



Preliminary Outcomes Of A Multi-Site, School-Based Modular Intervention For Adolescents Experiencing Mood Difficulties

By: **Kurt D. Michael** • Melissa W. George • Joni W. Splett • John Paul Jameson • Rafaella Sale • Abby A. Bode • Aidyn L. Iachini • Leslie K. Taylor •

Abstract

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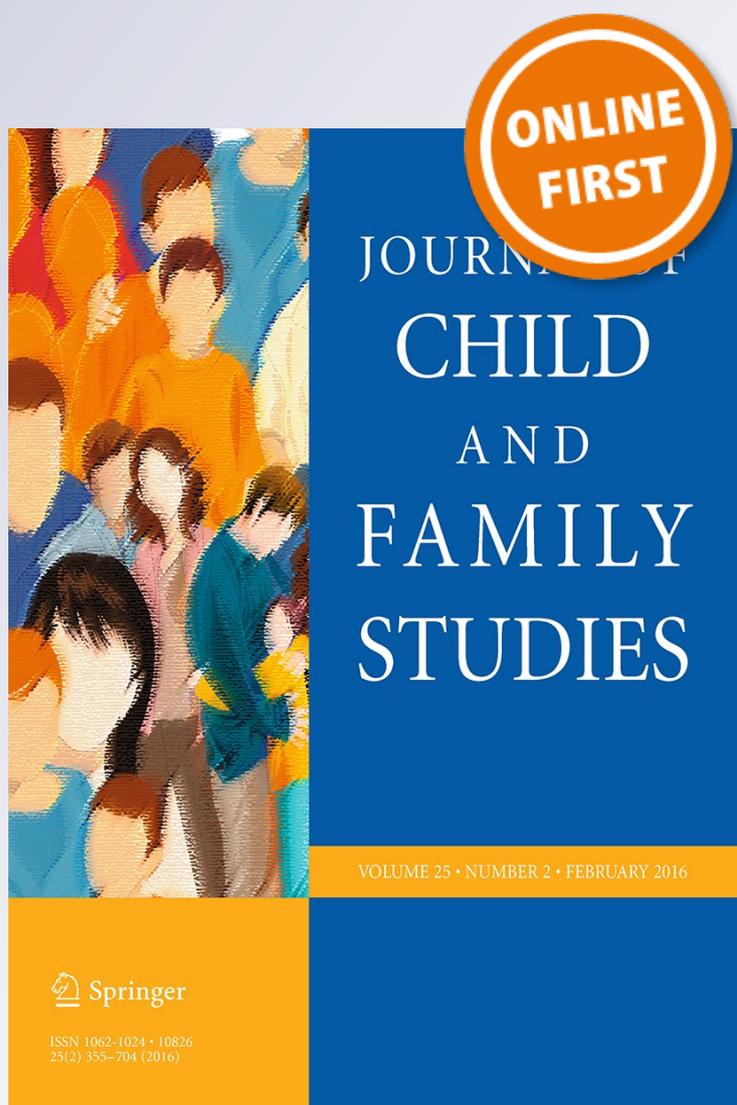
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Development (SEED) project, included a modularized manual of efficacious and common practice elements for the treatment of mood disorders among adolescents. Decision making protocols guided provision of specific modules based on baseline and treatment data. Statistically significant differences were found between pretest and posttest assessments with modest to large effect sizes for youth and/or parents’ report of mood-related symptoms, including reduced symptoms of depression, anxiety and inattention. Clinically significant findings were also detected with more than 50 % of participants demonstrating reliable improvement on a global assessment of mental health symptoms. With regards to feasibility, these results were achieved with an average of nine, 45-min sessions across 2–3 months, and a subsample of participants overwhelmingly supported the acceptability of SEED. Although limited by the lack of a controlled comparison and small sample size, findings from this pilot study suggest this modular intervention focused on internalizing symptoms in students can be feasibly implemented in the school setting, is acceptable to students, and holds promise for improving their psychosocial functioning.

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Keywords School mental health · Adolescent mood disorders · Modular interventions · Evidence-based practice · Cognitive behavioral therapy · Common elements

Introduction

Despite continued national and international efforts to improve children’s mental health services, many youth do not receive treatment due to a variety of barriers, including perceived stigma, limited access to services, transportation

difficulties, or limited financial resources (Fontanella et al. 2015; Kutcher et al. 2015; Owens et al. 2013). Indeed, it has been estimated that 20 % of youth experience social and emotional difficulties while only 6.0–7.5 % access mental health services (Kataoka et al. 2002), including those youth who struggle with the most significant impairments (Burns et al. 1995; Kataoka et al. 2002). Unmet mental health needs place youth at an increased risk for experiencing social and emotional difficulties across domains of functioning including interpersonal problems, family conflicts, school difficulties (e.g., poor grades, suspension, expulsion, drop out), and an increased possibility of engaging in risky behaviors (Aseltine et al. 2000; Flaherty et al. 1996; McWhirter and Page 1999) including suicide (Hawton et al. 2012). Given these serious consequences, innovative strategies are needed to improve access to, and the delivery of, effective services for children and adolescents (Michael et al. 2009).

