</tr>
<tr>
<td>Family structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>two parent family</td>
<td>1026 (76.4)</td>
<td>1094 (81.9)</td>
<td>2120 (79.2)</td>
</tr>
<tr>
<td>one parent family</td>
<td>317 (23.6)</td>
<td>242 (18.1)</td>
<td>559 (20.8)</td>
</tr>
<tr>
<td>Australian born</td>
<td>1223 (91.1)</td>
<td>1119 (83.8)</td>
<td>2342 (87.5)</td>
</tr>
<tr>
<td>Not Australian born</td>
<td>116 (8.9)</td>
<td>256 (16.2)</td>
<td>372 (12.5)</td>
</tr>
<tr>
<td>Language other than English spoken at home</td>
<td>293 (21.8)</td>
<td>444 (33.3)</td>
<td>737 (27.7)</td>
</tr>
<tr>
<td>Parental daily smoking at least one parent</td>
<td>354 (26.5)</td>
<td>647 (24.2)</td>
<td>1001 (37.5)</td>
</tr>
<tr>
<td>no smoking daily</td>
<td>96 (7.2)</td>
<td>241 (9.0)</td>
<td>337 (12.6)</td>
</tr>
<tr>
<td><strong>Quality of social relationships</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of attachments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>good</td>
<td>1133 (85.2)</td>
<td>1088 (82.1)</td>
<td>2221 (83.7)</td>
</tr>
<tr>
<td>poor</td>
<td>115 (8.6)</td>
<td>141 (10.6)</td>
<td>256 (9.6)</td>
</tr>
<tr>
<td>absent/very poor</td>
<td>82 (6.2)</td>
<td>96 (7.2)</td>
<td>178 (6.7)</td>
</tr>
<tr>
<td>Arguments with others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>758 (56.6)</td>
<td>704 (59.5)</td>
<td>1562 (59.2)</td>
</tr>
<tr>
<td>arguments with 1 or 2 people</td>
<td>437 (32.6)</td>
<td>444 (33.3)</td>
<td>881 (32.9)</td>
</tr>
<tr>
<td>arguments with 3 or more people</td>
<td>145 (10.8)</td>
<td>96 (7.2)</td>
<td>241 (9.0)</td>
</tr>
<tr>
<td><strong>School relationships</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bullied</td>
<td>724 (53.9)</td>
<td>687 (51.5)</td>
<td>1411 (52.7)</td>
</tr>
<tr>
<td>low engagement with school</td>
<td>492 (36.6)</td>
<td>440 (33.0)</td>
<td>932 (34.8)</td>
</tr>
<tr>
<td><strong>Depressive symptoms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control 1343 n (%)*</td>
<td>253 (18.8)</td>
<td>217 (16.3)</td>
<td>470 (17.6)</td>
</tr>
<tr>
<td>Intervention 1335 n (%)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 2678 n (%)*</td>
<td>253 (18.8)</td>
<td>217 (16.3)</td>
<td>470 (17.6)</td>
</tr>
</tbody>
</table>

*Percentages calculated on valid responses.

Table 2 Associations (OR, 95% CI) between school and social environment and depressive symptoms and substance use at baseline (wave 1)

<table>
<thead>
<tr>
<th></th>
<th>Depressive symptoms</th>
<th>Drinker</th>
<th>Smoker</th>
<th>Marijuana</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OR 95% CI</strong></td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
</tr>
<tr>
<td>Bullied</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>3.84</td>
<td>1.38</td>
<td>1.43</td>
<td>1.38</td>
</tr>
<tr>
<td>School attachment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Low</td>
<td>2.47</td>
<td>2.63</td>
<td>3.59</td>
<td>5.09</td>
</tr>
<tr>
<td>Quality of attachments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>good</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>poor</td>
<td>2.05</td>
<td>1.12</td>
<td>1.15</td>
<td>1.03</td>
</tr>
<tr>
<td>absent/very poor</td>
<td>3.29</td>
<td>0.90</td>
<td>1.55</td>
<td>1.85</td>
</tr>
<tr>
<td>Arguments with others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>no arguments</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>with 1 or 2 people</td>
<td>3.05</td>
<td>1.35</td>
<td>1.98</td>
<td>1.68</td>
</tr>
<tr>
<td>with 3 or more people</td>
<td>8.26</td>
<td>2.41</td>
<td>4.12</td>
<td>4.17</td>
</tr>
</tbody>
</table>

Social relations—availability of attachments and conflictual relationships

Indicators of perceived availability of attachments and conflictual relationships were adapted from the interview schedule for social interaction.22 Perceived availability of

reading suitable for young adolescents (Fleisch reading ease 78.5). Participants were defined as having anxiety/depressive symptoms if they scored ≥12, reflecting a level of minor psychiatric morbidity at which a general practitioner might be concerned.21
attachments was assessed in terms of having someone to talk to/depend on when angry or upset and having someone who can be trusted with private feelings and thoughts. Participants were categorised as having good availability of attachments, poor availability, or absent/very poor availability. For conflictual relationships, participants were categorised as reporting no arguments, arguments with one to two people, or with three or more people.

