

It is illegal to post this copyrighted PDF on any website.

### CME Background

Articles are selected for credit designation based on an assessment of the educational needs of CME participants, with the purpose of providing readers with a curriculum of CME articles on a variety of topics throughout each volume. Activities are planned using a process that links identified needs with desired results.

To obtain credit, read the article, correctly answer the questions in the Posttest, and complete the Evaluation.

### CME Objective

After studying this article, you should be able to:

- Investigate the availability of school programs in your area that encourage help-seeking behavior among young people with suicidal thoughts

### Accreditation Statement

The CME Institute of Physicians Postgraduate Press, Inc., is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.



### Credit Designation

The CME Institute of Physicians Postgraduate Press, Inc., designates this journal-based CME activity for a maximum of 1.0 *AMA PRA Category 1 Credit™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

**Note:** The American Academy of Physician Assistants (AAPA) accepts certificates of participation for educational activities certified for *AMA PRA Category 1 Credit™* from organizations accredited by ACCME or a recognized state medical society. Physician assistants may receive a maximum of 1.0 hour of Category I credit for completing this program.

### Date of Original Release/Review

This educational activity is eligible for *AMA PRA Category 1 Credit™* through June 30, 2018. The latest review of this material was May 2016.

### Financial Disclosure

All individuals in a position to influence the content of this activity were asked to complete a statement regarding all relevant personal financial relationships between themselves or their spouse/partner and any commercial interest. The CME Institute has resolved any conflicts of interest that were identified. In the past year, Larry Culpepper, MD, MPH, Editor in Chief, has been a consultant for Forest, Lundbeck, Merck, Shire, Takeda, and Elsevier Press; has been a stock shareholder of M3 My Mood Monitor; and has received royalties from UpToDate and Oxford University Press. No member of the CME Institute staff reported any relevant personal financial relationships. **Faculty financial disclosure appears at the end of the article.**

## Student Evaluation of the Yellow Ribbon Suicide Prevention Program in Midwest Schools

Alexandra Flynn, MD, PhD<sup>a</sup>; Rosalee Zackula, MA<sup>b</sup>; Nicole M. Klaus, PhD, ABPP<sup>a,\*</sup>; Liz McGinness, EdS, NCSP<sup>c</sup>; Susan Carr, MD, MPH<sup>a</sup>; and Matthew Macaluso, DO<sup>a</sup>

### ABSTRACT

**Objective:** Yellow Ribbon is a gatekeeper-type suicide prevention program that is widely used in public schools. However, data on its effectiveness are limited. The purpose of our study was to evaluate self-reported changes in knowledge and comfort level communicating about suicide following Yellow Ribbon training for a large, representative sample of students from a public school system in the midwestern United States.

**Methods:** The program was administered to students within the same school district during 2006 through 2009. A pre-post survey using a 4-point Likert scale was administered to rate students' knowledge of risk factors and available resources, comfort level communicating about suicide, estimate of friends at risk for suicide, and behavioral intent toward help-seeking.

**Results:** Aggregate responses from 3,257 students, aged 11 to 18 years, were collected by the schools; 51% were female, 33% were Hispanic, and 30% were white. Suicide-related knowledge of risk factors, where to go for help, and resources, along with comfort level in asking for help, all significantly improved following program participation (Cramer's  $V = 0.243$  to  $0.376$ ,  $P < .001$ ). Responses were associated with age and gender, indicating that younger males may benefit more than older males.

**Conclusions:** Implementation of the Yellow Ribbon school-based suicide prevention program appears to be beneficial for students in the midwestern United States. We observed significant improvement in knowledge, comfort level, and behavioral intent for help-seeking if suicidal thoughts occur. Findings also suggested that Yellow Ribbon training administered during middle school may be especially helpful for males.

*Prim Care Companion CNS Disord* 2016;18(3):doi:10.4088/PCC.15m01852

© Copyright 2016 Physicians Postgraduate Press, Inc.

<sup>a</sup>Department of Psychiatry and Behavioral Sciences and <sup>b</sup>Office of Research, University of Kansas School of Medicine–Wichita, Wichita, Kansas

<sup>c</sup>Sedgwick County Suicide Prevention Coalition, Kansas Youth Suicide Prevention Program, McGinness Family Foundation, Wichita, Kansas

\*Corresponding author: Nicole M. Klaus, PhD, ABPP, Department of Psychiatry and Behavioral Sciences, University of Kansas School of Medicine–Wichita, 1010 North Kansas, Wichita, KS 67214 (nklaus@kumc.edu).

**S**uicide has risen from the third to the second leading cause of death in adolescents, contributing to over 5,500 deaths in 2014.<sup>1–3</sup> A variety of school-based suicide prevention programs have been developed over the past 30 years.<sup>4</sup> Existing suicide prevention programs have been generally classified as (1) first-generation, single-mode psychoeducational; (2) second-generation, cognitive psychoeducational; (3) multimethod approach programs; and (4) gatekeeper training programs.<sup>5</sup> Evaluation of first- and second-generation suicide prevention programs, used since the 1980s, showed no strong effect of psychoeducation alone on improving maladaptive and help-seeking behavior.<sup>6,7</sup> Multimethod programs, such as Signs of Suicide,<sup>8</sup> combine a psychoeducation curriculum

- Suicide is now the second leading cause of death in adolescents.
- The US Surgeon General recommends implementing programs in educational settings to address adolescent distress, provide crisis intervention, and incorporate peer support for seeking help.
- Implementation of the Yellow Ribbon school-based suicide prevention program was beneficial for adolescents in midwestern schools; significant improvement was shown in suicide-related knowledge, comfort level, and behavioral intent for help-seeking for suicidal crisis.

with self-screening. These programs have demonstrated impressive findings: a 40% reduction in suicide attempts at 3 months' postintervention, an increase in knowledge, and improved attitudes toward help-seeking, although they were not associated with increased help-seeking behavior among emotionally troubled youth.<sup>8</sup> Promising outcomes were also reported for high school students when using the Surviving the Teens Suicide Prevention and Depression Awareness Program; however, the authors<sup>9</sup> state that results may not be generalizable to different age groups or to other locations.