Of the small percentage of adolescents who do access mental health services, many receive services through the school (Costello et al. 2014). School mental health (SMH) programs have gained momentum as a viable platform for reducing barriers to accessing services and providing a range of care, from mental health promotion to prevention of mental health problems, early intervention, and targeted intervention, as well as assessment and case management for students in both general and special education and their families (Weist et al. 2014). Utilizing schools as a context through which to support children and adolescents and their families can reduce many of the obstacles to receiving quality care, such as having limited access to professionals, transportation difficulties, and financial concerns (George et al. 2014; Zirkelback and Reese 2010). Provision of services within the school is considered a cost effective treatment modality (Flaherty et al. 1996), fundamental to the educational mission of schools to reduce barriers to student learning and an ecologically-grounded approach to providing care (Albright et al. 2013; Sulkowski and Michael 2014; Ghuman et al. 2013).

Further, federal agencies have recognized the importance of schools providing safe and positive school environments that support student emotional and behavioral well-being. Specifically, the President's New Freedom Commission on Mental Health (United States Department of Health and Human Services 2003), the Surgeon General's Report on Mental Health (United States Department of Health and Human Services 1999) and the No Child Left Behind Act of 2001 (2002), all call for the expansion of mental health services for youth in schools. Although the rationale for providing mental health services in schools is strong and the energy for increasing these efforts has grown in the United States in recent decades (Foster et al. 2005; Weist and McDaniel 2013), strengthening the

capacities of schools to provide high quality, evidence-based, on-site services remains a critical and on-going effort (Kutcher et al. 2015; Weist et al. 2014). Benefits to providing SMH programs have been documented for supporting youth with internalizing and externalizing symptoms broadly (e.g., Albright et al. 2013; Owens et al. 2008). For example, treatment provided through SMH programs have resulted in noticeable decreases in a variety of emotional and behavioral symptoms based on teacher and parent reports (e.g., Sander et al. 2011). Additionally, the interventions have been shown to have a moderate positive impact on academic variables (e.g., Michael et al. 2013). Overall, psychotherapy provided in the context of the school has demonstrated efficacy, with effect size estimates over the previous three decades ranging from .29 to .97 (Baskin et al. 2010; Mychailyszyn et al. 2012; Prout and DeMartino 1986; Prout and Prout 1998). Despite these generally positive outcomes, much less is known about the implementation and outcomes of specific evidenced-based mental health interventions that are translated to school settings, specifically for adolescents with mood disorders.

National estimates indicate that approximately 14 % of youth experience significant symptoms of mood disorders at any given time, including major depressive disorder and pediatric bipolar disorder (Merikangas et al. 2010). Current clinical practice guidelines published in Australia, the United Kingdom, and the United States for youth who present with mild to moderate mood disorders recommend that psychotherapy be attempted first or in combination with psychopharmacological agents for more severe variants of mood disorders (American Academy of Child and Adolescent Psychiatry 2007; Cheung et al. 2007; McDermott et al. 2011; National Collaborating Centre for Mental Health 2005). In an evidence-based medicine review, Compton et al. (2004) reported that problem-specific cognitive-behavioral therapy (CBT) was most effective in treating youth with internalizing disorders. The evidence from meta-analyses provides further support for these conclusions (e.g., Michael and Crowley 2002; Weisz et al. 2006). In another more recent meta-analysis, CBT was also found to be significantly more effective than the comparison conditions (e.g., waitlist, treatment as usual), with effect sizes ranging from .47 to .96 (Zhou et al. 2015). Despite these promising findings, there are only a few published attempts to test the effectiveness of CBT for youth with significant mood symptoms in school settings, the majority of which are quite dated (e.g., Kahn et al. 1990; Reynolds and Coats 1986; Shirk et al. 2009).

Further complicating matters is the fact that there is a major disconnect between what is being tested in clinical trials and what actually happens in everyday practice (Weisz et al. 2014). Indeed, many practitioners report a range of difficulties that prevent them from implementing

manualized, evidence-based practices in the school setting (Evans and Weist 2004; Schaeffer et al. 2005). Training SMH practitioners on a wide range of evidence-based programs and manuals is generally not feasible due to financial and time constraints (George et al. 2013; Schiffman et al. 2006). SMH practitioners report limited time, competing responsibilities, and lack of administrative support as just a few of the barriers that impede their ability to deliver evidence-based manualized interventions for emotional and behavioral problems in the school setting (Langley et al. 2010). Treatment manuals are also often viewed as barriers to intervention in the school, as practitioners perceive them to hinder rapport building and reduce opportunities for clinical judgment and decision making (Addis and Krasnow 2000; Chorpita and Daleiden 2007; Schaeffer et al. 2005). Thus, despite the evidence of demonstrating positive effects, manualized treatments for most behavioral and emotional problems are not regularly disseminated or implemented in schools (Hoagwood et al. 2001). There remains a need to develop an empirically-supported treatment modality that can be flexibly implemented in the real-world setting of schools.

One evidence-based treatment approach that has demonstrated success translating from the research to practice setting is the modularized “common elements” model developed by Chorpita et al. (2005). The common elements approach involves focus on the top empirically supported practice strategies for particular emotional/behavioral disorders based on comprehensive review of experimental studies on these strategies. As part of this approach, practice strategies are also tailored to match client characteristics (e.g., gender, race/ethnicity, developmental period) and problem types (e.g., aggression, depressed mood). Specific to the treatment of youth with symptoms of mood disorders, there are 30 common elements that exist for clinicians to select from, including cognitive therapy, activity selection, child psychoeducation, self-monitoring, maintenance/relapse prevention, goal setting, problem solving, communication skills, social skills training, parent/caregiver psychoeducation, guided imagery, behavioral contracting, relaxation, and relationship/rapport building (Chorpita and Daleiden 2009). In the clinical setting, the modular, common elements approach has demonstrated success by enhancing access to summaries of strategies from the research literature and allowing for a more flexible, user-friendly approach to implementing these strategies (Borntreger et al. 2009). The focus on modular practice strategies also reduces training, resource, and organizational demands while increasing practitioners’ sense of autonomy in making empirically informed clinical judgments (Chorpita et al. 2005). These advantages may help to overcome some of the corresponding barriers preventing widespread

implementation of evidence-based manualized interventions in schools. However, despite demonstrating implementation success in the clinical setting and receiving significant attention from leaders in SMH (Stephan et al. 2012; Weist et al. 2009), modular intervention practices for youth with mood disorder symptoms have not yet been tested for effectiveness and feasibility in the school setting.