Victimisation
Participants were classified as bullied if they answered yes to any of four items addressing types of recent victimisation: being teased, having rumours spread about them, being deliberately excluded, or experiencing physical threats or violence.

School engagement
The school engagement scale originally comprised 23 items and five sub-scales.24 Eighteen items asked about student-student relationships (for example: I like the other students in my classes; I help out other students who need it), student-teacher relationships (My teachers are fair in dealing with students, I like my teachers this year, There are lots of chances for me to work on my own with a teacher), student-student relationships (Doing well in school is important to me; I try hard in school), and opportunities for participation (At my school, students have a lot of chances to help decide and plan things like school activities, events, and policies). The response set for the items is “YES!”, “yes”, “no”, “NO!”.

The Cronbach α was 0.87. Summing across the 20 items a total school engagement score was created. Students were classified as having low school engagement in subsequent waves if they scored below the lowest tertile at wave 1.

Health risk behaviours—substance use
Participants rated their current smoking (non-smoker, ex smoker, occasional to heavy smoker) and drinking (non-drinker or drinker) using a standard set of questions developed by the Centre for Adolescent Health (see Patton et al25 for more details). A retrospective seven day diary was completed for those who had smoked tobacco in the past month or drunk alcohol in the past two weeks. Participants were classified as smokers or drinkers if they reported smoking or drinking respectively in the past month. Regular smoking was defined as smoking on six or more days in the previous week. Regular drinking was defined as drinking five or more drinks in a row. Cannabis use was defined as any use in the previous six months. Peer substance use was reported as none or some/most of a subject’s friends were smokers, drinkers, or cannabis users respectively.

Family measures
Family measures included family structure (intact family, separated/divorced, or other circumstances), language other than English spoken at home (LOTE), country of birth (Australia vs other), and whether parents drank alcohol and/or smoked cigarettes.

Implementation
The median number of lessons using Gatehouse curriculum material in the first year, reported by the school liaison team was 20 (about 15 hours) with most schools using the resources in English. One school did not teach the curriculum material in the first year of the project as they were focusing on structural changes within the school.

The intervention team provided an average of 40 hours of professional development for each school each year. For the first year, half the contact time (46%) was spent providing professional development and support for the curriculum. In the second year 50% of the contact time focused on whole school planning and 25% on curriculum.

Method of analysis
Statistical analysis was performed using Stata (version 7.0, College Station, TX). All analyses were conducted using the intention to treat principle. That is, students’ data were analysed according to their assigned intervention group whether they remained in that group or not. Comparisons were made on valid responses for each wave. Prevalence estimates and univariate and multivariate logistic regressions were performed for each outcome separately for each wave using robust “information-sandwich” estimates of standard errors to account for clustering within schools.26 Multivariate analyses are presented adjusting
and control groups at the subsequent waves (98%
There was no differential response rate between intervention
data collection was less than 3%, 8%, and 10% respectively.
1971 students (68%) from comparison schools completed the
1652 students on the intervention school rolls and 1342 of
Of the sample of 3623 students, 2678 (74%) participated in
RESULTS
variables considered to be potentially important confounders:
gender, family structure, ethnicity (Australian born and LOTE),
Table 4 presents the comparison of intervention and
Table 1 summarises the baseline measures for the
intervention and control groups. The intervention group
reported slightly lower levels of risk factors such as parental
separation and parental smoking.
Table 2 shows the associations between the school and
social relationship measures and depressive symptoms and
health risk behaviours at baseline. Having arguments with
many others, low school engagement, and being victimised
were strongly related to substance use. Relations between poor
social relationships and self reported depressive symptoms
were even stronger than with the health risk behaviours.
Table 3 presents the comparison between intervention and
control groups on depressive symptoms and social and school
relationships for subsequent waves. Both unadjusted and
adjusted odds ratios are shown. Overall, there was no
significant impact of the intervention on these measures
although there was some indication of a negative impact on
the reporting of availability of attachments in the interven-
tion schools.
Table 4 presents the comparison of intervention and
control groups for substance use and friends’ substance use
for waves 2 to 4. The table shows a comparatively consistent
3%–5% risk difference between the two groups in any
drinking, any smoking and regular smoking, and friends’
alcohol and tobacco use. The largest impact as assessed by the
odds ratios was the reduction in the reporting of regular
smoking by those in the intervention group. There was weak
odds ratios were often higher and certainly more variable
across the years, than anticipated. All analyses were adjusted
for these effects.

