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Effects of an Indicated Cognitive-Behavioral Depression Prevention Program are Similar for Asian American, Latino, and European American Adolescents

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Abstract

The authors tested whether a brief indicated cognitive-behavioral depression prevention program produced similar effects for Asian American, Latino, and European American adolescents (M age = 17.3, SD = 1.6) with elevated depressive symptoms using data from two randomized trials. The first trial involved 37 Asian American/Pacific Islanders, 32 Latinos, and 98 European Americans and the second trial involved 61 Latinos and 72 European Americans. Reductions in depressive symptoms from pre- to post-intervention and from pre to 6-month follow-up for intervention participants versus assessment-only controls did not differ significantly for the various ethnic groups in either trial, despite sufficient power to detect clinically meaningful differences. These findings suggest that this indicated depression prevention intervention is similarly efficacious for Asian American, Latino and European American adolescents.

Keywords

Depression; Prevention; Ethnic Differences; Adolescence

Introduction

Major depression in adolescents and adults is associated with functional impairment and increased risk for cardiovascular disease, suicide, academic failure, and substance abuse (Klein, Torpey, & Bufferd, 2008). Thus, developing efficacious prevention programs for this condition is a pressing public health priority. Given that the prevalence of major depression increases markedly during adolescence, this is a crucial period for prevention efforts (Klein et al., 2008).

Ethnic minority adolescents are thought to be at elevated risk for depression because they experience more life stressors than non-minority youth, such as discrimination, low

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socioeconomic status (SES), single-parent families, and acculturative stress (Plant, 2004). Nationally representative data indicate that relative to European American teens, African American, Asian American, and Latino teens report elevated depressive symptoms (Siegel, Aneshensel, Taub, Cantwell, & Driscoll, 1998; Turner, Taylor, & Van Gundy, 2004) and meet criteria for depression more often (Rushton, Forcier, & Schectman, 2002; Costello, Swendsen, Rose, & Dierker, 2008). However, very few depression treatment programs exist for ethnic minority adolescents. In a review of evidence-based treatments for minority youth, only two interventions were found to be “probably efficacious” and only one ethnic minority group (Latino) had enough data for inclusion in the review (Huey & Polo, 2008). Because 39% of US adolescents are from ethnic minority groups (U.S. Census, 2008), it is vital to test whether prevention programs are effective for these groups.

Cognitive-behavioral interventions that focus on reducing negative cognitions and increasing pleasant activities have produced significantly greater reductions in depressive symptoms than assessment-only control groups in universal trials (Cardemil et al., 2006; Spence, Sheffield, & Donovan, 2003), in selected trials with high-risk youth (Cardemil et al., 2002; Seligman, Schulman, & Tryon, 2007), and in indicated trials involving youth with elevated depressive symptoms (Clarke et al., 1995, 2001; Stice, Burton, Bearman, & Rohde, 2006; Young, Mufson, & Davies, 2006). A meta-analysis of 47 controlled trials found that 41% of depression prevention programs significantly reduced depressive symptoms (Stice, Shaw, Bohon, Marti, & Rohde, 2009).

Although prevention programs have been found to reduce depressive symptoms and risk for future major depression, it is important to test whether the effects vary across different ethnic groups. Depression prevention programs may be more effective for ethnic minority youth because they are at greater risk for depression than majority youth and depression prevention programs typically produce larger effects for higher-risk participants (Horowitz & Garber, 2006; Stice et al., 2009). We are aware of only three trials that evaluated depression prevention programs with specific ethnic groups (Cardemil, Reivich, & Seligman, 2002; Young et al., 2006; Cardemil et al., 2008). Cardemil et al. (2002; 2006) found that a cognitive-behavioral depression prevention program produced significant decreases in depressive symptoms at posttest (*effect size* $r = .27$) and 2-year follow up ($r = .19$) relative to controls for Latino but not African American low-income middle school students. Effect sizes for Latino students were slightly larger than mean effect sizes in studies demonstrating significant results with primarily European American participants; $r = .24$ at posttest and $r = .16$ at follow-up (Stice et al., 2009). Effect sizes were also large for an indicated prevention program for adolescents with a sample that was 92% Latino at post-intervention ($r = .57$), 3-month ($r = .50$) and 6-month follow up ($r = .47$; Young et al., 2006). Further, a meta-analysis of depression prevention trials found that effects were larger for samples containing a greater proportion of minority youth (Stice et al., 2009).

