Shorter communication

Cognitive-behavioral group depression prevention compared to bibliotherapy and brochure control: Nonsignificant effects in pilot effectiveness trial with college students

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ABSTRACT

Objective: Conduct a pilot trial testing whether a brief cognitive-behavioral (CB) group reduced depressive symptoms and secondary outcomes relative to bibliotherapy and brochure controls in college students with elevated depressive symptoms.
Method: 82 college students (M age = 19.0, SD = 0.9; 70% female, 80% White) with elevated self-assessed depressive symptoms were randomized to a 6-session CB group, bibliotherapy, or educational brochure control condition, completing assessments at pretest, posttest, and at 6- and 12-month follow-up.
Results: Planned contrasts found no significant effects for CB group on depressive symptoms compared to either bibliotherapy or brochure controls at posttest (d = −.08 and .06, respectively) or over follow-up (d = −.04 and −.10, respectively). There were no intervention effects for social adjustment and substance use, though CB group participants had improved knowledge of CB concepts at posttest, versus brochure controls. Condition differences in major depression onset were nonsignificant but suggested support for CB interventions (CB group = 7.4%, bibliotherapy = 4.5%, brochure control = 15.2%).
Conclusions: Unexpectedly modest support was found for a brief CB group depression prevention intervention, compared to bibliotherapy or brochure control, when provided to self-selected college students, suggesting that alternative screening or interventions approaches are needed for this population.

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Major depressive disorder (MDD) in adolescence is common, recurrent, and impairing (Klein, Torpey, & Bufferd, 2008), though the majority of depressed adolescents fail to receive treatment (Cummings & Druss, 2011), underscoring the need for effective depression prevention programs. Several depression prevention interventions for adolescents, predominantly focused on high school samples, have been developed, with cognitive-behavioral (CB) prevention interventions having the largest evidence base (e.g., Horowitz & Garber, 2006; Stice, Shaw, Bohon, Marti, & Rohde, 2009). The Stice et al. review found that average depressive symptom reductions by posttest (d = .30) and follow-up (d = .22) were small, but that 41% of the programs produced significant depressive symptom reductions though only 13% produced significant reductions in future depressive disorder onset. Among the significant moderators, larger effects were found for programs targeting higher risk participants and samples with older adolescents.

An efficacy trial in which 341 high school students with elevated depressive symptoms were randomized to a brief CB group depression prevention program, supportive-expressive group, bibliotherapy, or brochure control (Stice, Rohde, Seeley, & Gau, 2008) found that CB group participants showed significantly lower depressive symptoms than the other conditions at posttest, with some effects compared to bibliotherapy and brochure control remaining significant through 2-year follow-up. The CB group also showed significant effects on secondary measures of social adjustment and substance use compared to other conditions, with maintenance of some effects through 2-year follow-up, and significantly lower depressive disorders onset versus brochure controls (Stice, Rohde, Gau, & Wade, 2010). Based on these promising results, we conducted an effectiveness trial, in which high school personnel recruited 378 students with elevated depressive symptoms and delivered the CB group intervention, comparing it to

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bibliotherapy and brochure control (Rohde, Stice, Shaw, & Brière, 2014). By 6-month follow-up, CB group participants showed significantly lower MDD onset compared to both bibliotherapy and brochure control, and lower depressive symptoms at posttest (but not 6-month follow-up) compared to brochure controls. Contrary to findings from the efficacy trial, there were no effects on social adjustment and substance use in the effectiveness study.

The goal of this pilot was to explore the impact of this CB intervention in a college sample, using a design that paralleled the high school effectiveness trial. Depression is one of the most common mental health problems on college campuses (ACHA-NCHA, 2009) and college students have been identified as a high-risk population for which effective prevention programs have been understudied (Buchanan, 2012). We examined whether, relative to bibliotherapy or brochure control, CB group reduced depressive symptoms (Aim 1), and improved social adjustment and reduced substance use (Aim 2). Given the limited power, we focused on the magnitude of effect sizes, in addition to statistical significance, when interpreting study results.

