

An Outcome Evaluation of the SOS Suicide Prevention Program

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Suicide among young people is one of the most serious public health problems in the United States. According to the National Center for Health Statistics, the suicide rate for youths and young adults aged 15 to 24 years has tripled since 1950, and suicide is now the third leading cause of death in this age group.^{1,2} Recent studies indicate that the incidence of suicide attempts among adolescents may exceed 10% annually,^{3,4} although it is difficult to obtain reliable estimates because of the accompanying stigma associated with attempting suicide.

A number of diverse approaches to suicide prevention have been incorporated into high school curricula in the past 15 years.⁵⁻⁷ Few, however, have been subjected to rigorous evaluation, and those that have been scientifically evaluated have produced mixed results. On the positive side, a suicide awareness curriculum developed by Spirito et al. yielded a significant increase in knowledge about suicide and small but statistically significant reductions in the use of maladaptive coping strategies among ninth-grade students.⁸ Similarly, increases in personal control, problem-solving coping, self-esteem, and family support and decreases in depression were observed among at-risk high school students who were exposed to brief supportive counseling interventions developed by Randell et al.⁹ However, these modest successes are overshadowed by several other studies that have failed to observe any effects of such interventions on students' attitudes or behaviors.^{10,11}

A relatively new approach to reducing the incidence of suicide among adolescents is found in Signs of Suicide (SOS), a school-based prevention program. It incorporates 2 prominent suicide prevention strategies into a single program by combining curricula to raise awareness of suicide and its related issues with a brief screening for depression and other risk factors associated with suicidal behavior.¹² In the didactic component of the program, SOS promotes the concept that suicide is directly related to mental illness, typically depression, and that suicide is not a normal reaction to stress or emotional upset.¹³⁻¹⁷ Youths are taught to recognize

Objectives. We examined the effectiveness of the Signs of Suicide (SOS) prevention program in reducing suicidal behavior.

Methods. Twenty-one hundred students in 5 high schools in Columbus, Ga, and Hartford, Conn, were randomly assigned to intervention and control groups. Self-administered questionnaires were completed by students in both groups approximately 3 months after program implementation.

Results. Significantly lower rates of suicide attempts and greater knowledge and more adaptive attitudes about depression and suicide were observed among students in the intervention group. The modest changes in knowledge and attitudes partially explained the beneficial effects of the program.

Conclusions. SOS is the first school-based suicide prevention program to demonstrate significant reductions in self-reported suicide attempts. (*Am J Public Health.* 2004;94:446-451)

the signs of suicide and depression in themselves and in others, and they are taught the specific action steps necessary for responding to those signs. The objective is to make the action steps—ACT—as instinctual a response as the Heimlich maneuver and as familiar an acronym as CPR. ACT stands for acknowledge, care, and tell: First, *acknowledge* the signs of suicide that others display and take those signs seriously. Next, let that person know that you *care* and that you want to help. Then, *tell* a responsible adult.

The program's teaching materials consist of a video and a discussion guide. The video features dramatizations that depict the signs of suicidality and depression and the recommended ways to react to someone who is depressed and suicidal. It also includes interviews with real people whose lives have been touched by suicide. Students also are asked to complete the Columbia Depression Scale (CDS), a brief screening instrument for depression, derived from the Diagnostic Interview Schedule for Children.¹⁰ The screening form is scored by the students themselves; a score of 16 or higher on the CDS is considered a strong indicator of clinical depression, and the scoring and interpretation sheet that accompanies the screening form encourages students with such scores to seek help immediately. Each school provides a description of the resources available to students who wish to seek assistance.

