Suicide Prevention: An Analysis and Replication of a Curriculum-Based High School Program

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This article highlights some of the concerns about and benefits of curriculum-based suicide prevention programs delivered to students in a high school setting. In addition, it presents information about a specific curriculum-based prevention program and provides evidence that the program changed unwanted attitudes about suicide in all the areas targeted for change and reduced adolescents' reluctance to seek mental health treatment for themselves and their peers. The positive results were much like those found in a similar study by Ciffone (1993). Furthermore, multiple presenters in two separate schools all obtained similar positive results.

KEY WORDS: *adolescence; curriculum-based programs; prevention; research; suicide*

There appears to have been a clear and persistent decline in the number (and rate) of suicides among 15- to 19-year-olds in the United States from 1988 through 2003 (the last year for which data are available from the Centers for Disease Control and Prevention [CDC], n.d.). Two possible explanations for this decline are (1) greater awareness of behaviors associated with suicide and (2) greater help-seeking activities by and for those who are at risk of suicide. The most prevalent strategy for increasing awareness and help-seeking behavior has been curriculum-based presentations given to students in schools. However, a 2003 report prepared by the University of California, Los Angeles, Center for Mental Health in Schools stated: "For instance, many studies have found that while general education programs may increase students' general knowledge about suicide and warning signs, they do little to change students' attitudes about suicide and help-seeking behaviors" (p. 30).

CURRICULUM-BASED PRESENTATIONS

Shaffer and other researchers (Shaffer, Garland, Gould, Fisher, & Trautman, 1988; Shaffer, Garland, Vieland, Underwood, & Busner, 1991; Shaffer & Greenberg, 2002) have been critical of curriculum-based suicide prevention programs, particularly those who subscribe to the view that suicide is most often the consequence of stress as opposed to a consequence of a mental illness. Shaffer and his colleagues (1991) have asserted that an emphasis on presenting suicide "as an understandable response to common adolescent problems could inadvertently facilitate the expression of suicidal ideas" (p. 588). Suicide is not a common consideration following common problems, nor do the majority of stressed teenagers share a potential vulnerability to suicide (Clark, 1990). There is abundant research showing that suicide is most often the consequence of a mental illness (U.S. Public Health Service, 1999).

Wilcox and Shaffer (1996) have argued that the primary strategy for preventing teenage suicide should be the use of a screening tool as a mechanism to identify and intervene with at-risk students. However, to more clearly identify some of the advantages of using curriculum-based presentations, the disadvantages of using screening tools alone must first be discussed. For example, Shaffer and associates (2004) reported on the sensitivity and specificity of the Columbia SuicideScreen (Columbia University, 2003). According to that report, the SuicideScreen has a sensitivity of .75 and a specificity of .83. A sensitivity of .75 means that of those students who are at risk of suicide, 75 percent will score positively on the SuicideScreen. One obvious disadvantage is that the screeners cannot be sure that those who are not identified as at risk when screened may not actually become at risk at another juncture (CDC, 1992). Clark (1990) stated:

> A student's risk status can change silently at a moment's notice. A student who was screened

CCC Code: 0037-8046/07 $3.00

> and found healthy in November can develop a major depressive disorder or make a suicide attempt in the following February, and thus move from a low- to a high-risk category. Unless screening is instituted on a biweekly or monthly basis, how can these changes be detected? How can risk status changes be monitored over long summer vacations? (p. 2)

Although the Columbia SuicideScreen has a specificity of .83, its use could indicate that as many as 17 percent of those classified as not at risk are false negatives—actually at risk but missed by the screening (Shaffer et al., 2004, p. 77). Shaffer and associates concluded that a second-stage screening is necessary to assess the risk status of those who were not identified in the first screening and to also address the time and resource "burden of low specificity" on school personnel (p. 71). However, the CDC (1992) warned of the "potentially adverse consequences of referring false positives" (those thought to be at risk but actually not at risk) for more intensive screening or counseling (p. 102). Some adverse consequences may be embarrassment or anger, a raised level of anxiety in the student or parent, and a general aversion to mental health professionals in the future because the second-stage interview was perceived as an unpleasant and unwarranted intrusion.

