

RESEARCH ARTICLE

# Effectiveness of the Adolescent Depression Awareness Program (ADAP) on Depression Literacy and Mental Health Treatment

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## ABSTRACT

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**BACKGROUND:** Analysis of data from a NIMH-supported study was conducted to evaluate the effectiveness of the Adolescent Depression Awareness Program (ADAP) in promoting depression literacy and help-seeking behavior.

**METHODS:** Eighteen Pennsylvania schools were matched on size, sex, race, test scores, median income, and free/reduced lunch status. Schools randomized to the intervention implemented ADAP as a compulsory part of the schools health curriculum, while control schools collected study measures.

**RESULTS:** Post-randomization analysis revealed no significant differences by sex on the pre-assessments between intervention and control schools. In the intervention schools, a total of 1427 students received ADAP. Written parental consent and adolescent assent was obtained from 33.7% students. The online REDCap survey was completed by 41.78% of the consenting students. The Adolescent Depression Knowledge Questionnaire (ADKQ) findings suggest that ADAP significantly improved depression knowledge (Est. =1.07, SE =.25,  $p < .001$ ), compared to those in the control group. ADAP was found to facilitate help-seeking behavior by student report in those participating in the REDCap survey 4 months following the ADAP curriculum.

**CONCLUSIONS:** Results of the survey suggests that ADAP facilitates help-seeking behaviors in teens. This study supports the efficacy of a teacher delivered school-based universal prevention program, ADAP, on depression literacy.

**Keywords:** child & adolescent health; curriculum; mental health; public health; depression literacy; health communications.

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As early as Healthy People 2010, depression was recognized as a leading health indicator and a major cause of disability and death nationwide.<sup>1</sup> Adolescents are particularly at risk given that adolescent depression has emerged as a leading public health concern. The onset of depression often occurs during teen or young adult years.<sup>2</sup> Data on the onset of mental disorders suggests that early symptoms of a disorder may emerge several years before full diagnostic criteria are met.<sup>3</sup> In general, mental health disorders among children and adolescents have been reported by the National Institutes of Health to lead to school failure, alcohol or other drug abuse, family discord, violence,

and suicide.<sup>4</sup> Due to the lack of public awareness of the clinical presentation of mood disorders in children and adolescents, many go untreated or have a delay in onset of treatment, which may adversely affect the course of illness. The most severe consequence of untreated depression is suicide. Due to the prevalence of depression, its adverse sequelae, and risk of suicide universal depression prevention programs are crucial.

While there are numerous pathways to the development of depression, there are also numerous pathways to intervene and change the course and progression of this illness. This is consistent with the Institute of Medicine (IOM) report in 1994, which

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stated research on preventive interventions aimed at major depressive disorder should be increased immediately and substantially and expounded upon the importance of preventing comorbid disorders and reducing suicides.<sup>5</sup>

While the National Research Council and Institute of Medicine Prevention Committee has advocated a paradigm shift from a traditional disease model in which symptoms are treated when they emerge to a proactive focus on mental health and maximizing protective factors, selective prevention, which targets a subset of the population with an above-average risk of developing a disorder, appears to be more effective than universal prevention that encompasses the entire population.<sup>6</sup> Given the prevalence of major depressive disorders and the risk of suicide, the necessity of a traditional public health approach utilizing a blended universal intervention and a targeted secondary prevention is important in the identification of individuals with the disorder and then facilitating treatment. Educational programs that promote recognition of depression, promote early identification, facilitate the use of treatment interventions, and affect the course of the illness are necessary. This is critical as when one disorder, depression, leads to the development of maladaptive behavior, suicide, the prevention or treatment of the first disorder, depression, is a plausible prevention strategy for suicide. Despite the Institute of Medicine (IOM) call to action to increase and expand depression prevention interventions and the high proportion of adolescents with depression, there have been few large-scale school-based randomized trials investigating the effectiveness of universal interventions for depression prevention among adolescents.<sup>7</sup>