Method

Participants and procedures

To facilitate comparison of findings between this pilot and the high school effectiveness study, comparable methodological features were used, including the recruitment procedures and screening approach, the assessment measures, the three intervention conditions and their method of delivery, and participant reimbursement amounts. Participants were 82 college students (69.5% female) between 17 and 22 years of age ($M = 19.0$; $SD = 0.9$)

at pretest. The sample was composed of 11% Asian Americans, 3% African Americans, 81% Caucasians, and 5% other/mixed. Participants were recruited in 2010–2011 from a large state university through direct mailings to a subset of first/second year students; recruitment posters were also hung on campus. The recruitment letter contained a screener assessing depression based on the Center for Epidemiologic Studies-Depression Scale (Radloff, 1977); response options were reduced from 4 to 2, and all items were worded in the same direction. Students who endorsed two or more symptoms were encouraged to enroll. If the student had a current diagnosis of MDD or acute suicidal ideation ($n = 3$), they were excluded and offered referrals. Eligible participants were randomly assigned by the project coordinator using computer-generated random numbers to either: (1) CB group ($n = 27$), (2) bibliotherapy ($n = 22$), or (3) brochure control ($n = 33$).

Participants completed assessments at pretest, posttest, 6- and 12-month follow-up; receiving $25 for each assessment. A participant flowchart is shown in Fig. 1. Assessors were blind to condition, had a bachelors in psychology, received 40 h of training, and achieved a minimum kappa of .80 with experts before data collection; 10% of interviews were randomly selected for reliability rating. The Oregon Research Institute Institutional Review Board approved this study.

CB group

The group program was identical to the intervention evaluated in the effectiveness trial (Rohde et al., 2014). Each of the 6 weekly 1-h sessions had a portion devoted to thought identification/recording and cognitive restructuring (called "Changing Thinking") and a portion devoted to increased involvement in pleasant activities (called "Changing Doing"). Five mixed-gender groups of 4–8
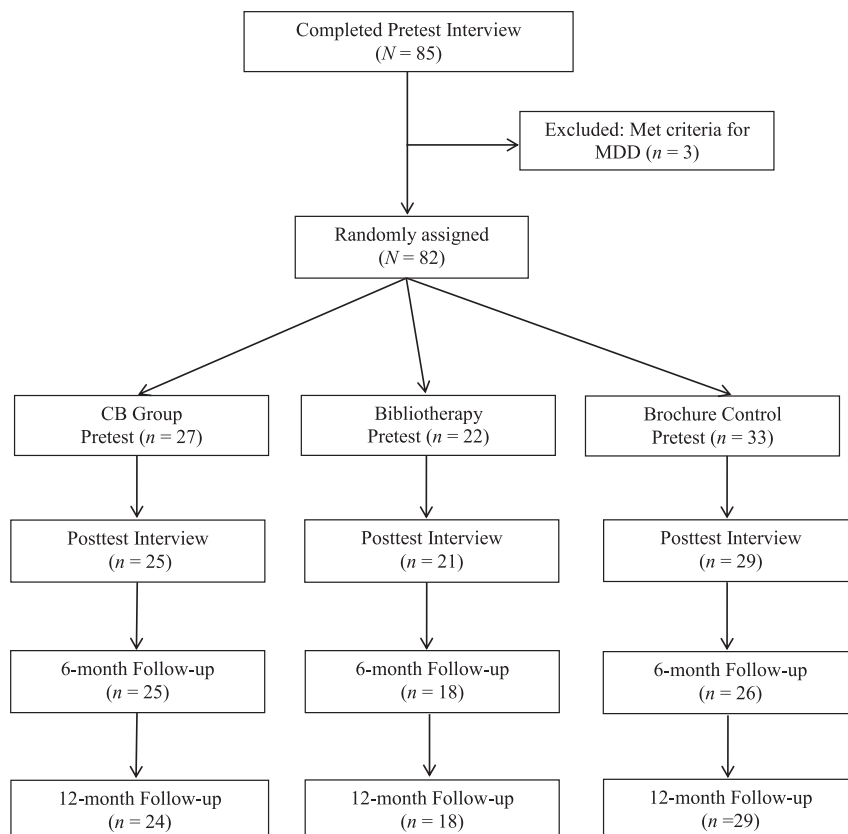

Fig. 1. Participant flowchart.

participants ($M = 5.4$) were conducted on campus. If a participant missed a session, a brief make-up session was conducted.

