Randomized Clinical Trial of an Internet-Based Depression Prevention Program for Adolescents (Project CATCH-IT) in Primary Care: 12-Week Outcomes

Benjamin W. Van Voorhees, MD, MPH,*†‡ Joshua Fogel, PhD,§ Mark A. Reinecke, PhD,¶ Tracy Gladstone, PhD,‖ Scott Stuart, MD,** Jackie Gollan, PhD,¶ Nathan Bradford, MD,†† Rocco Domanico, PhD,‡‡ Blake Fagan, MD,§§ Ruth Ross, PhD,¶¶ Jon Larson, PhD,‖‖ Natalie Watson, BA,* Dave Paunesku, BA,* Stephanie Melkonian, BA,* Sachiko Kuwabara, MA,*** Tim Holper, BA,††† Nicholas Shank, BA,††† Donald Saner, BA,††† Amy Butler, MSW,* Amy Chandler, MSW,* Tina Louie, MSW,* Cynthia Weinstein, MS,* Shannon Collins, BA,* Melinda Baldwin, MSW,* Abigail Wassel, BA,* Karin Vanderplough-Booth, MD,‡‡‡ Jennifer Humensky, MPP,§§§ Carl Bell, MD¶¶¶

ABSTRACT: ***Objective:*** **The authors sought to evaluate 2 approaches with varying time and complexity in engaging adolescents with an Internet-based preventive intervention for depression in primary care. The authors conducted a randomized controlled trial comparing primary care physician motivational interview (MI, 5–10 minutes) + Internet program versus brief advice (BA, 1–2 minutes) + Internet program.** ***Setting:*** **Adolescent primary care patients in the United States, aged 14 to 21 years.** ***Participants:*** **Eighty-four individuals (40% non-white) at increased risk for depressive disorders (subthreshold depressed mood >3–4 weeks) were randomly assigned to either the MI group (n = 43) or the BA group (n = 40).** ***Main Outcome Measures:*** **Patient Health Questionnaire-Adolescent and Center for Epidemiologic Studies Depression Scale (CES–D).** ***Results:*** **Both groups substantially engaged the Internet site (MI, 90.7% vs BA 77.5%). For both groups, CES–D-10 scores declined (MI, 24.0 to 17.0, $p < .001$; BA, 25.2 to 15.5, $p < .001$). The percentage of those with clinically significant depression symptoms based on CES–D-10 scores declined in both groups from baseline to 12 weeks, (MI, 52% to 12%, $p < .001$; BA, 50% to 15%, $p < .001$). The MI group demonstrated declines in self-harm thoughts and hopelessness and was significantly less likely than the BA group to experience a depressive episode (4.65% vs 22.5%, $p = .023$) or to report hopelessness (MI group of 2% vs 15% for the BA group, $p = .044$) by 12 weeks.** ***Conclusions:*** **An Internet-based prevention program in primary care is associated with declines in depressed mood and the likelihood of having clinical depression symptom levels in both groups. Motivational interviewing in combination with an Internet behavior change program may reduce the likelihood of experiencing a depressive episode and hopelessness.**

*(J Dev Behav Pediatr 30:*23–37, 2009) **Index terms:** depressive disorder, adolescents, prevention, Internet, primary care, intervention.

Depressive disorders have emerged as a major public health problem in developed economies. One quarter of individuals will experience a depressive disorder during adolescence.[1] Even with treatment, remission rates remain below 60% to 70% and educational attainment may be delayed.[2,3] World Health Organization reports and a recent Cochrane review have called for the development of preventive interventions to reduce the burden of this disorder.[4–6] Primary care is a critical setting for identification and treatment of adolescent depression and is a natural setting for preventive interventions. The controversy with regard to black box warnings for suicide risk for selective serotonin reuptake inhibitors and the lack of availability of promising preventive behavioral approaches (group and individual) have restricted the

From the Departments of *Medicine, †Psychiatry, and ‡Pediatrics, The University of Chicago, Chicago, IL; §Department of Economics, Brooklyn College of the City University of New York, Brooklyn, NY; ¶Department of Psychiatry and Behavioral Sciences, Northwestern University, Chicago, IL; ‖Wellesley Centers for Women, Wellesley College, Wellesley, MA; **Department of Psychiatry, University of Iowa, Iowa City, IA; ††Anderson Area Medical Center, Anderson, SC; ‡‡Department of Psychiatry, John C. Stroger Cook County Hospital, IL; §§Department of Family Medicine, University of North Carolina—Chapel Hill at the Mountain Area Health Education Center, Asheville, NC; ¶¶Advocate Healthcare, Chicago, IL; ‖‖Department of Psychology, Illinois Institute of Technology, Chicago, IL; ***Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD; †††Information Services, Biological Sciences Division, The University of Chicago, Chicago, IL; ‡‡‡Section of Developmental and Behavioral Pediatrics, University of Chicago, Chicago, IL; §§§Harris School of Public Policy, University of Chicago, Chicago, IL; and ¶¶¶Department of Psychiatry and Behavioral Neuroscience, University of Illinois Chicago, Chicago, IL.

Received July 2008; accepted November 2008.

Benjamin W. Van Voorhees has served as a consultant to Prevail Health Solutions, Inc and the Hong Kong University to develop Internet-based interventions.

Address for reprints: Benjamin W. Van Voorhees, M.D., M.P.H., Section of General Internal Medicine, Department of Medicine, The University of Chicago, 5841 South Maryland Blvd, Chicago, IL 60637; e-mail: nwatson@medicine.bsd.uchicago.edu.

range of treatment options available to primary care physicians.[7,8] Internet-based behavioral interventions for anxiety and depression have demonstrated benefits in randomized trials for adults in Australia, the United Kingdom, and the Netherlands[9–12] and are recommended as standard practice in the United Kingdom.[13] However, few similar interventions have been developed for adolescents and they have been limited by low levels of participation.[14,15]

To address the need for a low cost and easily accessible behavioral intervention in primary care, we developed an Internet-based preventive intervention (Fig. 1).[16,17] In this model, the primary care physician uses either a brief advice (BA, brief recommendation based on physician authority, 1–3 minutes) or motivational interview (MI, collaborative model on building motivation, 10–15 minutes) approach to engage the adolescent with an Internet-based behavior change/resiliency building intervention (Project CATCH-IT, for Competent Adulthood Transition with Cognitive-behavioral and Interpersonal Training). A pilot study of the MI version of the CATCH-IT intervention demonstrated high levels of Internet component participation and favorable trends (not statistically significant) in 3 factors (depressed mood, automatic negative thoughts, and social support) when using the MI approach.[17] However, we do not know what is the most appropriate method for a primary care physician to actively engage adolescents with an Internet-based behavior change program.

We examined the relative effectiveness of these 2 strategies (MI vs BA) on usage of the Internet intervention and in turn, on symptoms of depressive disorder and mood outcomes. Our first hypothesis was that the BA group participants would be less likely to substantively engage the Internet site. Our second hypothesis was that BA group participants would not demonstrate a significant decline in measures of depressed mood (similar to control groups in other prevention and Internet studies) while we would observe a significant decline in the MI group.[11,14,18–22] Our third hypothesis was that incidence of depressive disorder and/or depressive episodes would be higher in the BA group than the MI group. We report Internet participation and depressive disorder outcomes for a randomized clinical trial comparing MI + Internet versus BA + Internet in an at–risk sample of adolescents.

