Randomized Controlled Trial of Cognitive Behavioral Social Skills Training for Older People With Schizophrenia: 12-Month Follow-Up

Eric Granholm, Ph.D.; John R. McQuaid, Ph.D.; Fauzia Simjee McClure, Ph.D.; Peter C. Link, M.A.; Dimitri Perivoliotis, M.A.; Jennifer D. Gottlieb, Ph.D.; Thomas L. Patterson, Ph.D.; and Dilip V. Jeste, M.D.

Objective: There is an increasing need for empirically validated psychotherapy interventions that improve functioning in older people with schizophrenia. We developed a 24-session weekly group therapy intervention labeled Cognitive Behavioral Social Skills Training (CBSST), which combined cognitive-behavioral therapy with social skills and problem-solving training to improve functioning.

Method: We previously reported end-of-treatment findings from a randomized controlled trial that compared treatment as usual (TAU) with TAU plus group CBSST in 76 outpatients, 42 to 74 years of age, with schizophrenia or schizoaffective disorder (DSM-IV criteria). Twelve-month follow-up results of that trial (conducted from October 1999 to September 2004) are reported here. Blind raters obtained assessments of CBSST skill mastery, functioning, psychotic and depressive symptoms, and cognitive insight (belief flexibility).

Results: The significantly greater skill acquisition and self-reported performance of living skills in the community seen in CBSST versus TAU patients at the end of treatment were maintained at 12-month follow-up ($p \leq .05$). Participants in CBSST also showed significantly greater cognitive insight at the end of treatment relative to TAU, but this improvement was not maintained at follow-up. The treatment-group effect was not significant for symptoms at any assessment point; however, symptoms were not the primary treatment target in this stable outpatient sample.

Conclusion: Older people with very chronic schizophrenia were able to learn and maintain new skills with CBSST and showed improved self-reported functioning 1 year after the treatment ended. Longer treatment and/or booster sessions may be required to maintain gains in cognitive insight.

(J Clin Psychiatry 2007;68:730–737)

Received April 19, 2006; accepted Aug. 31, 2006. *From the Veterans Affairs San Diego Healthcare System, San Diego, Calif. (Drs. Granholm, McQuaid, Simjee McClure, Patterson, and Jeste and Messrs. Link and Perivoliotis); the Departments of Psychiatry (Drs. Granholm, McQuaid, Patterson, and Jeste) and Neurosciences (Dr. Jeste), University of California, San Diego; the San Diego State University/University of California, San Diego (SDSU/UCSD) Joint Doctoral Program in Clinical Psychology, San Diego (Mr. Perivoliotis); and the Department of Psychiatry, Massachusetts General Hospital/Harvard Medical School, Boston, Mass. (Dr. Gottlieb).*

This research was supported by the Office of Research and Development, Department of Veterans Affairs, and the National Institute of Mental Health (R01MH071410 and P30MH66248).

We would like to thank the participants in this study and Scott Roesch, Ph.D., of the SDSU/UCSD Joint Doctoral Program in Clinical Psychology, for statistical consultation. Dr. Roesch has no financial affiliations or other relationships relevant to the subject of this article.

The authors report no additional financial or other relationships relevant to the subject of this article.

Corresponding author and reprints: Eric Granholm, Ph.D., VA San Diego Healthcare System (116B), 3350 La Jolla Village Dr., San Diego, CA 92161 (e-mail: egranholm@ucsd.edu).

There is considerable evidence that cognitive-behavioral therapy (CBT) and social skills training (SST) are effective adjunctive interventions to pharmacologic treatment of schizophrenia. Randomized controlled trials of CBT for schizophrenia have found significant improvements in both positive and negative symptoms, as well as in anxiety and depression among individuals with psychotic disorder.[1–10] Several reviews and meta-analytic reports[11–14] of CBT trials have found medium to large posttreatment effect sizes for positive and negative symptoms when compared with standard treatment and supportive contact control conditions. Similarly, a number of studies have demonstrated that SST improves overall social adjustment and interpersonal functioning in people with schizophrenia.[15–18]

In addition to positive posttreatment outcomes, early follow-up evaluations (3–12 months) have indicated that differences between CBT and comparison treatments are even greater at follow-up. Studies indicate that patients receiving CBT maintain improvement despite therapy termination, whereas patients in comparison treatments do not maintain their gains. Differences between CBT and control treatments have been found for both positive and

negative symptoms, with mean effect sizes in meta-analytic reports ranging from 0.35 to 0.68 at posttreatment and increasing to 0.40 to 0.93 at follow-up.[12–14] Sensky et al.,[8] for example, did not find significant benefit for symptoms at the end of treatment relative to supportive contact ("befriending"), but did find greater improvement in positive and negative symptoms in CBT at 9-month follow-up. Early follow-up results in SST trials, however, have been less promising, especially with regard to generalization of skills acquisition to meaningful change in real-world functioning.[15,19]

