Promoting Social Inclusion in Schools: A Group-Randomized Trial of Effects on Student Health Risk Behavior and Well-Being

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Young people spend well over one third of their waking hours in school. For this reason, schools have often been a setting for preventive intervention. The use of school curricula to promote protective attitudes and skills has met with some success in reducing health risk behaviors. However, there have been some spectacular failures, which have led to calls for a reexamination of current approaches to prevention in schools.

One potential but currently neglected focus for prevention is the school’s social milieu. There is much evidence that the school’s social atmosphere affects patterns of substance use, antisocial and disruptive behaviors, as well as how well students learn. Advocates of health promotion have argued that addressing organizational processes and social relationships are likely to be effective in bringing about behavioral change. Despite the attractiveness of such a health promotional approach, relatively few strategies have been tested that use this approach.

The Gatehouse Project intervention was designed as a structured process to promote a sense of social inclusion and connection in secondary schools, building on the principles of the Health Promoting Schools Project. The process involved use of information about a school’s social climate to assist in setting priorities for action. Intervention elements ranged from establishing an inclusive classroom environment to creating opportunities for student participation in school life beyond the classroom, and included implementing a student curriculum that teaches interpersonal communication and emotional management. We examine the school-level effects of this intervention on indexes of health and behavior in lower secondary schools, measured at 2-year and 4-year follow-up.

Objectives. We sought to test the efficacy of an intervention that was designed to promote social inclusion and commitment to education, in reducing among students health risk behaviors and improving emotional well-being.

Methods. The design was a cluster-randomized trial in 25 secondary schools in Victoria, Australia. The subjects were 8th-grade students (aged 13 to 14 y) in 1997 (n=2545) and subsequent 8th-grade students in 1999 (n=2586) and 2001 (n=2463). The main outcomes were recent substance use, antisocial behavior, initiation of sexual intercourse, and depressive symptoms.

Results. At 4-year follow-up, the prevalence of marked health risk behaviors was approximately 20% in schools in the comparison group and 15% in schools in the intervention group, an overall reduction of 25%. In ordinal logistic regression models a protective effect of intervention was found for a composite measure of health risk behaviors in unadjusted models (odds ratio [OR] = 0.69; 95% confidence interval [CI] = 0.50, 0.95) and adjusted models (OR = 0.71; CI = 0.52, 0.97) for potential confounders. There was no evidence of a reduction in depressive symptoms.

Conclusion. The study provides support for prevention strategies in schools that move beyond health education to promoting positive social environments.

METHODS

Intervention

The Gatehouse Project intervention strategies have previously been described elsewhere. The intervention occurred during a 2-year period beginning in term 2 (April 19 to June 18), 1997. The structured process had 4 elements: (1) feedback from a student survey about security (a student’s personal sense of safety), communication with teachers, and broader participation in school life; (2) within each school, recruitment of staff involved in administration, student welfare, curriculum, or all 3 to a coordinating action team with a focus on school policies and professional practice of teachers; (3) consultation and training regarding specific intervention strategies; and (4) a curriculum element that focused on problem-solving in situations in which young people commonly experience emotional difficulties.

This strategy typically included the following sequence: (1) conduct a survey of the students, (2) provide feedback from the school social profile, based on the student survey, to the school-based action team, (3) consult with the school team regarding intervention priorities, and (4) train teachers in the selected strategies. The feedback process included an examination of the school profile of students’ school environment experiences, which was used to set priorities, facilitate discussion, and examine specific areas in need of action. Thus, for example, a school with students reporting a high level of deliberate social exclusion by peers might choose this particular area as a priority focus. Strategies varied between schools according to students’ perceptions of need; but, the implementation of school policy and curriculum elements that focused on social and emotional skills and strategies to promote inclusive relationships within the classroom were always addressed. The curriculum element of the intervention was designed to be taught in the 8th grade during a 10-week period in English, health, or personal development classes. The median number of lessons using the Gatehouse Project Intervention curriculum in the first year,
as reported by the school liaison team, was 20 (approximately 15 hours of instruction). An average of 40 hours of professional development were provided by the intervention team to each school during the first and second years, respectively, with the time split between a focus on curriculum and whole school strategies.

**Design and Participants**

A cluster randomization evaluation design was selected, with the school as the intervention unit. Twelve educational administrative districts were randomly sampled from 64 across metropolitan Melbourne. These were randomized to intervention and control status and the schools were pooled. The 2 pools were stratified by school administration so that 6 government and 6 independent/Catholic schools could be selected from each. This approximates the ratio of school types between these strata within the metropolitan area.