The structure of facilitator training and supervision paralleled previous trials with this intervention. Three female masters-level graduate students in clinical psychology completed a 4-h workshop after reading the intervention script and supporting documents. Sessions were audiotaped and half were randomly selected for review by the first and third authors for adherence/competence ratings, using developed scales (Rohde et al., 2014; Stice et al., 2008), and for supervision provided via email. Adherence was measured using session-specific 10-point checklists (a score of 7 was "good" and indicated that no key concept had been missed); competence was rated using 12 10-point items (6 = "good/average").

Bibliotherapy

Bibliotherapy participants were given *Feeling Good* (Burns, 1980), which provides CB techniques for preventing and reducing negative moods written at a high-school reading level; it is the only depression self-help book defined as "probably efficacious treatment" (Malouff & Rooke, 2007). Participants were told, "This book has been shown to be helpful to some individuals who are feeling sad or depressed. This copy is yours to keep, so feel free to write or highlight in it as you read. We encourage you to use this as a self-help resource." Staff made two brief scripted reminder calls encouraging participants to use the book.

Educational brochure control

Participants were given an NIMH educational brochure describing MDD symptoms and treatment ("Let's Talk About Depression" NIH Pub. 01-4162), as well as referral information.

Measures

Depressive symptoms and diagnosis. An adapted Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Puig-Antich & Chambers, 1983) interview assessed DSM-IV MDD symptoms. Participants reported the severity of each symptom (4-point response) over the past 12 months (at pretest) or since last interview. Symptom severity ratings were made on a month-by-month basis and summed to a depressive symptom composite for past month depression severity and used to diagnose MDD. The interview has shown test-retest reliability ($\kappa = .63–1.00$), inter-rater diagnostic reliability ($\kappa = .73–1.00$), and sensitivity to detection of intervention effects (Stice et al., 2008, 2010).

Substance use was measured with 10 items from Stice, Barrera, and Chassin (1998) assessing frequency (6-point response) of 8 substances and quantity per drinking and cigarette smoking days. Items were averaged to form a substance use measure, which was normalized with an inverse transformation. This scale has shown 1-year reliability ($r = .72$), predictive validity for substance abuse symptoms (Stice et al., 1998) and sensitivity to detection of intervention effects (Stice et al., 2008); $\alpha = .78$ at pretest.

Social adjustment was assessed using 13 items (5-point response) adapted from the Social Adjustment Scale-Self Report for Youth (Weissman, Orvaschel, & Padian, 1980). This measure has shown internal consistency ($\alpha = .77$), 1-week reliability ($r = .83$), and sensitivity to detection of intervention effects (Stice et al., 2008); $\alpha = .67$ at pretest.

Expectancies and manipulation check. After reading a description of conditions, participants at pretest completed items assessing credibility, expected improvement from each condition, satisfaction (5-point scales), and intervention preference. At posttest and follow-up assessments, bibliotherapy participants reported how much of the book they had read and when. As a manipulation check of the degree to which participants in either CB condition acquired knowledge of the intervention concepts, 15 True/False items designed for this study to assess knowledge regarding adolescent depression and CB interventions were administered at each assessment. We previously found that CB knowledge improved for CB treatment participants but not controls (Rohde, Clarke, Mace, Jorgensen, & Seeley, 2004).

Statistical methods

Percentages of missing data were 0–7% at pretest, 9–18% at posttest, 16–20% at 6-months, and 12–17% at 12-months. Missing data points were replaced with imputed data in 20 data sets, which were analyzed separately. Model parameters and standard errors, which incorporate within and between model parameter variability, were combined following Rubin (1987). Number of completed assessments was not related to condition ($\chi^2(6,82) = 2.02$, $p = .917$) and participants who did versus did not provide complete data did not differ significantly on pretest study variables. We tested whether conditions differed on pretest levels of outcome measures and demographics, finding that groups differed on pretest social adjustment ($F[2, 73] = 3.88$, $p = .025$). Statistical models accounted for this baseline difference.