METHODS

Study Design

We conducted a randomized controlled trial comparing motivational interview (MI) + Internet intervention (MI group) versus brief advice (BA) + Internet intervention (BA group) in 13 primary care sites in the United States (South and Midwest). This was a phase II study intended to determine the form and dose of primary care practitioner (PCP) interview time needed to effectively engage youth with this program. Consequently, no treatment as usual group was included. We compared adolescent baseline outcome measures with those at 6 and 12 weeks within the MI and BA groups (repeated measures) and also between the MI and BA groups at the same time points (Fig. 1). Practices elected to either have their own primary care physicians conduct the interview (N = 10 practices, physicians received prorated reimbursement of $100.00/adolescent) or have the study principal investigator ([PI], also a primary care physician, N = 3 practices) conduct the interview. All protocols were approved by the University of Chicago

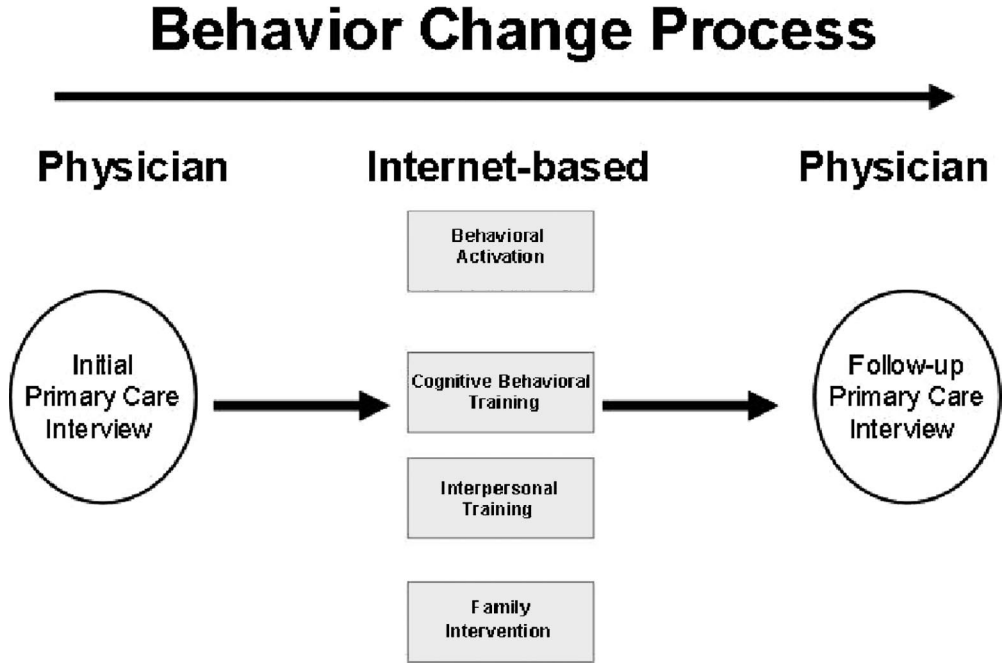

Figure 1. Intervention model.

Institutional Review Board and local site Institutional Review Boards.

Recruitment

We recruited primary care sites by approaching 5 major health care organizations (all agreed to participate) and then approached physicians within those organizations. Recruitment of adolescents occurred in both protocols from February 1, 2007, to November 31, 2007. Recruitment was accomplished by screening all adolescents visiting the PCP for risk of depressive disorder (presence of at least 1 core symptom of depressive disorder for at least 2 weeks)[23] as well as through advertisements posted in and around the clinics. Study staff contacted the adolescent by phone to conduct a full eligibility assessment, which included the full Patient Health Questionnaire-Adolescent (PHQ-A) assessment (after written informed consent obtained from adolescent and parent).[23] Adolescents were compensated $75.00 (PI performed interview) or $100.00 (own PCP performed interviews, involved 1 extra visit with study team for consenting, hence higher payment).

Adolescent Inclusion and Exclusion Criteria

Participants were required to be between the ages of 14 and 21 years and experiencing persistent subthreshold depression. Persistent subthreshold depressed mood was defined as reporting 1 core symptom of depression, i.e., depressed mood, irritability, or loss of pleasure for at least a few days in the last 2 weeks at 2 assessment points: (1) the PCP screening and then again at, (2) the eligibility assessment (usually 1–2 weeks after initial PCP screening). We sought to include a heterogeneous sample of adolescents representative of those seen in primary care clinics. Adolescents were excluded only if they were undergoing active treatment (within 1 year of treatment initiation) for major depression (rural physicians could enroll individuals with borderline major depression); expressed frequent suicidal ideation or actual intent; reported prior diagnosis of schizophrenia or bipolar disorder, a pattern of conduct disorder behaviors or met full criteria for major depression, substance abuse, generalized anxiety, panic, or eating disorders based on the PHQ-A Questionnaire assessment. The PHQ is a validated primary care assessment tool used to evaluate common mental disorders based on the Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV).[23] Individuals who reported symptoms but did not meet criteria for conduct disorder, generalized anxiety disorder, or past (rather than present) substance abuse were *not* excluded. Those found to meet criteria for a mental disorder were referred for treatment.

Primary Care Intervention and Training

Physicians performed initial and follow-up interviews for each participant (Fig. 2). Randomization was blocked to assure that each clinician performed an equal or nearly equal number of interviews of each type (BA and MI). Physicians and office staff were trained using a lecture/video example format (1 hour and 15 minutes). In the BA condition, the physician takes a directive approach and advises the adolescent that the adolescent is experiencing depressed mood and that the adolescent is at risk for progressing to depressive disorder and refers the adolescent to the CATCH-IT Internet site (1–2 minutes).[24] In the MI condition, the physician used a nondirective approach to help the adolescent develop a favorable cost/benefit assessment toward completing the intervention and building resiliency. The MI group also received 3 motivational phone calls from social worker case managers (3 hours of training, licensed clinical social worker).

Internet Intervention

Both groups received equal and private (secure sign-in) access to the Internet site. All procedures were Health Insurance Portability and Accountability Act compliant. The intervention is comprised of 14 modules based on behavioral activation, cognitive behavioral therapy,[25,26] interpersonal psychotherapy,[27,28] and a community resiliency concept model.[29] These components were constructed from manuals with demonstrated efficacy in face to face delivery models using a systematic method based on principles of effective translation of preventive interventions to community settings and instructional design theory.[30–32] Developed by a multidisciplinary team consisting of primary care physicians, clinical psychologists, psychiatrists, and young adults, the intervention was intended to reduce multiple thoughts (dysfunctional thoughts, impaired problems solving, and pessimistic expectations), behaviors (procrastination, passivity, and avoidance), and interpersonal interactions (indirect communications), thought to increase vulnerability to depressive disorders. CATCH-IT also endeavors to strengthen behaviors (behavioral scheduling of pleasurable activities), thoughts (optimistic appraisals, counter thoughts, and effective problem solving), and interpersonal relations (effective social problem solving and building and engaging social support) thought to be protective against depressive disorders. In addition, acknowledging that risk factors occur within ecological contexts and across multiple domains, a parent workbook, which focuses on supporting the development of resiliency in one's adolescent was provided to the parents of adolescents under the age of 18 years to enhance the intervention effects.[33]

Consent, Enrollment, Randomization, and Blinding

Study staff completed informed consent with adolescents and their parents. Participants were randomized and their group assignment was provided to them after enrollment (consent and complete baseline questionnaire). Participants were stratified by either physician (own primary care physician conducted interviews) and/or by gender (PI conducts interviews) and randomized (using sealed envelopes prepared before the start of