In the United States, universal prevention programs focusing on primary prevention utilizing instructional and cognitive group interventions for depression prevention have been conducted with at-risk populations; survival analysis has found the interventions have a significant advantage.<sup>8-10</sup> This is consistent with a meta-analysis of Penn's Resiliency Program (PRP), a group cognitive-behavioral intervention targeting depressive symptoms in youth. PRP participants have reported fewer depressive diagnoses at post-intervention and follow up compared to youth not receiving the intervention through 1 year.<sup>11</sup> Internationally, a number of cognitive behavioral and social problem solving interventions have been reported including Problem Solving for Life, Beyond Blue, and Resourceful Adolescent Program (RAP), The Gatehouse Project and Mood Gym. The results from these studies have been mixed with many trials not finding an intervention impact.<sup>10,12-15</sup> In New Zealand, RAP was adapted for indigenous populations, RAPP Kiwi, and immediately after the interventions depression scores significantly decreased.<sup>16</sup> In Germany, an

intervention based on cognitive-behavioral therapy and a social information-processing model of social competence reported low levels of depression and larger social networks for the intervention versus control group. Participants low in self-efficacy were reported to benefit most.<sup>17,18</sup>

Universal prevention programs focusing on secondary prevention, programs that increase detection of subthreshold and threshold symptoms of depression, have reported variable results. One intervention which includes a curriculum covering symptoms, causes, treatment of depression, encouraging treatment-seeking behavior and encouraging pleasant activities was found to decrease depressive symptoms in boys, however, the change was not sustained over 12 weeks.<sup>10</sup> The Mental Health Literacy curriculum, in Japan, which encompasses a multistep process that promotes help seeking was found to result in significant improvement in knowledge and help seeking after the intervention and at 3-month follow-up.<sup>19</sup>

To date, there is minimal empirical evidence or consensus regarding the effectiveness of school-based educational programs promoting mental health literacy.<sup>20-22</sup> However, in Canada, the Mental Health and High School Curriculum Guide designed to improve mental health literacy, to increase understanding of mental illness, and to reduce stigma associated with mental illness was found to increase knowledge and decrease stigma.<sup>23</sup> Cases finding strategies or those to identify and refer at risk youth are based on the valid premise that the emergences of mental illness in adolescents are under-identified.

To identify youth with depression, the Adolescent Depression Awareness Program (ADAP), a manualized, school-based universal intervention was developed by Dr Karen Swartz and colleagues at Johns Hopkins University.<sup>24</sup> Teachers are provided with a didactic curriculum for their health class that utilizes diverse methodologies of instruction. The course content includes symptoms of Major Depression and Bipolar Disorder, the process of diagnosing the illnesses, emphasis that it is a treatable medical illness, as well as an overview of treatment alternatives. The program reinforces the message that teens should speak with a trusted adult regarding their concerns and seek treatment. ADAP focuses on increasing depression literacy as a first step to encouraging youth to seek treatment.<sup>25</sup>

Important features of effective school-based mental health interventions include inclusion of parents, teachers and peers, and integration of the program content into the classroom.<sup>26</sup> ADAP achieved this by including the project team, teachers, parents, teenage focus groups and anonymous written feedback in curriculum feedback and development.<sup>25</sup> By presenting the program in a manner consistent with educators' primary mission, school

administrators and educators' support of the program was enhanced.

## METHODS

For the study, "Impact of Increasing Adolescent Depression Literacy on Treatment-Seeking Behavior," approved by the Johns Hopkins Medical Institution Institutional Review Board, the evaluation of the ADAP program was carried out using a school-based randomized effectiveness trial with a waitlist control design between 2012 and 2015.<sup>27</sup>

### Participants

In Pennsylvania, 18 public schools were approached to participate in a study of adolescent help seeking behavior of which 15 agreed to participate. Parental consent and adolescent assent was obtained to assess adolescent help seeking and mental health service utilization 4 months after the ADAP intervention.