Other programs promote help-seeking behavior as a strategy to reduce suicidal behavior.<sup>10–12</sup> Indeed, the US Surgeon General, among others, has recommended developing and implementing safe and effective programs in educational settings for youth that address adolescent distress, provide crisis intervention, and incorporate peer support for seeking help, similar to gatekeeper training.<sup>13,14</sup> Gatekeeper training is aimed at school personnel to develop skills for identifying students at risk, determining level of risk, and making necessary referrals.<sup>15,16</sup> Unfortunately, studies<sup>17,18</sup> show that adolescents often turn to peers for help, who may be ill-equipped to deal with suicidality.

The Yellow Ribbon Suicide Prevention Program<sup>19</sup> incorporates the above recommendations and addresses issues surrounding skill level of peers. This program was developed in 1994 and comprises "Be-A-Link" gatekeeper training for adults and skills curricula for youth and includes "Ask 4 Help" cards with a "help" message and suicide crisis hotline number.<sup>19,20</sup> Yellow Ribbon is listed in the Suicide Prevention Resource Center's Best Practices Registry<sup>21</sup> because its content meets standards of accuracy, safety, and suicide prevention program guidelines.

Despite meeting these standards, the use of the Yellow Ribbon program has not been supported by data showing it to be safe and effective. Yellow Ribbon was evaluated in a small study conducted in Denver high schools by analyzing preintervention and postintervention surveys of 146 students.<sup>22</sup> Students' postintervention responses showed a tripling utilization of a crisis hotline. However, no increase in student help-seeking from "helpers" was observed. Thus, it was concluded that further research with larger, more representative samples was needed to determine if findings were generalizable to other regions of the United States.<sup>22</sup> Moreover, research shows effectiveness of suicide prevention

programs varies drastically by geographical area and among socially diverse groups.<sup>9,23–25</sup>

Katz et al<sup>4</sup> conducted a systematic review of 16 school-based suicide prevention programs that included an evaluation of Yellow Ribbon. This study highlighted the lack of conclusive evidence for Yellow Ribbon, specifically related to help-seeking behavior, attitude/knowledge, and protective factors. However, the authors<sup>4</sup> could not recommend any specific suicide prevention program as a "best practice" for school-based suicide prevention. In lieu of the high rates of suicide among youth, along with sparse evidence for program effectiveness,<sup>7,26</sup> new knowledge regarding the efficacy of suicide prevention programs is needed, especially in different geographical areas.

The purpose of our study was to evaluate the Yellow Ribbon program using survey responses from a large, representative sample of the midwestern school system. Specifically, we sought answers to the following questions: Does Yellow Ribbon training affect adolescents' suicide-related knowledge? To what extent do adolescents think their friends are at risk for suicide? What types of help-seeking behavioral attitudes are influenced by Yellow Ribbon training? Are there factors that may affect Yellow Ribbon program outcomes? By investigating these research questions, we hope to refine youth suicide prevention efforts and add to the dialogue for what constitutes best practice for school-based suicide prevention programs.

## METHODS

### Participants

The Yellow Ribbon curriculum was administered to 3,257 students from 8 midwestern public schools within the same school district during 2006 through 2009. Both middle and high schools were included. Participants ranged in age from 11 to 18 years. To protect confidentiality and comply with school requirements, responses were compiled by school into 2 summary reports: (1) school demographics by school year, gender, age group, and race and (2) survey responses by school year and gender. These summaries were then forwarded to research study personnel. No personally identifiable records were obtained. As such, the study was deemed exempt from institutional review board approval.

### Study Procedures

**Intervention.** Goals of the Yellow Ribbon program were to provide educational information regarding risk factors for suicide, how to seek help for self and communicate about suicide, and how to respond appropriately and seek help for a friend who is suicidal. The training also aimed to reduce stigma around mental illness and suicidality. A group of trainers were trained by the Yellow Ribbon organization to deliver a 1-hour presentation during core curriculum classes for groups of approximately 30 students. Participating students were provided with a yellow card that could be given to a peer or adult to initiate a discussion and seek help in the event of suicidal thoughts. Trainers also provided education to school personnel on suicide intervention strategies.

**It is illegal to post this copyrighted PDF on any website.**

**Table 1. Student Characteristics by Year**

Characteristic <sup>a</sup>	School Year				Total	
	2006	2007	2008	2009	n	%
No. of students	1,656	362	324	915	3,257	100.0
Sex						
Male	806	161	161	457	1,585	48.7
Female	850	201	163	458	1,672	51.3
Race/ethnicity						
Asian	67	10	42	59	178	5.5
Black	304	29	27	98	458	14.1
Hispanic	427	195	177	275	1,074	33.0
Native American	59	5	11	47	122	3.7
White	570	80	37	280	967	29.7
Multiethnic	193	39	30	146	408	12.5
Unknown	36	4	0	10	50	1.5
Age group, y						
11–13	7	3	278	706	994	30.5
14–15	1,143	341	45	182	1,711	52.5
16–17	412	13	0	1	426	13.1
18	82	5	0	0	87	2.7
Unknown	12	0	1	26	39	1.2

<sup>a</sup>Not all schools reported survey responses by race/ethnicity or by age group.

