

The Effectiveness of a School-Based Adolescent Depression Education Program

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In an effort to decrease the suicide rate in adolescents, many interventions have focused on school-based suicide prevention programs. Alternatively, depression education in schools might be effective in decreasing the morbidity, mortality, and stigma associated with adolescent depression. The Adolescent Depression Awareness Program (ADAP) developed a 3-hour curriculum to teach high school students about the illness of depression. The purpose of this study was to assess the effectiveness of the ADAP curriculum in improving high school students' knowledge about depression. From 2001 to 2005, 3,538 students were surveyed on their knowledge about depression before and after exposure to the ADAP curriculum. The number of students scoring 80% or higher on the assessment tool more than tripled from pretest to posttest (701 to 2,180), suggesting the effectiveness of the ADAP curriculum. Further study and replication are required to determine if improved knowledge translates into increased treatment-seeking behavior.

Keywords: *adolescents; depression; school-based education program*

High school programs on suicide, the third leading cause of death in 15- to 24-year-olds (National Center for Health Statistics, 2004), are numerous and fraught with difficulty. Despite this, 75% of U.S. high schools require that some type of suicide prevention curriculum be taught in their schools (Kann, Brener, & Allensworth, 2001). Many programs have focused solely on suicide prevention, rather than addressing the association between adolescent suicide and depression. Education, identification, and

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treatment of psychiatric disorders, particularly depression, are alternative strategies for suicide prevention. In a survey of suicide prevention programs, Garland and colleagues reported that 95% of programs adhered to a theory that “youth suicide is most commonly a response to extreme stress or pressure and could happen to anyone” (Garland, Shaffer, & Whittle, 1989). Only 4% of the surveyed programs adhered to the theory that “suicide is usually a consequence of mental illness,” despite repeated findings in the medical literature, indicating that approximately 90% of teenagers who complete suicide are found to have a psychiatric diagnosis on psychological autopsy (Brent et al., 1993; Marttunen, Aro, Henriksson, & Lonnqvist, 1991; Rich, Sherman, & Fowler, 1990; Runeson, 1990; Shaffer, Gould, et al., 1996). Moreover, the suicide prevention programs studied by Shaffer and colleagues (Shaffer, Garland, Vieland, Underwood, & Busner, 1991) did not improve the students’ knowledge and attitudes about suicide. They raised the concern that programs presenting suicide as an understandable response to common adolescent problems may normalize or even romanticize suicide and have the negative consequence of facilitating suicidal ideation.

Major depression, frequently the diagnosis determined on psychological autopsy following a completed suicide, is one of the most common illnesses affecting teenagers. With an estimated prevalence of 5% among teens, depression represents a major public health concern for high school students (Shaffer, Fisher, et al., 1996). In their longitudinal study of teenagers with depression, Fergusson and Woodward (2002) found that adolescent depression (between the ages of 14 and 16) significantly increased the risk for major depression, anxiety disorders, and substance dependence during early adulthood. In addition, young adults with a history of depression demonstrated an increased risk of suicide attempts, educational underachievement, unemployment, and early parenthood. Thus, early identification of psychiatric disorders, leading to effective treatment, can address the morbidity and the mortality risks associated with adolescent depression.

Introducing depression education programs into the high schools is an alternative approach to addressing the public health crisis of adolescent suicide while concurrently addressing the morbidity associated with unrecognized and untreated adolescent depression. Such programs would function to destigmatize the illness of depression and its treatment while stressing that the behavior of suicide is a serious consequence of an underlying psychiatric illness. This focus would be in contrast to certain suicide prevention programs, which have been shown to actually increase the acceptability of suicide in some previous attempters (Shaffer et al., 1990), therefore potentially reducing the taboo against the behavior. To date, there have been no published studies examining the effectiveness of depression education programs in high schools, though there are several published studies about school-based depression prevention programs (Burns & Hickie, 2002; Merry, McDowell, Wild, Bir, & Cunliffe, 2004; Oria, Cureton, & Canham, 2001; Shochet et al., 2001).