The goal of the SOS program is to reduce suicidal behavior among adolescents through

2 mechanisms. First, the educational component of the program is expected to reduce suicidality by increasing students' understanding and recognition of depressive symptoms in themselves and in others and by promoting more adaptive attitudes toward depression and suicidal behavior. Second, the self-screening component of the SOS program helps students assess and evaluate the depressive symptoms and the suicidal thoughts they might be experiencing and prompts them to seek assistance when dealing with these problems. Seeking help need not be limited to referral for treatment by a mental health professional, which is likely to be constrained by such factors as availability and accessibility of providers, health insurance coverage, and social stigma, but should also be directed at the "indigenous trained caregivers" in the school environment (e.g., teachers and guidance counselors) as well as from loved ones.¹⁸

In addition to its use of multiple suicide prevention strategies, the SOS program offers other potential advantages. First, the focus on peer intervention is developmentally appropriate for the targeted age group.^{7,19,20} During adolescence, the peer group becomes the primary sphere of social involvement and emotional investment for most youths.^{21,22} The SOS program capitalizes on a key feature of this developmental period by teaching youths to recognize the signs of depression and by empowering them to intervene when confronted with a friend who is exhibiting these symptoms. Sec-

ond, the program can be implemented on a schoolwide basis by health educators with relative ease. Data from schools that offered the SOS program during the 2001–2002 school year indicate that the program can be implemented with minimal staff training and that the program does not unduly burden teachers, counselors, or administrative staff.²³ Implementation of other suicide prevention programs that include mental health screening can be costly, difficult, and time-consuming.¹³

This article presents data from an outcome evaluation of the SOS program conducted during the 2001–2002 school year in 5 high schools in Hartford, Conn, and Columbus, Ga. The primary goal of our research was to assess the short-term impact of the program on suicidal behavior, seeking help, and knowledge of and attitudes toward depression and suicide in a diverse student population.

METHODS

Our study included 2100 public school students in 3 high schools in Hartford and 2 high schools in Columbus. As indicated by the demographic profile of the sample (Table 1), these schools provided a racially mixed and economically diverse sample of youths. The students in the 3 Hartford schools (n=1435) were primarily economically disadvantaged youths from diverse racial and ethnic backgrounds: approximately 59% of the Hartford sample was Hispanic and 20% was non-Hispanic Black. Twenty percent of Hartford students had been placed in a remedial English or bilingual program during high school. In contrast, the students in the Columbus schools (n=665) were predominately from working- or middle-class families, with approximately equal proportions of White (39%) and Black (37%) youths.

The experimental design consisted of randomized treatment and control groups and posttest-only data collection. In 4 of the 5 participating schools, students were randomly assigned to health classes (Hartford) and social studies classes (Columbus) by a computerized scheduling program. (Only ninth-grade classes were eligible to participate in the Columbus sites, because all other grades had received the program during the previous year.) Because the semester in which students were assigned to these half-year classes was determined ran-

TABLE 1—Demographic Characteristics by City, 2001–2002

	Hartford, Conn	Columbus, Ga
Race/ethnicity, %		
Non-Hispanic White	6	39
Non-Hispanic Black	20	37
Hispanic	59	8
Multietnic	9	12
Other	6	5
Gender, %		
Male	47	52
Female	53	48
Grade, %		
9th	35	100
10th	30	0
11th	18	0
12th	18	0
ESL classes during high school, %		
No	80	85
Yes	20	15

Note. ESL = English as a Second Language. In Hartford and Columbus, respectively, n = 1363 and 655 for race/ethnicity; n = 1382 and 659 for gender; n = 1352 and 655 for grade; and n = 1367 and 655 for ESL classes during high school. The race/ethnicity numbers for Columbus add up to 101 because of a rounding error.

domly, all students who took these classes during the first half of the school year were assigned to the treatment group and participated in the program over a 2-day period from October through November 2001. Students who took these classes during the second half of the school year were assigned to the control group and did not participate in the program until after the evaluation was completed. The single exception was a technical–vocational high school in Hartford, where students were clustered in health classes according to their major area of study and where class composition did not change at midyear. For this school, random assignment of classes to both the intervention and the control conditions was achieved by flipping a coin. A number of potential concerns associated with the assignment of classrooms to experimental conditions were minimized,²⁴ because the same teachers and the same classrooms were used for both intervention and control conditions in all 5 schools.