From the 10 nonmetropolitan school districts outside of Melbourne, 2 regional districts were selected and randomly allocated to intervention and control status. Four schools (2 government, 2 independent/Catholic) were then randomly selected from each pool of schools in these districts. From the total group (metropolitan and nonmetropolitan), 2 schools—1 in the intervention group and 1 in the control—declined to participate, citing involvement in other projects. Four further schools were unable to participate because of threatened closure or amalgamation.

Three cross-sectional surveys of 8th grade students (aged 13–14 y) in the participating schools were conducted at 2-year intervals. The initial survey took place in the school classroom between February 17 and March 28, 1997 (term 1), before the intervention. The survey was a self-administered questionnaire conducted on laptop computers provided by the research team. Absent students were surveyed at school at a later date or by telephone. New cohorts of 8th grade students were surveyed between April 19 and June 18, 1999 (term 2) and again between April 23 and June 22, 2001 (term 2); the items from the initial survey were identical but were administered in a pencil and paper format. Student participation on each occasion was voluntary and required written parental consent. School participation rates are shown in Figure 1. The final sample consisted of 11 schools in the intervention group and 14 in the control group; 1 school in the intervention group failed to provide complete behavioral outcome data in the 1999 and 2001 surveys and so was not included in the analysis. Participation rates were initially slightly higher in the intervention group but fell to a level similar to that in the control group at the last survey.

**Measures**

**Substance use** was measured by the self-reported frequency of tobacco, alcohol, and cannabis use. Report of tobacco and alcohol use was limited to use within the past month. Participants who smoked cigarettes or consumed alcohol during this time kept a retrospective 7-day diary. Tobacco use was defined on 3 levels: no use in the past month, having smoked at least 1 cigarette in the past month, and having smoked on 3 or more days in the previous week (to distinguish weekend smokers from more consistent smokers). Alcohol use was defined on 3 levels as well: no recent use, use in the previous week, and binge drinking (consuming 5 or more drinks in a row on at least 2 occasions in the past 2 weeks). Report of cannabis use was limited to use within the past 6 months. Use was...
again defined on 3 levels: no use in the past 6 months, use at least once in the previous 6 months, and current use at least weekly.

Dichotomous variables were defined for estimating prevalence of use. Any substance use was defined as either having used alcohol in the previous week, tobacco in the previous month, or cannabis in the previous 6 months. Heavy substance use was defined as binge drinking, tobacco use on at least 3 days in the previous week, or cannabis use at least weekly. A composite outcome on 3 levels was defined for the purpose of multivariate analysis: no recent use of any of the 3 substances, recent use of at least 1, and recent heavy use of 1 or more.

Antisocial behavior was assessed with items from the Self-Reported Early Delinquency Scale covering property damage, interpersonal violence, and theft in the previous 6 months. Any antisocial behavior referred to at least 1 instance in the previous 6 months and frequent antisocial behavior referred to 2 or more instances. A composite antisocial behavior outcome on 3 levels was defined for each respondent for multivariate analysis: no reported behavior, 1 instance in the past 6 months, and more than 1 instance in the past 6 months.

Early initiation of sexual intercourse was assessed with a single item about ever having had sexual intercourse (sexual intercourse, “gone all the way”).

In order to assess the overall effect of the intervention on health risk behaviors, 2 further composite 3-level outcomes were defined, incorporating the substance use indicators, antisocial behavior, and early initiation of sexual intercourse. Any risky behavior was defined on 3 levels as either none, 1 behavior (any substance use, any antisocial behavior or early initiation of sexual intercourse), or 2 or more behaviors at this level. Marked risky behavior was defined as either none, 1 behavior at the highest level (heavy substance use, report of multiple antisocial behaviors, or early initiation of sexual intercourse), or 2 or more behaviors at this level.

Emotional problems were assessed at baseline (1997) using a computerized revised Clinical Interview Schedule (CIS-R). The total scores were dichotomized at a cut-off point of 11/12. In later surveys (1999 and 2001) the short Mood and Feelings Questionnaire was used to assess depressive symptoms with a cut-off point of 11/12, which was used to delineate high symptom levels.