Although these results imply that depression prevention programs can be efficacious for ethnic minority adolescents, we were unable to locate trials that expressly tested whether ethnicity moderated the effects of depression prevention programs. Thus, we investigated this question with data from two trials of an indicated cognitive-behavioral depression prevention program targeting adolescents at risk for depression by virtue of elevated depressive symptoms (Stice, Burton, Bearman, & Rohde, 2006; Stice et al., 2008). Given the literature reviewed above and prevalence data indicating that ethnic minority adolescents experience greater risk for depression symptoms and report elevated depressive symptoms compared to European American adolescents, we hypothesize that the intervention effects for an indicated depression prevention program may be significantly larger for ethnic minority youth than for ethnic majority youth.

STUDY 1

Participants and Procedure

Participants were 167 students (75% female) from a randomized controlled trial of a depression-prevention program for adolescents, recruited from two high schools and one college, aged 14 to 24 ($M = 18.6$; $SD = 1.8$). The current analyses focused on students who reported being European American ($n = 98$), Latino ($n = 32$), or Asian-American/Pacific Islander ($n = 37$). There were insufficient numbers of participants from other groups for adequate power (an additional 13 were African Americans and 16 reported a mixed racial heritage; Stice et al., 2006). Maximum parental education, a proxy for SES, was 18% high school graduate or less; 20% some college; 30% college graduate; and 32% graduate degree. Parental education was significantly higher among Asian- and European-American than Latino students (omnibus $F=11.47$, $p<.001$).

Participants were recruited using mass mailings and fliers inviting students experiencing sadness to be in a trial of an intervention to improve current and future mood. Students with scores ≥ 21 on the Center for Epidemiologic Studies-Depression scale (CES-D; Radloff, 1977) were eligible; no upper cutoff value was imposed. Participants were randomly assigned to one of six conditions; only the cognitive-behavioral group (CB; $n = 86$) and waitlist control ($n = 81$) conditions are considered in this report to maximize statistical sensitivity (other cell sizes were smaller). CB group consisted of four weekly 1-hour sessions utilizing cognitive and behavioral procedures to reduce negative cognitions and increase pleasant activities. Groups were composed of 6–10 participants and co-facilitated by a clinical graduate student and an undergraduate. See Stice et al., (2006) for details on session content. Participants completed a questionnaire at baseline, post-intervention (4 weeks later), 1-month follow-up, and 6-month follow-up. The local Institutional Review Board approved both Study 1 and Study 2 and written informed consent was collected.

Depressive symptoms—The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used to assess depressive symptoms in the past week using 21 items. Response choices ranged from 0 (symptom not present) to 3 (severe symptom). The BDI has shown test-retest reliability ($r = 0.60$ – 0.90) and internal consistency ($\alpha = 0.73$ – 0.95 ; Beck et al., 1988). With a Latino college sample, internal consistency was $\alpha = .89$ and one-week test-retest reliability was $r = .73$ (Wiebe & Penley, 2005); with an Asian-American college sample, internal consistency was $\alpha = .91$ (Yoon & Lau, 2008). This scale had an $\alpha = .88$ at baseline.

At 6-month follow up, 81% of participants provided complete data. Attrition did not differ significantly across intervention groups for any study variable. Full information maximum likelihood estimation was used to impute missing data because this approach produces more accurate and efficient parameter estimates than alternative imputation approaches (Schafer & Graham, 2002). A three-way mixed between- and within-subjects analysis of variance (ANOVA) tested whether the cognitive-behavioral group produced greater changes in depressive symptoms relative to controls over time similarly for the ethnic groups. The within-subjects factor was time and between-subjects variables were treatment condition and ethnicity. Preliminary models included gender and SES, but effects did not change when these variables were statistically controlled and they were dropped from the final models. Power calculations indicated that we had power of .99 to detect a medium effect size ($r=.24$) and power of .67 to detect a small effect size ($r=.10$) for the tests comparing each ethnic minority group to the ethnic majority group.