Students in both the treatment and the control groups were asked to complete a short

questionnaire in a group setting during class time approximately 3 months after implementation of the program. Trained interviewers from the University of Connecticut's Center for Survey Research and Analysis and Columbus State University read aloud the questions to each class, and students recorded their confidential written responses on anonymous questionnaires. Parents were notified in writing about the objectives of the study and were invited to contact their respective schools to ask questions or to withdraw their child from the study. Questionnaires were completed by 2100 of the 2258 students eligible for the study (n=1073 for the control group, n=1027 for the treatment group), which resulted in an overall response rate of 93%.

Measures and Instruments

The questionnaire included items relevant to 3 specific categories of outcome: (1) self-reported suicide attempts and suicidal ideation, (2) knowledge and attitudes about depression and suicide, and (3) help-seeking behavior. The primary endpoint for our study was a single-item measure of self-reported suicide attempts taken from the Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey: "During the past 3 months, did you actually attempt suicide (yes or no)?"⁴ Suicidal ideation also was assessed with a question taken from the survey: "During the past 3 months, did you ever seriously consider attempting suicide (yes or no)?"

The measures of knowledge and attitudes about depression and suicide were adapted from instruments previously used to evaluate school-based suicide prevention programs.^{8,10} Knowledge of depression and suicide was measured with 10 true/false items that reflect the central themes of the SOS program (e.g., "People who talk about suicide don't really kill themselves"; "Depression is an illness that doctors can treat"). Scores on this variable reflected the number of correct answers. The measure of attitudes toward depression and suicide was an 8-item summary scale that assessed attitudes toward suicidal people and suicidal behaviors (e.g., "If someone really wants to kill him/herself, there is not much I can do about it"; "If a friend told me he/she is thinking about committing suicide, I would keep it to myself"). Responses to these questions ranged from

TABLE 2—Descriptive Characteristics of Measures of Suicidal Behavior, Knowledge, and Attitudes

	Control (n = 1073)	Treatment (n = 1027)	Total Sample (N = 2100)	Valid N
Treated for depression/suicidal ideation, %	9.9	8.5	9.2	2039
Talked with adult about depression/suicidal ideation, %	18.7	15.9	17.3	2041
Talked with adult about friends' emotional problems, %	13.0	11.9	12.4	2042
Suicidal ideation during past 3 months, %	12.2	10.1	11.2	2034
Suicide attempt during past 3 months, %	5.4	3.6	4.5	2042
Knowledge of depression/suicide, mean (SD)	6.49 (1.68)	7.18 (1.68)	6.67 (1.97)	2090
Attitudes toward depression/suicide, mean (SD)	3.80 (0.658)	4.05 (0.644)	3.93 (0.662)	2041

“strongly disagree” to “strongly agree” on a 5-point scale, with higher values indicating more adaptive attitudes about depression and suicide (Cronbach $\alpha = .74$). Three questions were used to assess help-seeking behavior. Students were asked whether in the past 3 months, “. . . you received treatment from a psychiatrist, psychologist, or social worker because you were feeling depressed or suicidal (yes or no)”; whether “. . . you talked to some other adult (like a parent, teacher or guidance counselor) because you were feeling depressed or suicidal (yes or no)”; and whether “. . . you talked to an adult about a friend you thought was feeling depressed or suicidal (yes or no).”

Subjects who had missing values on any variable in a particular analysis were excluded from that analysis. Although 84 youths assigned to the treatment group did not actually participate in either of the central elements of the program—the video and depression screening—mainly because of absences from school, they were retained in the analysis so that we could estimate “intention to treat” effects. After exclusions for missing data, the effective sample size for these analyses ranged from 1894 to 1912. Descriptive statistics for all dependent variables used in this analysis are shown separately by treatment status in Table 2.