Given the established efficacy of CBT and SST in schizophrenia trials, we developed a group therapy intervention that combined these 2 treatments labeled Cognitive Behavioral Social Skills Training (CBSST).[20,21] By adding CBT to SST, thoughts that interfere with skill performance in the real world (e.g., low self-efficacy, expectancy, and ability beliefs) can be addressed in therapy. CBSST was specifically designed to help middle-aged and older people with very chronic schizophrenia attain personalized functioning goals. There has been very limited research on psychotherapy interventions for older people with schizophrenia.[4,22–24] The number of middle-aged and older people with schizophrenia, like the general population, is growing rapidly,[25] which will mean a dramatic increase in demand for treatments targeting the unique needs of this older population. While the age group 45 to 65 is not geriatric, the vast majority of schizophrenia research has been restricted to patients below age 50. Given the shorter average life span of patients with schizophrenia, "old age" may have different cutoffs in this group of individuals. In terms of cohort differences (e.g., physical comorbidity, illicit substance use, hospitalization rates), middle-aged patients with schizophrenia are, in some ways, more similar to elderly patients than to younger adults.[25] Aging is typically associated with improvement in positive symptoms and reduced hospitalization, but functional impairment persists with approximately 60% of older people with schizophrenia residing in assisted care settings (e.g., board-and-care homes).[26] Most have enduring neurocognitive impairments[27] that are exacerbated by aging and contribute to functioning deficits.[28] The primary target of CBSST, therefore, was functioning, and symptoms were secondary targets.

In a randomized controlled trial comparing treatment as usual (TAU) with TAU plus group CBSST,[4] we found greater improvement in skills and functioning in CBSST relative to TAU alone at the end of treatment. Patients in CBSST groups also showed significantly greater cognitive insight[29] than those in TAU after treatment. In contrast to clinical insight, which typically refers to awareness of a mental illness requiring treatment, cognitive insight refers to metacognitive processes of reevaluation and correction of distorted beliefs and misinterpretations (i.e., belief flexibility and objective reappraisal of symptoms). Improved cognitive insight or belief flexibility may mediate symptom change in CBT.[29,30] Consistent with this hypothesis, reduction in psychotic symptoms was correlated with increased cognitive insight at the end of treatment with CBSST.[4] The present study examined whether benefits found for CBSST relative to TAU at the end of treatment were maintained at 12-month follow-up. The primary outcomes were functioning and skills acquisition. In addition, groups were compared on cognitive insight, mood and psychotic symptoms, and antipsychotic dosage at 12-month follow-up.

METHOD

Sample

This study, conducted from October 1999 to September 2004, was approved by the institutional review boards of the University of California, San Diego, and the Veterans Affairs San Diego Healthcare System, and a written informed consent was obtained from all participants or their legal guardians. Seventy community-dwelling participants, 42 to 74 years of age, with diagnosis of either schizophrenia or schizoaffective disorder based on the Structured Clinical Interview for DSM-IV,[31] were recruited from treatment centers and residential settings in San Diego, California. Exclusion criteria for the study were disabling medical problems that would interfere with treatment, absence of medical records to inform diagnosis, or a comorbid substance dependence diagnosis (other than caffeine or nicotine) within the previous 6 months. The original sample included 76 participants, but 6 were excluded from follow-up analyses for missing follow-up data (fewer than 2 assessment points with data for multilevel modeling; 92% retention rate).

At baseline, 17 patients were prescribed at least 1 atypical antipsychotic medication, 42 at least 1 typical antipsychotic, 7 were prescribed both typical and atypical antipsychotics, and 4 were not prescribed any antipsychotic medications. Thirty-six patients were also prescribed antidepressant medications, and 21 were prescribed mood-stabilizers. Daily dosages of antipsychotic and anticholinergic medications were calculated as milligram chlorpromazine equivalent (mg/day chlorpromazine equivalent at baseline: CBSST mean = 446.7, SD = 386.2; TAU mean = 544.6, SD = 563.9) and benztropine equivalent (mg/day benztropine equivalent at baseline: CBSST mean = 1.4, SD =2.1; TAU mean = 1.9, SD = 2.4), respectively.[32–34] The mean age of the sample was 53.6 years (SD = 7.5). A majority of the participants were white (79%), male (76%), single (93%), nonveterans (61%), with a high school education (years of education mean = 12.8; SD = 2.5), and living in assisted care facilities (63%). At baseline, only 29% of subjects (N = 20) reported at least mild hallucinations, 40% (N = 28) reported at least mild

delusions, and 53% (N = 37) reported at least mild delusions or hallucinations.

Study Design

Participants were randomly assigned to TAU (N = 37) or CBSST (N = 33), treated for 6 months, and assessed at midtreatment, end of treatment, 6 months posttreatment, and 12 months posttreatment. Symptom and insight measures were obtained at all assessment points. Functioning measures were not obtained at midtreatment or 6 months posttreatment because functioning was not expected to change as rapidly as symptom and process measures. Assessors were independent of the therapists and blind to treatment-group assignment. Assessment of the blind showed that raters were uncertain of group assignment (see Granholm et al.[4]). Additional details of study methodology, participant characteristics, and specifics of the interventions can be found elsewhere.[4,21,35]

Treatments

Treatment as usual. Patients continued in whatever ongoing care they were receiving. No medication or other treatment guidelines were provided as part of this protocol.