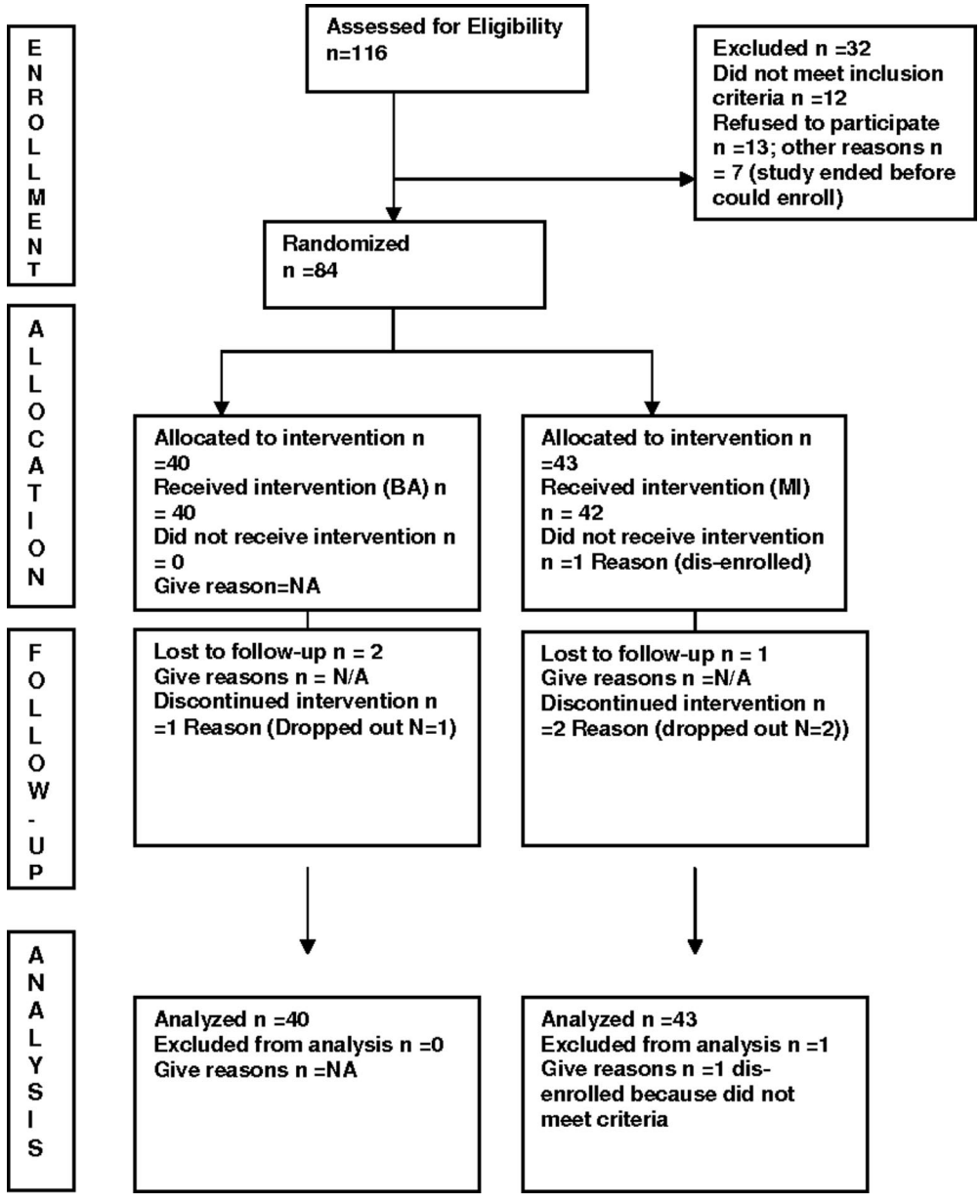

Figure 2. CONSORT study diagram.

the study) to receive either the "long interview" (MI) or the "short interview" (BA).

Sample Characteristics

We obtained information on relevant baseline characteristics to facilitate interpretation of the data. This included age, ethnicity, birth order, parents' marital status, and living situation. With regard to adolescent and parent education, we asked, "Please indicate the number of years of school completed" with response choices of high school at least 2 years, finished high school, college at least 2 years, and finished college for the adolescent and each parent (adolescent report). To understand their past history and experience with depressive disorder, we asked "Have you ever been treated for depression?" with responses that included medication or counseling. In terms of family history of depressive disorder, we asked "Have any of your family members (mother, father, sister, brothers) ever been treated for depression that lasted at least four weeks?"

Assessment of Interview Fidelity and Internet Participation

We evaluated the fidelity of interview style (BA or MI) using a MI rating system (26 taped interviews selected at random, 13 for each group).[34] For the PCP administered interviews, we used audiotapes of the actual interview with the adolescent. In the case of PI administered interviews, we used video tapes with standardized participants. We report these results as a scale that included all the key rated elements (e.g., collaboration, autonomy, and MI behaviors). We also report the mean time for each interview. For the Internet component adherence, we report the mean number of minutes on site, mean

percentage of exercises completed (defined as number of exercise response fields with any characters typed in/total number of exercise fields, the reported mean is the mean percentage for each participant for those who visited the site), and the number of characters typed for both groups. We report mean number of safety and motivational calls (motivational group only) received by participants in each group.

PHQ-A (DSM-IV) Depressive Disorder and Core Depressive Symptoms Outcomes

We report depressive disorder based on the DSM-IV using the PHQ-A.[23] The PHQ-A derived outcomes include separate categories for current prevalence of major depression, minor depression, dysthymia, or any depressive disorder and presence of core symptoms in the last 2 weeks (every day, a few days, or none).

Clinically Significant Depressive Episodes

We also report cumulative incidence of "clinically significant depressive episodes," which includes all individuals either meeting criteria for major depressive disorder according to the DSM-IV at the assessment points (N = 3) or who were diagnosed and treated for depressive disorder by a nonstudy clinician (N = 8). This variable was not defined a-priori but constructed as the study progressed to monitor the referral and follow-up of individuals identified as in need of treatment intervention. All individuals who reported worsening depressed mood or demonstrated increasing depressed mood during the study were referred for evaluation and treatment by a mental health specialist in collaboration with their PCP. Subsequent status with regard to evaluation and treatment was obtained in follow-up calls by study staff.

Center for Epidemiologic Studies Depression Scale Outcomes

We report outcomes derived from the Center for Epidemiologic Studies Depression Scale Score 10-item measure (CESD-10). The reliability and validity of the CESD has been demonstrated in several studies in adolescent populations.[35] With regard to the CESD-10 (scored as doubled to create a standard 60-point scale), we report the total CESD-10 scores and percentage of individuals above and below standard cut-offs, including asymptomatic and symptom free (women <14 and men <11) clinically significant depressed mood (CESD-10 >29 women, >23 men) and subsyndromyl depressed mood (CESD-10 14–29 women and 11–23 men).[22,35]

PHQ-A Self-Harm Risk

We report adolescent responses with regard to self-harm risk. Self-harm thoughts in the last 2 weeks included those who responded "yes" to "Have you often had thoughts that you would be better off dead, or of hurting yourself in some way in the last two weeks?" A second question asked, "Has there been a time in the past month when you have had serious thoughts about ending your life?" Response of "yes" to either of these items was considered endorsing "any self-harm thoughts." With regard to hopelessness, we report the percentage who responded "yes" to "In the last two weeks, have you often felt hopeless about the future?"

Data Collection and Training of Personnel

Outcomes were ascertained through blinded phone assessment interviews (Master's level social workers or psychologists) at 6 weeks and 12 weeks postrandomization. Each of the assessment callers received an additional 4 training sessions in the conduct of structured psychiatric interviews and suicide prevention. Assessment callers were blinded to group assignment (worked offsite, no contact with motivational caller) and the effectiveness of blinding was assessed at poststudy debriefing.

Data Analysis

We compared outcomes within groups (MI or BA) between baseline and follow-up (6 and 12 weeks) as well as between groups based on an intent-to-treat analysis. If the 6-week phone assessment call was not completed (N = 15) because of difficulty making contact with the adolescents, we used poststudy CESD (self-report) and interview reports (face-to-face debriefing with PI) at 4 to 6 weeks for study endpoints. For the 7 participants who were not available at follow-up at 6 weeks, we used the most conservative imputation method, last-observation-carried-forward to address missing data.[36] We also performed an additional analysis that did not use imputed data. For categorical outcomes with repeated measures, we used the McNemar test, and when relevant (<5 observations per cell), the exact version. For between-group comparisons, we used the Pearson χ^2 test or the Fisher exact test when there were <5 observations per cell. For continuous outcomes, we used paired *t* tests for within group comparisons between different time points and analysis of variance for between group comparisons at the same time points. We used logistic regression or analysis of covariance to adjust for any significant differences between groups at any time points for baseline differences in demographics and depressed mood. For continuous between-group data with nonnormal distribution, we used the Mann-Whitney test for comparisons. Stata Version 10.0 (College Station, TX, 2008) was used for all analyses.