A total of 1427 students received the ADAP curriculum in their health classes and were eligible to participate in the study investigating treatment-seeking behavior. Of those 1427 students, written parental consent and adolescent assent was obtained for 481 students (33.7%).

### Procedure

Of the 17 York County, Pennsylvania and 1 Cumberland County public schools approached, 1 was excluded due to another confounding mental health curriculum and another 2 declined to participate. The target population of this analysis included student participants recruited from the 15 Pennsylvania public schools. Participating schools were matched on school size, sex, race, test scores, median income and free/reduced lunch status, and then randomized to the intervention condition (implementing the ADAP curriculum as a compulsory part of the schools health curriculum) or control condition (collecting the same study measures with no intervention). Schools randomized to the control condition were offered the intervention in the subsequent year. Post-randomization analysis revealed no significant differences by sex on the pre-assessments between intervention and control schools.

Four months following the ADAP program in class the consented students received an email link to complete a self-administered, modified version of the Child and Adolescent Services Assessment (CASA) via REDCap survey.<sup>27-30</sup> At that time students reported on their lifetime use of mental health services, as well as, treatment in the 4-month period following the ADAP program in school.

### Instruments

All students were assessed using the Adolescent Depression Knowledge Questionnaire (ADKQ).<sup>31</sup> The

proximal outcome targets for the study are: (1) depression literacy, defined as correctly answering 80% on the Adolescent Knowledge Questionnaire (ADKQ) measured at pretest, and 6 weeks and 4 months post-intervention post-test, and (2) self-reported treatment seeking for depression collected from adolescents 4 months post ADAP intervention via a modified version of the Child and Adolescent Services Assessment (CASA).

Adolescent Depression Knowledge Questionnaire (ADKQ) was developed to assess students' knowledge about depression and help-seeking attitudes related to depression.<sup>25</sup> Psychometric evidence supports the ADKQ as a measure to evaluate adolescent depression literacy.<sup>31</sup> The questionnaire includes 13 questions to assess depression literacy and includes 4 clinical vignettes to assess whether the situation portrayed represents an individual who "has a rough time," "has the medical illness of Depression," or "has the medical illness of Bipolar Disorder." Depression literacy was defined as correctly answering 80% or more of the 17 knowledge-based questions on the ADKQ. The ADKQ was administered to students on the first day of the curriculum as a pretest, at 6 weeks post-intervention, and 4 months post-intervention.

In addition to the ADKQ obtained during school participation, for those providing parental consent and adolescent assent, data were collected via a REDCap survey that included demographic data (sex, race/ethnicity, age, school, and grade). Students also reported by dichotomous variable, yes/no, to the following statement and questions: (1) I have not sought help for depression prior to ADAP. (2) I have not sought help for depression after ADAP. (3) I have not sought help for another emotional concern prior to ADAP. (4) I have not sought help for another emotional concern after ADAP. (5) Have you ever been diagnosed with depression? (6) Did you seek help for depression or another emotional concern after the ADAP program? (7) Have one of your family members ever been diagnosed with depression?

### Data Analysis

The current analysis will focus on the depression literacy findings of the 15 Pennsylvania schools participating in the study and the subset of students who agreed to participant under the Johns Hopkins Institutional Review Board approved informed consent form.

Written parental consent and adolescent assent was obtained for 481 students. The online modified version of the Child and Adolescent Services Assessment (CASA) administered via REDCap survey was completed by 201 (41.78%) of the consenting students. Table 1 reports demographic characteristics of this population. A total of 55 students (11.43%) were lost to

**Table 1. Demographic Characteristics of the Population**

Demographics	Number	Percentage
Gender		
Male	73	36.6
Female	128	63.7
Sexual orientation		
Heterosexual	184	92.9
Bisexual	7	3.5
Not Sure	7	3.5
No Response	3	1.5
Race		
Asian	9	4.5
Black	17	8.5
Hispanic	9	4.5
Native American	2	1
Pacific Islander	1	.5
White	155	77.1
Other	8	4

follow-up due to failure to provide an email address or the email address was invalid at the time the REDCap survey was distributed, 3 students (0.62%) withdrew consent from the study, and 222 (46.17%) failed to complete the survey.