Results

Table 1 displays BDI scores at each measurement time by treatment group and ethnicity. The three ethnic groups did not differ on baseline BDI scores or age. Because data did not meet the sphericity assumption for within-subjects tests, the Greenhouse-Geisser corrected average F value is reported. Analyses tested the main effect of time, and time by condition, time by ethnicity, and time by condition by ethnicity interactions. Table 2 displays the ANOVA results. The time by condition interaction was significant, indicating that depressive symptom reductions were significantly greater for intervention than control participants. However, the time by condition by ethnicity interaction was not significant, suggesting that the effects of the depression prevention program did not differ for ethnic minority versus ethnic majority participants.

STUDY 2

Participants and Procedure

Study 2 improved upon Study 1 by using diagnostic interviews in addition to self-report measures to assess depressive symptoms, screening out initially depressed youth, and increasing training and supervision of group facilitators. Adolescent reports of depressive symptoms on diagnostic interviews are considered the most reliable and valid single source of data in the area of depression (e.g. Cantwell, Lewinsohn, Rohde, & Seeley, 1997). The second study also provided an opportunity for replication of the effects observed in Study 1. Participants were 133 students (58% female) from seven high schools, 14 to 19 years of age ($M = 15.5$; $SD = 1.2$). Maximum parental education was 40% high school graduate or less; 14% some college; 37% college graduate; and 9% graduate degree. Parental education was significantly higher among European-American than Latino students ($F=37.33$, $p<.001$).

Participants were recruited using mass mailings and fliers inviting students experiencing sadness to be in a trial of an intervention to improve mood. Students who reported elevated depressive symptoms (≥ 20 on the CES-D and < 30 on the BDI) were eligible. Individuals meeting criteria for major depression were excluded. Complete data were obtained from 89% of participants at 6-month follow up. Attrition did not differ across intervention groups or any study variable. Full information maximum likelihood estimation was used to impute missing data. Participants were randomized to one of four intervention conditions. This report focused on participants assigned to the CB group ($n = 74$) or assessment control condition ($n = 59$) who reported being European American ($n = 72$) or Latino ($n = 61$). We did not focus on participants from other ethnic groups because the cell sizes were too small to provide adequate statistical power for tests of differential efficacy (an additional 7 participants were Asian American, 30 were African American, and 34 who specified mixed or racial heritage; Stice et al., 2008). We did not focus on participants assigned to the other two conditions (supportive expressive group and bibliotherapy) because they have not been widely studied. CB group interventions consisted of six weekly 1-hour sessions utilizing cognitive and behavioral procedures to reduce negative cognitions and increase pleasant activities. Groups were composed of 6–10 participants and co-facilitated by a clinical graduate student and an undergraduate.

Depressive symptoms—An adapted version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982) assessed depressive symptoms. Participants reported to interviewers the peak severity of symptoms during the prior 12 months (at baseline) or since the last interview (at follow-ups). Responses ranged from 1 (symptom not present) to 4 (severe symptom). Severity ratings for each symptom were averaged to form a continuous depressive symptom composite, in contrast to the commonly used categorical scoring of the

K-SADS. Our version has shown test-retest reliability ($k = .63 - 1.00$) and internal consistency ($\alpha = .68 - .84$) with multiethnic samples (Stice et al., 2008). This scale had an $\alpha = .68$ at baseline. This version has also shown more sensitivity than the BDI-II in detecting depressive symptoms (Stice et al., 2008).

BDI-II—The Beck Depression Inventory II (Beck, Steer & Brown, 1996) was also used to assess depressive symptoms. The 21-item BDI-II is an updated version of the BDI and assesses symptoms over the past 2 weeks. Responses ranged from 0 (symptom not present) to 3 (severe). The BDI-II has shown test-retest reliability ($r = .93$) and high internal consistency with multiethnic samples ($\alpha = .93$; Beck et al., 1996; Al-Musawi, 2001) and with Mexican American adolescents ($\alpha = .90$; Van Voorhees & Blumentritt, 2007). This scale had an $\alpha = .83$ at baseline.