The Surgeon General asserted that there might be a greater reluctance to seek help because of a "stigma attached to mental disorders…and/or suicidal thoughts" (U.S. Public Health Service, 1999, p. 9). However, the question of whether associating suicide with mental illness (through educational presentations) has a negative impact on help-seeking attitudes was addressed by Ciffone (1993) and is addressed again later in this article.

Another concern about a curriculum-based prevention message is that it might cause some students to feel upset (Shaffer et al., 1991, p. 3151). However, a message that causes students to become upset may not be such an undesirable outcome. When an individual's thinking is challenged, or when he or she begins to question some of strongly held beliefs, it is natural to have some cognitive dissonance (Festinger, 1957). This dissonance can be even more upsetting if teenagers come to believe or feel that others believe that their suicidal thinking is not normal and that they may also be suffering from a mental illness. Yet, if the presentation includes the message that this illness can be treated if a teenager comes forward to a friend or adult, the dissonance the teenager experiences can be the driving force behind that positive link.

Shaffer and Greenberg acknowledged in 2002 that one of the "possible reasons for the declining suicide rate included . . . increased availability of suicide-awareness classes" in schools (p. 4). Such programs could very well have played a role in the national decline of the teenage suicide rate; if not directly, then it could at least be argued that they probably served as part of an awareness mechanism, causing more teenagers to get referred for psychological and medical treatment.

The advantage of a well-designed curriculum-based prevention message is that it has the potential to inoculate the entire cohort against the possibility of maintaining or developing undesirable attitudes about suicide (Clark, 1990). Furthermore, a presentation exposes students to an antisuicide message; it provides intervention instructions to peers who are, in most cases, the first to encounter a suicidal peer (Lazear, Roggenbaum, & Blase, 2003); and it allows for a supervised discussion of related issues. A screening tool alone (regardless of its sensitivity or specificity) does not offer any of these important direct and indirect prevention mechanisms. Therefore, the best strategy seems to be one that combines an authoritative delivery of a well-designed curriculum-based prevention message (as the primary strategy) with a follow-up screen (as the secondary strategy) to assist school personnel in determining which students, despite their exposure to the presentation, continue to personally consider suicide as a viable option.

THE SEHS SUICIDE PREVENTION PROGRAM COMPONENTS AND GOALS

The SEHS (South Elgin High School) Suicide Prevention Program (http://www.u-46.org/sehs/spp/) has, since its inception, continuously promoted the concept that suicide is directly related to mental illness, typically major depression, and that it is not a normal reaction to stress or emotional upset. The following are the program's core components:

- written intervention policies for all staff
- freshman orientation presentations by an on-site school social worker with all ninth-grade students to reduce access barriers and stimulate self- and peer referrals to the same school social worker

- easy access to school social workers, on-site from September through June, for assessment, intervention, and referral
- structured classroom discussions on mental health, mental illness, and suicide to all 10th-grade students in health class (in Illinois, the health class is a graduation requirement and seems to be the most legitimate class to provide for this type of discussion)
- prevention information materials for distribution to all 10th-grade students
- formal and informal evaluations of prevention message effectiveness
- follow-up screening mechanism for prosuicide attitudes
- intervention with at-risk students
- postvention component to be used following any student death (Ciffone, 2006).

The primary goals of the program for students are to

- learn appropriate initial responses to take with a peer who seems to be at risk for suicide
- become more willing to inform a trusted adult if a peer is told by a friend about intent to commit suicide, even if in confidence
- become convinced that suicide is not an option
- become more willing to make the initial connection with a trusted adult or professional counselor if having suicidal thoughts.

The primary goals for the program presenters are to

- reinforce appropriate attitudes about suicide
- normalize feelings of loneliness in adolescence
- reinforce the importance of having a satisfactory relationship with parents
- help students to recognize symptoms of major depression
- disassociate stress alone as the pathway to suicide and associate suicide with thinking errors and mental illness
- increase the visibility and acceptance of school and community mental health services
- unsettle those who are complacent about their history of suicidal behavior or current suicidal thinking
- screen and provide one-on-one follow-up with those who maintain a prosuicide attitude.