All schools received similar training by the same group of trainers. Thus, the intervention was conducted in a consistent manner across all years of data collection. However, the number of schools receiving the Yellow Ribbon program differed by year: the intervention was administered to 3 high schools the first year, 1 high school the second year, and 1 middle school the following 2 years. In this way, a wide range of students participated in the intervention. Potential bias was controlled by limiting the opportunity for repeating the program, which might have unduly influenced survey responses.

**Measures.** A survey, using a 4-point Likert scale, was created by the Yellow Ribbon Suicide Prevention Foundation for evaluation purposes. The first part included an anonymous, before and after exposure, questionnaire rating knowledge of risk factors, understanding of available resources, and comfort level communicating about suicide. The second part assessed the number of friends that respondents thought were at risk for suicide after training, along with their behavioral intent toward help-seeking. All participants completed the survey immediately following the intervention. Responses were tallied by question, school demographics, and year. School demographics included gender, age group, and race. To assess the overall impact of the intervention, those questions associated with knowledge acquisition and comfort level were combined by responses so that before and after exposure to Yellow Ribbon totals were compared.

### Statistical Analysis

Aggregate data from survey responses were analyzed with IBM SPSS Statistics, version 20 (IBM Corporation, Somers, New York). Categorical data were summarized using frequency and percentages. A 2-sample proportions  $z$ -test was used to assess program impact. The  $\chi^2$  test of independence was used to evaluate associations between categorical responses. Cramer's  $V$  was used to measure

strength of association before and after training;  $V=0$  indicated no association, while  $V=1$  indicated a very strong, perfect association. Since all data were in aggregate, it was not possible to match preintervention and postintervention responses, thus no paired-type testing was conducted.

## RESULTS

### Demographics and Bivariate Assessment

Participant characteristics from 3,257 students who completed the survey are summarized by year and appear in Table 1. While no dropouts are reported, approximately 400 participants did not respond to those questions identified as “after today's training.” To evaluate selection bias of the participants, we compared the sample distribution to demographic data from the school district. All demographics were similar, thus the respondents appear to be representative of the local district; therefore, no sample weighting was conducted. Next, we summarized the survey responses across years and evaluated results by each research question.

### Does the Yellow Ribbon Training Affect Suicide-Related Knowledge and Comfort Level in Asking for Help Among Adolescents?

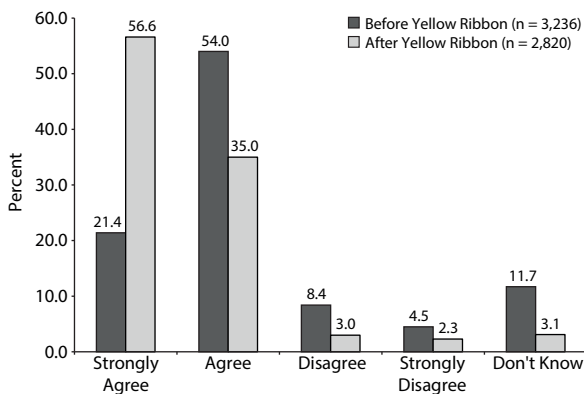
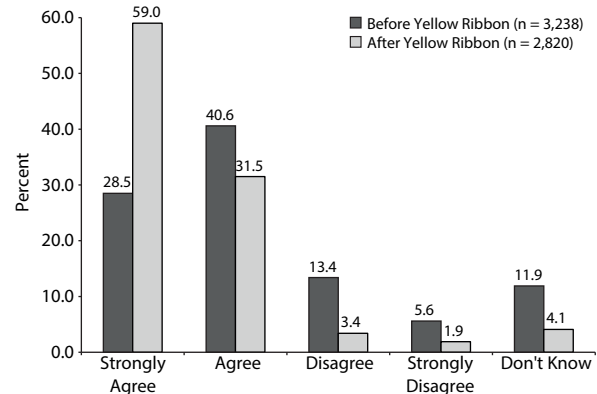
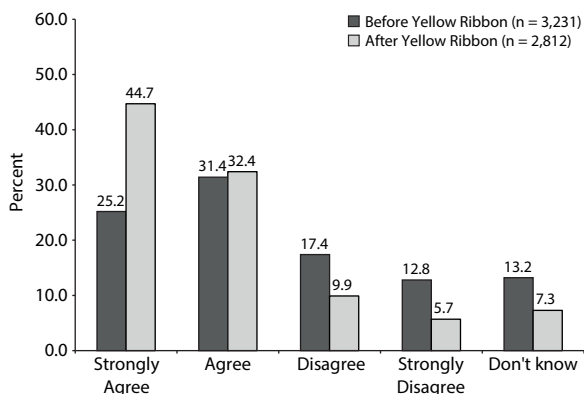
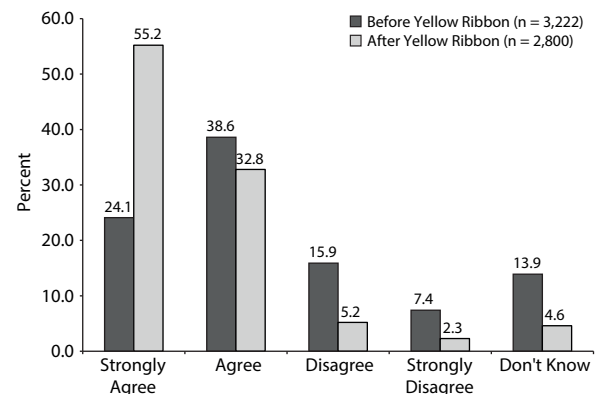
Figure 1A–D summarizes responses before and after the Yellow Ribbon program to survey items that evaluated (1) understanding of reasons that put youth at risk for suicide, (2) knowledge of where to go to for help, (3) comfort asking for help, and (4) knowledge of resources available. To assess the overall effect of the intervention, the number of those responding “agree” or “strongly agree” to these 4 questions were summed and compared by training status (before and after intervention). The overall agreement before Yellow Ribbon training was 65.9% (8,526 of 12,927 total responses) and after was 86.8% (9,767 of 11,252 total responses) ( $z=37.7$ ,  $P<.001$ ). Thus, Yellow Ribbon appears to significantly increase suicide-related knowledge and comfort level in asking for help.