Three-way mixed between- and within-subjects ANOVA were conducted to assess whether cognitive-behavioral group produced changes in depressive symptoms relative to controls similarly for each ethnic group. Within-subjects factor was time of assessment and between-subjects variables were treatment condition and ethnicity. The dependent variables were BDI-II and K-SADS symptom severity scores. Preliminary models included gender and SES, but effects did not change when these variables were statistically controlled and they were dropped from the final models. Power calculations indicated that we had a power of .99 to detect a medium effect size ($r = .24$) and a power of .65 to detect a small effect size ($r = .10$) for the tests comparing Latino to European American participants.

Results

Table 3 presents BDI-II and K-SADS depressive symptom severity scores by ethnicity and condition at each assessment. At baseline, Latino and European American participants did not differ on BDI-II or K-SADS severity scores. Data did not meet the assumption of sphericity for within-subjects effects, so the Greenhouse-Geisser average corrected F value are reported. Echoing results from Study 1, the repeated measures ANOVA model indicated a significant time by condition interaction for BDI-II and for K-SADS depressive symptoms (Table 4), indicating larger decreases in depressive symptoms for the CB group than control. However, the time by condition by ethnicity interaction was not significant, suggesting that the effects of the depression prevention program did not differ across ethnic groups.

Discussion

Collectively, results indicate that effects of a CB depression-prevention program for adolescents are similar for Asian American, Latino, and European American participants. The effects for Studies 1 and 2, effect sizes (r) for the time by condition by ethnicity interactions ranged from .03 to .13, with the average effect accounting for less than 1% of the variance ($r = .08$). By way of comparison, the condition by time interactions ranged from $r = .027$ to $r = .067$, with the average effect accounting for 4.8% of the variance. This suggests that, though power was somewhat limited to detect small effects, analyses did not miss clinically meaningful effects. Replication of these effects across two separate trials increases confidence in the findings. However, future trials with larger samples are needed to verify the small effect sizes observed for the time by condition by ethnicity interactions, as our small samples may not have provided the best effect size estimates. It should be noted, however, that cell sizes of $n=390$ for each ethnic group would have been necessary to have adequate power (.80) to detect the observed average effect for the time by condition by ethnicity interactions ($r = .08$). Although our results indicated no differences in program effectiveness across the three ethnic groups, effect sizes were somewhat larger for the 6-

session program evaluated in Study 2 relative to the 4-session program in Study 1, suggesting that a longer program may be somewhat more effective.

To our knowledge, no previous study has compared the effectiveness of a depression prevention program for ethnic minority US adolescents. In a meta-analysis of depression prevention programs (Stice et al., 2009), only one study included enough Latino students to determine whether the depression prevention program produced effects for this population, and the effects of that program for Latinos was similar to those for European Americans. No study to date has examined the effectiveness of a depression prevention program for Asian American adolescents.

The CB intervention may have produced similar effects across ethnic groups because it is targeting underlying factors in depression that are common across at-risk adolescents. A recent study of African American, Latino and European American adolescents found that self-efficacy, negative cognitive errors, and hopelessness predicted depressive episodes in all three ethnic groups (Kennard et al., 2006). An international study comparing adolescents in Hong Kong and the U.S. found similar associations between negative cognitions and depressive symptoms, further suggesting that targeting cognitive factors in depression intervention may be effective (Stewart et al., 2004). Our intervention, based on cognitive-behavioral principles, may be general enough to effectively target factors that are stronger predictors of depression than ethnicity alone. The CB program may also be flexible enough to adequately address any ethnicity-specific risk factors, given that participants apply the principles to their own situations and experience.

It is important to consider the limitations of this study when interpreting the findings. First, sample sizes were small for certain ethnic minority groups and we had limited power to detect small effects. It should be noted that in particular, our sample size of Asian Americans was small and may limit the generalizability of the conclusions for this population. However, the magnitude of effect sizes for the time by condition by ethnic group effects was trivial, suggesting that we did not miss any substantive effects. Second, due to the low total number of incidence cases, we were unable to test whether the risk for future onset of major depression differed across ethnic groups. Third, only three ethnic groups were investigated. Future studies need to test whether CB depression prevention programs are effective for African American youth, given that this minority group tends to report elevated depression compared to European Americans and is at elevated risk of onset of major depression (Turner et al., 2004; Van Voorhees et al., 2008).