Sample Size and Stopping Rules

The original sample size calculations (N = 46 in each group, N = 92 total) were based on differences in CESD-10 scores of 12.5 versus 8.5 with an estimated standard deviation value of 6.5 with 80% power and $\alpha = .05$.[17] The stopping rules included a clear advantage being demonstrated in 1 study or conversely, safety concerns in either arm. The Data Safety and Monitoring

Board met quarterly to review interim analyses, including all main outcomes and safety monitoring.

RESULTS

Sample Characteristics

We evaluated 116 individuals for participation of which 103 were eligible and 84 were enrolled and 83 are included in the analyses (Fig. 2, one immediately disenrolled because of meeting exclusion criteria). The sample was ethnically diverse (40% non-white) and approximately divided equally by gender (Table 1) with a mean age slightly above 17 years. There were no significant differences between the 2 randomization groups at baseline in gender, ethnicity, age, education, family or teen variables, pasttreatment history, family history, or baseline depressed mood/disorder.

Assessment of Interview Fidelity and Internet Participation

As shown in Table 2, interview fidelity ratings (physicians) and Internet participation levels (adolescents) were high in both groups. As expected, ratings of the Motivational Interview (MI) Fidelity scale demonstrated high fidelity to the MI model in the MI group (4.5 [SD = 0.83] out of a possible 5.0 score), whereas the brief advice (BA) interviews demonstrated low adherence to the MI model (1.02, SD = 0.07), and this comparison was statistically significant ($p = .003$). Similarly, the MI interview length was significantly longer than the interview for the BA group ($p = .002$). Preliminary qualitative review of the taped interviews revealed many adolescents provided only very short response to open-ended MI questions. With regard to Hypothesis 1, the MI group spent more time on site and typing more characters in the exercises as can be seen in Table 2. The mean number of safety calls was similar in both groups.

Depressive Disorder-Related Outcomes in Pre/Postcomparisons

The entire sample (Table 3), the MI group (Table 4), and the BA group (Table 5) all demonstrated significant reductions in overall measures of depressed mood (Center for Epidemiologic Studies Depression Scale [CESD-10] total score; see Fig. 3) and the prevalence of symptoms (Patient Health Questionnaire-Adolescent [PHQ-A] score) at 6 weeks that were sustained at 12 weeks after enrollment (Hypothesis 2). With regard to Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV) mental disorders, the incidence of major depression declined for all participants from baseline to 12 weeks (Table 3). For all participants, comparisons between baseline to 6 weeks and baseline to 12 weeks, there was a significant change (decline) in the prevalence of DSM-IV depressive disorder core symptoms. For both groups, CESD-10 symptoms declined below standard cutoff values for clinically significant depressive symptoms. The percentage of those with clinically significant depression symptoms based on CESD-10 scores significantly declined in both groups from baseline to 12 weeks (MI, 52% vs 12%, $p \leq .001$; BA, 50% vs 15%, $p < .001$). The prevalence of depressive disorder (major, minor, and combined) remained low throughout the follow-up period (not significantly different from baseline, except for major depression for all participants, 4% vs 2%, $p = .047$). Results did not differ meaningfully when imputed missing data were excluded. With regard to blinding, poststudy debriefing revealed that callers were unaware of the randomized trial design or group assignment.

Self-Harm Risk

There was a significant decline in self-harm thoughts and hopelessness for all participants from baseline to 6 weeks and from 6 weeks to 12 weeks, which is shown in Table 3. There was a change in percentage reporting "any self-harm thoughts" of borderline significance in the MI group (Table 4) (MI, 14% vs 3%, $p = .06$) but not for the BA group (Table 5), (BA, 19% vs 4%, $p = .38$). The percentage of those reporting hopelessness declined for both the MI group and BA groups between baseline and 12 weeks, but was statistically significant only for the MI group. For all participants, hopelessness declined significantly between baseline and 6 weeks and baseline and 12 weeks, and there was not a statistically significant trend toward further decline between 6 and 12 weeks.

Intent-to-Treat Between-Group Comparisons

Primary depressive disorder and symptom outcomes at 6 and 12 weeks were similar between groups, with the exception of prevalence of hopelessness at 12 weeks and the cumulative incidence of clinically significant depressive disorder at 12 weeks (Hypothesis 3). There was a significant difference in the percentage of those reporting hopelessness at 12 weeks favoring a lower percentage in the MI group of 2% versus 15% for the BA group ($p = .044$). For depressive outcomes, the primary difference between the 2 groups was in the cumulative prevalence of clinically significant depressive episodes as assessed by clinicians. which was significantly lower in the MI group at 4.65% versus 22.5% for the BA group ($p = .02$, Fig. 4). The protective effect of MI persisted for clinically significant depressive episodes (odds ratio 0.068; 95% confidence interval [CI]: 0.007–0.61) after adjustment for demographic factors, baseline depressed mood, prior history of depression treatment, and family history of depression. The relationship between MI group and lower likelihood of hopelessness did not persist after adjustment for demographic factors.

Effect Size

Baseline to 6 week effect sizes were in the moderate to large range. For PHQ-A score, effect sizes were 0.74 (95% CI: 0.43–1.05) for all participants, 0.94 (95% CI: 0.49–1.36) for the MI group, and 0.58 (95% CI: 0.14–1.03) for the BA group. With regard to the CESD-10,

Table 1. Comparison of Baseline Characteristics by Group

	Motivational (n = 43)		Brief Advice (n = 40)		Group Comparison
	(Mean)/Percent	(SD), N	(Mean)/Percent	(SD), N	*p*
Gender					.83
Male	45.45	19	41.46	17	
Female	54.55	24	58.54	23	
Ethnicity					.56
White	59.52	26	60	24	
Black	19.05	8	32.5	13	
Hispanic	7.14	3	2.5	1	
Asian	11.9	5	2.5	1	
Native American	0	0	0	0	
Other	2.38	1	2.5	1	
Age (yrs)	(17.44)	(2.17)	(17.34)	(1.96)	.89
Family information					
First born	45.24	19	48.65	19	.76
Parents marital status					.72
Married	59.52	26	50	18	
Divorced	21.43	9	19.44	7	
Separated	2.38	1	2.78	1	
Widowed	0	0	0	0	
Never married	16.67	7	27.78	10	
Teen living situation					.12
At home with parents	61.9	26.00	76.32	29	
Alone	0.00	0	5.26	2	
With friends or roomates	26.19	11	10.53	4	
Other	11.9	5	7.89	3	
Father's education					.12
High school at least 2 yrs	2.63	1	11.43	4	
Finished high school	26.32	10	40	14	
College at least 2 yrs	18.42	7	5.71	2	
Finished college	52.63	20	42.86	15	
Mother's education					.99
High school at least 2 yrs	7.69	3	5.56	2	
Finished high school	25.64	10	27.78	10	
College at least 2 yrs	28.21	11	25	9	
Finished college	38.46	15	41.67	15	
Teen's education					.92
High school at least 2 yrs	57.89	22	60	21	
Finished high school	13.16	5	11.43	4	
College at least 2 yrs	28.95	11	25.71	9	
Finished college	0	0	2.86	1	
Depression history					
History of depression or emotional disorder treatment	26.19	41	29.73	37	.73
Family history of depression	45.24	19	60.53	23	.17

(*Table continues*)

Table 1. Continued

	Motivational (n = 43)		Brief Advice (n = 40)		Group Comparison
	(Mean)/Percent	(SD), N	(Mean)/Percent	(SD), N	*p*
PHQ-A DSM-IV depressive disorder outcomes					
Depressive disorder any PHQ-A					
Major depression	2.7	1	5.26	2	.58
Minor depression	10.81	4	5.26	2	.38
Dysthymia depressed mood > half days last 6 months	2.7	1	0	0	.31

PHQ-A, Patient Health Questionnaire-Adolescent assessment; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition.

effect sizes were 0.69 (95% CI: 0.38–1.0) for all participants, 0.56 (95% CI: 0.14–0.96) for the MI group, and 0.82 (95% CI: 0.35–1.27) for the BA group. Effect sizes were similar for baseline to 12-week comparisons.