The purpose of the current study was to assess the effectiveness, feasibility, and acceptability of a modular common elements intervention—the Student Emotional and Educational Development (SEED) program—for treating mood disorders among middle and high school students within the school context. A pilot study of the intervention approach was implemented with interdisciplinary professionals and students from two universities in two states in the southeastern U.S. We hypothesized SEED to be feasible for clinicians and acceptable to students receiving the intervention, and for there to be clinically and statistically significant changes in mood disorder symptoms from pretest to posttest for these students.

Method

Participants

Participants ($N = 20$) were middle- and high-school aged students between 12 and 16 years old ($M = 13.93$; $SD = 1.19$) who attended two middle schools (grades 6–8) and three high schools (grades 9–12) located in rural (2) and urban (3) areas of two states in the southeastern region of the U.S. An average of 1332 students attended each school with actual enrollment ranging from 664 to 2031. School personnel (e.g., professional school counselors, administrators) and parents referred the student participants (50 % female; $n = 10$) to the study/intervention team during the 2012–2013 school year. Fifty percent of the participants reported being Caucasian/non-Latino ($n = 10$), with 40 % indicating African American ($n = 8$) and 10 % reporting Latino/a ($n = 1$). The sample was representative of the population demographics of the areas in which the students resided. Eligibility for the intervention required that students met at-risk or clinically elevated criteria for a mood disorder on at least one of the inclusionary measures. These two measures were the Behavioral Assessment System for Children—Second Edition (BASC-2; Reynolds and Kamphaus 2004; Parent or Self-Report Depression and/or Internalizing T Score ≥ 60), Beck Depression Inventory –II (BDI-II; Beck et al. 1996; Total Score ≥ 14), and the Youth Outcomes Questionnaire - 30 (YOQ-30; Burlingame et al. 2004; Total Score ≥ 29).

Procedure

Students and their families who participated in the study provided full-informed parental consent and student assent to participate in the SEED project. The Institutional Review Boards for both universities and participating school districts granted approval. Prior to the start of treatment, research assistants collected baseline data by administering measures in person. Subsequent measurement tools were given at specified intervals (i.e., before/after individual sessions, post-treatment) as further described below.

Clinicians

Nine clinician trainees and one licensed psychological associate provided therapeutic services. Clinicians were placed in schools through several diverse arrangements, either as full time employees under contractual arrangements between the university and school or by way of various training agreements (e.g., internships, residencies, clinical practicum placements, grant supported roles). As a result of these arrangements, families and students received the services at no cost to them. Trainees were from multiple disciplines, including two social work masters' students, three clinical psychology doctoral students, one school psychology doctoral student, two adolescent/child psychiatry residents, one clinical psychology graduate intern, and two masters-level licensed psychologists. Trainees represented diverse racial/ethnic backgrounds, including American Indian/Alaskan Native ($n = 1$), Black/African American ($n = 2$), and White/Non-Hispanic ($n = 7$). Seven had prior experience working with youth at-risk for, or currently experiencing, a mood disorder. Training included seminars and group supervision at least monthly, as well as 1 h of weekly individual supervision provided by a doctoral-level clinical or school psychologist, including a licensed psychologist. In addition, clinician trainees received weekly group supervision and consultation in the schools they were working in with school guidance counselors, psychologists and administrators, and were able to access additional supervision from licensed psychologists and social workers as needed. Further information specific to the training of the clinicians can be found in a paper that evaluated the impact of the interprofessional training intervention described by Iachini et al. (2014).

Intervention

Once inclusionary criteria were met, each student received weekly individual therapy based on the modular common elements approach coupled with crisis and case

management services as deemed appropriate. The modules were developed based on the most common and efficacious elements for the treatment of child and adolescent mood disorders (e.g., Chorpita and Daleiden 2009; Chorpita et al. 2005) and were included in a project intervention manual. The project intervention manual also provided decision-making protocols on strategies to implement, based on baseline assessment and treatment data, as well as parameters for the approximate number of sessions indicated based on the presenting problem of the student. To enable achievable implementation in the school setting, the intervention was designed to include approximately 4–12 sessions, depending on symptom severity and the student's response to treatment. The common elements included in the modular project manual included client and parent/caregiver psychoeducation of symptoms and treatment, behavioral activation and activity scheduling, cognitive restructuring (e.g., thought records, cognitive distortions), communication training, problem solving, crisis management, relapse prevention and maintenance of gains, and self-monitoring procedures. A more specific and illustrative description of how the modular intervention approach was implemented can be found in case studies from the SEED project (Splett et al. 2014).