Our results suggest that this indicated CB depression prevention program is equally efficacious for Asian American, European American and Latino adolescents and thus can be delivered to a wide range of adolescents. Nonetheless, future research needs to investigate other factors that influence response to CB depression prevention programs, such as cognitive ability and facilitator competence, as this may allow the design of even more efficacious interventions.

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Table 1**Study 1:** BDI scores at each assessment time by ethnicity and intervention group

Group	<i>n</i>	Baseline	Posttest	1-Month Follow-Up	6-Month Follow-Up
<i>CB</i>		Mean (SD)			
Asian American	16	25.19 (2.47)	15.55 (9.54)	13.77 (13.40)	11.29 (9.69)
European American	49	26.31 (9.61)	17.86 (9.72)	16.13 (8.54)	14.18 (8.92)
Latino	21	28.62 (8.88)	18.79 (10.42)	19.59 (10.41)	16.41 (12.19)
<i>Control</i>					
Asian American	21	22.52 (7.35)	22.19 (8.95)	19.99 (7.13)	16.31 (13.32)
European American	49	23.76 (9.55)	23.89 (10.02)	19.54 (11.85)	17.26 (13.74)
Latino	11	22.55 (10.46)	16.78 (7.47)	13.31 (11.12)	10.63 (12.19)

Table 2**Study 1:** Multivariate ANOVA results for BDI score by time, ethnicity, and treatment condition

Source	df*	F*	Effect size (<i>r</i>)	<i>p</i>
Time	2.64	58.77	.52	<.001
Time * Ethnicity	5.27	0.69	.10	.64
Time * Condition	2.64	6.93	.20	<.001
Time * Ethn * Condition	5.27	0.81	.10	.55
Error	424.35			

* Greenhouse-Geisser corrected *F* and degrees of freedom were used for all variables.

Table 3**Study 2:** BDI-II and K-SADS scores at each assessment time by ethnicity and intervention group

Group	<i>n</i>	Baseline	Posttest	1-Month Follow-Up	6-Month Follow-Up
CB					
<i>Mean (SD)</i>					
<i>BDI-II</i>					
Latino	37	20.76 (9.19)	15.90 (8.28)	10.00 (8.64)	12.12 (7.78)
European American	37	18.65 (9.29)	15.27 (8.96)	12.91 (10.26)	11.95 (10.78)
<i>K-SADS</i>					
Latino	37	1.92 (0.34)	1.53 (0.33)	n/a	1.56 (0.43)
European	37	1.84 (0.37)	1.57 (0.37)	n/a	1.50 (0.44)
Control					
<i>BDI-II</i>					
Latino	24	17.96 (8.78)	15.65 (7.72)	14.88 (8.58)	16.45 (11.47)
European American	35	19.00 (9.50)	20.12 (9.38)	16.71 (10.10)	15.93 (10.06)
<i>K-SADS</i>					
Latino	24	1.84 (0.37)	1.65 (0.34)	n/a	1.68 (0.45)
European American	35	1.76 (0.26)	1.71 (0.37)	n/a	1.63 (0.43)

Table 4

Study 2: Multivariate ANOVA results for BDI-II and K-SADS scores by time, ethnicity, and treatment condition

Source	df*	F*	Effect size (<i>r</i>)	<i>p</i>
<i>BDI-II</i>				
Time	2.55	24.80	.40	<.001
Time * Ethnicity	2.55	2.19	.13	.10
Time * Condition	2.55	6.43	.22	.001
Time * Ethn * Condition	2.55	2.06	.13	.15
Error	328.24			
<i>K-SADS</i>				
Time	1.92	39.31	.48	<.001
Time * Ethnicity	1.92	2.71	.14	.07
Time * Condition	1.92	7.18	.23	.001
Time * Ethn * Condition	1.92	<.001	.03	.99
Error	248.15			

* Greenhouse-Geisser corrected *F* and degrees of freedom were used for all variables.