Random effects growth models in a hierarchical linear model framework were fit with PROC MIXED. Individual variability in level-1 change in outcomes from posttest to 12-month follow-up was modeled as a function of the level-2 predictor condition, with pretest score included as a covariate. Given our interest in comparing findings to previous research evaluating the CB group, we contrasted CB group (coded "1") versus bibliotherapy (coded "0") or brochure control (coded conducted two planned comparisons "0") for the outcomes. For the manipulation check on CB knowledge, an omnibus test of the three conditions was used as the level-2 predictor, and if significant, follow-up planned contrasts were run. Two parameter estimates from the growth models were examined to determine program effectiveness: (1) condition (represents change in the outcome at posttest for CB group relative to either control; serves as a test of acute phase differential effects) and (2) condition × time (represents change in the outcome from posttest to 12-month follow-up for CB group relative to either control; serves as a test of the maintenance or later emergence of differential effects). To accommodate the partially nested data structure, controls were treated as a group of one and condition specified as a random effect (Bauer, Sterba, & Hallfors, 2008). If the random condition effect variance was estimated at zero, bounds on the parameter were relaxed and allowed to be freely estimated. Effect sizes were estimated with a partial point biserial correlation coefficient and converted to Cohen's *d*, which can be interpreted as a small, medium, or large effect at values of 0.2, 0.5, and .0.8, respectively.

Results

Participants rated the three conditions similarly on perceived credibility ($F[2, 75] = 0.13$, $p = .88$), expected benefit ($F[2, 75] = 0.13$, $p = .88$), and satisfaction with assignment to that condition ($F[2, 75] = 1.47$, $p = .24$); scores on these 5-point measures (1 = extremely disappointed, 3 = neutral, 5 = extremely pleased) suggested that the participants were generally neutral on their expectations (credibility $M = 3.14$, $SD = 0.68$; benefit $M = 3.08$, $SD = 0.66$; satisfaction $M = 3.19$, $SD = 0.52$). Regarding intervention preference, 7% of participants preferred CB group, 30% preferred bibliotherapy, 28% preferred CB group or bibliotherapy but not control, 9% preferred brochure, and 26% reported no opinion.

Mean attendance among CB group participants was 3.9 of 6 sessions ($SD = 2.1$), although 70% attended 4–6 sessions (excluding four CB group participants who attended no sessions, mean attendance was 4.6). Among bibliotherapy participants, 43% indicated they read at least half the book, 42% read less than a quarter, and 15% did not read any. The amount read by bibliotherapy participants was not significantly correlated with change in depressive symptoms through follow-up ($r = .20$, $p = .36$). Of those who read at least part of the book, 36% indicated they read it when depressed, 32% when bored, and 32% immediately after receiving it.

Regarding the CB group, mean adherence was 7.9 ($SD = 1.0$) and competence was 7.3 ($SD = 1.5$), which were comparable to ratings from the high school effectiveness trial (7.0 and 7.1, respectively) and suggested that key concepts were generally presented with good or very good fidelity. Only 1% of items were rated as "minimal adherence" (score of 4; "minimal adherence; the majority of key concepts were presented but poorly") and 3% as "minimal competence" (score of 4; fair/below average).

Intervention effects for change in primary outcome

Descriptive statistics for outcomes are shown in Table 1. Planned contrast results are shown in Table 2. Condition estimates across both comparisons for the primary outcome were nonsignificant, suggesting that CB group did not differ on posttest depressive symptom levels, compared to bibliotherapy ($d = -.08$) or brochure controls ($d = .06$). Similarly, condition × time estimates for depressive symptoms across both comparisons were nonsignificant, suggesting that CB group did not differ in change for the depression measure from posttest to 12-month follow-up, compared to CB bibliotherapy ($d = -.04$) or brochure controls ($d = -.10$).

Given the small sample size, we examined changes in depressive symptoms as the primary outcome rather than MDD onset. However, rates of MDD onset by 12-month follow-up were examined and suggested support for both CB interventions (7.4% [$n = 2$] in CB group, 4.5% [$n = 1$] in bibliotherapy, and 15.2% [$n = 5$] in brochure control). Though the effect for condition was nonsignificant; $\chi^2(2,79) = 2.11$, $p = .35$, the effect sizes, represented by odds ratios, were medium to large in magnitude for both CB group versus brochure control ($OR = 2.40$) and bibliotherapy versus brochure control ($OR = 3.85$).