Adverse Events

There was 1 suicide attempt (1 week after enrollment) in the BA arm. This individual did not report suicidal ideation during the assessment, and the event was classified as nonresearch-related because of prior suicide attempts and psychiatric hospitalizations. The Data Safety and Monitoring Board elected to stop enrollment at 84 (intended N = 96) because they believed that individuals with past psychiatric hospitalizations or attempts should not be enrolled. They did not want to change inclusion/exclusion criteria late into the study. Also, after reviewing the data, they believed that the major study endpoints had been reached (significant pre/post changes in measures of depressed mood in both groups) and that a significant trend had emerged favoring the MI group for a lower cumulative incidence of clinically significant depressive episodes.

DISCUSSION

Using a randomized controlled trial design, we evaluated the relative effectiveness of 2 versions of a primary care/Internet-based intervention intended to prevent depressive disorders in a diverse group of adolescents in 13 US primary care practices. There was excellent adherence to the primary care interventions by physicians and participation in the Internet intervention by adolescents in both groups. Contrary to expectations, Hypothesis 2 was not confirmed. Both groups demonstrated substantial declines in depressed mood by 2 instruments. These gains were sustained at 12 weeks after randomization. Nearly half the sample was asymptomatic at 6 weeks, prevalence of clinically significant depressed mood dropped by more than half, and the incidence of any depressive disorder remained low. Motivational interview (MI) participants demonstrated higher levels of time on site and characters typed were less likely to report hopelessness or to have experienced a clinically significant depressive episode by 12 weeks. This provided partial support to Hypotheses 1 and 3.

The high level of participation in a mental health intervention (preventive or treatment) for adolescents in primary care that is reported in this study is a new finding. Measures of engagement in this study were much higher than those observed in free-standing Internet-based health and behavior change interventions. These studies report that 30% to 50% visit Internet sites and most use it for less than 10 minutes.[14,15] The per-

Table 2. Assessment of Interview Fidelity and Internet Participation

	Motivational		Brief Advice		Comparison
	Mean/(Percent)	SD, (N)	Mean/(Percent)	SD, (N)	*p*
Interview					
Motivational Interview Fidelity Rating Scale (α = 0)	4.21	0.83	1.02	0.07	0.003
Interview length (min)	5.96	1.90	1.79	0.45	0.002
Percentage visiting the site	(90.7)	(38)	(77.5)	(31)	0.13
Mean time on site (min)	143.70	109.05	98.40	124.60	0.02
Mean percentage of exercises completed	(61)	(37)	(67)	(23)	0.11
Number characters typed into exercises	3532.74	—	1915.90	2326.00	0.004
Telephone calls					
Number safety calls	2.08	1.09	2.11	0.94	0.60
Number motivational calls	2.23	0.92	NA	NA	NA

Table 3. Baseline and 6 and 12 Weeks Outcomes for All Participants (N = 83)

	Baseline		6 wk			12 wk			
	(Mean)/ Percentage	(SD), N	(Mean)/ Percentage	(SD), N	*p* Value, Baseline vs 6 wk	(Mean)/ Percentage	(SD), N	*p* Value, Baseline vs 12 wk	*p* Value, 6 wk vs 12 wk
Mood measures									
CESD-10 score	(24.46)	(12.35)	(16.46)	(16.46)	<.001	(14.79)	(9.64)	<.001	.06
PHQ-A score	(7.35)	(3.83)	(4.83)	(4.83)	<.001	(4.52)	(4.37)	<.001	.35
PHQ-A DSM-IV depressive disorder outcomes									
Depressive disorder any PHQ-A	11	9	4	3	.29	5	3	.69	1.00
Major depression	4	3	3	2	.56	2	1	.047	.06
Minor depression	8	6	1	1	.27	3	2	.24	.20
Dysthymia depressed mood > half days last 6 mo	3	1	0	0	1.00	0	0	1.00	NA
PHQ-A DSM-IV core depressive symptoms outcomes					<.001			<.001	.15
Core symptoms every day	28	21	11	8		7	4		
Core symptoms every other day	68	59	44	35		50	43		
No core symptoms	4	3	46	38		43	36		
CESD-10 outcomes					<.001			.03	.02
Clinically significant depressed mood CESD >29 women, >23 men	51	42	23	19		13	11		
Subsyndromyl depressed mood CESD 14–29 women, 11–23 men	30	25	34	28		37	31		
Symptom free CESD <14 women, <11 men	19	16	43	36		49	41		
PHQ-A self-harm risk									
Self-harm thoughts last 2 wks	13	10	4	3	.07	3	2	.047	.03
Serious thoughts of suicide last month	7	5	3	2	.69	2	1	.03	.03
Any self-harm thoughts	16	12	5	4	.04	3	2	.02	.03
Hopelessness	30	22	19	14	.01	12	7	.01	.12

CESD, Center for Epidemiologic Studies Depression Scale; PHQ-A, Patient Health Questionnaire-Adolescent assessment; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition.

Table 4. Baseline and 6 and 12 Week Outcomes for the Motivational Interview Group (N = 43)

	Baseline		6 wk			12 wk			
	(Mean)/ Percentage	(SD), N	(Mean)/ Percentage	(SD), N	*p* Value, Baseline vs 6 week	(Mean)/ Percentage	(SD), N	*p* Value, Baseline vs 12 wk	*p* Value, 6–12 wk
Mood measures									
CESD-10 score	(24.03)	(12.3)	(17.55)	(11.67)	<.001	(14.91)	(8.85)	<.001	.03
PHQ-A score	(7.53)	(3.35)	(4.69)	(3.48)	<.001	(4.64)	(4.59)	<.001	.92
PHQ-A DSM-IV depressive disorder outcomes									
Depressive disorder any PHQ-A	12	5	3	1	.25	6	2	1.00	1.00
Major depression	3	1	3	1	1.00	3	1	.25	.50
Minor depression	10	4	0	0	.21	3	1	.30	.28
Dysthymia depressed mood > half days last 6 mo	3	1	0	0	.32	0	0	NA	NA
PHQ-A DSM-IV core depressive symptoms outcomes					.07	0		.17	.61
Core symptoms every day	30	12	8	3		7	2		
Core symptoms every other day	68	30	54	23		54	25		
No core symptoms	3	1	38	16		40	16		
CESD-10 outcomes	0		0		.02	0		<.001	.01
Clinically significant depressed mood CESD >29 women > 23 men	52	23	26	12		12	5		
Subsyndromyl depressed mood CESD 14–29 women, 11–23 men	24	10	38	16		43	18		
Symptom free CESD <14 women, <11 men	24	10	36	15		45	19		
PHQ-A self-harm risk						0			
Self-harm thoughts last 2 wks	11	4	3	1	.50	3	1	.13	.25
Serious thoughts of suicide last month	8	3	0	0	.50	3	1	.25	.25
Any self-harm thoughts	14	5	3	1	.25	6	2	.06	.25
Hopelessness	27	10	21	8	.22	3	1	.02	.02

CESD, Center for Epidemiologic Studies Depression Scale; PHQ-A, Patient Health Questionnaire-Adolescent assessment; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition.

