Cognitive Therapy for the Prevention of Suicide Attempts
A Randomized Controlled Trial

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I N 2002, SUICIDE WAS THE FOURTH leading cause of death for adults between the ages of 18 and 65 years with approximately 25 000 suicides for this age group in the United States.[1] As recommended by the *National Strategy for Suicide Prevention*, one public health approach for the prevention of suicide involves identifying and providing treatment for those individuals who are at high risk for suicide.[2]

Attempted suicide is one of the strongest risk factors for completed suicide in adults. A meta-analysis of follow-up mortality studies estimated that individuals who attempted suicide were 38 to 40 times more likely to commit suicide than those who had not attempted suicide.[3] Prospective research also has supported the validity of attempted suicide as a risk factor for eventual suicide.[4-7]

Empirical evidence for treatments that effectively prevent repetition of suicide attempts is limited.[8] Randomized controlled trials of individuals who have attempted suicide have used intensive follow-up treatment or intensive case management,[9-11] interpersonal psychotherapy,[12] or cognitive behavior therapy.[13] Several studies supporting the efficacy of cognitive behavior therapy or problem-solving therapy for reducing suicide behavior[13,14] have highlighted the need for randomized controlled trials with sufficient power to detect treatment differences.[15]

Context Suicide attempts constitute a major risk factor for completed suicide, yet few interventions specifically designed to prevent suicide attempts have been evaluated.

Objective To determine the effectiveness of a 10-session cognitive therapy intervention designed to prevent repeat suicide attempts in adults who recently attempted suicide.

Design, Setting, and Participants Randomized controlled trial of adults (N=120) who attempted suicide and were evaluated at a hospital emergency department within 48 hours of the attempt. Potential participants (N=350) were consecutively recruited from October 1999 to September 2002; 66 refused to participate and 164 were ineligible. Participants were followed up for 18 months.

Intervention Cognitive therapy or enhanced usual care with tracking and referral services.

Main Outcome Measures Incidence of repeat suicide attempts and number of days until a repeat suicide attempt. Suicide ideation (dichotomized), hopelessness, and depression severity at 1, 3, 6, 12, and 18 months.

Results From baseline to the 18-month assessment, 13 participants (24.1%) in the cognitive therapy group and 23 participants (41.6%) in the usual care group made at least 1 subsequent suicide attempt (asymptotic z score, 1.97; P=.049). Using the Kaplan-Meier method, the estimated 18-month reattempt-free probability in the cognitive therapy group was 0.76 (95% confidence interval [CI], 0.62-0.85) and in the usual care group was 0.58 (95% CI, 0.44-0.70). Participants in the cognitive therapy group had a significantly lower reattempt rate (Wald χ^2_1=3.9; P=.049) and were 50% less likely to reattempt suicide than participants in the usual care group (hazard ratio, 0.51; 95% CI, 0.26-0.997). The severity of self-reported depression was significantly lower for the cognitive therapy group than for the usual care group at 6 months (P=.02), 12 months (P=.009), and 18 months (P=.046). The cognitive therapy group reported significantly less hopelessness than the usual care group at 6 months (P=.045). There were no significant differences between groups based on rates of suicide ideation at any assessment point.

Conclusion Cognitive therapy was effective in preventing suicide attempts for adults who recently attempted suicide.

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This study was designed with adequate power to determine whether a brief psychosocial intervention could reduce the rate of repetition for suicide attempts over an 18-month interval, a longer period than previously reported in most randomized controlled trials. Cognitive therapy was selected as the psychosocial intervention for this study because it builds on clinical investigations regarding the psychopathological characteristics of suicide behaviors[16] and it has been shown to be successful in a wide variety of psychiatric disorders.[17] We examined 3 hypotheses. First, the hazard ratio for another suicide attempt would be lower in the cognitive therapy group compared with the usual care group. Second, during follow-up, the proportion of participants who attempt suicide would be lower in the cognitive therapy group compared with the usual care group. Third, participants in the cognitive therapy group would have significantly lower scores on measures of depression, hopelessness, and suicide ideation during follow-up compared with the participants in the usual care group.