Measures

Behavioral Assessment System for Children-2 (BASC-2)

To assess the emotional, behavioral, and adaptive functioning of the participants, the BASC-2 (Reynolds and Kamphaus 2004) Self-Report-Adolescent (SRP-A) and Parent Rating Scale-Adolescent (PRS-A) versions were used. The BASC-2 is a multi-observer measure of behavioral functioning in youth that has clinical, adaptive, broad- and narrow-band subscales and provides information concerning emotional and behavioral functioning. The SRP-A and PRS-A were administered at the time of intake and at post intervention or end of the semester. The PRS-A and SRP-A forms have high internal consistency on composite scales ($\alpha = .84-.96$). Test-retest reliabilities are high for the SRP-A ($\alpha =$ upper .70-low .80s) and the median composite scales for the PRS form ($\alpha = .81$). The BASC-2 is a reasonably sensitive measure of outcome (McClendon et al. 2011) and has been used in other studies to assess symptom outcomes following school-based psychotherapy (e.g., Evans et al. 2007). The BASC-2 was used in the current study to document student need for treatment (as presented earlier) and to compare the changes in *T*-score elevations on BASC-2 broadband scales at baseline administration versus post-treatment administration. *T*-scores were calculated based on sex and norm group, where scores falling below 60 are considered within the normal

range, scores between 60 and 69 are considered elevated levels or At-Risk, and scores 70 or above are considered clinically significant levels of distress in that area.

Youth Outcome Questionnaire-30 (YOQ-30)

To assess students' response to the intervention, the Youth Outcome Questionnaire-30 (YOQ-30) was administered at baseline, at the beginning of at least every other session, and at post-intervention. The YOQ-30 was selected as a brief measure of youth emotional/behavioral functioning that is also sensitive to change. The YOQ-30 measures symptoms across problem types and disorders (e.g., mood disorders, anxiety disorders, conduct problems, attention problems, interpersonal concerns). The total score is the most sensitive to tracking change and has strong psychometric properties (Burlingame et al. 2004). The YOQ-30 was normed on a relatively large sample ($N = 530$) and includes data on community and outpatient mental health samples. The YOQ has high internal consistency for community normative samples ($\alpha = .92$) and outpatient normative samples ($\alpha = .93$).

Beck Depression Inventory (BDI-II)

The BDI-II is a 21-item self-report measure designed to assess depressive symptoms (Beck et al. 1996) for individuals age 13 and older (Beck et al. 1961). Respondents are asked to rate depressive symptoms in the past 2 weeks using a four-point Likert rating scale (0-not at all, 3-always). The BDI-II was administered at the time of intake and at post intervention or end of the semester. All items on the BDI-II are summed to produce a single score of depression. A total score of 0–13 is considered in the minimal range or indicative of normal variation in mood, 14–19 is indicative of mild mood difficulties, 20–28 is considered moderate depressive symptoms, and 29–63 indicates severe depression. The BDI-II has been established for use in clinical and non-clinical settings and has excellent internal consistency for outpatient normative samples ($\alpha = .92$; Beck et al. 1996).

Analysis Plan

To address the research aims of the current pilot study, descriptive data analyses were conducted and contributed to conservative interpretations of the data. Means and standard deviations for study variables can be seen in Table 1. Paired samples t test statistics were calculated to assess change in youth emotional and behavioral problems from pre- to post-assessment. Because the current

trial was considered to be a pilot, no adjustments were made to control for Type I error. Thus, t test results should be considered cautiously and in light of effect sizes.

Analyses to determine clinically significant change and a reliable change index (RCI) were conducted based on Jacobson and Truax (1991) procedures for the YOQ-30 and the BDI-II. The RCI is the difference between an individual's pre-test and post-test scores, adjusted for the standard error of the difference between scores. The RCI is based on a standardized metric, and Jacobson and Truax (1991) suggest that if the amount of change observed exceeds a particular threshold (e.g., z value 1.96, 2 tailed) at the desired level of significance ($p < .05$), then "reliable change" in the functioning of the client has been shown. Classification into one of the four categories relied upon a two-part criterion. First, the client had to have begun treatment with symptom levels that met or exceeded established cutoffs for clinically elevated difficulties and end treatment in the non-clinical range. Second, the amount of change exhibited must have been sufficient enough to suggest meaningful reliable change had occurred in the context of treatment. More specifically, in the context of this two-part criterion, those students who were categorized as "recovered" began treatment in the clinical range, ended treatment in the non-clinical range, and exhibited reliable change on study measures such that degree of symptom change exhibited from pre- to post-test could be considered reliable and meaningful. Those classified as "improved" ended treatment still in the clinical range, but they demonstrated a reliable and meaningful amount of symptom reduction. Those students categorized as "unchanged" did not exhibit reliable change in symptoms, and those students classified as "deteriorated" ended treatment with symptoms that were reliably more severe than was measured at pre-test (Jacobson and Truax 1991). The cutoff scores that are suggestive of elevated depressive symptoms on the BDI-II and elevated distress symptoms on the YOQ, as described in the measures section, are consistent with the published literature and were used in the present study to determine the benchmarks for clinically significant change.

Indicators of intervention feasibility and acceptability were evaluated based on qualitative data collected through interviews with youth who received SEED, and clinician tracking related to SEED implementation. Acceptability data were analyzed according to three areas: (1) perceived helpfulness of the intervention, (2) preferences regarding specific components or topics covered in SEED, and (3) areas for change. Feasibility for clinicians included consideration of the number of sessions in which the intervention could be delivered and the length of time each session was delivered.