Table 5. Baseline and 6 and 12 Week Outcomes for the Brief Advice Group (N = 40)

	Baseline		6 wk			12 wk			
	(Mean)/ Proportion	(SD), N	(Mean)/ Proportion	(SD), N	*p* Value, Baseline vs 6 wk	(Mean)/ Proportion	(SD), N	*p* Value, Baseline vs 12 wk	*p* Value, 6–12 wk
Mood measures									
CESD-10 score	(25.19)	(12.57)	(15.52)	(11.03)	<.001	(14.88)	(10.53)	<.001	.64
PHQ-A score	(7.13)	(4.34)	(5)	(4.34)	.01	(4.5)	(4.18)	.003	.27
PHQ-A DSM-IV depressive disorder outcomes									
Depressive disorder any PHQ-A	10	4	6	2	1.00	4	1	.63	1.00
Major depression	5	2	3	1	1.00	1	0	.13	.50
Minor depression	5	2	3	1	.54	4	1	.37	.37
Dysthymia depressed mood > half days last 6 mo	0	0	0	0	NA	0	0	NA	NA
PHQ-A DSM-IV core depressive symptoms outcomes	0		0		<.001	0		.11	.08
Core symptoms every day	26	10	13	5		7	2.00		
Core symptoms every other day	68	26	32	12		48	20.00		
No core symptoms	5	2	55	23		45	18.00		
CESD-10 outcomes	0		0		.01	0		<.001	.75
Clinically significant depressed mood CESD >29 women >23 men	50	20	20	8		15	6		
Subsyndromyl depressed mood CESD 14–29 women, 11–23 men	35	14	30	12		33	13		
Symptom free CESD <14 women, <11 men	15	6	50	20		53	21		
PHQ-A self-harm risk	0		0			0			
Self-harm thoughts last 2 wks	16	6	5	2	.45	4	1	.63	.50
Serious thoughts of suicide last month	6	2	5	2	1.00	1	0	.25	.50
Any self-harm thoughts	19	7	8	3	.45	4	1	.38	.50
Hopelessness	31	11	18	6	.18	15	6	.56	.22

CESD, Center for Epidemiologic Studies Depression Scale; PHQ-A, Patient Health Questionnaire-Adolescent assessment; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition.

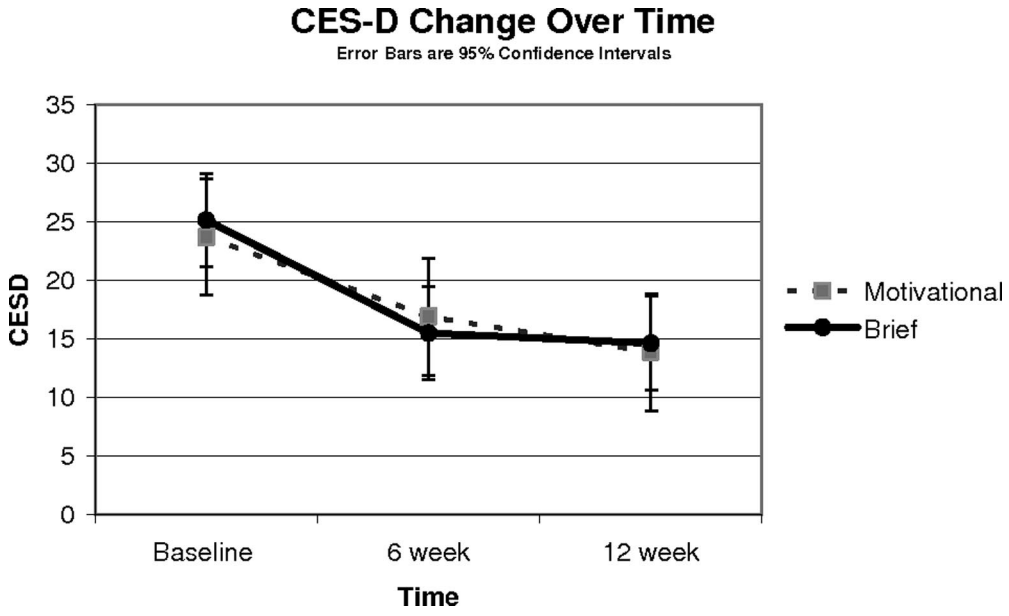

Figure 3. Depressed mood (Center for Epidemiologic Studies Depression Scale) score by intention to treat group over time.

centage of adolescents in this study visiting the Internet site at least once (90.7% in the MI group and 77.5% in the brief advice [BA] group) compares favorably with the 30% rate of attendance to at least one psychotherapy session in a well designed and executed finding in a primary care chronic disease model intervention study.[37]

The finding that the BA group participated at levels only modestly less than those in the MI group contrasted with our expectations set out in Hypothesis 1. This participation by the BA group participants could be explained by the strength of nonspecific aspects of the physician-patient relationship in persuading adolescents, the perceived authority of the physician from the adolescent perspective, high intrinsic levels of motivation in adolescents who entered the study, the relatively short version of the MI that was used, receipt of safety calls by both groups (unintentionally acting as prompts to visit the Internet site), many MI participants not receiving MI phone calls, or even the experience of the financial incentive. Although motivational interviewing has demonstrated benefits in reducing smoking, drug use, and promoting pro-health behaviors in adolescents, many of these interventions are longer than the one used in this study (>1 hour vs our 5–10 minutes).[38,39] Although physicians may have completed the manualized MI as directed with high "fidelity," the short length of the interview and observation that many adolescents provided only very short responses suggests that this "abbreviated" MI lacked some of the persuasive power of the more extended version that would be more ideal for study settings. Similarly, BA has demonstrated superiority over usual care in multiple studies and this benefit may be reflected in these data.[24]

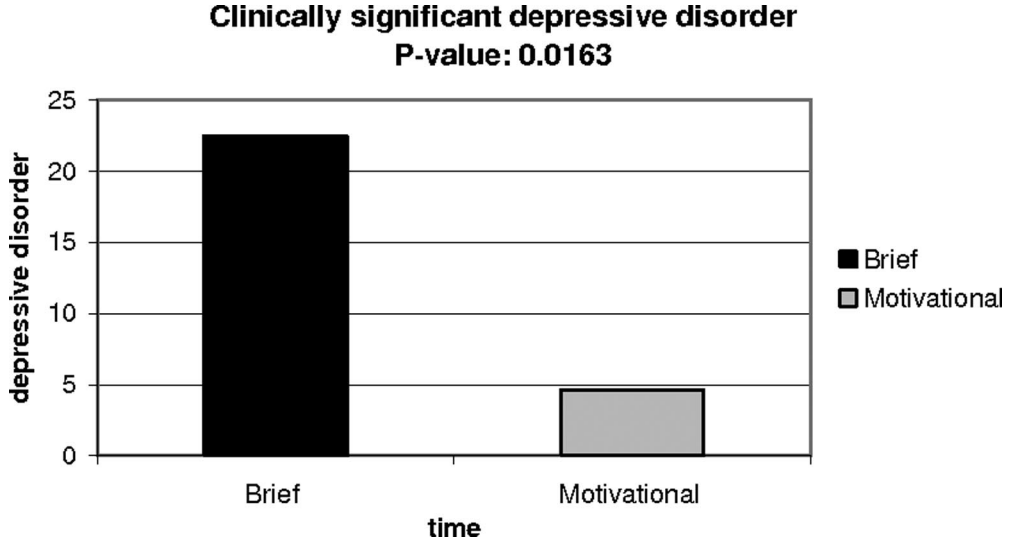

Figure 4. Cumulative incidence of clinically significant episodes of depressive disorder at 12 weeks.

The substantial declines in depressed mood and in the prevalence of clinically significant symptoms and the increase in the percentage of asymptomatic individuals in both groups is another addition to the literature relating to adolescents. The finding that there was significant decline in depressed mood with moderate to large pre/post effect sizes with a stand-alone Internet-based preventive intervention in primary care is also a new finding among adolescents. The levels of depressed mood at baseline are consistent with adolescents at risk for depressive disorders (as identified in other studies in medical settings),[20] and with adults enrolled in Internet interventions,[11,12] and are somewhat higher than those in school-based interventions.[40,41] The decline in Center for Epidemiologic Studies Depression Scale (CESD-10) scores (pre/post with moderate to large effect sizes) are comparable with those demonstrated in successful targeted preventive interventions using face-to-face group psychotherapy (this intervention was based on the same manual)[20,42] and with the MoodGym, Bluepages,[11] and Beating the Blues Internet-based interventions for adults,[12] and greater than those reported in school-based interventions.[22,41] Although there was no control group in this study (treatment as usual and attention, wait list, or supportive counseling) to whose experience, we could compare with the 2 active treatment arms, the control groups in the above referenced studies demonstrate minimal change over 6- to 12-week intervals after randomization.