METHODS

Participants

The study sample consisted of 120 individuals who attempted suicide and who received a medical or psychiatric evaluation within 48 hours of the attempt. Individuals were initially identified in the emergency department following a suicide attempt or intentional self-injury (eg, overdose, laceration, gunshot wound) at the Hospital of the University of Pennsylvania, Philadelphia.[18] After the patients were medically cleared or stabilized in the emergency department, they were transferred to the psychiatric emergency department. Eligible individuals were identified by research assistants in the emergency department during the initial evaluation and through screening intake logs at the psychiatric emergency department.

Individuals admitted to an inpatient unit of the hospital were contacted by research assistants after obtaining permission from the attending physician. Potential participants who were not admitted to an inpatient unit and discharged were contacted by telephone. A brief interview was conducted to determine if an attempt had occurred with verbal consent obtained for the interview. A *suicide attempt* was defined as "a potentially self-injurious behavior with a nonfatal outcome for which there is evidence, either explicit or implicit, that the individual intended to kill himself or herself."[19(p247)] The Suicide Intent Scale was used to ascertain suicide intent.[20] For those acts in which it was not clear whether a self-harmful act was an actual suicide attempt, study investigators were consulted to achieve consensus regarding an individual's study eligibility.

A complete description of the study was provided to potential participants and signed written informed consent was obtained by study personnel. The institutional review board at the University of Pennsylvania and an independent data and safety monitoring board approved and monitored the research protocol.

Inclusion criteria consisted of a suicide attempt within 48 hours prior to being evaluated at the emergency department; age of 16 years or older; ability to speak English; ability to complete a baseline assessment; ability to provide at least 2 verifiable contacts to improve tracking for subsequent assessments; and ability to understand and provide informed consent. Individuals were excluded if they had a medical disorder that would prevent participation in an outpatient clinical trial. Individuals were not asked or required to discontinue any form of mental health or substance abuse treatment prior to entering the study.

An in-person baseline interview and self-report inventories were administered within 3 days but no longer than 3 weeks after the suicide attempt by trained clinicians who held master's or doctoral degrees. Psychiatric diagnoses were determined by clinicians trained in administering the Structured Clinical Interview for Axis I of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*[21] and by a study psychologist who reviewed symptoms. Subsequent in-person assessments were conducted independently of study therapists at 1, 3, 6, 12, and 18 months following the baseline interview.

Random Assignment

Participants (N=120) were randomly assigned to cognitive therapy or usual care. A computerized randomization sequence programmed to prohibit more than 7 consecutive assignments in either treatment group was used. Although blinded assessments were conducted at baseline, blinded follow-up evaluations were not possible for 2 reasons. First, the evaluation of a suicide attempt involved an investigation of the circumstances preceding the self-harmful act and the postattempt use of mental health services, which presented clues to the group assignment. Second, information regarding treatment assignment was often essential for adequate clinical management of acutely suicidal individuals.[22,23]

Comparison Conditions

Participants in the cognitive therapy intervention were scheduled to receive 10 outpatient cognitive therapy sessions specifically developed for preventing suicide attempts.[24-26] The cognitive therapy sessions were provided on a weekly or biweekly basis or as needed. The central feature of this psychotherapy was the identification of proximal thoughts, images, and core beliefs that were activated prior to the suicide attempt. Cognitive and behavioral strategies were applied to address the identified thoughts and beliefs and participants were helped to develop adaptive ways of coping with stressors. Specific vulnerability factors that were addressed included hopelessness, poor problem solving, impaired impulse control, treatment noncompliance, and social isolation. A relapse prevention task was conducted near the end of therapy. The ob-

jective of this task was to prime, in session, the specific thoughts, images, and feelings associated with prior suicide attempts and to determine if participants were able to respond to their problems in an adaptive way. Successful completion of this task was justification for completion of the treatment. If the participant failed to respond adaptively, additional sessions were provided. All cognitive therapy sessions were audiotaped and each therapist was rated for competency using the Cognitive Therapy Rating Scale.[27] Feedback was provided to therapists biweekly or as needed if therapists did not adhere to the treatment manual.

Participants in both study groups received usual care from clinicians in the community as well as tracking and referral services from the study case managers.[28] In both conditions, study case managers obtained detailed contact information regarding participants' family, friends, clergy, probation officers, and mental health workers. These individuals were contacted by case managers with permission from the participants if they could not be contacted. Case managers contacted participants throughout the follow-up period on a weekly to monthly basis by mail and by telephone using a community voice mail account. Additionally, case managers offered referrals to community mental health treatment, addiction treatment, and social services (as needed during the follow-up period) and obtained feedback from participants regarding their contact with these services. Although participants in both conditions were encouraged to seek additional mental health and substance abuse treatment in the community, the study did not cover the costs of these interventions.