The strength of relationship before and after training was also measured on each item with Cramer's  $V$ . Results ranged from 0.243 to 0.376, indicating a low to moderate positive change following Yellow Ribbon. Specifically, significant differences by question were as follows: “I understand some of the reasons that may put youth at risk for suicide” ( $V=0.376$ ,  $P<.001$ ) (the strongest effect size). “If someone comes to me with suicidal thoughts I would know whom to go to for help” ( $V=0.339$ ,  $P<.001$ ). “If I were having suicidal thoughts I would feel comfortable enough to ask for help” ( $V=0.243$ ,  $P<.001$ ) (the weakest effect size). “I know resources available to me if I have suicidal thoughts” ( $V=0.356$ ,  $P<.001$ ).

### To What Extent Do Adolescents Think Their Friends Are at Risk for Suicide?

After Yellow Ribbon, the degree to which adolescents thought their friends were at risk for suicide was measured. Responses to the question, “How many of your friends do

Figure 1. Responses Before and After the Yellow Ribbon Training

A. I Understand Reasons That Put Youth at Risk for Suicide<sup>a</sup>B. If Someone Comes to Me With Suicidal Thoughts, I Would Know Whom to Go to for Help<sup>b</sup>C. If I Were Having Suicidal Thoughts, I Would Feel Comfortable Enough to Ask for Help<sup>c</sup>D. I Know Resources Available to Me If I Have Suicidal Thoughts<sup>d</sup><sup>a</sup>Cramer's V = 0.376,  $P < .001$ .<sup>b</sup>Cramer's V = 0.339,  $P < .001$ .<sup>c</sup>Cramer's V = 0.243,  $P < .001$ .<sup>d</sup>Cramer's V = 0.356,  $P < .001$ .

you think are at risk of suicide?" were as follows: 63.6% of students (1,791 of 2,816) reported "none," 16.0% reported "1," 11.9% reported "2 to 3," and 8.5% reported "more than 3" of their friends were at risk. Thus, over one-third of all respondents (36.4%) reported 1 or more of their friends were at risk of suicide.

Taken together, these data suggest that Yellow Ribbon improves suicide-related knowledge, increases comfort level in asking for help, and may increase adolescent awareness of those at risk for suicide. Next, help-seeking behavior attitudes were evaluated.

### What Types of Help-Seeking Behavioral Attitudes Are Influenced by Yellow Ribbon Training?

The primary approach to address this question was to ask participants what they would do if they had suicidal thoughts. Results showed that, on average, 45.1% of students indicated that they would be willing to seek help. Regarding type of help-seeking, 53.2% responded they would "give yellow card to friend," 38.3% would "give yellow card to school staff," 40.5% would "give yellow card to outside adult," 37.9%

would "call suicide prevention hotline," 39.0% would "talk to school staff," 41.9% would "talk to an outside adult," and 64.9% would "talk to friend." Thus, help-seeking behavior rates were highest among those willing to give a yellow card to a friend or talk to a friend, suggesting the importance of providing adolescents with resources for helping peers who may approach them with suicidal ideation.

### Statistical Analysis After Yellow Ribbon Intervention by Groups

**Differences in knowledge and attitude by sex.** Given age and gender differences in suicidal behaviors within our area,<sup>27</sup> we evaluated the extent to which the sex and age groups were associated with survey responses after exposure to Yellow Ribbon. Separate contingency tables were constructed for middle and high school students by participant sex (Table 2).