Table 1 Descriptive statistics for paired samples *t* tests of adolescent outcomes across SEED intervention

Adolescent outcome	Pre-SEED Mean (SD)	Post-SEED Mean (SD)	Sig	Cohen's <i>d</i>
<i>Self report</i>				
BDI-II depression*	29.25 (10.59)	20.80 (15.45)	<i>p</i> = .019	<i>d</i> = .64 ^m
YOQ-SR outcomes**	46.10 (14.27)	30.43 (21.72)	<i>p</i> = .001	<i>d</i> = .85 ^l
BASC-2 attitudes toward School	58.45 (10.69)	56.30 (10.01)	<i>p</i> = .375	<i>d</i> = .21 ^s
BASC-2 attitudes toward teacher	62.20 (11.24)	58.00 (11.73)	<i>p</i> = .09	<i>d</i> = .37 ^s
BASC-2 atypicality*	61.60 (15.30)	53.75 (18.64)	<i>p</i> = .009	<i>d</i> = .41 ^s
BASC-2 anxiety**	66.65 (10.96)	56.30 (11.84)	<i>p</i> = .000	<i>d</i> = .91 ^l
BASC-2 depression*	70.05 (13.67)	56.05 (14.51)	<i>p</i> = .001	<i>d</i> = .99 ^l
BASC-2 somatization	60.85 (14.57)	56.95 (16.01)	<i>p</i> = .175	<i>d</i> = .25 ^s
BASC-2 inattention*	62.75 (13.38)	58.25 (14.70)	<i>p</i> = .018	<i>d</i> = .32 ^s
<i>Parent report</i>				
BASC-2 atypicality	52.87 (9.76)	51.93 (9.99)	<i>p</i> = .668	<i>d</i> = .10
BASC-2 anxiety	60.07 (12.52)	57.20 (15.26)	<i>p</i> = .188	<i>d</i> = .21 ^s
BASC-2 Depression**	70.07 (17.89)	61.80 (15.53)	<i>p</i> = .003	<i>d</i> = .50 ^m
BASC-2 somatization	56.27 (13.76)	53.87 (12.33)	<i>p</i> = .548	<i>d</i> = .18
BASC-2 withdrawal	59.07 (13.73)	54.13 (11.51)	<i>p</i> = .102	<i>d</i> = .39 ^s
BASC-2 attention problems	59.60 (11.75)	58.07 (10.70)	<i>p</i> = .445	<i>d</i> = .14

* *p* < .05; ** *p* < .01Cohen's *d*: ^s = small effect size, ^m = medium effect size, ^l = large effect size

Results

Descriptive Statistics

Adolescent Symptoms at Pre-test

All participants demonstrated clinically significant elevations on at least one of the three measures. Three participants demonstrated such elevation on two of the three measures, and 16 participants demonstrated such elevation on all three measures. In terms of mean scores, at pre-test prior to treatment, SEED participants on average reported elevated levels of depressive symptoms on the BDI-II ($M = 29.25$; $SD = 10.59$), and distress on the YOQ ($M = 46.35$; $SD = 14.59$), both of which are above clinical cutoffs. The mean BASC-2 SRP-A score on the Depression scale for the sample at pre-treatment was also in the clinically significant range (T -score $M = 70.60$; $SD = 13.59$), approximately 2 standard deviations above the mean for the normative sample. The average report for the Anxiety scale was also elevated (T -score $M = 66.75$; $SD = 10.92$) according to the guidelines in the BASC-2 Manual (Reynolds and Kamphaus 2004). The mean scores reported by parents were also elevated but on average slightly lower than the adolescent report of their internalizing symptoms; for the BASC-PRS Depression scale the parent-reported mean (T -score $M = 68.74$; $SD = 14.02$) was just below the clinically significant cutoff and the

mean for parent-reported Anxiety on the BASC-PRS (T -score $M = 59.58$; $SD = 14.32$) was at the At-Risk cut off.

Frequency of symptom severity at pre-test among SEED participants based on the BDI-II (Table 3) indicated that half of participants reported severe levels of depression ($n = 10$; 50 %), 30 % ($n = 6$) reported moderate levels of depression, 15 % ($n = 3$) reported mild mood difficulties and 5 % ($n = 1$) reported depression symptoms that fell within the normal range on the BDI-II prior to treatment. Clinical cutoff criteria on the YOQ suggested that more than three quarters of SEED participants ($n = 18$) were experiencing clinically significant levels of distress at the beginning of treatment; two participants ($n = 2$) reported levels of distress below the clinical cut off for the YOQ. At pre-test on the BASC-SRP-A Depression scale, more than half of participants reported clinically significant levels ($n = 12$; 60 %), 20 % ($n = 4$) reported elevated levels in the At-Risk range, and 20 % ($n = 4$) fell in the normative range at pre-test. Anxiety scale scores on the pre-test for the BASC-SRP-A indicated that half of the participants were experiencing clinically significant levels ($n = 10$; 50 %), 25 % ($n = 5$) reported elevated levels in the At-Risk range, and 25 % ($n = 5$) fell in the normative range at pre-test. Parent report on the BASC-PRS Anxiety scale yielded a quarter of participants meeting clinically significant levels ($n = 5$, 26.32 %), 21.05 % ($n = 4$) meeting elevated levels in the At-Risk range, and 52.63 % ($n = 10$) fell in the normative range at pre-test. Parent report for the

Depression scale indicated that nearly half of participants were meeting clinically significant levels ($n = 9$, 47.37 %), 21.05 % ($n = 4$) meeting elevated levels in the At-Risk range, and 31.58 % ($n = 6$) fell in the normative range at pre-test for parent report.