RESULTS

Comparability of Treatment and Control Groups

Preliminary analyses were conducted to assess the comparability of treatment groups and control groups in terms of race/ethnicity, gender, grade, and English as a Second Language (ESL) status. Chi-square tests revealed no differ-

ences in the composition of treatment and control groups by race/ethnicity or gender. However, significant differences were observed for grade ($\chi^2 = 23.6$, $df = 3$) and for ESL status ($\chi^2 = 7.8$, $df = 1$): 10th-grade students were slightly more likely than students in other grades to be assigned to the treatment group (e.g., 58% of 10th-grade students were in the treatment group vs an expectation of 50%), while ninth-grade students were slightly less likely than students in other grades to be assigned to the treatment group (44% in treatment), and only 40% of those who had taken ESL or bilingual classes during high school were assigned to the treatment group.

Assessing Effects of the SOS Program

To account for the assignment of classrooms to experimental conditions, we used HLM 5 software²⁵ to perform multivariate analyses of program effects. HLM was developed to address generic problems in the analysis of hierarchical data structures—that is, data in which characteristics of 1 unit of analysis (e.g., individuals) are nested within and vary among larger units (e.g., social groups or contexts). In our analysis, the effect of exposure to the SOS program on each outcome variable was estimated in a 2-level HLM model, where students (the level-1 unit of analysis) were nested with classrooms (the level-2 unit of analysis). The basic level-1 model for these outcomes was

$$(1) \quad Y_{ij} = B_{0j} + B_{1j}Female_{ij} + B_{2-5j}Race_{ij} + B_{6j}ESL_{ij} + B_{7-9j}Grade_{ij} + e_{ij}$$

where Y represents the predicted value of each outcome variable for each individual (i) in the classroom (j); $Female$, $Race$, and ESL represent

a series of dummy variables for the demographic control variables included in the analysis; and e represents random error. To reduce the error variance in the outcome measures and to control for differences in the composition of the treatment and control groups,²⁶ all level-1 models included dummy variables for race/ethnicity (non-Hispanic Black, Hispanic, multiethnic, and other race vs non-Hispanic White), gender (female vs male), grade (10, 11, and 12 vs 9), and ESL status (ESL vs no ESL).

Because exposure to the SOS program was determined at the classroom level, treatment effects were assessed for each outcome by inserting a dummy variable for exposure to the program into the level-2 equation for the level-1 intercept term:

$$(2) \quad B_{0j} = G_{00} + G_{01}Treatment_j + U_{0j}$$

The random error in this equation (U_{0j}) represents residual variability in treatment effects across classrooms. All demographic control variables were modeled as fixed effects (i.e., $B_{1j} = G_{10}$).

The effects of the SOS program on students' knowledge of and attitudes toward depression and suicide, help-seeking behavior, and suicidal ideation and self-reported suicide attempts are shown in Table 3. For the analysis of attitudes and knowledge, this table shows coefficients from a standard 2-level HLM analysis; for help-seeking behavior, suicidal ideation, and suicide attempts, coefficients are derived from nonlinear 2-level HLM models that used the logit link function. The top row in Table 3 shows the effects of exposure to the SOS program on the various outcome measures included in our study. First and most important, the coefficients shown in column 1 of Table 3 indicate that exposure to the SOS program was associated with significantly fewer self-reported suicide attempts. The coefficient for the effect of the SOS program on attempts is -0.467 , which when converted to an odds ratio (OR) indicates that the youths in the treatment group were approximately 40% less likely to report a suicide attempt in the past 3 months compared with youths in the control group (OR = $e^{-0.467} = 0.628$). The magnitude of the difference between the treatment group and the control group also is indicated in the descriptive statistics shown in Table 2; the rate of self-reported suicide attempts among students in the

TABLE 3—Effects of Signs of Suicide Program on Students' Knowledge of and Attitudes Toward Depression and Suicide, Seeking Help, and Suicidal Ideation and Suicide Attempts