Table 1
Descriptive statistics for outcomes by condition across assessment points.

	Pretest		Posttest		6-Month follow-up		12-Month follow-up	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Primary outcome								
Depressive symptoms								
Control	1.43	0.35	1.40	0.33	1.27	0.37	1.18	0.30
Bibliotherapy	1.51	0.41	1.36	0.31	1.30	0.36	1.16	0.35
CB group	1.52	0.39	1.43	0.33	1.26	0.33	1.27	0.34
Secondary outcomes								
Substance use								
Control	1.20	0.76	1.08	0.80	1.18	0.80	1.06	0.78
Bibliotherapy	1.07	0.77	1.05	0.66	1.25	0.69	1.15	0.74
CB group	0.99	0.78	0.90	0.72	0.99	0.68	1.00	0.70
Social adjustment								
Control	2.42	0.44	2.23	0.45	2.23	0.37	2.13	0.43
Bibliotherapy	2.77	0.47	2.54	0.53	2.37	0.44	2.24	0.47
CB group	2.53	0.40	2.33	0.43	2.39	0.40	2.29	0.41
Manipulation check								
CB knowledge								
Control	0.63	0.11	0.65	0.12	0.65	0.12	0.67	0.09
Bibliotherapy	0.67	0.10	0.71	0.10	0.73	0.12	0.74	0.10
CB group	0.64	0.13	0.72	0.14	0.76	0.13	0.76	0.10

CB = cognitive behavioral, SD = standard deviation.
Note. Means and standard deviations are averages across 20 imputed data sets.

Intervention effects for change in secondary outcomes

Planned contrast results for the secondary outcomes are also shown in Table 2. Condition estimates for both secondary outcomes across both comparisons were nonsignificant, suggesting that CB group did not differ on substance use or social adjustment at posttest, compared to bibliotherapy or brochure control. Likewise, condition × time estimates for both outcomes across both comparisons were nonsignificant, suggesting that CB group did not differ in the linear growth for either secondary outcome from posttest to 12-month follow-up, compared to alternative condition. The largest (albeit nonsignificant) result for a primary or secondary outcome was the condition estimate for posttest substance use in CB group versus bibliotherapy ($d = .37$), suggesting a small-medium reduction in substance use for CB group participants relative to bibliotherapy controls at the end of the group intervention.

Manipulation check

Omnibus tests of condition and condition × time were examined for change in CB knowledge; the overall test of condition was significant (estimate = .046, $SE = .022$, $t = 2.10$, $p = .036$). Planned comparisons for CB knowledge were modeled and included in Table 2. CB group participants had significantly higher scores on CB knowledge at posttest versus brochure controls, which represented a medium-large effect ($d = .65$). The nonsignificant effects of time and condition × time interaction for CB group versus brochure controls implied that gains in knowledge were maintained through 12-month follow-up. Both the condition and condition × time interaction for CB group versus bibliotherapy were nonsignificant.

Discussion

This pilot evaluated whether a brief indicated CB group intervention, previously found to produce positive results in both efficacy and effectiveness trials with high school students, reduced depressive symptoms or substance use or improved social adjustment, relative to either bibliotherapy or a minimal control intervention in college students with elevated depressive symptoms. Unexpectedly, we found no indication of effects on depressive symptoms, even immediately at posttest ($M\ d = -.01$), which routinely shows the strongest condition differences (e.g., Horowitz & Garber, 2006). In the high school efficacy trial, we had found significant effects for depressive symptoms for CB group compared to both bibliotherapy and brochure controls at posttest ($M\ d = .49$), that were maintained at 12-month follow-up ($M\ d = .34$). In the ongoing high school effectiveness trial, CB group resulted in lower depressive symptoms than brochure controls at posttest ($d = .29$) though not at 6-month follow-up ($d = .12$); differences relative to bibliotherapy at posttest and 6-month follow-up were nonsignificant ($d = .27$, and .05, respectively). We had previously noted that the magnitude of depressive symptom reductions in the high school effectiveness trial was approximately half that found in the efficacy study, but effects in this current college effectiveness pilot for the primary outcome measure are even smaller and could be considered virtually nonexistent.