A 20-question quiz completed by the students at the end of the program serves two important functions. First, it provides teachers with the opportunity to reinforce some key discussion points. The teacher reviews the quiz and directs students to the correct answers. Kalafat and Elias (1994) found that presenting students with correct answers or facts about suicide in the form of a quiz helps to heighten the salience of the information presented and establishes an educational, rather than a subjective, and emotional, tone for the classes. This tone allows the teacher to authoritatively address a student's views of suicide as being correct or incorrect.

The second important function of the quiz is to screen for and identify students who maintain a prosuicide attitude. Students who give a "true" response to the item "I myself might seriously consider suicide if I had an extremely serious and unavoidable problem" are referred to one of the on-site school social workers who does a risk-for-suicide assessment. Although there are a varying number of false positives from semester to semester, the number has not been too burdensome, nor is it predetermined that these not-at-risk students complete a second-stage questionnaire. Students identified through the quiz have the opportunity (during a one-on-one interview) to indicate their false-positive status, which minimizes a sense of intrusion or feelings of infringement.

EVALUATION OF PROGRAM EFFECTIVENESS

An evaluation of the SEHS Suicide Prevention Program was undertaken with a focus on three major questions: (1) How effective is the message presented in the current program in changing attitudes about suicide? (2) Will the results of the analysis replicate the positive results of the program measured in 1993? (3) Is the program as effective in another school when presented by different individuals?

Method

Two large and demographically diverse high schools in the Chicago metropolitan area were selected. A total of 421 students, 271 in school 1 (Larkin High School in Elgin, Illinois) and 150 in school 2 (Prairie Ridge High School in Crystal Lake, Illinois)

were surveyed in their 10th-grade health class in October 2003. Treatment and control groups were established in each school. Both groups completed the same semianonymous eight-question survey (identifying themselves only by their gender, birth date, teacher, and class period) at the same intervals and with the same instructions. This first survey served as a baseline measurement of student attitudes about suicide.

The survey questions (Table 1) were mainly presented in a yes–no format and were written to assess the targeted areas of attitudinal change. Seven of the eight questions (questions 1 through 6 and question 8) were worded exactly the same as or very similar to those in an eight-question survey given to school 1 in 1993 (Ciffone, 1993). The results from the 1993 study showed significant attitudinal change in the desired direction on six of the eight questions (questions 1 through 5 and question 8). In the 1993 survey, question 7 asked if the student thought suicide could be "a possible solution" for "people who have a lot of problems." That question was replaced by a new question that assesses students' understanding of the relationship between thinking errors and suicide. Question 7 from the 1993 survey was modified and is now the key question in the follow-up quiz that serves as a screen for students who may maintain a prosuicide attitude ("I myself might seriously consider suicide if I had an extremely serious and unavoidable problem").

The program's overall effectiveness was measured by the extent to which the presentation changed unwanted attitudes toward suicide and increased help-seeking attitudes. The unwanted attitudes are opposite the desired responses for questions 1, 2, 3, 7, and 8, and the help-seeking attitudes are shown as the desired responses to questions 4, 5, and 6 (Table 1).

All Illinois students (regardless of their demographic profile) are required to take a health class and were randomly assigned to a health teacher at the beginning of the school year. To achieve an equal numerical distribution of students assigned to a treatment or control group and to achieve the greatest variety of instructors, the treatment group consisted of all available students already assigned to four teachers and the control group consisted of all available students already assigned to two other teachers (Table 2).

The day following the survey, the treatment group received a 50-minute presentation from two school social workers. One social worker gave a presentation to several classes assigned to the treatment group in school 1, and the other social worker did the same to classes assigned to the treatment group in school 2. The information included the viewing of *Choosing Life: Gail's Story,* a 14-minute video (LHS Productions, 1995), and a structured discussion that included the presentation of 13 transparencies.