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Any drinking</th>
<th>Wave2</th>
<th>Controls %</th>
<th>Intervention %</th>
<th>OR 95% CI</th>
<th>Adj OR 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any drinking</td>
<td>Wave2</td>
<td>1081</td>
<td>44.0</td>
<td>39.4</td>
<td>0.83</td>
<td>(0.63 to 1.09)</td>
</tr>
<tr>
<td>Any drinking</td>
<td>Wave3</td>
<td>1227</td>
<td>53.6</td>
<td>50.3</td>
<td>0.88</td>
<td>(0.65 to 1.19)</td>
</tr>
<tr>
<td>Any drinking</td>
<td>Wave4</td>
<td>1619</td>
<td>70.2</td>
<td>66.3</td>
<td>0.83</td>
<td>(0.55 to 1.28)</td>
</tr>
<tr>
<td>Tobacco</td>
<td>Any smoking</td>
<td>Wave2</td>
<td>607</td>
<td>24.9</td>
<td>22.0</td>
<td>0.85</td>
</tr>
<tr>
<td>Tobacco</td>
<td>Any smoking</td>
<td>Wave3</td>
<td>638</td>
<td>28.7</td>
<td>25.0</td>
<td>0.83</td>
</tr>
<tr>
<td>Tobacco</td>
<td>Any smoking</td>
<td>Wave4</td>
<td>630</td>
<td>28.2</td>
<td>24.9</td>
<td>0.84</td>
</tr>
<tr>
<td>Regular smoker</td>
<td>Wave2</td>
<td>171</td>
<td>8.3</td>
<td>4.9</td>
<td>0.57</td>
<td>(0.36 to 0.91)</td>
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<td>Regular smoker</td>
<td>Wave3</td>
<td>232</td>
<td>11.9</td>
<td>7.7</td>
<td>0.62</td>
<td>(0.39 to 0.99)</td>
</tr>
<tr>
<td>Regular smoker</td>
<td>Wave4</td>
<td>322</td>
<td>15.6</td>
<td>11.8</td>
<td>0.72</td>
<td>(0.52 to 1.00)</td>
</tr>
<tr>
<td>Marijuana use</td>
<td>Any in past 6 months</td>
<td>Wave2</td>
<td>307</td>
<td>12.2</td>
<td>11.5</td>
<td>0.94</td>
</tr>
<tr>
<td>Marijuana use</td>
<td>Any in past 6 months</td>
<td>Wave3</td>
<td>219</td>
<td>9.6</td>
<td>10.0</td>
<td>1.04</td>
</tr>
<tr>
<td>Marijuana use</td>
<td>Any in past 6 months</td>
<td>Wave4</td>
<td>466</td>
<td>21.7</td>
<td>18.6</td>
<td>0.83</td>
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<td>Friends’ use</td>
<td>Alcohol</td>
<td>Wave2</td>
<td>1468</td>
<td>58.5</td>
<td>54.6</td>
<td>0.85</td>
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<td>Friends’ use</td>
<td>Alcohol</td>
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<td>71.3</td>
<td>66.8</td>
<td>0.81</td>
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<tr>
<td>Friends’ use</td>
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<td>Wave2</td>
<td>2027</td>
<td>88.5</td>
<td>82.9</td>
<td>0.63</td>
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<td>Friends’ use</td>
<td>Tobacco</td>
<td>Wave3</td>
<td>371</td>
<td>15.9</td>
<td>12.7</td>
<td>0.77</td>
</tr>
<tr>
<td>Friends’ use</td>
<td>Tobacco</td>
<td>Wave4</td>
<td>433</td>
<td>19.8</td>
<td>16.0</td>
<td>0.77</td>
</tr>
<tr>
<td>Friends’ use</td>
<td>Tobacco</td>
<td>Wave4</td>
<td>530</td>
<td>24.2</td>
<td>20.6</td>
<td>0.81</td>
</tr>
</tbody>
</table>

*Adjusted for measure at baseline (wave 1) and gender, family structure, Australian born, parental smoking.
indicated a small effect at best. In general, adjusted odd ratios were closer to one than the unadjusted ones, possibly reflecting the lower levels of risk factors such as parental separation and parental smoking at baseline in the intervention group (table 1).