Regarding middle school-aged students, significant differences occurred by sex for the questions, "I understand some of the reasons that may put youth at risk for suicide" and "If someone comes to me with suicidal thoughts, I



**It is illegal to post this copyrighted PDF on any website.**

**Table 2. Suicide-Related Knowledge and Behavioral Attitudes After Yellow Ribbon Training by Sex Within Age Group<sup>a</sup>**

	Middle School		<i>p</i> <sup>b</sup>	High School		<i>p</i> <sup>b</sup>
	Males (n = 550)	Females (n = 564)		Males (n = 817)	Females (n = 951)	
I understand some of the reasons that may put youth at risk for suicide			< .001			< .001
Strongly agree	305 (55.5)	353 (62.6)		388 (47.9)	551 (61.5)	
Agree	179 (32.5)	177 (31.4)		319 (39.4)	311 (34.7)	
Disagree	19 (3.5)	20 (3.5)		36 (4.4)	11 (1.2)	
Strongly disagree	22 (4.0)	6 (1.1)		26 (3.2)	10 (1.1)	
Don't know	25 (4.5)	8 (1.4)		41 (5.1)	13 (1.5)	
If someone comes to me with suicidal thoughts, I would know whom to go to for help			.041			< .001
Strongly agree	323 (58.8)	366 (64.9)		410 (50.6)	565 (63.0)	
Agree	169 (30.8)	163 (28.9)		270 (33.3)	287 (32.0)	
Disagree	27 (4.9)	11 (2.0)		41 (5.1)	18 (2.0)	
Strongly disagree	10 (1.8)	8 (1.4)		26 (3.2)	9 (1.0)	
Don't know	20 (3.6)	16 (2.8)		63 (7.8)	18 (2.0)	
If I were having suicidal thoughts, I would feel comfortable enough to ask for help			.299			.257
Strongly agree	290 (52.8)	263 (47.0)		342 (42.3)	362 (40.4)	
Agree	152 (27.7)	177 (31.6)		271 (33.5)	311 (34.7)	
Disagree	41 (7.5)	54 (9.6)		80 (9.9)	104 (11.6)	
Strongly disagree	29 (5.3)	29 (5.2)		44 (5.4)	59 (6.6)	
Don't know	37 (6.7)	37 (6.6)		71 (8.8)	59 (6.6)	
I know what resources are available to me if I am having suicidal thoughts			.706			< .001
Strongly agree	316 (57.7)	306 (54.6)		407 (50.7)	517 (58.2)	
Agree	166 (30.3)	188 (33.6)		262 (32.6)	301 (33.9)	
Disagree	26 (4.7)	28 (5.0)		61 (7.6)	30 (3.4)	
Strongly disagree	15 (2.7)	11 (2.0)		24 (3.0)	13 (1.5)	
Don't know	25 (4.6)	27 (4.8)		49 (6.1)	28 (3.1)	
After attending the intervention, how many of your friends are at risk of suicide			< .001			< .001
None	386 (73.0)	291 (56.1)		577 (70.6)	537 (56.5)	
1	68 (12.9)	86 (16.6)		112 (13.7)	185 (19.5)	
2–3	40 (7.6)	85 (16.4)		61 (7.5)	150 (15.8)	
> 3	35 (6.6)	57 (11.0)		67 (8.2)	79 (8.3)	

<sup>a</sup>Values are presented as n (%).

<sup>b</sup>Pearson  $\chi^2$  test of independence to detect differences by sex within age group.

would know whom to go to for help” ( $P < .001$  and  $P = .041$ , respectively). These results suggest that after suicide prevention training, middle school-aged females (more so than males) tend to understand risk factors of suicide and would know where to go for help.

Similar results occurred for high school-aged students. In addition, high school females, significantly more so than males, agreed they know what resources are available should they have suicidal thoughts ( $P < .001$ ). Conversely, when asked, “How many friends are at risk of suicide,” males tended to respond “none” significantly more often than did females regardless of age (71%–73% compared with 56%–57%, respectively). Thus, it appears that females, when compared with males, may be more skilled at identifying friends who might be at risk of suicide.

#### **Differences in knowledge and attitudes by age group.**

Next, we compared responses from same-sex students across age groups. Younger males tended to agree, more so than older males, when answering the following: “I understand some of the reasons that may put youth at risk for suicide” (55.5% versus 47.9%,  $P = .052$ ). “If someone comes to me with suicidal thoughts, I would know whom to go to for help”

(58.8% versus 50.6%,  $P = .003$ ). “If I were having suicidal thoughts I would feel comfortable enough to ask for help” (52.8% versus 42.3%,  $P = .004$ ). “I know what resources are available to me if I am having suicidal thoughts” (57.7% versus 50.7%,  $P = .058$ ). However, percentages for females in agreement remained stable regardless of school age. This finding suggests that timing of a suicide prevention program may influence response rates, especially for males, with younger males potentially benefiting more from the training than older males.

**Differences in help-seeking behavior intent by sex and age group.** Table 3 summarizes student responses regarding willingness to seek help from a variety of sources. Similar patterns of significant differences by sex and by age group emerged. For example, when comparing middle school males and females, males were significantly more likely to give their yellow card to school staff (47.6% versus 41.2%), call a suicide prevention hotline (48.4% versus 36.9%), talk to school staff (51.5% versus 40.1%), and talk to an adult outside of school (45.5% versus 39.5%). Likewise, high school males were significantly more likely than females to give their yellow card to school staff (37.8% versus 31.8%)