School commitment was assessed with a questionnaire comprising 23 items and 5 subscales reflecting school attachment, student–teacher communication, perceived opportunities for participation, disinterest, and rewards for participation.

Data Analysis
Data analysis was designed to test the hypotheses that the prevalence of behavioral and emotional problems would be lower among students in the schools in the intervention group compared with those in control group at later surveys of 8th grade students. Power estimates for more common behavioral and emotional problems with a prevalence of 25% and an intraclass correlation of .05 suggested that the study should have 80% power to detect a 20% reduction in prevalence at a significance level of .05. Statistical analyses were conducted with the Stata 8.0 program (Stata Corp LP, College Station, Tex). All analyses were conducted using an intention to treat principle with the intervention group at later surveys of 8th grade students. Power estimates for some outcomes were higher in follow-up surveys, reflecting the later timing of the survey in the school year with students being 3 months older than those at the original assessment.

There was little difference at baseline in key outcome measures between schools in the intervention group and those in the control group. In 1999, trends were apparent for lower rates of substance use among students in schools in the intervention group. For example, the estimated difference in the prevalence of any health risk behavior was 2.8%.

TABLE 1—Demographic Characteristics and Percentage of Responders of 8th-Grade Students in the Study Schools at Baseline and Follow-Up in 1999 and 2001.

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<tbody>
<tr>
<td>Female</td>
<td>52</td>
<td>54</td>
<td>55</td>
<td>55</td>
<td>53</td>
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<tr>
<td></td>
<td>Student with first language other than English</td>
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<td>22</td>
<td>24</td>
<td>18</td>
<td>22</td>
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<tr>
<td>Parental separation</td>
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<td>24</td>
<td>21</td>
<td>23</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Non-Australian born</td>
<td>16</td>
<td>9</td>
<td>16</td>
<td>9</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>

Note. Intervention numbers were based on the 11 intervention schools with complete data at all 3 surveys.
TABLE 2—Intervention Effects (Odds Ratios and Confidence Intervals) on Risky Behaviors Among 8th-Grade Students Aged 13–14 Years in 25 Schools, Estimated by Logistic and Ordinal Regression.a

<table>
<thead>
<tr>
<th></th>
<th>Substance Useb</th>
<th>Antisocial Behaviorc</th>
<th>Early Initiation of Sexual Intercourse</th>
<th>Any Risky Behaviorsd</th>
<th>Marked Risky Behaviorsd</th>
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<tr>
<td></td>
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<tr>
<td>1997</td>
<td>Unadjusted OR</td>
<td>0.88 (0.66, 1.2)</td>
<td>1.05 (0.71, 1.4)</td>
<td>1.07 (0.65, 1.6)</td>
<td>1.03 (0.76, 1.4)</td>
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<tr>
<td></td>
<td>Adjusted estimate ORd</td>
<td>0.92 (0.70, 1.2)</td>
<td>1.02 (0.73, 1.4)</td>
<td>1.10 (0.68, 1.8)</td>
<td>1.07 (0.9, 1.5)</td>
</tr>
<tr>
<td>1999</td>
<td>Unadjusted OR</td>
<td>0.79 (0.54, 1.16)</td>
<td>0.95 (0.68, 1.3)</td>
<td>0.81 (0.54, 1.2)</td>
<td>0.84 (0.61, 1.15)</td>
</tr>
<tr>
<td></td>
<td>Adjusted estimate ORd</td>
<td>0.84 (0.61, 1.18)</td>
<td>0.99 (0.73, 1.3)</td>
<td>0.84 (0.59, 1.2)</td>
<td>0.89 (0.68, 1.17)</td>
</tr>
<tr>
<td>2001</td>
<td>Unadjusted OR</td>
<td>0.80 (0.59, 1.07)</td>
<td>0.75 (0.54, 1.06)</td>
<td>0.54 (0.35, 0.86)</td>
<td>0.80 (0.59, 1.07)</td>
</tr>
<tr>
<td></td>
<td>Adjusted estimate ORd</td>
<td>0.85 (0.65, 1.12)</td>
<td>0.78 (0.57, 1.07)</td>
<td>0.55 (0.37, 0.83)</td>
<td>0.84 (0.62, 1.11)</td>
</tr>
</tbody>
</table>

aWald tests were used to exclude deviation from the constant odds ratio assumption for group effects and for overall models.

bNone, 1, or 2 or more behaviors.

cAdjusted estimates were based on models and were adjusted for student gender, non-Australian birth, and parental marital status.

dAdjusted estimates were based on models and were adjusted for student gender, non-Australian birth, and parental marital status.