The Adolescent Depression Awareness Program (ADAP) developed a school-based curriculum to teach “depression literacy” to high school students, with the core message that “depression is a treatable medical illness.” The purpose of this study was to measure the students’ knowledge and attitudes about depression before and after the teaching of the ADAP curriculum.

METHOD

ADAP Development

The ADAP program began in 1999 with two psychiatrists and one psychiatric nurse teaching a newly designed depression education curriculum to 530 students in 8 schools.

The Adolescent Depression Knowledge Questionnaire (ADKQ) was devised and administered to the students as a pretest and posttest measure of their knowledge about depression. During the ensuing 6 years, the program has grown significantly, with 45 trained instructors, having taught the curriculum to more than 8,000 students in 36 schools.

In the first 2 years of the program, the pretest and posttest ADKQ comparisons demonstrated that teaching the curriculum in multiple sessions (intervention group) compared to a limited one-session curriculum (control group) effected a greater improvement in ADKQ scores. The mean change between pretest and posttest ADKQ scores for the intervention group was 1.98 compared to 1.36 for the control group; in a one-way ANOVA analysis, this difference was significant at the $p < .0001$ level. In the third year, ADAP focused on increasing the number of students receiving the ADAP curriculum and began teaching the curriculum in a large public school district in Maryland. Years 4 through 6 have focused on finalizing the curriculum and developing a training program for psychiatric clinicians and nursing and medical students to learn and teach the ADAP curriculum.

Setting and Participants

The data analyses presented here will be restricted to students from six high schools in a large public school district in Maryland, during the 4-year period of 2001 to 2005. This analysis is further limited to classes taught by ADAP instructors who were all experienced psychiatrists or psychiatric nurses, trained by the study's Principal Investigator. Students participated as part of their health classes, a requirement for graduation in this school district, with the unit on adolescent depression being taught by ADAP instructors. The students were primarily ninth graders (age 14 to 15), as this is the grade that health class is taught in this district. Occasionally an older student would be in the class, if he or she had failed health or had transferred into the district without the required health credit. There were no exclusion criteria; all students present in the class were included. The students were surveyed on their knowledge and attitudes about depression with no personal information collected about the students. The protocol received exemption status from the institutional review board, as the study focused on curriculum development and no personal identifying information was collected from the students. Within these six schools, there is significant ethnic and economic diversity and representation of special education, as outlined in Table 1.

ADAP Design

The ADAP curriculum involves 3 hours of instruction, designed to be taught during two to three consecutive health classes. The curriculum addresses not only knowledge about depression but also attitudes about treatment. The curriculum reviews the steps in making a diagnosis of a medical condition, teaches the symptoms of depression in detail, and discusses the criteria for diagnosing major depression and bipolar disorder. The students view the video *Day for Night: Recognizing Teenage Depression*, featuring adolescents with major depression and bipolar disorder, describing their experiences with these illnesses.

The project team, teachers, parents, teenage focus groups, and anonymous written feedback guided the process of curriculum development. The 3-hour ADAP student curriculum employs multiple teaching modalities, including lecture and discussion, videos, homework, video assignments, and group interactive activities. ADAP also utilizes new educational tools, including an interactive video, *Psychiatry 101: Psychiatry One on*

Table 1. Percentage of Students With Specific Characteristics in the Six Schools Participating in the Adolescent Depression Awareness Program

School	<i>n</i>	Ethnicity (% Non- White)	Free or Reduced Lunch (%)	Special Education (%)	4-Year College Following Graduation (%)
1	719	30.3	5.3	9.8	51.3
2	631	33.3	3.2	4.8	77.9
3	483	31.2	5.3	8.1	65.4
4	483	52.1	19.5	11.7	54.0
5	1,133	30.4	2.2	8.0	74.0
6	89	36.8	11.1	10.4	— ^a

NOTE: *N* = 3,538. Data were provided by individual annual school profiles (2005).

a. No info available.

One, which portrays a portion of an initial evaluation with a psychiatrist to demystify the process of psychiatric evaluation. With an emphasis on the need for further evaluation of symptoms, the overall message is hopeful: Depression is a treatable medical illness.