On the second day, one teacher in school 1 and three teachers in school 2 participated in the treatment by showing *Day for Night: Recognizing Teenage Depression,* a 26-minute video (Depression and Related Affective Disorders Association, 1999); distributing written information; and having all the students (in the treatment group) complete a 20-question quiz. On the third day, these four teachers reviewed the answers to the quiz and encouraged

Table 1: SEHS Survey Questions and Desired Responses

Survey Question	Desired Response 21 Days Later
1. I would counsel a suicidal friend without getting help from someone else.	No
2. If my friend appeared suicidal and asked me not to tell anyone, I. . . .	Would tell someone anyway
3. If a friend said he/she was "thinking of suicide" and it seemed like they were saying it to get sympathy or attention from me, I would probably. . . .	Take them seriously
4. If a friend came to school in a bad mood and said, "My family would be better off without me," I would encourage him/her to get help from a professional counselor.	Yes
5. If suicidal thoughts crossed my mind regularly, I would seek out and talk to a friend about those thoughts.	Yes
6. If I was very upset and suicidal thoughts crossed my mind, I would be willing to talk with a professional counselor about those thoughts.	Yes
7. Suicide is the result of (choose the most accurate)—stress or certain thinking errors?	Certain thinking errors
8. Most teens who killed themselves were probably suffering from a mental illness.	Yes

Table 2: Sample Size by Gender and by Group (N = 421)

	School 1 (n = 271; 64%)		School 2 (n = 150; 36%)		
	Treatment	Control	Treatment	Control	%
Male	74	57	32	35	47
Female	75	65	40	43	53
%	55	45	48	52	100

discussion about items that students missed. Although control group students did not participate in any of the three-day activities, they received the presentation following the study's completion.

The treatment and control groups were given the same survey 21 days later. Only those with surveys that could be matched on the basis of identifying information were included in the cohort. The purpose of the second survey was to determine whether significant attitudinal change in the desired direction occurred within the treatment group. The primary comparison was based on the differences between the treatment group's responses in the baseline response (pretest) and responses in the second survey given 21 days later (posttest).

Results

The treatment produced very favorable results by each of two methods of analysis. The pretreatment and posttreatment responses of the treatment group were compared within each school (Table 3). Second, the posttreatment responses of the treatment group were compared with the posttreatment responses of the control group within each school (Table 4). In every case, the treatment showed significant attitudinal change ($p < .0001$) in the desired direction.

Each of the eight individual questions contains a p value uncorrected for multiple comparisons (Tables 5 and 6). To correct for multiple comparisons (Bonferroni inequality method) at, for example, the .05 level of significance, a reported p value must be less than .0063 (equal to .05/8). The results for schools 1 and 2 were calculated separately and then the pretest and posttest results per question for each person receiving the treatment were compared. For each of the eight questions, the desired response at the posttest exceeded that at the pretest in both schools.

Another evaluation of the program was a comparison of the control group to the treatment group with the data from the posttreatment responses. This was done by performing a logistic regression analysis for each question. For this comparison, all the students were divided into eight subsets (two schools × two genders × two groups). The primary outcomes were the p values for the three main effects and their interactions. Most important here is the p value for the difference between the two schools (Table 7). To illustrate, consider question 8, which produced the most significant result. The observed difference (36.5 percent compared with 76.3 percent) had a highly significant regression p value of .0001. The three factors (school, gender, group) produced four interactions within each of the eight questions, making 32 interactions in all. None of these 32 interactions was statistically significant. This is a very favorable result because it means that the difference between the two treatment groups did not depend on the school or on the gender. Although the two genders may have differed on a question, for example, the difference between the two treatments within the gender did not depend on the difference between the genders.

Two other analyses were performed. The effect of the teachers was investigated using chi-square. For each of the eight questions, there was no significant difference in the treatment group's response across all four teachers. The Surgeon General asserted that a risk factor for suicide may include an unwillingness

Table 3: Mean Number of Total Desired Responses to SEHS for the Treatment Groups (Both Schools)

		Pretreatment (Baseline)		Posttreatment (21 days later)		Comparison	
School	n	M	σ_M	M	σ_M	Difference	p
1	149	4.56	.374	5.97	.489	1.41	<.0001
2	72	4.47	.196	5.89	.217	1.42	<.0001

Note: Two-sided p value from the t test for paired comparisons.