Emotional Problems

Emotional problems at baseline, measured with the CIS-R, were 20.2% (CI= 16.4, 24.0) in the control group and 17.2% (CI= 14.2, 20.2) in the intervention group. At the 1999 follow-up survey, in which the Mood and Feelings Questionnaire measured emotional problems, rates were 16.9% (CI= 13.9, 19.6) in the control group and 17.5% (CI= 14.0, 21.0) in the intervention group. In 2001, rates of emotional problems were 14.2% (CI= 11.7, 17.5) in the control group and 12.7% (CI= 9.4, 15.8) in the intervention group. No differences were found in adjusted ORs for emotional problems at baseline (OR= 0.85; CI= 0.67, 1.1), in 1999 (OR= 1.1; CI= 0.85, 1.4) or in 2001 (OR= 0.90; CI= 0.65, 1.3).

DISCUSSION

Four years after beginning an intervention to promote social inclusion within schools, patterns of health risk behaviors among students in intervention schools differed from those in schools in the control group. Marked health risk behaviors were reported by approximately 15% of students in the intervention school group after the intervention, compared with 20% of those in the control group, an overall reduction of one quarter. This difference arose from lower rates of substance use, antisocial behavior, and early initiation of sexual intercourse by students in the intervention schools. This group difference was not explained by changes in student emotional problems because these did not differ between the intervention and control groups before or after intervention.

These reductions in risky behaviors are greater than those found in most recent studies of health education.9,20,28,29 These findings stand out in 2 further respects. First, the effect was apparent across a range of behaviors. Second, the changes were apparent in subsequent cohorts of students, a finding that is consistent with the intent of maximizing sustainability by nesting the intervention within normal school processes and curricula. Given the effects of adolescent-initiated health risk behaviors on health later in life, reductions of this kind could have major public health benefits if the approach were adopted broadly.

There were some study limitations. Cluster randomization took place at a school district level, but the intervention and analyses were at the individual school level. This design was necessary to reduce the risks of contamination but is a weaker randomization design. The number of schools that were available after randomization was diminished by nonparticipation of 6 selected schools, raising questions about the effectiveness of randomization, as well as study...
power. Similarities in the demographic profile of intervention and control groups across surveys are consistent with the integrity of randomization, but a possibility of unmeasured confounding cannot be totally excluded.

Although overall response rates were moderately high, some differential response between intervention and control groups in the first 2 surveys might account for our findings. Nonresponse tended to be greater in the control group, and because nonresponders have higher levels of health risk behaviors, differential nonresponse seems more likely to have led to an underestimation of intervention effect. Social desirability, a potential source of measurement bias in nonblinded trials, was limited by integrating the intervention within usual school curriculum and administrative processes. The health education component was delivered by teachers through the usual curriculum, minimizing the chances that students were aware of being part of an intervention. It is possible that the first cohort—the 1997 baseline group—were aware of being a special group, but this is unlikely to have been the case in subsequent surveys. Finally, we cannot exclude chance variation as an explanation for our findings, although changes in health risk behaviors after intervention consistently moved in a favorable direction at follow-up surveys.

Our findings carry implications for concepts of how schools may influence student behavior. Measures of school engagement were strongly associated with health risk behaviors, but behavioral change in the intervention schools was not matched by equivalent changes on these measures. This raises a question of whether the constructs of school social inclusion and student connection to education were adequately operationalized to capture change in this study.

The intervention also had no clear effect on emotional problems. It is possible that the intervention was not sufficiently specific or sustained to produce a detectable effect, given that study power was marginal. Alternatively, key determinants of depressive symptoms may differ from those for health risk behaviors, perhaps operating outside the secondary school setting or at a developmentally earlier point.

Our study is a rare example of the implementation and evaluation of a complex
systems intervention to improve health. The elements of the intervention process—feedback on the social context, creation of a coordinating structure (i.e., the action team), and ongoing consultation—may be useful in other settings. The process coordinated health promotional work with varied foci, as well as provided a means for nesting a health agenda within a school’s policy and practice framework. The result was the development of interventions tailored to the needs of particular schools but differing between schools. Although there remains much to learn about the wider application of this particular approach, our findings support strategies to promote the social milieu of schools as a way of achieving better health and learning outcomes.

References