Outcome Measures

The primary outcome measure was the occurrence of a suicide attempt during the follow-up period. The interviewer assessed suicide attempts by participant report. The clinician-administered 24-item Hamilton Rating Scale for Depression (HRSD)[29] and

the self-reported 21-item Beck Depression Inventory II[30] were used to assess the severity of depression. Hopelessness was measured by the Beck Hopelessness Scale, which consisted of 20 true or false statements designed to assess the extent of positive and negative beliefs about the future.[31] The 19-item Scale for Suicide Ideation evaluated the intensity of the participant's specific attitudes, behaviors, and plans to commit suicide.[32] Because the distribution of scores for the Scale for Suicide Ideation is highly skewed, it was dichotomized at 0 (vs >0) to indicate any current suicide ideation.[33]

Safety Assessment and Management

At any point in the study, participants who were suspected to be at risk for suicide were asked the following questions by a doctoral-level clinician: (1) Do you have a desire to kill yourself that you think you might act on? (2) Do you have a plan for killing yourself and intend to carry the plan out? Participants were also identified as high risk if they reported a moderate to severe level of suicide intent as indicated on other self-report measures or during a clinical interview. A participant randomized to either study group was referred or transferred to the emergency department if the clinician determined that he/she was at imminent risk for suicide and could not be safely treated on an outpatient basis. Participants who were hospitalized during the follow-up period were allowed to continue with treatment and assessments after they were discharged. All suicide attempts and deaths were reported to the institutional review board and data and safety monitoring board.

### Sample Size and Power Estimates

To test the primary hypothesis that the mean time to the next suicide attempt during the follow-up period is different between treatment groups, a priori power calculations were based on the results of a previous randomized controlled trial with a similar protocol.[13] The current sample size (N = 120) provided

at least 80% power to detect a hazard ratio of 0.44 in terms of time to next suicide attempt between treatment groups using an assumed repeat attempt rate of 25.8% during the follow-up period and a 2-sided α level of .05.[34]

Statistical Methods

Data entry and verification, data transfer, confidentiality and security, and data analyses were conducted under the direction of the principal investigators and statisticians. All effectiveness analyses were conducted using the intent-to-treat (ITT) principle, which included all randomized participants in the treatment groups to which they were assigned regardless of their protocol adherence, actual treatment received, and/or subsequent withdrawal from treatment or assessment. Descriptive statistics for assessment scores at baseline were compared between treatment groups to determine if any variables needed to be included as covariates in the primary analyses of treatment effects.

Survival analyses were conducted using the Cox proportional hazard regression model[35] to test for the effectiveness of the intervention on the time to the first repeat suicide attempt while controlling for censoring effects due to the differential length of follow-up or the completion of follow-up without a repeat suicide attempt. Length of follow-up for each participant was represented by either the number of days between the date of baseline evaluation and the date of the repeat suicide attempt or the end of the follow-up period, whichever came first. Single and multiple covariate Cox proportional hazards regression models were used. Associated Wald χ^2 tests were conducted using a significance level of .05 (2-sided) to test the null hypothesis that the 2 reattempt-free probabilities were the same for the cognitive therapy and usual care groups at any time point. To confirm the single covariate Cox model results, the results of the log-rank test also were reported. Estimates of participants making at least 1 subsequent suicide attempt before 18 months and