## RESULTS

The first specific aim of the proposed research was to assess the effectiveness of the Adolescent Depression Awareness Program (ADAP) in increasing depression literacy by comparing ADAP to the standard health education curriculum, with a post-test at 6 weeks. The sustainability of depression literacy changes was evaluated with a post-test at 4 months following the ADAP curriculum. The ADKQ findings for the schools in Pennsylvania suggest that the ADAP program significantly improved depression knowledge (Est. =1.07, SE = .25,  $p < .001$ ).

The second aim of the study was to evaluate whether ADAP, compared to the standard health education curriculum influenced treatment-seeking behavior as evidenced by increased visits to the schools health counselor and self-reported treatment seeking via the Child and Adolescent Services Assessment (CASA) administered via REDCap survey. However, due to obstacles in data collection and reporting from available schools we were unable to conduct the analysis comparing treatment-seeking behaviors between the 2 groups. Our reporting of treatment-seeking behavior is thus limited to youth self-reports of those providing parental consent and adolescent assent.

Of the 481 eligible students, 201 responded to the REDCap survey (33.7%). Part of this population is perceived to be an at-risk population, given a family history of depression was reported by 85 students (42%) and 27 (13%) self-reported a personal history

**Table 2. Mental Health Services Utilization and Perceived Improvement**

Service	Four Months Post ADAP, Number of Students Reporting Utilization of Service	Average Percentage of Students Perceived Improvement Reported by Service
Psychiatric hospitalization	0	
Psychiatric day hospitalization	3	100
Community mental health center	1	100
Psychiatrist	14	85.7
Psychologist	13	84.6
Pediatrician for mental health issue	8	75
Other health provider for mental health issue	7	85.7
Emergency department	1	0
School counselor for mental health issue	8	50
School psychologist for mental health issue	1	100
In-home emergency services	0	
Medication for depression	9	66.6
Therapy for depression	9	88.8

of depression or another emotional concern. The remaining 174 (35%) students denied prior diagnosis or treatment for depression or other emotional concerns.

After receiving ADAP in class, 33 (16%) of students reporting they were receiving treatment. Of these 33 students, 19 (58%) endorsed prior treatment, and 14 (42%) were treatment naïve or had no previous treatment.

The students most commonly identified seeking care from a psychiatrist, psychologist, school counselor, and pediatrician. Student service utilization and perception of improvement, 4 months post ADAP, is reported in Table 2. Students reported dichotomously, yes or no, as to whether a specific service improved their health. Students expressed perceiving greater improvement from therapy for depression (88.8% reporting improvement) compared to treatment with medications for depression (66.6% reporting improvement). Students also conveyed comparable perceptions of improvement for care provided by psychiatrist (85.7%), psychologist (84.6%), or other health provider (85.7%); however, perceived satisfaction following treatment by school counselors and pediatricians were reported as 50% and 75%, respectively. The number of mental health services utilized is reported by family history of depression in Table 3. The majority of students (49%) accessed 1 service. Students who endorsed a family history of depression endorsed greater service utilization.

**Table 3. Utilization of Mental Health Services Reported By Family History of Depression**

Number of Services Utilized	Number of Students Who Reported No Family History of Depression	Number of Students Who Reported Positive Family History of Depression
1	12	17
2	5	8
3	0	6
4	1	5
5	0	4
6	0	1

Limitations of the study include the students participating may not be representative of the general population, the REDCap survey was not completed by a control group, and a validation of treatment seeking by a care provider was not obtained.

