An Evaluation of the SOS Suicide Prevention Program Among Students in Technical-Vocational Settings

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Background

Suicide among young people is one of the most serious public health problems facing the United States. According to the National Center for Health Statistics, the suicide rate for youth and young adults aged 15-24 has tripled since 1950, and suicide is now the third leading cause of death in this age group [1, 2]. One promising prevention program aimed at reducing the incidence of suicide among adolescents is SOS: Signs of Suicide (SOS), a suicide prevention program with documented efficacy [e.g., 3, 4]. SOS educates students to understand that suicide is directly related to mental illness, typically depression, and that it is not a normal reaction to stress or emotional upset [e.g., 5]. Based on this evidence, 675 schools across the country implemented SOS during the 2007-2008 school year. At this point, however, it is not clear if the benefits of SOS will extend to all types of high school populations. The current study assesses the short-term impact of the program on students in technical-vocational high schools who may be at greater risk of depression and suicidal behavior. In addition, the current study has a pre-test, post-test design a more rigorous design than the post-test-only design of previous studies.

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Methods

Participants

Students (n=1066) from 17 schools in Connecticut that implemented the SOS prevention program during the 2007-2008 and 2008-2009 school years completed baseline and follow-up surveys. Table 1 presents demographic characteristics of the sample.

Table 1. Demographic characteristics for participants (n=1066)

Race/Ethnicity	Percent of sample
White, non-Hispanic	59.6
Black, non-Hispanic	6.7
Hispanic	21.6
Asian	1.3
Indian	0.5
Multi-ethnic	9.9
Other	0.4
	100%
Gender	
Male	58.4
Female	41.6
	100%
Free lunch	
Yes	31.6
No	68.4
	100%

Measures

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)?" [6]. The measures of knowledge and attitudes about depression and suicide were adapted from instruments previously used to evaluate school-based suicide prevention programs [e.g., 7]. Knowledge of depression and suicide was measured with 7 true/false items that reflect the central themes of the SOS program. "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 10-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 "strongly disagree" to "strongly agree" on a 5-point scale, with higher values indicating more adaptive attitudes about depression and suicide.

Procedure

Approximately half the schools were assigned to the treatment condition and received the SOS program, with the other half assigned to a wait-list control condition. Participating students in treatment and control schools completed baseline surveys assessing knowledge and attitudes about depression and suicide, past help-seeking for mental health issues, and previous suicidal behavior. Approximately three months following implementation of the SOS program in treatment schools, a follow-up survey was administered to all participating students in the treatment and control schools

Table 2. Baseline reports by students of suicidal behavior, help seeking, and knowledge and attitudes about suicide

	Control n=395		Treatment N=655		Total N=1066	
Suicide…	n	%	n	%	n	%
Attempt—past 3 months	11	2.8	8	1.2	19	1.8
Plan—past 3 months	32	8.1	36	5.5	68	6.5
Consider—past 3 months	37	9.4	42	6.4	79	7.6
Lifetime Attempt	36	9.2	41	6.3	77	7.4
Of someone close	150	38.4	214	33.0	364	35.0
Help from professional	26	6.6	46	7.1	72	6.9
Help from adult	81	20.9	124	19.0	205	19.7
	M	***SD***	***M***	***SD***	***M***	***SD***
Attitudes	3.7	0.6	3.7	0.6	3.7	0.6
Knowledge*	4.1	1.5	3.5	1.8	3.7	1.7

*$p < 0.05$

Results

Baseline levels of suicidal behaviour, help seeking, and knowledge of and attitudes toward suicide for treatment and control groups are presented in Table 2. Treatment and control groups were comparable on all outcomes listed in Table 2 except knowledge; the control group demonstrated higher levels of knowledge about depression and suicide at baseline.

To account for the clustered sampling design in which students were nested within schools, SAS Proc Mixed was used to perform regression analyses of intervention effects. Logistic regressions were performed on suicide attempt and linear regressions were performed on knowledge and attitudes. In our analysis, the effect of exposure to SOS on suicide outcomes (knowledge, attitudes, and suicide attempt) (S_2) was estimated with the following regression model:

$$S_2 = B_0 + B_1S_1 + B_2G_1 + B_{3\text{-}5}Controls_{3\text{-}5}$$

where S_2 is the suicidal outcome at follow-up and S_1 is the baseline outcome; G_1 is a dummy variable for intervention status; $Controls_{3\text{-}5}$ refers to a series of demographic characteristics which include dummy variables for sex (female vs. male), race/ethnicity (Black, Hispanic, Multi-racial, and Other race) with White race as the omitted referent category, and average grades. Grades were included with race and gender because they was significantly related to intervention status at baseline.

Table 3. Effects of SOS program on suicide attempts and students' attitudes toward and knowledge of depression and suicide.

	Model 1		Model 2		Model 3	
	Follow-up Attempt (prior 3 months)		Follow-up Attitudes		Follow-up Knowledge	
	B	SE	B	SE	B	SE
Intercept	-2.40*	1.05	1.01*	0.15	2.72*	0.29
Lifetime attempt at pretest	2.97*	0.43	---	---	---	---
Baseline score on outcome	---	---	0.62*	0.03	0.32*	0.03
SOS intervention	-1.19*	0.54	0.13*	0.05	0.47*	0.13
Female gender	0.17	0.43	0.05	0.04	0.18	0.10
Race: Black	-0.97	1.10	0.06	0.08	-0.41*	0.19
Other	0.16	1.21	0.01	0.16	0.09	0.38
Hispanic	0.02	0.49	0.07	0.05	-0.20	0.12
Multi-racial	-0.74	0.81	0.11	0.06	-0.23	0.15
Grades	-0.33	0.25	0.06*	0.03	0.14*	0.06

*$p < 0.05$

Suicide attempts:

Table 3 presents coefficients from the logistic regression model predicting suicide attempts during the three months following SOS, controlling for demographics and baseline risk as measured by self-reported history of lifetime suicide attempt at baseline. The coefficient for the effect of the SOS program on attempts is -1.19 (Odds Ratio (OR) = $e^{-1.19}$ = 0.30). Thus, students who participated in the treatment group were approximately 70% less likely to report a suicide attempt in the past three months compared with students in the control group.

Attitudes and Knowledge:

Coefficients for the model predicting knowledge of and attitudes toward depression and suicide, controlling for baseline scores, are presented in Table 3. Models controlled for gender, race/ethnicity, grades, and baseline score. Participation in the SOS program resulted in greater knowledge of depression and suicide and more adaptive attitudes toward these problems. The effects of the SOS program on knowledge and attitudes were modest in magnitude and resulted in effect sizes of approximately a quarter of a standard deviation (Attitudes: ES =0.13/0.6 =22; Knowledge: ES = 0.47/1.7 = 0.28).

Summary and Conclusions

This replication and extension of our previous evaluations of SOS [3,4] provides further evidence that the SOS program is a potent tool for curtailing suicidal behavior among diverse groups of high school-aged youth in the U.S., and as such, merits serious consideration from school faculty and administrators seeking to bolster their school's health curricula and prevention portfolio.

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