Figure 1. Flow of Participants Through the Trial
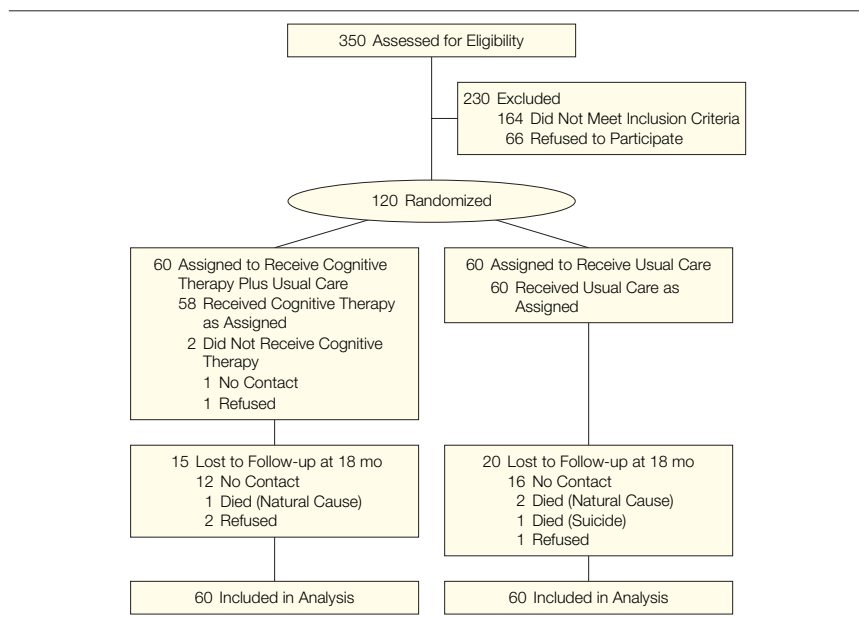
reattempt-free probabilities at any time point were derived by the Kaplan-Meier method.[36] The between-group difference in the proportion of participants making at least 1 repeat suicide attempt by 18 months was evaluated using the asymptotic properties of the Kaplan-Meier estimators of survival probabilities. This method was chosen to account for dropouts based on the ITT principle.

To examine whether cognitive therapy reduced suicide ideation, hopelessness, and depression more than usual care, comparisons between the 2 study groups were conducted on continuous measures. Analyses of repeated-measures data were performed to determine and characterize the patterns of change over time between treatment groups. Although procedures were developed for maintaining follow-up during the assessment period, missing data and loss to follow-up are inevitable. By using latent random-effects variables for each participant, hierarchical linear (or logit) modeling permits estimation of changes in repeated measures without necessitating last observation carried forward or exclusion of participants with missing data. We used SAS software version 8 (SAS Institute Inc, Cary, NC) for all statistical analyses.

Tests and estimates of ITT differences for both continuous and binary outcomes were based on longitudinal models with random effects. The longitudinal random-effects models included main effect and interaction terms that represented ITT contrasts between groups at each follow-up visit. Using data from all participants regardless of dropout or treatment adherence status, this modeling allowed testing of ITT differences at each follow-up visit separately and together with increased power while accounting for group differences with respect to participants who dropped out. We first tested for significant ITT differences in linear trend for each outcome. However, the linear trend model did not fit any of the outcomes well so we relied on separate ITT tests of the 5 follow-up visits using separate visit-treatment interactions at each visit and also jointly across all 5 visits using an omnibus visit-treatment interaction test with 5 degrees of freedom. The omnibus statistic tests for significant ITT contrasts at any particular follow-up visit

using a time group interaction with 5 degrees of freedom.[37-39] To assess ITT differences with respect to dropouts, we used a discrete time survival model.[40] Two-sided *P* values are presented unadjusted for multiple comparisons so that adjustment of choice, such as using the Bonferroni adjustment, may be performed by the reader.

RESULTS

Enrollment Statistics

Over a 2-year period (October 2000 to September 2002), 350 individuals were invited to participate (**FIGURE 1**). Of the 230 who were excluded, 164 (71%) did not meet inclusion criteria and 66 (27%) declined to participate in the study. For most excluded individuals, we determined that the self-harmful act was not a suicide attempt. Of those who declined to participate, 36 (55%) refused to provide a reason, 21 (32%) did not wish to receive treatment, 4 (6%) declined for emotional reasons, and 5 (8%) declined due to situational factors (eg, no child care, no transportation).

Of 186 eligible participants, 120 (65%) were enrolled in the study. The only demographic variable that was found to be related to participation was ethnicity ($\chi^2_1 = 4.9$; $P = .03$). Specifically, blacks were 1.2 times (odds ratio, 1.2; 95% confidence interval [CI], 1.0-1.5) more likely than whites and other minorities to participate in the clinical trial.