Intercorrelations among all study variables at pre-test prior to the SEED intervention can be seen in Table 2. As expected, there were a number of significant correlations supporting positive associations between the measures of depression, anxiety and mood-related difficulties. For example, higher scores reflecting more depressive symptoms on the BDI-II scale were associated with higher scores indicating more anxiety ($r = .58$, $p < .01$) and depressive symptoms ($r = .55$, $p < .05$) on the BASC-2 SRP-A scales. In addition, parent report of higher scores reflecting more depressive symptoms on the BASC-2 PRS-A were positively correlated with parent report of higher

scores on anxiety symptoms ($r = .67$, $p < .01$). Significant correlations across reporters were also found; for example, parent report of higher scores on withdrawal on the BASC-2 PRS-A were associated with student report of higher scores of depressive symptoms reported by adolescents on the BASC-SRP-A ($r = .46$, $p < .05$).

Adolescent Symptoms at Post-test

At post-test following the SEED intervention, participants reported on average mild to moderate levels of depressive symptoms on the BDI-II ($M = 20.80$; $SD = 15.45$) and distress on the YOQ ($M = 30.10$; $SD = 22.23$). The mean BASC-2 SRP-A score on the Depression scale and Anxiety scale fell in the normative range (T -score $M = 55.68$; $SD = 14.81$; T -score $M = 56.16$; $SD = 12.15$, respectively). Mean scores reported by parents were also in the

Table 2 Correlations among study variables before SEED intervention

Adolescent outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<i>Self report</i>															
BDI-II	–														
YOQ-SR	.31	–													
BASC-2 Att to school	.21	.53*	–												
BASC-2 Att to teacher	–.02	.19	.31	–											
BASC-2 atypicality	.53*	.39	–.13	.15	–										
BASC-2 anxiety	.58**	.42	–.10	.19	.69**	–									
BASC-2 depression	.55*	.54*	.22	.12	.53*	.80**	–								
BASC-2 somatization	.28	.41	.18	.38	.55*	.48*	.37	–							
BASC-2 inattention	.05	.51*	.21	.65**	.55*	.31	.14	.55*	–						
<i>Parent report</i>															
BASC-2 atypicality	.17	.22	.12	.16	.29	.24	.23	.10	.39	–					
BASC-2 anxiety	.09	.32	.34	.07	.24	.14	.37	.15	.25	.32	–				
BASC-2 depression	.16	.19	.45	–.17	–.07	–.12	.27	–.17	–.15	.28	.67**	–			
BASC-2 somatization	–.00	.56*	.68**	–.02	.02	–.09	.07	.21	.29	.30	.61**	.49*	–		
BASC-2 withdrawal	.15	.25	.17	–.50*	.20	.28	.46*	–.09	–.16	.21	.59**	.55*	.33	–	
BASC-2 attn problems	–.15	.29	.17	.31	.07	–.03	–.05	–.11	.49*	.61**	.31	.38	.35	.13	–

* $p < .05$; ** $p < .01$

normative range on average for the BASC-2 PRS-A Depression and Anxiety scales (T -score $M = 59.27$; $SD = 11.16$; T -score $M = 54.20$; $SD = 13.28$).

Frequency of symptom severity at post-test among SEED participants based on the BDI-II (Table 3) indicated that less than one-third of participants reported severe levels of depression ($n = 6$; 30 %), 20 % ($n = 4$) reported moderate levels of depression, 15 % reported mild mood difficulties ($n = 3$), and 35 % ($n = 7$) reported symptoms in the normative range. YOQ criteria for symptom severity suggested that half of the SEED participants (50 %, $n = 10$) were experiencing levels of distress below the clinical cutoff at post-treatment.

Participants' self-report of Depression on the BASC-2 SRP-A at post-test indicated three participants were experiencing clinically significant levels (15.79 %), three reported elevated levels in the At-Risk range (15.79 %), and the majority of SEED participants, more than two-thirds (68.42 %; $n = 13$) fell in the normative range. For self-report of Anxiety on the BASC-2 SRP-A, two participants were experiencing clinically significant levels (10.53 %), five reported elevated levels in the At-Risk

range (26.32 %), and the majority of SEED participants, nearly two-thirds (63.16 %; $n = 12$) fell in the normative range. Regarding parent report on the BASC-2 PRS-A Anxiety scale, at post-test only two participants met clinically significant levels (13.33 %), 20 % ($n = 3$) met elevated levels in the At-Risk range, and two-thirds of participants (66.67 %; $n = 10$) fell in the normative range. Parent report for the Depression scale at post-test indicated that nearly half of participants met clinically significant levels ($n = 3$, 20 %), 20 % ($n = 3$) met elevated levels in the At-Risk range, and almost two-thirds (60 %; $n = 9$) fell in the normative range.

Change in Adolescent Symptoms from Pre- to post-Intervention

Central to our primary hypotheses, paired samples t test statistics were calculated to assess change in youth mood-related difficulties from pre- to post-intervention. Preliminary outcomes of the SEED pilot intervention suggest positive changes in many of the adolescent outcomes. As seen in Table 1, which presents the descriptive statistics including means and standard deviations for each variable at pre- and post-test, there was a significant decrease in adolescent self-report of depression on the BDI-II and psychological distress on the YOQ-30. Adolescent report on the BASC-2 scales also indicated a significant decrease in symptoms of Anxiety and Depression among other scales. Parent report of symptoms on the BASC-2 also showed a significant decrease in symptoms of depression. Large effect sizes were found for self-report of distress on the YOQ-30, and symptoms of Anxiety and Depression on the BASC-2 SRP-A. Although the change in other adolescent outcomes were not significant at $p < .05$, there were observed decreases in symptoms, albeit the effect sizes were small, including parent reported Anxiety among other symptoms.