In addition to significant depressive symptom reductions, the high school efficacy trial found that CB group participants showed secondary benefits of improved social adjustment (M 6-month $d = .32$, 12-month value nonsignificant) and decreased substance use at posttest ($M\ d = .25$) through 12-month follow-up ($M\ d = .37$; Rohde, Stice, Gau, & Seeley, 2012; Stice et al., 2010). However, as in the present study, nonsignificant effects were found in the high school effectiveness trial for CB group relative to either bibliotherapy or brochure controls on both social adjustment (M posttest

Table 2
Results of fixed effects from hierarchical growth models for planned contrasts.

	CB. versus bibliotherapy comparison					CB. versus control comparison				
	Estimate	SE	t-Value	p-Value	d	Estimate	SE	t-Value	p-Value	d
Primary outcome										
Depressive symptoms										
Condition	.032	.097	0.33	.741	−0.08	−.025	.090	−0.28	.780	0.06
Time	−.016	.009	−1.76	.080	0.41	−.019	.007	−2.70	.007	0.61
Condition × time	.002	.013	0.13	.893	−0.04	.005	.011	0.42	.673	−0.10
Secondary outcomes										
Substance use										
Condition	.229	.144	−1.59	.112	0.37	−.055	.159	−0.34	.731	−0.08
Time	.007	.012	0.61	.540	0.14	−.002	.014	−0.15	.878	0.04
Condition × time	.002	.018	0.11	.915	0.02	.012	.028	0.43	.666	−0.10
Social adjustment										
Condition	−.072	.094	−0.77	.443	0.18	.035	.075	0.46	.642	−0.10
Time	−.024	.010	−2.34	.020	0.54	−.009	.009	−0.96	.335	0.22
Condition × time	.022	.016	1.34	.182	−0.30	.001	.016	0.34	.733	−0.08
Manipulation check										
CB knowledge										
Condition	.037	.033	1.12	.264	0.24	.086	.029	2.95	.003	0.65
Time	.003	.003	0.89	.376	0.20	.001	.002	0.55	.582	0.02
Condition × time	.001	.004	0.27	.785	0.06	.003	.004	0.73	.463	0.16

CB = cognitive behavioral, SE = standard error.
Note. Not shown are the fixed effects estimates of the covariates: baseline scores for the outcome and social adjustment. For each comparison the CB group is coded "1" and the comparison group "0". A negative d-value indicates poorer outcome for the CB group relative to comparison condition.

$d = .22$; M 6-month $d = .15$) and substance use (M posttest $d = .10$; M 6-month $d = .08$). In the present study, effects were even lower for social adjustment (M posttest $d = .04$) but appeared different from zero for substance use (M posttest $d = .14$), due to a small-medium effect in substance use for CB group versus bibliotherapy participants. Across the three studies, the impact of CB group prevention on improving social adjustment and reducing substance use appears tenuous.

As a confirmation that CB group participants in this pilot learned the concepts, they significantly improved on a brief measure of knowledge of CB change principles, relative to brochure controls, and this difference was maintained through follow-up. As expected, differences in CB knowledge for CB group versus bibliotherapy participants did not differ.

Though the study was clearly underpowered to detect differences in MDD onset, it was potentially encouraging that the incidence of MDD over follow-up in both CB-based interventions was half the rate found in brochure controls (7.4% in CB group, 4.5% in bibliotherapy, 15.2% in brochure controls). In the high school efficacy trial, by 6-month follow-up, 6.8% of CB group and 2.5% of bibliotherapy participants experienced MDD, compared to 13.1% of brochure controls ($p < .05$). In the high school effectiveness trial, by 6-month follow-up, CB group participants had a lower ($p < .03$) risk of MDD (0.8%) compared to both bibliotherapy (6.3%) and brochure controls (6.5%), which did not differ. Although MDD onset is generally low, there appears to be a signal across studies that brief CB-based interventions may prevent onset of clinically significant disorder. Better identification of participants, high school or college aged, who are at greatest risk for imminent MDD onset could enhance the clinical value of CB group prevention programs.