Table 4: Mean Number of Total Desired Responses on the SEHS from Both Schools for the Control and Treatment Groups 21 Days Later

	Control			Treatment			Comparison	
School	*n*	*M*	σ_M	*n*	*M*	σ_M	Difference	*p*
1	122	4.49	.158	149	5.97	.130	1.48	<.0001
2	78	4.44	.191	72	5.89	.217	1.45	<.0001

Note: Two-sided *p* value from the two-sample *t* test.

to seek help because of the stigma attached (by way of an educational presentation) to mental disorders, suicide, or both (U.S. Public Health Service, 1999). To assess the validity of this assertion, an analysis of a treatment subgroup (that had not associated suicide with mental illness before the treatment) was done. Forty-two percent of the treatment group (schools combined) switched from a "no" response to a "yes" response on question 8. As a result of the presentation, this subgroup now associated suicide with mental illness. The help-seeking attitudes of this subgroup were examined on questions 5 and 6 because these attitudes bear directly on the Surgeon General's hypothesis. For question 5, 86 percent either switched from a "no" response to a "yes" response or maintained a "yes" response; for question 6, 78 percent either switched from a "no" to a "yes" response or maintained a "yes" response. Similar findings (73 percent for question 5 and 78 percent for question 6) were noted in Ciffone (1993). These results do not support the assertion that students are less inclined to seek help for themselves when they come to associate suicide with mental illness.

Table 5: Observed Proportions (Expressed as Percentages) of Desired Responses on the SEHS from the Treatment Group for Each of the Eight Questions: School 1

Question	*n*	Pre-treatment (%)	Post-treatment (%)	*p* <
1	144	54.9	72.9	.0005
2	147	75.5	87.1	.006
3	146	68.5	75.3	.14
4	149	69.1	79.9	.017
5	148	71.0	81.1	.014
6	148	60.1	72.3	.0051
7	144	23.6	55.6	.0001
8	148	37.8	75.7	.0001

Notes: Two-sided *p* value from the binomial test. To correct for multiple comparisons at the .05 level of significance, *p* must be less than .0063 (equal to .05/8).

Discussion

The evaluation set out to answer three major questions. First, how effective is the current program in changing targeted attitudes about suicide? The results of this study show that changes in attitude occurred in the desired direction for each of the eight target areas (the eight questions listed in Table 1). Statistical significances varied widely, depending on the question and the method used to evaluate the change. These targeted areas correlate with the program's primary goals and with risk factors the Surgeon General associated with a greater potential for suicide: the positive portrayal of suicide, the view that suicide is common or normal, the view that suicide is an understandable solution to a stressful life event, and the stigma of associated mental illness (U.S. Public Health Service, 1999). These targeted areas additionally correlate with factors associated with reduced potential for suicide: appropriate attitudes about suicide, knowledge about major depression, easy access to a mental health professional, help-seeking for self and peers, and social support (U.S. Public Health Service).

Second, did the results of the current program replicate the positive results of the program measured earlier (Ciffone, 1993)? The current results were greater (statistically significant in seven of eight similar targeted areas) than those of the program measured in 1993 (six of eight).

Finally, the third and most important question was "Is the program as effective in another school when given by a different presenter?" The results showed that the program is effective even when given by a different presenter.

The emphasis of the SEHS Suicide Prevention Program (from its inception) is to be forthright with students and to frame suicide in the context of its being the manifestation of a mental illness that results from, includes, or exacerbates certain thinking errors. The message is that those who share certain thinking errors with a mental illness are most vulnerable to suicide and require professional

Table 6: Observed Proportions (Expressed as Percentages) of Desired Responses on the SEHS from the Treatment Group for Each of the Eight Questions: School 2

Question	*n*	Pre-treatment (%)	Post-treatment (%)	*p* <
1	72	61.1	70.8	.26
2	70	74.3	87.1	.023
3	70	67.1	81.4	.031
4	72	41.7	70.8	.0002
5	70	72.9	78.6	.45
6	71	66.2	78.9	.036
7	69	26.1	49.3	.0016
8	71	42.3	77.5	.0001

Notes: Two-sided *p* value from the binomial test. To correct for multiple comparisons at the .05 level of significance, *p* must be less than .0063 (equal to .05/8).

attention. Associating suicide with mental illness is not intended to stigmatize suicidal thoughts or actions, and making this link is not intended to serve as a behavioral deterrent. When students understand that what they are dealing with in themselves or in their peers is not normal, there may be a greater sense of urgency to get help. The results of this study show that in schools curriculum-based prevention programs using a mental illness model can in fact change unwanted attitudes toward suicide and positively influence the help-seeking attitudes of those concerned about themselves and their peers.