The curriculum relies heavily on the medical model, though the fact that depression is the result of complex interactions between psychosocial stressors and underlying biology is addressed in the curriculum. For example, in the discussion of treatment, the importance of psychotherapy, family therapy, illness education, and behavioral choices is presented in conjunction with medication treatment. But ultimately, stressing the underlying medical model is an approach to address each classroom's variability in the students' cognitive ability to process complex causal disease pathways.

With regard to suicide, the ADAP curriculum does not isolate and emphasize the topic of suicide. Rather, suicide is first presented as a symptom of depression and, second, is discussed in the *Day for Night* video when some of the featured adolescents discuss suicide in the context of describing their own experiences with depression. In all cases, the resounding message is that suicide is not a normal part of adolescence and a trusted adult should always be informed when an adolescent has thoughts of suicide. This approach was chosen to put suicide in the context of an illness needing treatment, rather than a normal response to a stressful event. Furthermore, this approach operationalizes the program's framework that depression education is effective suicide prevention.

Survey Instrument

The ADKQ (available from the author) is an assessment of knowledge and attitudes about adolescent depression. Thirteen yes–no questions were designed to test factual knowledge about depression and are listed in Table 2. Seven points were given for listing five symptoms of depression and two symptoms of mania. This portion of the questionnaire constituted the 20-point knowledge assessment. The questionnaire also included four open-ended questions about the students' attitudes regarding depression treatment, which are analyzed in a forthcoming publication. No questions were asked about individual symptoms or personal experiences.

Survey Method

Students were tested using the ADKQ prior to the program and approximately 6 weeks following the ADAP classes. All students present in class received the initial test

Table 2. Number and Percentage Correct on Individual Items of the Adolescent Depression Awareness Program Depression Knowledge Questionnaire on Pretest Compared to Posttest

ADKQ Question	Correct Response	Pretest Correct		Posttest Correct		χ^2	p
		n	%	n	%		
1. Five percent of all teenagers will suffer a major depression.	Yes	3,019	85.3	3,357	94.9	35.05	< .0001
2. Major depression is a normal part of adolescence. ^a	No	1,932	84.7	2,082	91.3	112.90	< .0001
3. Depression runs in some families.	Yes	3,031	85.7	3,347	94.6	120.17	< .0001
4. Depression can be controlled through willpower.	No	1,960	55.4	2,594	73.3	353.76	< .0001
5. The cause of Major Depression is well known.	No	2,774	78.4	2,880	79.7	213.87	< .0001
6. A change in behavior is a symptom of depression.	Yes	3,052	86.3	3,247	91.8	137.76	< .0001
7. There are certain groups of people who are immune to depression.	No	2,932	82.9	3,052	86.2	337.68	< .0001
8. Major Depression is a treatable medical illness.	Yes	2,759	78.0	3,093	87.4	126.77	< .0001
9. A person with depression always feels sad.	No	2,319	65.5	2,989	84.5	301.96	< .0001
10. The abuse of alcohol and drugs can be a sign of depression.	Yes	3,346	94.6	3,404	96.2	85.09	< .0001
11. Bipolar Disorder is more common than Major Depression.	No	2,263	64.0	2,356	66.6	82.09	< .0001
12. Major Depression is a curable illness.	No	1,222	34.5	1,828	51.7	189.62	< .0001
13. Someone who has a major stress (like having parents get a divorce) always develops a depressive illness.	No	2,913	82.3	3,097	87.5	344.59	< .0001

NOTE: N = 3,538. ADKQ = Adolescent Depression Knowledge Questionnaire.

a. For Question 2, n = 2,281 because Question 2 was not asked in Year 3.

at the beginning of the first health class, following a brief introduction to the program but before receiving any teaching about depression. An identical test was distributed at follow-up to assess changes in knowledge and attitudes. The test was unannounced so that the follow-up test reflected information the students had retained rather than a performance on a “test” following specific preparation and review. Each test was numbered and a corresponding sign-in sheet was used to facilitate students’ receiving the corresponding posttest. The sign-in sheet was kept by the classroom teacher and was then destroyed after distribution of the posttest. Only results from students with both a completed pretest and a completed posttest are included in this analysis.