**DISCUSSION**

The findings from this cluster randomised controlled trial of a comprehensive school based health promotion strategy indicate that implementation of such a strategy can be effective in reducing adolescents' health risk behaviours particularly with respect to their substance use. With differences between the intervention and control groups of 3% to 5% for alcohol, smoking, and friends' drug use, these findings are as strong or stronger than many reported in the drug education literature.\(^4\)\(^{27}\)\(^{30}\)\(^{62}\) Percentage reductions (difference between control and intervention rates, divided by the control rates), which range from about 5% to 40%, are somewhat lower than those reported by others; however, this measure of effect is influenced by the prevalence of behaviour.

As expected from the literature strong associations were found between depressive symptoms and participants' social relationships and school attachment. It was however, disappointing to find the intervention had no apparent effect on adolescents' social relationships or their reporting of depressive symptoms. These findings are consistent with other studies of preventive interventions that have failed to show an effect on depression and related problems.\(^14\) It may be that the key determinants of depressive symptoms differ from those for substance use, or alternatively that the intervention was not short term, quick fix solutions.

In the analysis of this study, due consideration has been taken for the clustered design. Intraclass correlations varied across measures and between intervention and comparison schools, effectively reducing the sample size to about 500 for some outcomes and thereby reducing the power of the study and precision of many estimates. Thus, we may be over-estimating or underestimating the intervention effects. While the possibility cannot be excluded that the findings indicating some benefit from the intervention may have occurred by chance, the consistency of the reductions across the measures of substance use provides some support that this is not the case.

Using the quantitative assessment of implementation, we were not able to show a “dose response” in terms of behaviour changes. This finding would have strengthened our conclusions regarding the effect of the intervention on health risk behaviours. However, the assessment of

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**Key points**

- A broader focus on students’ connectedness and school climate may be equally if not more effective in addressing health and problem behaviours than specific, single issue focused education packages.
- A major limitation to the implementation of multilevel interventions is their fundamental complexity. Such interventions require long term commitment by schools and communities, and an understanding that such interventions are not short term, quick fix solutions.
- For schools to successfully implement environment change they require appropriate and locally relevant data, support in using these data, and continued support throughout the process of change.
- Implementing and assessing change in complex environments is challenging. Further work is needed to determine more fully the mechanisms of change and to explore how interactions between context and intervention affect the success of such complex interventions.

**Policy implications**

- The adoption of a multilevel, whole of school approach to health and mental health promotion in schools requires a stronger interface between health and education at all levels. It is also therefore, appropriate to have multi-sectoral support and importantly, funding for such initiatives as they affect multiple outcomes.
- A more effective focus for health and mental health promotion is on people, processes, and support structures rather than health education packages. Furthermore, this approach leads to a broader conceptualisation of student welfare from individual service focus, to a focus on organisational health.
- Multilevel school based health promotion is fundamentally complex. The complexity and the time frame have implications for resources and planning. Success requires long term commitment by funders, government departments, communities, and schools and an understanding that such interventions are not short term, quick fix solutions.
- Access to appropriate information or local data and the capacity to use these data to guide priorities and strategies is an important component of this work. There is a need to recognise data as a tool for change as well as a tool to assess change.
- High quality professional learning is essential to support improving school climate and working with young people to improve their emotional literacy skills. It needs to be undertaken both during basic teacher training and during teachers’ ongoing learning.
implementation was mainly focused on the curriculum component of the intervention and could not capture the complexity of the whole school changes undertaken by the schools. Establishing measures of whole school change would be an important direction for future research in the understanding of complex interventions such as the Gatehouse Project, in complex environments.

A potential source of bias in non-blinded trials such as this one is that of social desirability. However, it is unlikely that the students were aware of being subject to an intervention, which was designed to sit within the school curriculum and administrative processes. Students did not work from specific project workbooks nor was material presented with project titles. The most prominent aspect of the project for the students was their participation in the surveys. Hence, these students may have felt they were a special group in their schools but this would be equally so for both intervention and control.

The Gatehouse approach indicates that a broader focus on students’ connectedness and school climate may be equally if not more effective than specific, single issue focused education packages, in addressing health and problem behaviours. It is clear, however, that a major limitation is the fundamental complexity of implementing a multi-focused intervention. Such an intervention requires long term commitment by schools, an understanding that such interventions are not short term, quick fix solutions, and support throughout the process.

From this study it is obvious that further research and evaluation is needed to determine more fully the mechanisms that can explain the differences we have found. The lower rates of substance use in the intervention school students appear consistent with a true intervention effect, achieved through a multilevel intervention with a focus not only on drugs nor on refusal skills, but on changing social processes underlying these activities. These findings are entirely consistent with the literature on resilience, connectedness, and positive youth development.17 20–31 Importantly, this project indicates an innovative and feasible direction for sustainable multilevel school interventions with the potential for reduction of substance use and perhaps, in the long term, reduction of other health risk behaviours.

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