Clinically Significant Change

BDI-II

Overall, more than one-third ($n = 7$; 36.84 %) of the SEED participants who reported above clinical level cut-offs for depression on the BDI-II at pre-test ($n = 19$), reported normative levels of depression at post-test. Examining the reliability and type of change among those 19 adolescents, six were unchanged in their symptoms at post-test (31.58 %), one deteriorated (5.26 %), and twelve (63.16 %) improved or recovered in their symptoms based on BDI-II scores at post-test.

Table 3 Frequency statistics for SEED participants based on symptom severity for BDI-II and YOQ-SR

Adolescent outcome	Pre n (%)	Post n (%)
BDI-II depression		
Normal	1 (5)	7 (35)
Mild	3 (15)	3 (15)
Moderate	6 (30)	4 (20)
Severe	10 (50)	6 (30)
YOQ-SR outcomes		
Below clinical	2 (10)	10 (50)
Clinical	18 (90)	10 (50)
BASC 2 SRP-depression		
Normative	4 (20)	13 (68)
At-Risk	4 (20)	3 (16)
Clinical	12 (60)	3 (16)
BASC 2 SRP-anxiety		
Normative	5 (25)	12 (63)
At-Risk	5 (25)	5 (26)
Clinical	10 (50)	2 (11)

Levels of depression determined according to Beck's Depression Inventory-II scoring: ≤ 13 Normal; 14–19 mild mood difficulties; 20–28 moderate depression; 29+ severe depression

Levels of distress on Youth Outcome Questionnaire determined using the clinical cutoff of ≥ 29

Levels of depression and anxiety scores on the BASC 2 SRP-A are t scores with values below 60 normal, 60–69 at-risk; 70+ clinical severity

YOQ-30

Overall, half ($n = 9$; 50 %) of the participants who reported clinical levels of distress on the YOQ-30 at pre-test ($n = 18$), reported distress levels below the clinical cutoff at post-test. Examining the reliability and type of change for those 18 adolescents meeting criteria for clinical level problems at pre-test, 11 adolescents were unchanged in their symptoms (61.11 %) and seven participants were classified as recovered or improved (38.89 %) based on their YOQ-30 scores at post-test.

BASC-2

Overall, almost two-thirds ($n = 9$; 60 %) of adolescents who reported at-risk or clinically significant levels of depression on the BASC-SRP-A at pre-test ($n = 15$; one student who was clinical at pre-test did not complete the post-test), reported depression levels in the normative range of symptoms at post-test. For the adolescent report of Anxiety on the BASC-SRP-A, half ($n = 7$; 50 %) of the participants who reported at-risk or clinically significant levels of anxiety on the BASC-SRP-A at pre-test ($n = 14$), reported anxiety levels in the normative range at post-test.

Feasibility and Acceptability

The SEED intervention was delivered in an average of 8.9 sessions (range: 6–11) with sessions typically occurring in a 45-min block of time during the school day. Based on student availability, eleven students participated in post-treatment interviews regarding their experience in the SEED project. All eleven students reported that they believed SEED helped them. One student elaborated, “It made me realize some skills that I actually did have that I didn’t put into practice and it helped me solve more problems instead of going talking about it in an argumentative manner and I can go to it in a calmer way.” Another shared, “It made me express myself so I didn’t have all that thing inside me.” Students also shared specific things they liked about SEED, including the ability to share their feelings, the support and trust they had in their counselor, and the topics covered within the intervention. One student shared, “I like...that we take each topic step by step. And that you go over my feelings and you go over about how I feel about each week. And you listen to what I’m saying.” Another shared, “Like how caring the counselor was and the whole program in general about how it actually helped me and taught me like this whole they showed me and helped me explore different things and umm like different ways of solving a problem.” Five students indicated they wouldn’t change anything about SEED. Three students mentioned that they would like the measures to be less

lengthy, two students shared they didn’t like leaving class to meet, and one student reported that they would have liked to meet more often.

Discussion

The feasibility, acceptability and effectiveness of a modular intervention for significant mood disorder symptoms (SEED) were tested among middle and high school students in a school-based setting. Each of the students was clinically referred and deemed eligible for inclusion based on their scores on several well-established measures of psychological functioning. Overall, 50 % of the adolescents evidenced lower levels of psychological distress at post assessment when compared to their scores at baseline. The changes in self-reported symptom levels across the YOQ-30 and BDI-II from pre- to post-treatment were statistically significant and the effect sizes were large. The results from BASC-2 SRP-A revealed statistically significant differences and large effect sizes between pre- and post-treatment intervals on the Depression and Anxiety scales.

Similarly, the pre/post findings on the BASC-2 PRS-A Depression scale were statistically significant and the effect size was large. Based on RCI criteria as defined by Jacobson and Truax (1991), over half of the students who began treatment exhibiting clinically significant levels of depression or general distress were recovered or improved at post-treatment. Similarly, the pre-test elevations on the BASC-2 SRP-A Depression and Anxiety scales that were observed to be two standard deviations above the normative sample mean were measured to be within the normal range on average at the conclusion of treatment. The BASC-2 PRS-A scores on the Depression scale revealed similar results. That is, the main targets of clinical intervention (i.e., mood disorder symptoms) showed the most improvement, or an approximate 50 % response rate over the course of treatment across measures and observers.