Data Analysis

All data analyses were conducted using the Statistical Program for the Social Sciences 13.0 software program (SPSS Inc., 2004). For the analysis of ADKQ total score, number of depressive symptoms, and number of manic symptoms, means were calculated with comparison of pretest and posttest data. Paired *t* tests were used to test the significance of these differences. For comparison of the 13 yes–no questions, cross-tab analyses were performed with chi-square analyses to test significance.

RESULTS

A total of 4,299 students completed the ADKQ either during the first class period (pretest) or at follow-up (posttest). A total of 641 students completed only a pretest. Of these, 232 had completed the posttest, but the tests were lost in the school district’s internal mail system. A total of 72 were from one teacher’s classes who, for unknown reasons, neglected to administer the posttest to his students. The remaining 337 (8% of the total) represent students who were not in class the day the posttest was administered. Reasons might include illness, field trip, or being late for the class. A total of 120 students (3% of the total) completed only a posttest. Therefore, a total of 3,538 students had matched pretest and posttest. The mean pretest score for students completing only a pretest was 12.58 ($SD = 3.0$) compared to 12.96 ($SD = 2.97$) for students completing a pretest and posttest, a statistically significant difference ($p = .003$). The mean posttest score for students completing only a posttest was 15.73 ($SD = 2.88$), compared to 15.76 ($SD = 2.98$) for students completing pretest and posttest, a nonstatistically significant difference ($p = .93$). Because of the study design, further comparisons among the three groups cannot be made.

Table 3 summarizes the mean total ADKQ scores for the students for the pretest and posttest and the number of students scoring in four ranges. The number of students scoring 80% or higher more than tripled from pretest (701) to posttest (2,180), while the mean test scores showed a statistically significant improvement ($p < .0001$) from pretest (12.96) to posttest (15.76).

Table 2 summarizes the responses to the 13 yes–no questions, all of which had a statistically significant improvement from pretest to posttest.

Table 4 summarizes the improvement in the students’ ability to list symptoms of depression and mania comparing the pretest and posttest results. The analysis of the number of depressive symptoms reveals that 42.7% of the students listed 4–5 symptoms on the pretest, whereas 70.1% were able to list that many on the posttest. There was a similar significant change in listing manic symptoms with the change in percentage listing two manic

Table 3. Pretest and Posttest Total Scores on the Adolescent Depression Awareness Program Depression Knowledge Questionnaire

ADKQ Score Total Score Range	% Correct	Pretest		Posttest	
		<i>n</i>	%	<i>n</i>	%
0-5	0 to 25	43	1.2	15	0.4
6-10	30 to 50	653	18.5	211	6.0
11-15	55 to 75	2,141	60.5	1,132	32.0
16-20	> 80	701	19.8	2,180	61.6
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>p</i> ^a
Total ADKQ score	12.96	0.050	15.76	0.050	< .0001

NOTE: *N* = 3,538. ADKQ = Adolescent Depression Knowledge Questionnaire.

a. Paired-samples *t* test.

Table 4. Number of Symptoms of Depression and Mania Listed by Students on the Adolescent Depression Awareness Program Depression Knowledge Questionnaire Comparing Pretests and Posttests

	Pretest Correct		Posttest Correct	
	<i>n</i>	%	<i>n</i>	%
Number of depressive symptoms listed				
0-1	687	19.4	239	6.8
2-3	1,342	37.9	818	23.1
4-5	1,509	42.7	2,481	70.1
<i>M</i> ^a	2.96		3.85	
<i>SE</i>	0.026		0.022	
Number of manic symptoms listed				
0	2,944	83.2	1,087	30.7
1	444	12.5	1,206	34.1
2	150	4.2	1,245	35.2
<i>M</i> ^a	0.21		1.04	
<i>SE</i>	0.008		0.014	

NOTE: *N* = 3,538.

a. Paired-samples *t* test, *p* < .0001.

symptoms going from 4.2% to 35.2%. Changes in the mean number of depressive and manic symptoms identified were both statistically significant at the *p* < .0001 level.

