Does a School-wide Intervention to Improve School Climate Have a Long-Term Effect on Middle School Student Behavior and Well-Being?

Introduction

Preventative school-wide interventions that develop a positive school climate can be a successful way to improve student learning outcomes and diminish behaviors such as substance use, antisocial and disruptive behaviors. In a recent research study, Patton et al. (2006) investigated the long-term effectiveness of one such intervention, called "The Gatehouse Project." Patton et al. (2006) explored the impact of the intervention on middle school student behavior and health over time, comparing baseline data to data collected after two years and four years post-intervention.

Methods

Intervention: The Gatehouse Project intervention is designed to promote a sense of social inclusion and connection in secondary schools through a structured process. The intervention elements vary from school to school based on the specific school's climate, and may include establishing an inclusive classroom environment and creating opportunities for student participation at the whole-school level. The intervention also includes implementing up to 15 hours of student curriculum about interpersonal communication and emotional management, and up to 40 hours of teacher professional development about this curriculum and related strategies for improving school climate (for more information, see Bond et al., 2001 and Patton et al., 2003 and see the website: http://www.rch.org.au/gatehouseproject/).

Research Design: To test the hypothesis that prevalence of self-reported behavioral and emotional problems would be lower in schools where the Gatehouse Project interventions occurred, Patton et al. (2006) employed a cluster randomization evaluation design with the school as the intervention unit. Using a stratified random sample of 16 out of 74 school districts in and around the city of Melbourne Australia, eight school districts were randomly selected to receive the intervention and eight school districts were randomly selected to be the control group. At the end of the study, the researchers were able to collect data on 11 schools that had received the interventions and 14 schools which were control schools.

The study used three cross-sectional surveys conducted at two-year intervals to obtain information about student behaviors regarding substance use, antisocial behavior, and early initiation of sexual intercourse. Baseline data was collected through self-administered surveys using laptop computers; in subsequent years the same items were used but in pencil and paper form. Statistical analyses were conducted with the Stata 8.0 program. Ordinal logit models were fitted to 3-level composite end points for substance

use and antisocial behavior, and summary measures of the three health risk behaviors were also modeled as 3-level ordinal variables.

Participants: The participants in this study were all 8th grade students from 25 middle schools (11 intervention school and 14 control schools, both government and independent or Catholic schools, representative of the total sample of schools in the area), all located in metropolitan or non-metropolitan Melbourne, Australia. Baseline data prior to the intervention was collected in 1997 (n = 2545), and subsequent cohorts were surveyed in 1999 (n = 2586), and in 2001 (n = 2463). The student population was primarily male, English-speaking, and Australian-born. Participation was voluntary and required written parental consent.

Measures: *Substance use* was measured by self-reported frequency of tobacco, alcohol, and marijuana use. A summary variable for *any substance use* was computed, defined as having used alcohol in the previous week, tobacco in the previous month, or marijuana in the previous 6 months. The summary variable for *heavy substance use* was defined as binge drinking, tobacco use at least three days in the previous week, or marijuana use at least weekly.

Antisocial behavior was measured with items about property damage, interpersonal violence, and theft in the previous 6 months from the Self-Reported Early Delinquency Scale (Moffitt & Silva, 1988). Antisocial behavior was coded as *any antisocial behavior* (at least one instance in previous six months) or *frequent antisocial behavior* (2 or more instances). *Early initiation of sexual intercourse* was assessed with a single item asking if the student had ever engaged in sexual intercourse.

Any risky behavior was defined on three levels: none, one behavior (any substance use, early initiation of sexual intercourse, any antisocial behavior), or two or more behaviors at this level. *Marked risky behavior* was also defined on three levels: none, one behavior at the highest level (heavy substance use, report of multiple antisocial behaviors, or early initiation of sexual intercourse), or two ore more behaviors at this level.

Emotional problems were assessed in the initial survey using the Clinical Interview Schedule (CIS-R) (Lewis & Pelosi, 1992), and measured in subsequent surveys using items from the short Mood and Feelings Questionnaire (reflecting depressive symptoms) (Angold et al., 1995). *School commitment* was assessed with a questionnaire reflecting school attachment, student-teacher communication, perceived opportunities for participation, and disincentives and rewards for participation (Arthur et al., 2002).