Demographic and Clinical Characteristics

Participant age ranged from 18 to 66 years and 61% were female. As assessed by participant self-report for the purpose of describing the racial characteristics of the sample, 60% were black, 35% were white, and 5% were Hispanic, Native American, or unspecified. The racial composition of the sample is similar to the racial composition of the general population in the Philadelphia area where the Hospital of the University of Pennsylvania is located. At baseline, 77% had a major depressive disorder and 68% had a substance use disorder. Specific substance

use disorders included alcohol (30%), cocaine (23%), and heroin (17%) dependence. Most participants (85%) had more than 1 psychiatric diagnosis. The majority of participants (58%) attempted suicide by overdosing using prescription, over-the-counter, or illicit substances. Other methods were penetrating injury (17%); jumping (7%); and hanging, shooting, or drowning (4%). Participants in the cognitive therapy and usual care groups did not differ significantly on demographic variables (TABLE 1). The groups did not differ on the incidence of major depressive disorder, substance use disorder, or prevalence of suicide ideation at baseline.

Dropout Rates

The cumulative dropout rate at the 1-month assessment was 10% (n=6) for the cognitive therapy group and 7% (n=4) for the usual care group; 3-month assessment, 13% (n=8) and 10% (n=6); 6-month assessment, 17% (n=10) and 13% (n=8); and 12-month assessment, 18% (n=11) and 18% (n=11), respectively. The cumulative dropout rate at the 18-month follow-up assessment was 25% (n=15) for the cognitive therapy group and 34% (n=20) for the usual care group (Figure 1). Using a discrete time survival model,[40] drop-out rates did not differ across all 5 follow-up assessments (P=.36). The proportion of participants with missed assessment visits was similar between groups; differences did not exceed 8.3% at any visit (P>.30).

Repeat Suicide Attempts

From the baseline to the 18-month assessment, 13 participants (estimated proportion: 24.1%) in the cognitive therapy group and 23 participants (estimated proportion: 41.6%) in the usual care group made at least 1 subsequent suicide attempt (asymptotic z score=1.97; P=.049). Using the Kaplan-Meier method, the estimated 6-month reattempt-free probability in the cognitive therapy group was 0.86 (95% CI, 0.74-0.93) and in the usual

care group was 0.68 (95% CI, 0.54-0.79). In addition, the estimated 18-month reattempt-free probability in the cognitive therapy group was 0.76 (95% CI, 0.62-0.85) and in the usual care group was 0.58 (95% CI, 0.44-0.70). Kaplan-Meier survival curves illustrate the differences in repeat suicide attempts between groups over time (FIGURE 2). Results indicated that participants in the cognitive therapy group (Wald χ_1^2=3.9; P=.049; log-rank χ_1^2=4.0; P=.045) had a significantly lower reattempt rate than those in the usual care group (log-rank χ_1^2=4.0; P=.045). The hazard ratio from this analysis was 0.51 (95% CI, 0.26-0.997), which suggests that participants in the cognitive therapy group were 50% less likely to attempt suicide during the follow-up period than participants in the usual care group. Additional multiple Cox re-

gression models revealed that the impact of cognitive therapy remained significant even when controlling for the effects of other outcome measures (ie, Beck Depression Inventory, Beck Hopelessness Scale, HRSD, Scale for Suicide Ideation) at baseline (hazard ratio, 0.47 [95% CI, 0.24-0.93]; P=.03). Although the effect of cognitive therapy showed only a trend toward significance when controlling for age, sex, and minority status (hazard ratio, 0.52 [95% CI, 0.26-1.02]; P=.06), there was only a 2% difference between the adjusted and unadjusted hazard ratios. All repeat suicide attempts were determined to be adverse events that were not related to the study. The total number of cognitive therapy sessions received was not related to repeat suicide attempt status (OR, 1.08 [95% CI, 0.97-1.92]; χ_1^2=2.11; P=.14).

Table 1. Baseline Demographic and Clinical Characteristics*

	Cognitive Therapy (n = 60)	Usual Care (n = 60)	P Value
Women	36 (60.0)	37 (61.7)	.99
Age, mean (SD), y	35.1 (10.1)	34.9 (10.5)	.90
Minority race/ethnicity	42 (70.0)	36 (60.0)	.34
High school education	35 (57.9)	38 (63.3)	.58
Employed	14 (23.3)	8 (13.3)	.24
Married	9 (15.5)	4 (6.9)	.12
Multiple suicide attempts	44 (73.3)	43 (71.7)	.99
Diagnosed†			
Major depressive disorder	47 (78.3)	45 (75.0)	.83
Substance use disorder	44 (73.3)	37 (61.7)	.24

*Data presented as No. (%) except as noted.
†According to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*.