DISCUSSION

The primary goal of ADAP is increasing adolescents' knowledge about the illness of depression with the secondary goals of changing attitudes and decreasing the stigma associated with adolescent mood disorders. The number of students scoring a total of 80% or

higher on the ADKQ more than tripled from pretest to posttest. Because of the lack of a randomized, controlled study design, conclusions about the ADAP curriculum causing these changes cannot be made. However, the temporal relationship and degree of the change make the ADAP curriculum a plausible explanation for these results; replication of these findings in a controlled, randomized study will be necessary to determine causality. The results of pretest knowledge are consistent with findings reported in a previous manuscript, summarizing only the pretest results of the ADKQ (Hess et al., 2004).

On examination of the individual questions, versus the total score, several interesting points emerged. There are several questions that the students had a good knowledge of before the teaching intervention. On the pretest, most of the students knew that drugs and alcohol can be signs of depression (Question 10) and thus demonstrating only a small percentage increase on the posttest. Similarly, the students had a good baseline understanding that major depression is not a normal part of adolescence (Question 2), that depression runs in some families (Question 3), and that a change in behavior is a symptom of depression (Question 6). However, the scores on all of these questions improved on the posttest, suggesting that additional learning did occur in these areas.

The three questions that had the greatest improvement from pretest to posttest have significant treatment implications. Question 12, "Major Depression is a curable illness" (*no*), increased from 34.5% correct on the pretest to 51.7% correct on the posttest, a change of 17.2%. It is vitally important for students (and parents) to understand that for the majority of adolescents, major depression is a chronic illness, and thus, an episodic approach to care is not optimal.

Question 9, "A person with depression always feels sad" (*no*), also had a significant improvement from pretest to posttest. The curriculum stressed that teenagers often experience irritability as the predominant mood change, versus sadness, which is seen more typically in adults. This is an important nuance for adolescents to understand to potentially recognize the disorder in themselves or in others.

The question that best assesses the students' understanding of the core message of the ADAP curriculum is Question 4, "Depression can be controlled through willpower" (*no*). The posttest scores showed a 17.9% improvement over the pretest scores, suggesting that the students are indeed grasping the message that depression is a treatable medical illness. Again, this question has significant treatment implications, as the students must understand that willpower alone is by no means adequate treatment for depression, just as willpower would not be sufficient treatment for asthma or diabetes.

There were small differences in mean scores for those with both a pretest and a posttest compared to students with only one of these. There was a statistically significant difference in pretest scores among those with only a pretest but no statistically significant difference in students with only a posttest when compared to those with both. It is possible that a selection bias (e.g., students who miss more school days might be overrepresented in the group with only a pretest) is responsible for this difference. However, the absolute difference in means between those with only a pretest and those with both is 0.38 (with a total score of 20); this difference is not evident in those with only a posttest, a group with the potential for the same bias.

LIMITATIONS

Although the results of this pilot study are encouraging, there are several limitations to consider. First, we do not know if improved knowledge about depression leads to an increase in treatment-seeking behaviors; nor can we determine if increased knowledge

ultimately will decrease the morbidity, mortality, and stigma associated with adolescent affective disorders. Given the current tenets of health education that knowledge is only moderately related to behavior (Perry, Kelder, & Klepp, 1994; Rimal, 2000; U.S. Department of Health and Human Services, 1994) and that brief one-time interventions may not be effective for changing behavior (Joint Committee on National Health Education Standards, 1995), one might argue that the 3-hour ADAP curriculum is not a worthwhile endeavor. The model guiding the intervention, coupled with the unique dynamics of implementing a school-based curriculum, offers rationales for why such an intervention is worthwhile, despite the arguments to the contrary.

Goldberg and Huxley (1980) put forth the framework that an individual passes through a series of “filters” before accessing care for mental health concerns. Zwaanswijk, Verhaak, Bensing, van der Ende, and Verhulst (2003) further adapted this model for adolescents. In both, the first filter involves symptom recognition. Individuals will not seek treatment if they do not recognize that they are suffering from symptoms worthy of professional attention. Therefore, the intervention of the ADAP curriculum addresses this first filter, not only for the affected adolescent but also for their community of friends to whom they might turn for guidance in whether or not to seek care.