In sum, contrary to strong positive effects found in the initial efficacy trial and attenuated though still encouraging effects in the subsequent effectiveness trial, effects in this effectiveness pilot with college students were very weak. Differences in treatment fidelity could not account for the null effects, as treatment adherence and therapist competence ratings in this trial were similar to values in the high school efficacy and effectiveness studies. However, CB group attendance was slightly lower (e.g., 26% of college participants attended all 6 CB group sessions compared to 44% in the high school efficacy trial and 47% in the high school effectiveness trial) and

participants in the present study began with a mean symptom level ($M = 1.49$, $SD = .39$) that was approximately half a standard deviation lower than in the high school efficacy trial ($M = 1.70$, $SD = .33$), though slightly higher than the high school effectiveness trial ($M = 1.34$, $SD = .33$). In addition, positive expectancies for CB group (perceived credibility, expected benefit, satisfaction with condition) were lower in this college sample than in either high school sample. It is possible that the lower "dose" of the CB group, lower baseline severity compared to the efficacy trial, and/or lower expectation for improvement may have weakened the effects.

The present results were also less supportive than most previous prevention research with college students. Of the 47 trials identified in our meta-analysis (Stice et al., 2008), 6 examined college samples, generally finding large depressive symptom reductions by posttest (M $d = .84$, range = .36–1.36) and medium reductions during follow-up (M $d = .60$, range .14–1.52). The two largest trials with college students were selective/indicated trials conducted by Seligman and colleagues, in which participant risk level was assessed by the research staff. Seligman, Schulman, DeRubeis, and Hollon (1999) evaluated a 16-h CB group intervention with 225 students who had pessimistic explanatory style. Significant posttest effects were found for interviewer-based ($d = .28$) and self-report ($d = .32$) measures of depressive symptoms, and over 3-year follow-up, CB group participants had lower self-reported (but not interviewer-rated) depressive symptoms. Seligman, Schulman, and Tryon (2007) evaluated a similar workshop supplemented with web-based materials and coaching, in which 227 college students with elevated depressive symptoms were randomized to intervention or assessment control. CB group participants had lower self-reported depressive symptoms at posttest ($d = .67$) and at 6-month follow-up ($d = .59$) (interviewer-based rates of MDD were very low and did not differ).

Study limitations should be noted. First, the small sample resulted in limited power to detect differences, but effect size values, with the possible exception of substance use (relative to bibliotherapy), gave no indication of meaningful effects for CB group. Second, we did not assess additional factors of interest (e.g., comorbidity, parental depression) and those variables might inform future prevention efforts with this age group. For example, we did not assess the duration of depressive symptoms or past history of MDD, and it may be more

difficult to impact young people with subthreshold symptoms if they have experienced those conditions for some time (i.e., depression could have been more entrenched in the college, compared to high school, participants). Third, the simplified screening format may have selected a less depressed sample.

What might be accounting for these nonsignificant findings for CB group prevention at the college level? One possibility is the use of an effectiveness, rather than efficacy, design. To our knowledge, this is the first effectiveness depression prevention trial conducted with college students and issues of less tightly controlled participant and therapist factors may have attenuated effects. Second, we evaluated an intervention found to be efficacious with high school students, and although it appeared to employ standard CB approaches, it may have been developmentally inappropriate for college students. Third, the participants may not have been at high enough risk to be motivated. We do not have comparable data on average depression levels for college students but a large survey of college students found that 43% "felt so depressed it was difficult to function" in the past school year (ACHA-NCHA, 2009, p. 485). As noted, the college participants had lower attendance and positive expectancies for CB group than high school students, which might be signs of lower motivation or hopefulness for change. Fourth, it is possible that participants were simply too busy by the demands of college to prioritize time and energy to improve their mental health. If competing demands are found to be a valid limiting factor for program engagement and impact, longer prevention interventions may not be practical; rather programs may need to more directly increase motivation for change or provide intervention strategies that can more efficiently achieve stronger effects.

Acknowledgments

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