Results

Data was reported in odds ratios and 95% confidence intervals (CI). There were not significant differences between the control and intervention student groups at the time of the baseline data collection. After two years of the interventions, there was a 2.8% difference between the intervention and control schools in the summary variable *any risky behavior* (CI = -4.6, 10) and a 4.3% difference in the summary variable *marked*

risky behavior (CI = -3.7, 12.2). Four years after the interventions were begun, the absolute difference for *any risky behaviors* among students in the intervention schools compared to students in control schools was 4.9% (CI = -3.1, 12.9). The between-group difference for *marked risky behaviors* was also 4.9% (CI = 0.5, 10.4). These differences translate into a 25% reduction of those behaviors in the intervention group compared to the control group.

Binary and ordinal logistic regression models were used to more formally test intervention effects, and the association between group and *marked risky behaviors* revealed that students in the intervention schools had a lower risk for each level of behavioral problems (OR = 0.9; CI = 0.5, 0.95), even after controlling for possible confounding variables such as gender, cultural background, and parental marital status.

Emotional problems were originally measured by the CIS-R, and were 20.2% (CI = 16.4, 24.0) for students in the control schools and 17.2% (CI = 14.2, 20.2) for students in the intervention schools. In 1999, using the Mood and Feeling Questionnaire, the rate of emotional problems for students in the control schools was 16.9% (CI = 13.9, 19.6) and in the interventions schools was 17.5% (CI = 14.0, 21.0) . In 2001, using the same measure, rates were 14.2% (CI = 11, 17.5) for the control schools and 12.7% (CI = 9.4, 15.8) for students in the intervention schools. While compromised somewhat by the change in the measurement, this data reveals that there were not significant differences between the control and intervention groups in the amount of emotional problems at any point in the study. There were also no significant difference between the control schools and intervention schools on the measure of student commitment levels (t = 1.9, P = .07).

Implications

This study indicates that the Gatehouse Project intervention using improvements in school climate impacts key student risk behaviors and that the significant effect is a long-lasting one. After 4 years of the intervention, almost 15% of students in the intervention schools had marked health risk behaviors, compared with 20% of the students in the control schools, which is a 25% reduction in these behaviors. Lower rates of alcohol, tobacco, and marijuana use, in addition to lower rates of antisocial behaviors and lower rates of early sexual intercourse in intervention students all lead to the conclusion that the Gatehouse Project is effective. This intervention may be more successful than similar interventions because the effect could still be seen four years after the intervention.

It is imperative to keep in mind that all of the data in this study is self –reported by the students, and not actual student behavior. Another limitation is that cluster randomization took place at the school district level, but interventions took place at the individual school level, leading to a weaker randomization design. Students in the control schools were more likely to skip items on the survey than students in the intervention schools, which may account for some of the outcome differences between the two groups.

Critical Perspectives

The National Panel for Evidence-Based School Counseling has designed an outcome research protocol which codes and rates the levels of evidence for the causal effect of an intervention. Interventions are rated in seven domains with two levels of strength: strong evidence and promising evidence. To be considered an evidence-based practice, an intervention must demonstrate strong evidence in all seven domains; to be considered promising practice, an intervention must exceed promising evidence in all the domains.

Patton et al. (2006) describe an intervention that seems to be effective but cannot be considered promising practice according to these standards, because the study does not satisfy or exceed promising practice in all seven domains. Important personal and social outcomes are measured in this study, and reliability characteristics show adequate reliability. The comparison group in this study (control schools) was selected in a way so that most resulting differences (between the intervention schools and control schools) could be attributed to the intervention; however, group equivalence in attrition was not established. This study did not state effect sizes, but rather used confidence intervals and odds ratios. The Gatehouse Project intervention is structured but not standardized, in that intervention elements vary from school to school. The schools that are included in this study have limited diversity, although they are purposefully representative of the population in the city where the intervention was implemented. The Gatehouse Project intervention does seem to have a high level of persistence of effect.

In summary, the Patton et al. (2006) study indicates that the Gatehouse Project intervention is successful at impacting the health risk behaviors of substance use, early sexual intercourse, and antisocial/delinquent behavior within middle schools across metropolitan and non-metropolitan Melbourne, Australia. This intervention had no measured effect on student emotional problems, and learning outcomes were not measured.

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