	β (SE)						
	Attempts	Ideation	Knowledge	Attitudes	Treatment	Adult	Adult/Friend
Intercept	-3.447* (.133)	-2.196* (.078)	6.803* (.054)	3.914* (.019)	-2.459* (.094)	-1.759* (.081)	-2.114* (.074)
SOS program	-.467* (.207)	-.272 (.147)	.689* (.109)	.255* (.038)	-.217 (.181)	-.233 (.146)	-.147 (.138)
Female	1.022* (.313)	.764* (.183)	.349* (.077)	.136* (.031)	.719* (.189)	1.266* (.193)	1.152* (.165)
Hispanic	-.193 (.218)	-.245 (.144)	-.626* (.108)	.097* (.038)	-.147 (.299)	.091 (.158)	.132 (.186)
Non-Hispanic Black	-1.478* (.378)	-1.027* (.202)	-.589* (.104)	.039 (.032)	-.999* (.288)	-.415* (.187)	-.388 (.199)
Multiracial	-.025 (.392)	-.095 (.232)	-.432* (.145)	-.038 (.054)	-.147 (.299)	.344 (.214)	-.138 (.274)
Other race	-1.307* (.659)	-.510 (.342)	-.495* (.194)	-.050 (.070)	-.692 (.388)	.032 (.292)	-.520 (.392)
ESL status	.753* (.273)	-.113 (.198)	-.569* (.103)	-.029 (.086)	.495* (.177)	.332* (.155)	.314 (.170)
10th grade	-.434 (.337)	.117 (.191)	.176 (.137)	-.040 (.039)	-.217 (.288)	-.595* (.201)	-.057 (.206)
11th grade	-.540 (.438)	-.387 (.306)	.228 (.151)	.057 (.059)	-.071 (.268)	-.132 (.193)	-.141 (.233)
12th grade	-.281 (.426)	-.016 (.226)	.336 (.142)	.050 (.054)	.105 (.251)	-.166 (.208)	-.115 (.221)
ICC	.000	.002	.088	.071	.011	.011	.000

Note. ESL = English as a Second Language; ICC = intraclass correlation coefficient for each outcome.

* $P < .05$.

control group was 5.4%, compared with only 3.6% among students in the treatment group.

Similarly, exposure to the SOS program resulted in greater knowledge of depression and suicide and more adaptive attitudes toward these problems (Table 3, columns 3 and 4). The effects of the SOS program on knowledge and attitudes were modest in magnitude and resulted in effect sizes of slightly more than one third of a standard deviation (e.g., knowledge: $.689/1.98 = .35$). The effects of the SOS program on both attitudes and knowledge remained statistically significant at the .0071 and .0083 levels, respectively, when Holm adjustments were applied to correct for multiple tests that involved these secondary endpoints.^{27,28} In contrast, the effects of the SOS program on help-seeking behavior did not achieve statistical significance. The negative coefficients for treatment effects in columns 3, 4, and 5 of Table 3 indicate that the treatment group was slightly less likely than the control group to seek help for emotional problems, but these effects did not achieve statistical significance at either a nominal or a corrected .05 α level. Finally, although the descriptive statistics in Table 2 indicate lower levels of suicidal ideation among the treatment group, this difference fell short of statistical significance at the .05 level in the full multilevel model (Table 3, column 2).

With regard to the impact of the demographic control variables on these outcomes,

the patterns observed in Table 3 are consistent with those observed in national data from the 1999 Youth Risk Behavior Surveys.⁴ The female coefficients used in these models indicate that girls, compared with boys, had significantly greater knowledge and more constructive attitudes about depression and suicide, were more likely to seek help when depressed and to intervene on behalf of friends, and were significantly more likely to report suicidal ideation and suicide attempts in the past 3 months.²⁹ Students in high school ESL programs had less accurate knowledge about depression and suicide and had a higher prevalence of self-reported suicide attempts. However, ESL status was positively related to seeking help, as students in these programs were more likely to seek treatment or to talk with an adult when feeling depressed.