Figure 2. Survival Curves of Time to Repeat Suicide Attempt

Log-Rank P=.045

No. at Risk

	0	6	12	18
Cognitive Therapy	60	45	37	16
Usual Care	60	36	28	11
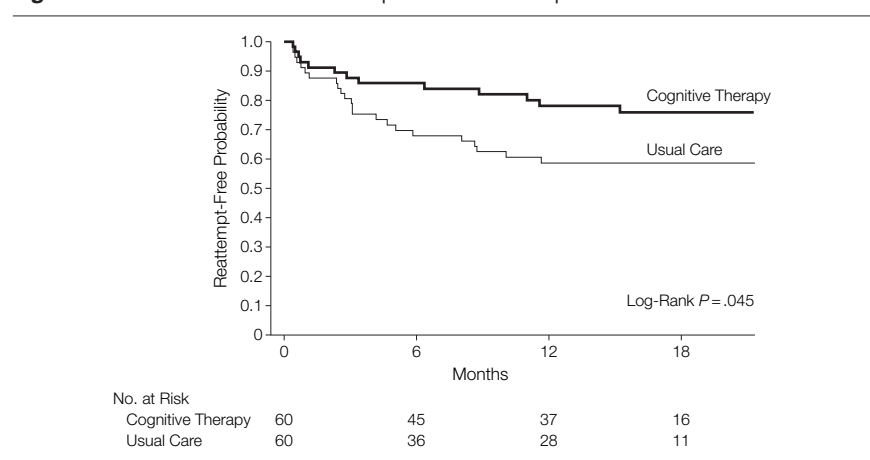
Secondary Outcome Measures

The impact of cognitive therapy on measures of depression, hopelessness, and suicide ideation was also examined from 1 to 18 months following the baseline assessment (TABLE 2). The severity of depression (measured by the Beck Depression Inventory) was significantly lower for the cognitive therapy group than for the usual care group at 6-month ($P=.02$), 12-month ($P=.009$), and 18-month ($P=.046$) assessment points, yielding a significant overall omnibus test ($\chi^2_5=29.9$; $P<.001$). Although the overall omnibus test for the HRSD was significant ($\chi^2_5=22.2$; $P<.001$), no significant differences between groups on HRSD were observed at any assessment point. However, there was significantly less hopelessness in the cognitive therapy group than in the usual care group at 6 months ($P=.045$) and the overall omnibus test for the Beck Hopelessness Scale was significant ($\chi^2_5=19.1$;

$P<.001$). There were no differences between groups on the rates of suicide ideation overall (Scale for Suicide Ideation total score >0; $\chi^2_5=1.2$; $P=.95$) or at any assessment visit.

Treatment

Participants in the cognitive therapy group participated in a mean (SD) of 8.92 (5.97) cognitive therapy sessions (range, 0-24). Thirty participants (50%) received 10 or more cognitive therapy sessions. Additional cognitive therapy sessions were provided until participants completed the relapse prevention task successfully. Twenty-eight participants (46.7%) received 1 to 9 sessions and 2 participants (3.3%) did not receive any cognitive therapy. Of those participants who received 0 to 9 sessions, 21 participants could not be located and 9 participants refused treatment. Additional (nonstudy) treatments received by both groups are described in TABLE 3. There were no

significant differences between the usual care and cognitive therapy groups with respect to the proportion of participants receiving psychotropic medication overall (53.6% vs 51.7%; $\chi^2_1=0.3$; $P=.65$) or addiction treatment overall (12.9% vs 15.8%; $\chi^2_1=1.1$; $P=.36$) or at any assessment point. However, there was a trend for a larger proportion of the usual care group to participate in nonstudy psychotherapy treatment overall (27.1% vs 20.6%; $\chi^2_1=3.6$; $P=.07$) and at the 1-month assessment, specifically ($P=.07$). In addition, a significantly larger proportion of the usual care group compared with the cognitive therapy group did not receive any type of psychotherapy (cognitive therapy or other psychotherapy), medication, or addiction treatment overall (31.6% vs 16.8%; $\chi^2_1=10.0$; $P<.001$) or at 1-month ($P<.001$), 3-month ($P<.001$), or 6-month ($P<.001$) assessments. There was no significant difference between