**Table 3. Types of Help-Seeking Behavior After Yellow Ribbon Training by Sex Within Age Group<sup>a</sup>**

	Middle School		<i>p</i> <sup>b</sup>	High School		<i>p</i> <sup>b</sup>
	Males (n= 589)	Females (n= 594)		Males (n= 894)	Females (n= 1,011)	
If I had suicidal thoughts I would be willing to . . .						
Give my yellow card to a friend			.278			< .001
No	59 (10.0)	46 (7.7)		142 (15.9)	95 (9.4)	
Maybe	217 (36.8)	211 (35.5)		314 (35.1)	362 (35.8)	
Yes	313 (53.1)	337 (56.7)		438 (49.0)	554 (54.8)	
Give my yellow card to school staff			.041			.021
No	92 (15.7)	120 (20.3)		233 (26.2)	299 (29.7)	
Maybe	215 (36.7)	228 (38.5)		321 (36.1)	388 (38.5)	
Yes	279 (47.6)	244 (41.2)		336 (37.8)	320 (31.8)	
Give my yellow card to an outside adult			.024			.970
No	103 (17.7)	131 (22.2)		199 (22.5)	227 (22.5)	
Maybe	249 (42.8)	210 (35.5)		332 (37.6)	374 (37.1)	
Yes	230 (39.5)	250 (42.3)		353 (39.9)	408 (40.4)	
Call a suicide prevention hotline			< .001			.492
No	101 (17.1)	149 (25.2)		250 (28.2)	264 (26.2)	
Maybe	203 (34.5)	224 (37.9)		325 (36.6)	393 (39.1)	
Yes	285 (48.4)	218 (36.9)		312 (35.2)	349 (34.7)	
Talk to school staff			< .001			.045
No	97 (16.7)	125 (21.2)		239 (27)	314 (31.2)	
Maybe	185 (31.8)	228 (38.7)		314 (35.5)	366 (36.3)	
Yes	300 (51.5)	236 (40.1)		331 (37.4)	327 (32.5)	
Talk to an adult outside of school			.028			.069
No	102 (17.6)	138 (23.3)		200 (22.6)	203 (20.1)	
Maybe	214 (36.9)	221 (37.3)		305 (34.4)	398 (39.5)	
Yes	264 (45.5)	234 (39.5)		381 (43.0)	407 (40.4)	
Talk to a friend			.054			< .001
No	44 (7.5)	34 (5.7)		117 (13.2)	53 (5.2)	
Maybe	181 (30.8)	154 (26.0)		245 (27.7)	251 (24.9)	
Yes	362 (61.7)	405 (68.3)		523 (59.1)	706 (69.9)	

<sup>a</sup>Values are presented as n (%).<sup>b</sup>Pearson  $\chi^2$  test of independence to detect differences by sex within age group.

and talk to school staff (37.4% versus 32.5%). Conversely, among female responders, middle school females were significantly more likely than males to give their yellow card to an outside adult (42.3% versus 39.5%). In comparison, high school females were more likely than males to give their yellow card to a friend (54.8% versus 49.0%) and more likely to talk to a friend (69.9% versus 59.1%).

Last, percentages by age showed a declining trend for males on willingness to seek help, especially for talking to school staff: 51.5% of middle school-aged males reported “yes” versus 37.4% for high school. Results were similar regarding males’ willingness to call a suicide prevention hotline: 48.4% for middle school versus 35.2% for high school. Thus, it appears that both sex and age are important factors when considering student responses to the Yellow Ribbon program. Specifically, the responses indicate that males and females differ significantly in who they would be willing to divulge thoughts of suicide.

## DISCUSSION

Our findings suggest that implementation of a Yellow Ribbon school-based suicide prevention program in midwest schools leads to significant improvements in suicide-related

knowledge, comfort level, and behavioral intent for help-seeking in case of suicidal thoughts among adolescents. In fact, more than 77% of respondents reported feeling comfortable seeking help for suicidal thoughts after Yellow Ribbon training compared to 57% prior to training. Still, research shows that iatrogenic effects of suicide prevention programs may occur.<sup>28</sup> While we found no direct evidence that participation in this suicide prevention program decreased students’ comfort level or their willingness to seek help, future suicide prevention program studies may want to monitor iatrogenic factors, such as increased self-harm associated with training.

Results also showed that after training, 36.4% of participants reported thinking that their friends may be at risk of suicide, which may be an indication of increased knowledge and awareness of suicidal risk factors. Similar to other research,<sup>18</sup> preferential source of help-seeking among adolescents appears to be a friend, followed by an outside adult and school staff. This finding supports the importance of providing adolescents with resources for helping peers who divulge suicidal thoughts. Future efforts of suicide prevention programs might also focus on empowering adolescents to override peers’ requests for “secrecy” and locate appropriate resources for help as well as improving

communication between adolescents and adults regarding suicide.

We observed important gender and age differences that may or may not be explained by normal development. Specifically, a subgroup analysis showed that females (in both middle and high school age groups) were significantly more likely than males to believe their peers might be at risk for suicide. Females appear to have a better understanding of risk factors and available sources for help. In addition, we observed that older males were less likely to seek help for suicidal thoughts, which may be explained by gender role theory or social psychology of help-seeking.<sup>29</sup> These findings may also coincide with statistics of males being at higher risk of suicide-related mortality, while females have higher attempts.<sup>3</sup>

More hopeful was the finding that younger males seemed to benefit from the Yellow Ribbon program more so than older males in terms of knowledge acquisition and comfort seeking help in case of suicidal thoughts. This observation may suggest a benefit to introducing suicide prevention programs during middle school. At this age level, males were significantly more likely than females to seek help by calling a suicide prevention hotline or by talking to school staff, whereas high school males were more likely to seek help from school staff. Regardless, our findings support the importance of educating school staff and providing them with suicide prevention resources.