The possible protective effect of motivational interviewing in reducing the cumulative incidence of clinically significant depressive episodes and 12-week prevalence of hopelessness is a new contribution and is worthy of replication. This finding could result from the enhancement of motivation to use coping skills when confronting stressors or the modestly higher levels of participation in the Internet intervention. The coupling of a primary care MI with self-directed behavior change has been demonstrated to be effective in engaging adults with workbook-based programs for depression and alcohol abuse and motivational interviewing may reduce excacerbation of problem drinking.[43–45] The potential benefit of motivational interviewing in reducing excacerbation of unwanted behaviors and symptoms may explain why the groups differed little on standard mood measures, but the BA group seems to have had more elevations of depressed mood into the clinically significant range. This may be consistent with the finding that purely "curricular" (e.g., classroom) universal preventive programs have often not proved efficacious for adolescents, whereas the same program in an interactive group model targeting mild to moderately depressed adolescents is efficacious.[20,46] Perhaps establishment of personal relevance (symptom levels) and motivation (face-to-face engagement) for prevention are necessary and essential steps for using curricular learning to build affect regulation skills.

The primary strength of this study was the incorporation of the intervention into a variety of practice settings with high fidelity and the recruitment of a diverse group of adolescents with symptom levels consistent with those found in other preventive studies in adolescents and Internet treatment studies in adults. Limitations in terms of internal validity include difficulty in obtaining timely data collection for adolescents who are often difficult to make phone contact with and reluctant to complete study questionnaires, the possibility of a favorable response bias by adolescents in all groups (i.e., becoming invested in "prevention" and thereby underreporting symptoms), and inability to blind study staff with exception of phone callers. Another limitation is the use of the Patient Health Questionnaire-Adolescents (PHQ-A)[23] rather than the Kiddie-Schedule for Affective Disorders and Schizophrenia, which is more commonly used in studies of depressive disorders in children.[47] We selected the PHQ-A because of its ease of use in primary care settings. As with any study, there may be the possibility of a Hawthorne effect where the act of participation resulted in favorable changes. A non-a-priori measure of the clinically significant depressive episode variable is an additional limitation. Similarly, long-term follow-up will be needed to determine whether this difference persists (multiyear follow-up in progress).

The reader should consider several elements of the study design in interpreting these results. In terms of external validity, the physician and clinic settings were selected via contact with major health care organizations and may have resulted in recruitment of clinicians most predisposed to successful implementation of psychosocial interventions. These physicians were not only likely more motivated than most, but may have been strongly invested in the success of the intervention based on financial incentives and recruitment into the study by respected peers and be more psycho-socially oriented than most primary care practitioners. Similarly, the adolescents may have been more motivated than most, both by their recruitment by their physician, but also by virtue of a financial incentive and, as suggested above, very invested in a favorable outcome for the study. Similarly, the short nature of the interview with many teens offering only short responses suggests they may share broad similarities in response to the intervention with other adolescents.

CONCLUSIONS

In conclusion, implementation of an Internet-based intervention for depression prevention in primary care was associated with declines in depressed mood scores, a decrease in prevalence of clinically meaningful symptom levels, and low prevalence of depressive disorder. For clinicians, the results suggest that motivational interviewing and brief advice may both be useful in engaging adolescents with mental health disorders with interventions and that motivational interviewing may confer an added protective benefit in reducing the incidence of

depressive episodes. For policy makers, an Internet-based approach may offer a low-cost way to implement depression prevention in community settings. For researchers, randomized trials comparing varying degrees of face-to-face contact coupled with Internet interventions may be essential for developing the optimal delivery model— one with the best cost/benefit ratio and that yields the most effective results. Further research, including development of more engaging Internet models, and randomized clinical trials with a treatment-as-usual care control group, will be critical in determining the full benefit of this approach. A version of the Internet intervention for use by physicians and the general public is available at http://catchit-public.bsd.uchicago.edu.

ACKNOWLEDGMENTS

This investigation was supported by a NARSAD Young Investigator Award, Robert Wood Johnson Foundation Depression in Primary Care Value Grant and a career development award from the National Institutes of Mental Health (NIMH K-08 MH 072918-01A2).

REFERENCES

1. Kessler RC, Walters EE. Epidemiology of DSM-III-R major depression and minor depression among adolescents and young adults in the National Comorbidity Survey. *Depress Anxiety.* 1998;7:3–14.
2. March J, Silva S, Petrycki S, et al. Fluoxetine, cognitive-behavioral therapy, and their combination for adolescents with depression: Treatment for Adolescents With Depression Study (TADS) randomized controlled trial. *JAMA.* 2004;292:807–820.
3. Wilcox-Gok V, Marcotte DE, Farahati F, Borkoski C. Early onset depression and high school dropout. In: Marcotte DE, Wilcox-Gox V, eds. *The Economics of Gender and Mental Illness.* Amsterdam: Elsevier; 2004.
4. Bramesfeld A, Platt L, Schwartz FW. Possibilities for intervention in adolescents' and young adults' depression from a public health perspective. *Health Policy.* 2006;79:121–131.
5. Saxena S, Jane-Llopis E, Hosman C. Prevention of mental and behavioural disorders: implications for policy and practice. *World Psychiatry.* 2006;5:5–14.
6. Bower P, Garralda E, Kramer T, Harrington R, Sibbald B. The treatment of child and adolescent mental health problems in primary care: a systematic review. *Fam Pract.* 2001;18:373–382.
7. Gibbons RD, Brown CH, Hur K, et al. Early evidence on the effects of regulators' suicidality warnings on SSRI prescriptions and suicide in children and adolescents. *Am J Psychiatry.* 2007; 164:1356–1363.
8. Richardson LP, Katzenellenbogen R. Childhood and adolescent depression: the role of primary care providers in diagnosis and treatment. *Curr Probl Pediatr Adolesc Health Care.* 2005;35:6–24.
9. Kaltenthaler E, Shackley P, Stevens K, Beverley C, Parry G, Chilcott J. A systematic review and economic evaluation of computerised cognitive behaviour therapy for depression and anxiety. *Health Technol Assess.* 2002;6:1–89.
10. Spek V, Cuijpers P, Nyklicek I, Riper H, Keyzer J, Pop V. Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: a meta-analysis. *Psychol Med.* 2007;37: 319–328.
11. Christensen H, Griffiths KM, Jorm AF. Delivering interventions for depression by using the internet: randomised controlled trial. *BMJ.* 2004;328:265.
12. Cavanagh K, Shapiro DA, Van Den Berg S, Swain S, Barkham M, Proudfoot J. The effectiveness of computerized cognitive behavioural therapy in routine care. *Br J Clin Psychol.* 2006; 45(pt 4):499–514.
13. Tylee A. Identifying and managing depression in primary care in the United kingdom. *J Clin Psychiatry.* 2006;67(suppl 6):41–45.
14. Christensen H, Griffiths KM, Korten A. Web-based cognitive behavior therapy: analysis of site usage and changes in depression and anxiety scores. *J Med Internet Res.* 2002;4:E3.
15. Santor DA, Poulin C, LeBlanc JC, Kusumakar V. Online health promotion, early identification of difficulties, and help seeking in young people. *J Am Acad Child Adolesc Psychiatry.* 2007;46: 50–59.
16. Van Voorhees BW, Ellis JM, Gollan JK, et al. Development and process evaluation of a primary care Internet-based intervention to prevent depression in emerging adults. *Prim Care Companion J Clin Psychiatry.* 2007;9:346–355.
17. Van Voorhees BW, Ellis J, Stuart S, Fogel J, Ford D. Pilot study of a primary care depression prevention intervention for late adolescents. *Can Child Adolesc Psychiatr Rev.* 2005;14:40–43.
18. Clarke G, Reid E, Eubanks D, et al. Overcoming depression on the Internet (ODIN): a randomized controlled trial of an Internet depression skills intervention program. *J Med Internet Res.* 2002;4:E14.
19. Clarke GN. Adolescent use of web-based depression treatment programs. Portland, OR; 2002.
20. Clarke GN, Hornbrook M, Lynch F, et al. A randomized trial of a group cognitive intervention for preventing depression in adolescent offspring of depressed parents. *Arch Gen Psychiatry.* 2001;58:1127–1134.
21. Horowitz JL, Garber J. The prevention of depressive symptoms in children and adolescents: a meta-analytic review. *J Consult Clin Psychol.* 2006;74:401–415.
22. Possel P, Horn AB, Groen G, Hautzinger M. School-based prevention of depressive symptoms in adolescents: a 6-month follow-up. *J Am Acad Child Adolesc Psychiatry.* 2004;43:1003–1010.
23. Johnson JG, Harris ES, Spitzer RL, Williams JB. The patient health questionnaire for adolescents: validation of an instrument for the assessment of mental disorders among adolescent primary care patients. *J Adolesc Health.* 2002;30:196–204.
24. Lancaster T, Stead L. Physician advice for smoking cessation. *Cochrane Database Syst Rev.* 2004;4:CD000165.
25. Clarke GN. *The Coping with Stress Course Adolescent: Workbook.* Portland, OR: Kaiser Permanente Center for Health Research; 1994.
26. Jacobson NS, Martell CR, Dimdjian S. Behavioral activation treatment for depression: returning to contextual roots. *Clin Psychol Sci Practice*. 2001;8:255–270.
27. Mufson L, Pollack-Dorta K, Moreau D, Weissman MM. *Interpersonal Psychotherapy for Depressed Adolescents.* New York, New York: Guilford Press; 2004.
28. Stuart S, Robertson M. *Interpersonal Psychotherapy: A Clinicians Guide.* New York, New York: Oxford University Press; 2003.
29. Bell CC. Cultivating resiliency in youth. *J Adolesc Health.* 2001; 29:375–381.
30. Nation M, Crusto C, Wandersman A, et al. What works in prevention. Principles of effective prevention programs. *Am Psychol.* 2003;58:449–456.
31. Wandersman A, Florin P. Community interventions and effective prevention. *Am Psychol.* 2003;58:441–448.
32. Gagne RM, Briggs LJ, Wager WW. *Principles of Instructional Design.* Fort Worth, TX: Harcourt Brace Jovanovich College Publishers; 1992.
33. Beardslee WR, Gladstone TR, Wright EJ, Cooper AB. A family-based approach to the prevention of depressive symptoms in children at risk: evidence of parental and child change. *Pediatrics.* 2003;112:e119–e131.
34. Bennett GA, Roberts HA, Vaughan TE, Gibbins JA, Rouse L. Evaluating a method of assessing competence in motivational interviewing: a study using simulated patients in the United Kingdom. *Addict Behav.* 2007;32:69–79.

35. Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *J Youth Adolesc.* 1991;20:149–166.
36. Baron G, Ravaud P, Samson A, Giraudeau B. Missing data in randomized controlled trials of rheumatoid arthritis with radiographic outcomes: a simulation study. *Arthritis Rheum.* 15 2008;59:25–31.
37. Jaycox LH, Miranda J, Meredith LS, Duan N, Benjamin B, Wells K. Impact of a primary care quality improvement intervention on use of psychotherapy for depression. *Ment Health Serv Res.* 2003;5:109–120.
38. McCambridge J, Strang J. The efficacy of single-session motivational interviewing in reducing drug consumption and perceptions of drug-related risk and harm among young people: results from a multi-site cluster randomized trial. *Addiction.* 2004;99:39–52.
39. Erol S, Erdogan S. Application of a stage based motivational interviewing approach to adolescent smoking cessation: the Transtheoretical Model-based study. *Patient Educ Couns.* 2008; 72:42–48.
40. Possel P, Baldus C, Horn AB, Groen G, Hautzinger M. Influence of general self-efficacy on the effects of a school-based universal primary prevention program of depressive symptoms in adolescents: a randomized and controlled follow-up study. *J Child Psychol Psychiatry.* 2005;46:982–994.
41. Horowitz JL, Garber J, Ciesla JA, Young JF, Mufson L. Prevention of depressive symptoms in adolescents: a randomized trial of cognitive-behavioral and interpersonal prevention programs. *J Consult Clin Psychol.* 2007;75:693–706.
42. Clarke GN, Hawkins W, Murphy M, Sheeber LB, Lewinsohn PM, Seeley JR. Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: a randomized trial of a group cognitive intervention. *J Am Acad Child Adolesc Psychiatry.* 1995;34:312–321.
43. Fleming MF, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL. Brief physician advice for problem drinkers: long-term efficacy and benefit-cost analysis. *Alcohol Clin Exp Res.* 2002;26: 36–43.
44. Katon W, Rutter C, Ludman EJ, et al. A randomized trial of relapse prevention of depression in primary care. *Arch Gen Psychiatry.* 2001;58:241–247.
45. Willemse GR, Smit F, Cuijpers P, Tiemens BG. Minimal-contact psychotherapy for sub-threshold depression in primary care. Randomised trial. *Br J Psychiatry.* 2004;185:416–421.
46. Clarke G, Hawkins W, Murphy M, Sheeber L. School based primary prevention of depressive symptomology in adolescents: findings from two studies. *J Adolesc Res.* 1993;8:183–204.
47. Ambrosini PJ. Historical development and present status of the schedule for affective disorders and schizophrenia for school-age children (K-SADS). *J Am Acad Child Adolesc Psychiatry.* 2000; 39:49–58.

Book Review

Boy in the World, Preschool Inclusion at Brown/Fox Point

DVD produced by Jessica Jennings, and Penny Kadmon, directed by Jessica Jennings, Visionwink Production, 44 minutes, sponsored by Rhode Island Parent Information Network 2007, available at www.ripin.org $25 includes shipping.

Boy in the World follows the story of Ronen, a young boy with Down syndrome, and his full inclusion into a regular education preschool classroom. The film begins with comments by John Susa, PhD, of Rhode Island's Sherlock Center on Disability, who states that a study by the US Department of Education in the 1980s demonstrated that the only variable predictive of positive outcomes for students in Special Education programs was the time they spent in inclusion. We are then shown everyday scenes of Ronen interacting with peers, teachers, and therapists. These scenes are interspersed with comments by teachers, administrators, therapists, and Ronen's parents, which provide additional perspective. School staffs speak about the rewards and challenges of inclusion. They describe how they meet challenges such as making adaptations to the curriculum, providing all services within the classroom, and maintaining close communication between classroom teachers and service providers. They and Ronen's parents describe how, by having the same behavioral expectations for him as for other children, they are teaching him how to function in the society he will live in as an adult.

Those we see in the film conclude that inclusion is a worthwhile experience for all involved. They point out that in addition to the benefits to Ronen, there are benefits to the other children in the classroom. The children learn that everyone has areas of strength and weakness. The film does not touch on other areas such as the cost of implementing a full inclusion program or the reaction of other parents, which can play a factor in the success and feasibility of such as program. Overall, however, the viewer is shown a compelling story. *Boy in the World* gives an excellent example of how inclusion can succeed admirably with the support and investment of families, teachers, service providers, and administrators. Providers and parents interested in understanding both the challenges and opportunities of inclusion for young children will want to view this DVD.

Angela A. Huang, MD
Department of Pediatrics
School of Medicine at Amarillo
Texas Tech University Health Sciences Center
Amarillo, TX