## DISCUSSION

The aim of the current paper was to investigate whether ADAP, a universal depression education program, increased depression literacy and treatment-seeking behavior. The ADKQ findings for the schools in Pennsylvania public schools suggest that the ADAP program significantly improved depression knowledge (Est. = 1.07, SE = .25,  $p < .001$ ). Those who received the ADAP curriculum showed greater improvements in depression knowledge compared to those in the control group. Given the number of students who endorsed seeking help for depression or another emotional concern after the ADAP program, the results suggests that ADAP facilitates treatment seeking not only in students with a past medical history or family history of depression but in a treatment naïve population. This was evident as 85 students (42%) reported a positive family history of depression and 27 students (13.3%) reported a diagnosis of depression. Of the remaining 174 students who denied prior diagnosis or treatment for depression or other emotional concerns, 14 (8%) sought treatment after ADAP.

Treatment seeking for those responding to the Child and Adolescent Services Assessment (CASA) via REDCap survey was 13%. However, the actual number of students who sought treatment following the intervention is difficult to determine given the 33.7% REDCap survey response rate.

This study supports the efficacy of a school-based universal prevention program, ADAP, which is delivered by teachers as part of the regular class curriculum in health class in promoting depression literacy. The study suggests that treatment-seeking behavior is facilitated by the intervention. By increasing treatment-seeking behavior, ADAP has the potential to improve outcomes associated with

untreated depression. Untreated depression can result in decreased academic performance and social functioning and can lead to suicide. ADAP has the potential to improve outcomes associated with untreated depression including, through greater treatment seeking, a reduction in the risk for suicide.

In fact, mood disorders are prominent among adolescents who attempt or die by suicide.<sup>32-35</sup> Therefore, the prevention and treatment of mood disorders in youth is a logical approach for reducing suicide attempts and deaths. This is a significant public health issue as reported in Healthy People 2020, 15% of high school students have seriously considered suicide, and 7% have made a suicide attempt.<sup>36</sup> There are significant barriers to existing school-based suicide prevention programs preventing their widespread implementation. These barriers include the need for “gatekeepers” to recognize and refer at-risk students, the concerns of school administrator regarding the topic of suicide, and the requirement of parental consent for youth to receive certain programs. Compared to traditional suicide prevention programs, ADAP’s focus on depression as a component of health education circumvents these barriers, allowing large numbers of students to be reached and potentially helped.

Although the results from this study are promising, limitations exist, namely treatment-seeking data was not obtained in a control group and the limited number of students whose parents gave consent and participated in the survey of mental health treatment-seeking behaviors. It is important to note that 42% of the respondents who had informed consent reported a family history of depression, thus representing an enriched population. This finding suggests in addition to a universal intervention ADAP has potential applicability as a selective prevention program, targeting individuals or a subgroup of the population who are at above-average risk of developing a disorder. Such interventions, which speed initial treatment contact, are likely to reduce the burdens and hazards of untreated mental disorders.<sup>37</sup>

Despite advances in the broader field of prevention, prevention related to mental health disorders has lagged in comparison. In part, this has been attributed to stigma associated with mental health disorders. Another difficulty is that even though research has shown that a number of effective treatment interventions are available, specifically related to depressive disorders, the information is not generally known to the public.<sup>5</sup> Universal prevention programs, such as ADAP, combat this ignorance. While the 1999 Surgeon General Call to Action to Prevent Suicide emphasized the importance of addressing the issue, many schools still do not have an adequate plan.<sup>38</sup> While a comprehensive approach encompassing primary, secondary, and tertiary prevention strategies is advocated,

state and district level policies have not been broadly adopted.<sup>39</sup>

Numerous challenges exist to implementing school based research and health services research. Conducting research in school settings that requires parental consent and adolescent assent is labor intensive and requires a high level of research infrastructure support, school administration and teacher support and engagement. Despite these issues, policymakers have recommended reaching youth and families in naturalistic settings and providing them with tools to recognize and seek help for mental illnesses and have specifically recommended school-based programs.