When comparing our results to the current literature about the efficacy of the Yellow Ribbon program, Freedenthal<sup>22</sup> reported no increase in help-seeking behavior and a modest increase in youths reporting they had called a crisis hotline. These inconsistencies with our findings may be explained by a larger and more diverse sample or by differences in survey methodology. For example, we conducted the intervention in smaller groups of about 30 students during core curriculum classes versus a 50-minute presentation at a school-wide assembly. Our results might also be explained by social desirability bias, such that students might have been embarrassed to disclose unpleasant behaviors and attitudes, or perhaps they misreported due to a lack of effort given when responding to the survey.<sup>30</sup> To circumvent this, we maintained each student's confidentiality by using an anonymous survey and reporting only aggregate data, a strategy that may have helped increase student comfort level and lessen the potential for embarrassment.

Several limitations of the current study are worth noting and suggest potential directions for further research. First, to our knowledge the reliability and validity of this school-wide survey has not been ascertained. Moreover, the questionnaire was created by the same institution that developed the program. Second, we had access only to aggregate data by school and were therefore unable to match preintervention and postintervention responses. This was problematic, especially given that some postevaluation responses appeared to be missing. Next, there was a possibility that a very small number of students may have received the suicide prevention training more than once. Because surveys were completed

immediately after the Yellow Ribbon training, we assessed behavioral intent rather than actual help-seeking behaviors.

Future research might consider a more robust program evaluation, such as outlined by the Centers for Disease Control<sup>31</sup> regarding public health programs, which they claim can be generalized to any evaluation effort. Future strategies might also include longitudinal studies of knowledge retention, suicide-related attitude, and help-seeking behaviors using record-level data over time (eg, several months postintervention). Last, utilization of matched designs for precurricula and postcurricula implementation would allow for more sophisticated statistical techniques, such as propensity score matching and repeated-measure type testing that could incorporate stratification by risk groups.

## CONCLUSION

Overall, our results suggest the Yellow Ribbon school-based suicide prevention program is beneficial for students aged 11–18 years who attend midwest schools. Significant improvement was shown in suicide-related knowledge, comfort level, and behavioral intent for help-seeking for suicidal crisis. While no direct evidence was observed that Yellow Ribbon increased thoughts of self-harm, this was not specifically measured, and program efficacy for reducing suicidality among adolescents remains unknown. Regardless, our findings suggest that the Yellow Ribbon suicide prevention program may be especially effective during the middle school years.

**Submitted:** June 19, 2015; accepted March 7, 2016.

**Published online:** June 30, 2016.

**Disclosure of off-label usage:** The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside US Food and Drug Administration–approved labeling has been presented in this article.

**Financial disclosure:** Dr Macaluso has conducted clinical trials research as a principal investigator over the last 12 months for AbbVie, Alkermes, Assurex, Eisai, Forum, Janssen, and Naurex; all clinical trial and study contracts were with and payments made to the Kansas University Medical Center Research Institute, a research institute affiliated with Kansas University School of Medicine–Wichita. Drs Flynn, Klaus, McGinness, and Carr and Ms Zackula have no personal affiliations or financial relationships with any commercial interest to disclose relative to the article.

**Funding/support:** None.

## REFERENCES

1. Kochanek KD, Xu J, Murphy SL, et al. Deaths: preliminary data for 2009. National Vital Statistics Reports Web site. [http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_04.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf). Updated March 16, 2011. Accessed March 10, 2016.
2. National Suicide Statistics. Centers for Disease Control and Prevention Web site. <http://www.cdc.gov/ViolencePrevention/suicide/statistics/index.html>. Updated 2016. Accessed April 29, 2016.
3. Suicide: Facts at a Glance 2015. Centers for Disease Control and Prevention Web site. <http://www.cdc.gov/violenceprevention/pdf/suicide-datasheet-a.pdf>. Updated 2016. Accessed April 29, 2016.
4. Katz C, Bolton SL, Katz LY, et al; Swampy Cree Suicide Prevention Team. A systematic review of school-based suicide prevention programs. *Depress Anxiety*. 2013;30(10):1030–1045.
5. Klimes-Dougan B, Klingbeil DA, Meller SJ. The impact of universal suicide-prevention programs on the help-seeking attitudes and behaviors of youths. *Crisis*. 2013;34(2):82–97.
6. Mazza J. School-based suicide prevention programs: are they effective?