The study's findings must be interpreted with the following two caveats. First, the fidelity of research conducted in a school setting is limited, among other things, by the degree to which researchers choose to impose certain selection and assessment methods on teachers and students. In this study, randomly assigning students within the same classroom to either a control or a treatment group was not practicable, and assigning classrooms of students with the same teacher to either group would have been too great a burden on the teacher. In an effort to minimize confusion and disruption to the normal academic routine and to maximize cooperation among the six teachers, the primary goal was to achieve numerical parity between the two groups in each of the two schools through an arbitrary assignment of students by teacher to one group or the other. This precluded specific efforts to ensure that the two groups within each school were adequately similar in terms of race, socioeconomic status, or intellectual ability. Therefore, one could argue that selection bias could have had an effect on the findings.

Second, one could argue that efforts to judge program effectiveness based on student responses to surveys are limited because attitudes and behavior are not always causally linked. What adolescents say they will do may be very different from what occurs when they find themselves in the middle of an emotionally charged situation. However, because the program set out to change attitudes and beliefs, it seems legitimate to note the success of these changes.

Although surveys measuring attitudinal change are of limited value, a more telling measure of program effectiveness is to compare the incidence of suicide attempts and completions in one setting with other comparable settings over the same

Table 7: Overall Posttreatment Response Proportions (Expressed as Percentages) for the Control and Treatment Groups with Logistic Regression Results for the Difference between the Response Proportions

SEHS Question	Control		Treatment		Estimated *p* value
	n	%	*n*	%	
1	199	64.3	221	72.4	<.32
2	197	72.6	220	86.8	<.0032
3	198	59.1	220	77.7	<.0001
4	200	60.5	221	76.9	<.0005
5	200	68	219	80.4	<.0031
6	200	65	220	74.5	<.032
7	194	24.2	215	53.5	<.0001
8	197	36.5	219	76.3	<.0001

interval. The SEHS Suicide Prevention Program (with some minor variations) has been in effect continuously since 1987. During the past 19 years, there have been more than 11,000 participants in the SEHS program. During this same time period, there have been a negligible number of suicide attempts requiring medical treatment (less than 0.5 percent) by participants. A nationwide survey of teenagers conducted in 2003 showed that 2.9 percent reported one or more suicide attempts requiring medical treatment (Grunebaum et al., 2004). Because the definition of a suicide attempt is unclear and because high school demographics vary widely in the United States, it would not be appropriate to make a direct comparison of the trend of suicide attempts between Larkin High School and the nationwide survey results. Nevertheless, this difference does seem remarkable and interesting. Moreover, since the program's inception, there has not been a single suicide by a participant while enrolled as a student at Larkin High School.

CONCLUSION

A new and important goal for all involved in the prevention of teenage suicide is to identify and reinforce factors associated with the decline in the national rate of completions. Curriculum-based prevention programs in schools have probably played a role in this decline. At the local level (Larkin High School), it appears that the SEHS Suicide Prevention Program may be a positive factor in the lower-than-expected rate of attempts and completions. Although the results of this study may suggest a relationship between participation in the three-day presentation and the lower rate of suicide behavior, it is more likely that these behavioral outcomes were influenced by a combination of participation in the presentation and the program's influence on the school environment rather than just by participation in the presentation. In addition to the 10th-grade presentation, the program includes early exposure to the social workers at the beginning of the ninth grade and subsequent to the three-day presentation and the use of a follow-up quiz to screen for, and possibly intervene with, an at-risk student. Beyond those annual activities, the SEHS Suicide Prevention Program strives to foster a network of support among peers in grades nine through 12 who will look out for and, if indicated, refer a friend who seems to be at risk to one of the social workers. These other program-related activities and interventions may have a mitigating effect on suicidal behavior that may be equal to or greater than the change in attitudes about suicide that is promoted by direct participation in the three-day presentation. Finally, although screening as a prevention strategy may have limited value, greater reliance and emphasis should be placed on a thoughtful and well-delivered curriculum-based message along with other related activities similar to those in the SEHS Suicide Prevention Program. SW

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Original manuscript received January 5, 2005
Final revision received November 14, 2005
Accepted January 19, 2006