Significant effects of race/ethnicity on knowledge of depression and suicide, 2 of the help-seeking outcomes, and suicidal ideation and self-reported suicide attempts also were observed. White students were more knowledgeable about depression and suicide compared with those in other race and ethnic categories. However, Black students reported lower rates of suicidal ideation and suicide attempts than did White students and were less likely to seek professional help for these problems, consistent with previous epidemiological research that showed lower rates of suicidal

ideation and depression among Blacks.^{1,4}

A reparameterization of the models shown in Table 3 (adding a dummy variable for White race and removing the Black term) indicated that Black students also had significantly lower rates of suicidal ideation, self-reported suicide attempts, and seeking professional help than did Hispanic students. Differences in these outcomes by grade did not exceed what would be expected by chance (only 1 significant effect out of 21 contrasts).

Finally, the intraclass correlation coefficient for each outcome variable is shown in the bottom row of Table 3. The coefficients range from nearly 0 (for self-reported suicide attempts, suicidal ideation, and talking with an adult about a troubled friend) to a high of .07 to .09 (for the measures of knowledge and attitudes). These coefficients indicate that there is a high degree of independence among observations within classrooms for each outcome variable; at the most, only 7% to 9% of the variance in these outcomes occurred at the classroom level.

Effects of the SOS Program on Suicide Attempts

The impact of the SOS program on suicidal behavior may in part be due to its role in fostering greater knowledge about and more constructive attitudes toward depression and suicide. These 2 measures were included as

TABLE 4—Role of Knowledge and Attitudes in Mediating the Effects of the Signs of Suicide Program on Suicide Attempts

	Suicide Attempts	
	Model 1, β (SE)	Model 2, β (SE)
Intercept	-3.447 (.133)	-3.615 (.146)
SOS program	-.467* (.267)	-.264 (.207)
Knowledge	...	-.195* (.055)
Attitudes	...	-.605* (.165)

Note. All models controlled for gender, race/ethnicity, grade, and English as a Second Language status.
* $P < .05$.

predictor variables in the level-1 model for self-reported suicide attempts (Table 4) so that we could examine the role of knowledge and attitudes in explaining the effects of the SOS program on suicidality. More adaptive attitudes toward depression and suicide and greater knowledge of depression and suicide were both significantly associated with a lower probability of self-reported suicide attempts. When we controlled for these variables, the effect of the SOS program on self-reported attempts was substantially reduced, as demonstrated by the finding that the coefficient that captured the effect of the program on this outcome was reduced by approximately 40% $([-.467] - [-.264]) / -.467$) and was no longer statistically significant. Although there is some causal ambiguity regarding the associations between these concurrent measures of attitudes and behavior, our analysis suggests that a substantial portion of the effect of the SOS program on self-reported suicide attempts may be explained by the subjects' improved understanding of and attitudes about depression and suicide.

DISCUSSION

It is clear from these data that the SOS suicide prevention program had a substantively important short-term impact on the attitudes and behaviors of high school-aged youths in high-risk settings. By significantly reducing rates of self-reported suicide attempts in the 3 months following exposure to the program, SOS appears to have had a substantial impact on the ultimate target of suicide prevention

programs. Efficacy in increasing students' knowledge of and promoting more adaptive attitudes toward depression and suicide also was demonstrated, and further analysis highlighted the importance of these variables in potentially accounting for the beneficial effects of the SOS program on self-reported suicide attempts. Although further research is necessary to determine whether the effects of the SOS program are enduring, the short-term impact of this program on students' attitudes and behaviors was noteworthy. This is the first school-based suicide prevention program for which a reduction in self-reported suicide attempts has been documented with a randomized experimental design.

In contrast, significant effects of the SOS program on suicidal ideation and help-seeking behaviors were not observed. The fact that self-reported suicide attempts were reduced by a much greater extent than were thoughts of suicide is most likely a result of the SOS program's relatively greater emphasis on action and behavior. Reductions in levels of suicidal ideation are expected to be an ancillary benefit of the SOS program, particularly if the program's efforts to encourage active engagement and communication with peers about these issues fosters a general mobilization of peer support.²² However, suicide prevention programs that place a greater emphasis on personal growth and positive youth development will likely have a greater relative impact on outcomes such as depressed mood and suicidal ideation.