- School Psych Rev.* 1997;26(3):383–396.
7. Shaffer D, Garland A, Vieland V, et al. The impact of curriculum-based suicide prevention programs for teenagers. *J Am Acad Child Adolesc Psychiatry.* 1991;30(4):588–596.
  8. Aseltine RH Jr, James A, Schilling EA, et al. Evaluating the SOS suicide prevention program: a replication and extension. *BMC Public Health.* 2007;7(1):161.
  9. King KA, Strunk CM, Sorter MT. Preliminary effectiveness of Surviving the Teens(®) Suicide Prevention and Depression Awareness Program on adolescents' suicidality and self-efficacy in performing help-seeking behaviors. *J Sch Health.* 2011;81(9):581–590.
  10. Barker G. *Adolescents, Social Support and Help-Seeking Behaviour: an International Literature Review and Programme Consultation With Recommendations for Action.* Geneva, Switzerland: World Health Organization; 2007.
  11. Pearson JL. Challenges in US Suicide Prevention Public Awareness Programmes. In: O'Connor RC, Platt S, Gordon J, eds. *International Handbook of Suicide Prevention: Research, Policy and Practice.* Chichester, United Kingdom: John Wiley & Sons, Ltd; 2011:577–590.
  12. Niederkrotenthaler T, Reidenberg DJ, Till B, et al. Increasing help-seeking and referrals for individuals at risk for suicide by decreasing stigma: the role of mass media. *Am J Prev Med.* 2014;47(suppl 2):S235–S243.
  13. US Public Health Service. *The Surgeon General's Call to Action to Prevent Suicide.* Washington, DC: Department of Health and Human Services; 1999.
  14. Claassen CA, Pearson JL, Khodyakov D, et al. Reducing the burden of suicide in the US: the aspirational research goals of the National Action Alliance for Suicide Prevention Research Prioritization Task Force. *Am J Prev Med.* 2014;47(3):309–314.
  15. Gould MS, Greenberg T, Velting DM, et al. Youth suicide risk and preventive interventions: a review of the past 10 years. *J Am Acad Child Adolesc Psychiatry.* 2003;42(4):386–405.
  16. Wyman PA, Brown CH, Inman J, et al. Randomized trial of a gatekeeper program for suicide prevention: 1-year impact on secondary school staff. *J Consult Clin Psychol.* 2008;76(1):104–115.
  17. Gould MS, Velting D, Kleinman M, et al. Teenagers' attitudes about coping strategies and help-seeking behavior for suicidality. *J Am Acad Child Adolesc Psychiatry.* 2004;43(9):1124–1133.
  18. Pisani AR, Schmeelk-Cone K, Gunzler D, et al. Associations between suicidal high school students' help-seeking and their attitudes and perceptions of social environment. *J Youth Adolesc.* 2012;41(10):1312–1324.
  19. A Symbol of Life and Hope. Yellow Ribbon Suicide Prevention Program Web site. <http://yellowribbon.org>. Updated 2015. Accessed September 17, 2015.
  20. 2012 National Strategy for Suicide Prevention: Goals and Objectives for Action. US Department of Health and Human Services (HHS) Office of the Surgeon General's Web site. <http://www.surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/full-report.pdf>. Updated 2012. Accessed March 10, 2016.
  21. Ask 4 Help Suicide Prevention for Youth. Best Practices Registry: Section III: Adherence to Standards. Suicide Prevention Resource Center's Web site. <http://www.sprc.org/bpr/section-III/ask-4-help-suicide-prevention-youth>. Updated 2013. Accessed November 17, 2015.
  22. Freedenthal S. Adolescent help-seeking and the Yellow Ribbon Suicide Prevention Program: an evaluation. *Suicide Life Threat Behav.* 2010;40(6):628–639.
  23. Hirsch JK. A review of the literature on rural suicide: risk and protective factors, incidence, and prevention. *Crisis.* 2006;27(4):189–199.
  24. Middleton N, Gunnell D, Frankel S, et al. Urban-rural differences in suicide trends in young adults: England and Wales, 1981–1998. *Soc Sci Med.* 2003;57(7):1183–1194.
  25. Kataoka S, Stein BD, Nadeem E, et al. Who gets care? mental health service use following a school-based suicide prevention program. *J Am Acad Child Adolesc Psychiatry.* 2007;46(10):1341–1348.
  26. Rodgers PL, Sudak HS, Silverman MM, et al. Evidence-based practices project for suicide prevention. *Suicide Life Threat Behav.* 2007;37(2):154–164.
  27. Perveen G, Dao D. *Suicide in Kansas: Injury Prevention and Disability Program.* Topeka, Kansas: Kansas Department of Health and Environment, Bureau of Health Promotion; 2012.
  28. Gould MS, Marrocco FA, Kleinman M, et al. Evaluating iatrogenic risk of youth suicide screening programs: a randomized controlled trial. *JAMA.* 2005;293(13):1635–1643.
  29. Vaswani N. Encouraging Help-Seeking Behaviour Among Young Men: A Literature Review. Glasgow City Council's Web site <http://www.glasgow.gov.uk/chtphandler.ashx?id=5252>. Updated 2011. Accessed March 10, 2016.
  30. Kaminska O, Foulsham T. *Understanding Sources of Social Desirability Bias in Different Modes: Evidence From Eye-Tracking.* Colchester, United Kingdom: Institute for Social and Economic Research; 2013.
  31. Program Performance and Evaluation Office (PPEO) Program Evaluation. Centers for Disease Control and Prevention Web site. <http://www.cdc.gov/eval/>. Updated May 18, 2015. Accessed November 11, 2015.



## POSTTEST

To obtain credit, go to <http://www.cmeinstitute.com/activities/Pages/PCC.aspx> to complete the Posttest and Evaluation.

1. The Yellow Ribbon Suicide Prevention Program provides skills training for peers to recognize warning signs of suicide and seek help.
  - a. True
  - b. False
2. According to this study, students were most willing to seek help from a \_\_\_\_\_.
  - a. Trusted teacher or school staff member
  - b. Parent or other adult outside of school
  - c. Friend
3. Given the higher rate of suicide deaths among males, a school system is looking for strategies for addressing suicide risk in male students. Based on the findings of this study, which of the following strategies would you recommend?
  - a. Avoid discussing suicide in schools, given the iatrogenic effects of these discussions
  - b. Implement a Yellow Ribbon Suicide Prevention Program beginning in the middle school years
  - c. Implement a Yellow Ribbon Suicide Prevention Program for older teens only
  - d. Await further research, given the conflicting results of studies on school-based suicide prevention programs