With regard to a brief intervention not affecting behavior change, again we suggest that a school-based depression education curriculum, geared toward all students, is just one of many interventions that need to occur to increase help seeking for depressed adolescents. It would not be cost-effective, time efficient, or logical to offer repeated educational interventions to all students, given that an estimated 95% of the students will not suffer from the illness during their high school years. Therefore, a 3-hour curriculum on depression presented to all students might function as the first and most global intervention, which might then be followed by interventions such as screening and more repetitive, in-depth interventions for high-risk groups of students.

Another limitation is that personal information was not collected on the students; therefore, analysis cannot be done to compare the learning of different groups of students (e.g., boys vs. girls or those without both a pretest and a posttest). In this large school district, the district’s clear emphasis on education, versus research, placed understandable limitations on the study design. This school district was receptive to the ADAP team entering the classroom as guest speakers and testing a new curriculum on depression, but not to scientists coming to conduct research on the students. In addition, parental consent would have been needed to collect personal information on the students. Recent research has demonstrated the low participation rates when parental and student consent is necessary (Gould et al., 2004; Shaffer et al., 2004), and so seeking parental consent would have potentially limited the number of participating students.

The challenges of collaborating with schools in regard to mental health interventions and need for careful planning have been discussed in the literature, and two articles in particular offer guidelines for the process (Waxman, Weist, & Benson, 1999; Weist, Lowie, Flaherty, & Pruitt, 2001). Several of the outlined guidelines include assisting in school development and teacher training, focusing on prevention and early intervention, developing working and friendship relationships with teachers and administrators, and communicating clear and achievable goals are important and attainable goals for any school-based depression education program.

It was not feasible to include control schools (where students received no instruction) in this study. The participating schools agreed to have the multiple-session intervention curriculum presented and would not agree to include a no-intervention control group of students from their schools. Although it is unlikely that the significant changes in ADKQ scores would have occurred without the intervention, without a control group we cannot

definitively conclude that the changes in students' knowledge about depression were due directly to the intervention of the ADAP curriculum. We considered using data from the limited one-session curriculum used in the first 2 years of the program as a control; however, the schools, the survey instrument, and the curriculum all differed from the current study to a degree that we believed would not be a suitable comparison group. Further work will need to be done to establish relationships with schools that will allow the pretest and posttest ADKQ to be given without the ADAP curriculum intervention.

As this is the first published study examining changes in high school students' knowledge about depression after a depression education curriculum, to date there are no studies for comparison. Watson and colleagues (2004) conducted a similar study, though in a middle school population. They reported similar findings to ours, with *The Science of Mental Illness* curriculum producing significant improvements in students' knowledge about mental illness. Furthermore, they described similar limitations of not having a control group, not having the opportunity to conduct follow-up assessments, and not knowing whether or not the intervention had an impact on actual behavior, all further suggesting these next steps in research are indeed warranted.

IMPLICATIONS FOR PRACTICE

Given the aforementioned limitations and paucity of research in this area, carefully controlled studies, examining the impact of a depression education program on referrals to treatment, engagement in treatment, measures of stigma, and suicide rates in specified populations will need to be conducted. Furthermore, studies combining different interventions that address various filters for accessing care should be implemented. For example, when considering the potential strategies for suicide prevention, a depression education program, such as the ADAP curriculum, could be combined with a case identification or depression-screening effort. The Columbia Teen Screen established the feasibility and accuracy of screening for depression in high schools (Shaffer et al., 2004). However, acceptance of treatment after screening has not been well documented. The impact of complementary interventions could identify the students at greatest risk for depression and suicide and improve the acceptance of treatment. The increased knowledge in the students might decrease the stigma associated with depression in that school, thus supporting the adolescents who are identified in the screening as needing treatment. Furthermore, the benefit of depression education is not limited to the time of the intervention, as the participants may later use this information to identify mood disorder symptoms in themselves, friends, family, or coworkers.

Finally, psychiatric clinicians and school personnel have a common goal in mind, to support and guide adolescents as they transition through the high school years to adulthood. By working collaboratively to provide accurate information about depression, as is done with other health concerns, adolescent depression as an important topic for discussion is underscored.

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