Table 2. Impact of Cognitive Therapy on Secondary Outcome Measures

		Assessment Period, mo				
	Baseline	1	3	6	12	18
Beck Depression Inventory II						
Cognitive therapy, mean (SD)	32.87 (12.03)	21.80 (15.48)	19.96 (14.82)	13.82 (12.34)	13.59 (13.40)	14.51 (12.90)
Usual care, mean (SD)	31.03 (15.70)	21.66 (15.14)	21.19 (14.92)	19.33 (15.61)	18.73 (14.87)	18.18 (13.75)
Effect (95% CI)		−0.3 (−5.1 to 4.5)	−2.2 (−7.0 to 2.60)	−6.0 (−10.9 to −1.1)	−6.7 (−11.7 to −1.7)	−5.4 (−10.6 to −0.1)
t Score		0.13	0.89	2.41	2.63	2.00
P value		.90	.37	.02	.009	.046
Hamilton Rating Scale for Depression						
Cognitive therapy, mean (SD)	26.88 (10.04)	19.89 (10.88)	17.40 (11.22)	14.70 (11.05)	15.08 (11.44)	13.09 (9.96)
Usual care, mean (SD)	26.08 (10.62)	19.05 (12.65)	19.33 (11.13)	17.83 (13.27)	16.27 (13.82)	14.55 (11.64)
Effect (95% CI)		0.9 (−3.2 to 5.0)	−2.1 (−6.2 to 2.1)	−3.5 (−7.7 to 0.7)	−3.0 (−7.3 to 1.3)	−3.0 (−7.5 to 1.5)
t Score		0.44	0.98	1.64	1.37	1.13
P value		.66	.33	.10	.17	.19
Beck Hopelessness Scale						
Cognitive therapy, mean (SD)	11.48 (5.45)	9.09 (5.91)	7.45 (4.99)	5.57 (4.47)	6.57 (5.76)	6.07 (5.28)
Usual care, mean (SD)	11.81 (6.25)	8.71 (6.59)	9.06 (6.98)	8.21 (6.96)	8.22 (6.77)	7.24 (6.35)
Effect (95% CI)		0.8 (1.1 to 2.6)	−1.3 (−3.5 to 0.9)	−2.0 (−4.0 to 0)	−1.7 (−4.0 to 0.5)	−1.3 (−3.7 to 1.0)
t Score		0.84	1.16	2.01	1.51	1.14
P value		.40	.24	.045	.13	.25
Scale for Suicide Ideation*						
Cognitive therapy, No. (%)	60 (65.0)	54 (44.4)	52 (38.5)	50 (24.0)	49 (20.4)	45 (15.6)
Usual care, No. (%)	60 (65.0)	56 (46.4)	54 (44.4)	52 (30.8)	49 (24.5)	40 (22.5)
OR (95% CI)		1.0 (0.4 to 2.7)	0.8 (0.3 to 2.1)	0.7 (0.2 to 2.4)	0.8 (0.2 to 2.4)	0.6 (0.2 to 2.2)
P value		.99	.66	.49	.63	.41

Abbreviations: CI, confidence interval; OR, odds ratio.
*Indicates greater than zero.

groups in the proportion of participants who were determined to be an imminent risk and referred or transferred to the emergency department by study investigators during the follow-up period (13.3% of cognitive therapy group vs 8.3% of usual care group; $\chi^2_1 = 0.8$; $P = .38$).

COMMENT

The results of this randomized controlled trial indicated that a relatively brief cognitive therapy intervention was effective in preventing suicide attempts for adults who recently attempted suicide. Specifically, participants in the cognitive therapy group were approximately 50% less likely to attempt suicide during the follow-up period than participants in the usual care group.

The severity of depression as measured by the Beck Depression Inventory was significantly lower for the cognitive therapy group than for the usual care group at the 6-month, 12-month, and 18-month assessments. Although there were no significant differences in the severity of depression as measured by the HRSD at any assessment point, the superiority of cognitive therapy was significant overall. The discrepancy between measures of depression severity across assessment points may be due to differences in the type of assessment methods (self-report vs clinician-administered).[41]

The cognitive therapy group also had significantly less hopelessness than the usual care group at 6 months. Previous research has indicated that participants whose hopelessness did not significantly change with psychiatric treatment may be more likely to commit suicide.[42] Moreover, results from a previous clinical trial indicated that stable levels of hopelessness in individuals with remitted depression are more predictive of a suicide attempt than a high level of hopelessness at any 1 time point.[43]

These results are consistent with a previous randomized controlled trial of suicide attempters that compared cognitive behavior therapy and usual care.[13] That study found that cognitive therapy

had an impact on the proportion of participants repeating a suicide attempt at the 6-month follow-up period. Similar to our results, the previous study reported that cognitive therapy participants improved significantly more on self-reported measures of depression and hopelessness but not suicide ideation. Although both groups demonstrated decreased suicide ideation in the present study, the differential impact of cognitive therapy on depression and hopelessness suggests that improvement on these variables may be more highly associated with a reduced risk of repeat suicide attempts. Given the results of the present and previous studies, further research that examines the effectiveness

of the techniques specific to cognitive therapy is warranted.