These results were achieved in the pilot sample after approximately nine sessions, over a 2–3 month period using modularized CBT, a lower than average dosage of psychotherapy when compared to what is typically seen in randomized, controlled trials for mood disorders and related conditions. For instance, in the Treatment of Adolescent Depression Study (TADS 2004), of those that received CBT alone, 43.2 % were improved after 12 weeks of treatment as compared to 34.8 % of the placebo group. The TADS study defined improvement as the proportion of the adolescents being rated as either *very much improved* (1) or *much improved* (2) on the Clinical Global Impression – Improvement (CGI-I) Scale. The results of the within-subjects analyses in the TADS study were notably better at

18 weeks, given that 65 % were deemed “improved” based on the same rubric after approximately 4 months (TADS 2007). Overall, the SEED findings were roughly commensurate with TADS at 12 weeks (within subjects) and better, on average, than the proportion of adolescents who improved in the placebo condition. However, the TADS study suggests perhaps that providing a higher dosage of CBT beyond 12 weeks might be associated with additional benefits.

The results are also comparable to past trials of CBT for adolescents with depression in schools. In a benchmarking study conducted by Shirk et al. (2009) doctoral-level psychologists provided CBT in school health clinics and counseling centers using the core individual CBT components from three published trials (e.g., TADS 2004), including psychoeducation, mood monitoring, and cognitive restructuring. There were several benchmarking strategies described in Shirk et al. For instance, a positive responder was defined as “no longer meeting criteria for any depressive disorder at posttreatment” (p. 112). Based on this definition, the overall response rate for the current study was 64 % after approximately 9 sessions. Unlike Shirk et al., the current study did not address the question of whether the adolescents were diagnosis-free at post-treatment, yet RCI criteria were used in both studies to better contextualize the clinical meaningfulness of results. Indeed, similar to Shirk et al. study, a substantial number of youth in the SEED study met criteria for clinically significant change on the dependent measures (e.g., BDI, YOQ). Furthermore, the pre- to post-treatment changes observed in the current study are comparable to findings from a recent meta-analysis, which revealed mild to moderate pre- to post-test changes in internalizing conditions when treated within the school context (Mychailyszyn et al. 2012). We acknowledge that differences in measurement methods preclude one-to-one benchmarking comparisons and limit the ability to interpret comparisons across studies. However, given both the overlap of instrumentation between the current study and other studies (e.g., BDI-II) and the use of validated metrics for measuring change in functioning (e.g., YOQ), we are confident that these results are more likely the product of the similar effects of treatment rather than differences in measurement.

Like Shirk et al. (2009), the current investigation was not a controlled trial. Thus, the findings should be considered preliminary. Yet, the aims of the present study are consistent with the extensive work of Weisz and colleagues, both in the broad domain of psychotherapy research and in the area of depression treatment in particular. Broadly, Weisz et al. (2013) suggested that despite decades of RCTs efficacy trials and the associated findings regarding evidence-based psychotherapies (EBPs), testing the effects of EBPs in real-world practice settings is rare

and even when it is done, the effect sizes are much smaller. Indeed, Weisz et al. (2013) issued yet another call to action to conduct more effectiveness and benchmarking studies in bona fide practice settings such as schools. The current study's aims are well aligned with this call to action.

With respect to interventions for depression, Weisz et al. (2012) demonstrated that modular treatments produced far steeper improvement trajectories than standard manualized evidence-based treatment programs. Although the SEED project and current study did not examine rates of improvement, the pilot study did demonstrate preliminary evidence of the positive impact of modular interventions for these youth with mood disorder symptoms in a school setting. In a related finding, (Ng et al. 2015) assessed the fit between evidence-based psychotherapy for youth depression and real-life coping in early adolescence by conducting structured interviews with youth about their experiences in treatment. The researchers reported that the modular intervention strategy that was perceived as most effective by youth was behavioral activation, with 71 % of the adolescents selecting it as having the largest impact. It was also reported as the most common habitual behavior they end up (not) doing that makes them feel depressed (60 %). The next most common habitually problematic behavior and perceived effective strategy was social support, at 24 and 30 % respectively. Interestingly, although cognitive modular strategies (both maladaptive and perceived effective) made the list, they were much less common (11 and 6 %, respectively). Several widely known EBP components for depression treatment did not make the list, including goal setting, psychoeducation, self-monitoring, and reinforcement, to name a few. The current study offers some related insights that modular components show some initial evidence of effectiveness in school mental health settings.

It is important to consider these positive findings in light of existing limitations in the design of the present study. Notably, the lack of a controlled comparison condition and small sample size limit the strength of conclusions one can draw and contribute to the potential of effect size inflation. However, the study's multi-site design and the inclusion of the RCI comparisons improved the generalizability of the findings. Future research would benefit from including comparison of treatment outcomes to a control or treatment as usual condition, as well as a larger sample size enabling more sophisticated analyses.

Despite these limitations, the findings indicate a modular approach to treatment in schools holds promise. The fact that these results were achieved with clinically-referred youth in a context where they have better access to care is equally encouraging, especially given the recent emphasis on disseminating and implementing research supported interventions in authentic practice settings

(Weisz et al. 2014). Furthermore, treatment was given in an individualized and flexible format, increasing the acceptability of tailoring interventions for individuals, but without sacrificing the implementation of evidence-based treatment components. Continued research on the SEED intervention is warranted in order to make effective treatment more accessible to children and youth experiencing mood symptoms in the school setting.

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