## IMPLICATIONS FOR SCHOOL HEALTH

In the United States in 2014, 11.4% of youth aged 12 to 17 (nearly 3 million adolescents) experienced at least one episode of depression in the past year.<sup>40</sup> Adolescence is the peak period for the onset of depression.<sup>34</sup> Mood disorders are prominent among adolescents who attempt or die by suicide.<sup>32-35</sup> The 2012 National Strategy for Suicide Prevention (NSSP) identified a goal of providing training to community service providers, including educators and school personnel and identified school counselors as the “frontlines of suicide prevention” and recommended that schools, colleges, and universities “train relevant school staff.”<sup>41</sup>

There is not a federal mandate for depression or suicide prevention training and state mandates are variable, from some states requiring annual training while others only require one training. The duration of trainings also differ and range from a “self-study review” to 8 hours of training.<sup>42</sup> Therefore, local school leadership must be cognizant of state and district requirements.

Given that teachers spend significant time with students, they are in a unique position to promote and address student mental health concerns. Therefore, policies that support integration of mental health curriculum should be advocated within school systems.

Considering the paucity of evidence-based depression education programs available to teachers, the findings of this research support the implementation of ADAP as an effective depression education program that increases depression literacy and promotes treatment. An added benefit of the ADAP curriculum is that it includes recommendations for teachers in the management of students who approach them expressing concerns or seeking treatment. This is not to suggest that teachers should be in a position to provide therapeutic interventions or treatment, but that they too achieve depression literacy, recognize the need for treatment, and are in a position to facilitate referral to treatment.

The reported perceived satisfaction following treatment by school counselors in this study, 50%, suggest the need for school counselors to effectively convey their role and manage expectations. Dissatisfaction may be attributable to students expecting school counselors to assume a treatment role which is incongruent with their professional role.

Teachers have been called upon to meet a broad educational agenda, to meet the academic standards of education but to also fulfill the public health education needs of the student population.<sup>43</sup> It is possible that teachers will be more receptive to adopting mental health curricula if they receive resources that align with Common Core Standards (CCS) and are consistent with the primary mission of educating students. Teachers may also experience more comfort with course content related to mental health issues if they have resources developed by mental health experts and guidance about how to respond to and address mental health concerns that arise. ADAP addresses these concerns, is a model intervention to improve mental health literacy, and complies with CCS.<sup>43</sup>

Owing to the potential mortality of untreated depression due to suicide, delivering depression literacy is vital. Schools and teachers need to be prepared. Support systems should be in place to assist with the identification of students at-risk, development of protocols that direct teachers how to manage students if approached regarding mental health needs, and with information on directing student treatment referrals. A close relationship between teachers and guidance counselors is crucial. Being a teacher in an environment with constantly evolving demands is challenging but this is especially so when encountered with a student in crisis. Teachers can be best prepared to face this challenge through the use of an evidence-based mental health curriculum and protocols that outline teacher actions if approached by a student. Prior to implementing mental health curriculums schools should identify the point person in the school counseling office. Should a student approach a teacher for help, their role should be in facilitating the students connections with the Guidance Office, and accompanying them to the office should they have a urgent concern or concern for the safety of the student. The Guidance Office then communicates with the student, parent or guardian to facilitate evaluation and treatment.

Recognizing the geographic and fiscal challenges school systems are under, the ADAP curriculum is available via the Web by contacting [adap@jhmi.edu](mailto:adap@jhmi.edu). Teachers are then contacted and asked to complete a questionnaire via REDCap survey. After the questionnaires are completed and reviewed by the ADAP team, instructors receive an automatic email through REDCap with instructions regarding registration for the online training.<sup>42</sup>

## Human Subjects Approval Statement

The Institutional Review Board at Johns Hopkins University School of Medicine approved all study procedures (Protocol NA 00073580).

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