The generalizability of these findings may be limited to suicide attempters who reside in an urban setting and who are evaluated at an emergency department. In addition, given that a larger proportion of the sample who consented to the study was black, additional research is required to investigate this possible participation bias.

As indicated by a sensitivity analysis, another study limitation concerns the possibility that small changes in the number of suicide attempts during the follow-up period may affect the significance of the results. However, the results of our study are strengthened by

Table 3. Types of Treatment Received by Participants in the Cognitive Therapy Group vs the Usual Care Group Over Time*

	Unadjusted Estimates, No. (%)		Analysis for Cognitive Therapy vs Usual Care	
	Cognitive Therapy (n = 60)	Usual Care (n = 60)	OR (95% CI)	P Value
At 1 mo				
Cognitive therapy	55 (91.7)	0	1.0	
Other psychotherapy	5 (9.3)	13 (23.2)	0.3 (0.1-1.0)	.07
Medication	36 (60.0)	42 (70.0)	0.6 (0.3-1.4)	.34
Addiction treatment	7 (13.0)	6 (10.7)	1.2 (0.4-4.0)	.77
No treatment	1 (1.7)	13 (23.2)	0.1 (0-0.5)	.001
At 3 mo				
Cognitive therapy	53 (88.3)	0	1.0	
Other psychotherapy	12 (23.1)	20 (37.0)	0.5 (0.2-1.2)	.14
Medication	34 (56.7)	39 (65.0)	0.7 (0.3-1.5)	.46
Addiction treatment	10 (19.2)	11 (20.4)	0.9 (0.4-2.4)	>.99
No treatment	1 (1.8)	12 (22.2)	0.1 (0-0.5)	.001
At 6 mo				
Cognitive therapy	37 (61.7)	0	1.0	
Other psychotherapy	9 (18.0)	15 (28.8)	0.5 (0.2-1.4)	.25
Medication	28 (46.7)	26 (43.3)	1.1 (0.6-2.4)	.86
Addiction treatment	11 (22.0)	7 (13.5)	1.8 (0.6-5.1)	.31
No treatment	6 (12.0)	21 (40.4)	0.2 (0.1-0.6)	.001
At 12 mo				
Cognitive therapy	21 (35.0)	0	1.0	
Other psychotherapy	13 (26.7)	13 (27.1)	1.0 (0.4-2.4)	>.99
Medication	21 (35.0)	23 (38.3)	0.9 (0.4-1.8)	.85
Addiction treatment	7 (14.3)	6 (12.5)	1.2 (0.4-3.8)	>.99
No treatment	14 (27.5)	21 (43.8)	0.5 (0.2-1.1)	.10
At 18 mo				
Cognitive therapy	3 (5.0)	0	1.0	
Other psychotherapy	12 (26.7)	12 (20.0)	0.8 (0.3-2.2)	.81
Medication	20 (33.3)	18 (30.0)	1.2 (0.5-2.5)	.85
Addiction treatment	5 (11.1)	3 (7.5)	1.5 (0.3-6.9)	.72
No treatment	20 (43.5)	17 (42.5)	1.0 (0.4-2.5)	>.99

Abbreviations: CI, confidence interval; OR, odds ratio.
*Treatment categories are not mutually exclusive.

the consistency of the results across several outcomes (ie, suicide attempts, depression, and hopelessness).

An important goal of the National Strategy for Suicide Prevention is to improve community linkages with primary care and mental health/substance abuse health systems for translating evidence-based treatments into community-based settings.[2] The short-term feature of cognitive therapy would make it particularly applicable for the treatment of suicide attempters at community mental health centers, which typically provide relatively short-term therapy. Additional studies are warranted to examine the feasibility, effectiveness, and cost-effectiveness of this intervention in community-based mental health and substance use treatment settings.

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