Although significant effects of the intervention on help-seeking behaviors were expected, further investigation revealed several likely explanations for the absence of program effects on help-seeking behaviors for this particular sample. First, a process evaluation that included site coordinators at schools that implemented the SOS program during the 2000–2001 school year found evidence that the number of youths who sought help from school personnel, either because of their own emotional problems or because of those of their friends, was generally lower in urban communities. Second, there were several barriers to seeking help that were specific to schools involved in our study, particularly in Hartford. Administrators in the Hartford schools reported a serious shortage of available staff for helping students with mental health concerns. Moreover, a series of informal

discussions conducted in 12 classes from 3 Hartford schools several months after exposure to the program revealed that students were unlikely to seek out school personnel to discuss emotional problems, primarily because of confidentiality concerns. Instead, students reported that friends were the first people they would turn to when feeling depressed, a finding that is corroborated in previous research.⁷

Some may question the rates of self-reported suicide attempts in our sample (4.5% over a 3-month period), which appear to be somewhat higher on an annualized basis than recent 1-year national prevalence estimates from the CDC's Youth Risk Behavior Surveys (8.5%–10.5%).⁴ Although there is ample reason to expect higher rates of suicidal behavior in our sample because of the predominance of seriously disadvantaged youths at high risk for depression and substance abuse, research has shown that data collected during shorter recall periods cannot be "annualized" through simple multiplication (i.e., multiplying the 3-month prevalence by 4). For example, epidemiological data from the National Comorbidity Survey on the course of major depression among adolescents indicate that the 1-month prevalence rate for major depression is approximately one half that observed for the past year, because of chronicity and the lengthy duration of depressive episodes.³⁰ Applying this logic to the 3-month prevalence rates obtained in our study yields annual prevalence rates that are not inconsistent with the national data published by the CDC. No suicides were reported in any of the participating schools during the study period.

Finally, our study has a number of limitations that must be acknowledged. First, our evaluation should be replicated in more socially and geographically diverse locations. The significant positive impact of the SOS program on high-risk youths in urban settings is certainly an important finding, but replication in rural and suburban settings that contain fewer disadvantaged youths is necessary to determine whether these findings are generalizable to a broader population. Second, the effects of the SOS program were observed over a very short postintervention period. A longer-term follow-up of youths exposed to the SOS program is necessary to determine whether the observed effects are enduring. Third, pretest measures of the

outcomes assessed in our study would add confidence that the assignment of classes to experimental conditions resulted in equivalent groups. Fourth, our study has revealed some of the challenges facing school-based programs designed to foster help-seeking behaviors among students. Uncertainty about confidentiality may be acting to suppress interaction between students and school personnel regarding serious mental health concerns, which may lead to acute problems among youths in high-risk settings who possess limited parental and financial resources. Relatedly, future research should assess the degree to which help-seeking behaviors among emotionally troubled adolescents are directed toward friends and siblings. Future research also should assess the impact of the support received from these relationships on suicidal behavior. Finally, some may question whether our results are tainted by the desire of the students exposed to the program to provide what they perceive to be the “right answers” when responding to survey questions about attitudes and behavior; however, suicide prevention programs have historically demonstrated very little efficacy. Adolescents have not felt compelled to select what they thought were the “right” answers in previous research, and there does not appear to be anything unique about this sample that would lead students to do so in our study. Additionally, if students were endorsing the “right” answers rather than their true feelings and experiences, it is reasonable to expect that treatment effects would be observed universally. The selective impact of the SOS program on the various outcomes assessed in our study provides fairly strong evidence to the contrary. ■

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Contributors

R. Aseltine conceived of the study and took primary responsibility for data analysis and writing of the article. R.

DeMartino contributed to the study design and data interpretation and reviewed drafts of the article.

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Human Participant Protection

The procedures used to collect these data were approved by the institutional review board of the University of Connecticut Health Center.

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