Cognitive Behavioral Social Skills Training. Patients received 24 weekly 2-hour group therapy sessions. SST components were modified from symptom management, communication role-play, and problem-solving SST modules available from Psychiatric Rehabilitation Consultants.[36] The CBT components were developed specifically for patients with schizophrenia.[37,38] Cognitive interventions targeted beliefs about psychotic symptoms and negative attributions and self-efficacy beliefs that interfered with functioning behaviors. Symptoms were a relatively minor focus and only addressed in the context of education about warning signs and communication role-plays with providers about medications and by modifying beliefs about hallucinations or delusional beliefs that interfered with functional goals. Aids to compensate for cognitive impairment common in both schizophrenia and normal aging were also added. Age-relevant content modifications included identifying and challenging ageist beliefs (e.g., "I'm too old to learn"), age-relevant role-play situations (e.g., talking to a doctor about eyeglasses), and age-specific problem solving (e.g., finding transportation, coping with hearing and vision problems). The CBSST thus targeted the multidimensional deficits that lead to disability in middle-aged and older people with schizophrenia.

Two masters' or higher level therapists with prior CBT experience facilitated each group and received weekly supervision from the first 2 authors (E.G. and J.R.M.) with session videotape review. The Cognitive Therapy Scale for Psychosis[39] was used to rate therapist competence from 30 videotaped sessions that were randomly selected, but stratified according to module. Interrater reliability of the 3 raters was 0.85. The mean Cognitive Therapy Scale for Psychosis rating was 43 (SD = 7.1), which was comparable to previous trials of CBT for psychosis.[8]

Outcome Measures

Skills and functioning. Knowledge and application of skills trained in the intervention were assessed using a modified version of the Comprehensive Module Test (CMT).[17] Questions about skills (e.g., "What are the 3 *C*'s?") with vignettes requiring skill application were used to assess mastery of CBSST skills, including communication, problem solving, and thought challenging. The Independent Living Skills Survey (ILSS)[40] and the University of California, San Diego Performance-Based Skills Assessment (UPSA)[41] were used to evaluate functioning. A composite score of 5 ILSS domains assessed self-reported living skill activities performed during the previous month: leisure (hobbies, social interactions with family and friends, etc.), transportation (independently riding the bus or driving, etc.), appearance and clothing (wearing appropriate clothes for the weather; changing regularly, etc.), personal hygiene (bathing, combing hair, etc.), and health maintenance (vision, hearing, dental, primary care, etc.). On the UPSA, standardized role-playing situations were used to measure the extent to which patients were capable of performing specific skills within 5 domains (household chores, communication, finance, transportation, and planning recreational activities).

Symptoms and insight. Cognitive insight was assessed with the Beck Cognitive Insight Scale (BCIS).[29] This self-report measure includes 2 subscales, Self-Reflectiveness (objective reappraisal) and Self-Certainty (overconfidence in beliefs), which together create a summary score, the R–C Index (Reflectiveness minus Certainty). The Positive and Negative Syndrome Scale (PANSS)[42] and Hamilton Rating Scale for Depression (HAM-D)[43] were used to assess symptom severity.

Statistical Analyses

Multilevel modeling techniques[44] were used to analyze the outcome measures. A conditional growth model predicting each level-1 outcome variable (ILSS composite score, UPSA Total score, CMT Total score, BCIS R-C Index, HAM-D Total score, PANSS Total score, PANSS Positive Syndrome score, and PANSS Negative Syndrome score) was estimated using time (in months) as a level-1 predictor and group as a level-2 predictor of both the slope and intercept parameters. Because the focus of this study was on the 12-month follow-up, time was centered about the 12-month follow-up assessment, so that the level-2 group variable provided a test of group differences at follow-up. Depending upon the outcome measure, subjects were examined on 3 (functioning measures)

to 5 (skills acquisition, symptoms and insight measures) occasions. Subjects with at least 2 assessments on a given outcome measure were included in the analysis. PANSS Positive Syndrome, PANSS Negative Syndrome, PANSS Total, and the HAM-D scores violated the assumption of normally distributed residuals. Transformations (natural logarithm and square root) were successful in correcting this violation.

RESULTS

Outcome

Descriptive statistics for participants with data at each assessment point are presented in Table 1. The groups did not differ significantly on any outcome measure at baseline. At 12-month follow-up, participants in the CBSST group showed significantly higher scores on the CMT ($t = 2.44$, $df = 62$, $p = .02$, $d = 0.61$) and ILSS ($t = 2.01$, $df = 61$, $p = .05$, $d = 0.50$), suggesting greater CBSST skill acquisition and superior self-reported living skills performance in the community 1 year after the end of therapy.

Results from multilevel modeling analyses are presented in Table 2. The group effect was significant for both ILSS and CMT scores, indicating that the CBSST and TAU groups differed significantly at 12-month follow-up (Figures 1 and 2). The CBSST participants, therefore, showed greater skill acquisition and superior self-reported functioning 1 year after treatment ended. The group-by-time interaction was also significant for ILSS, indicating that the CBSST group continued to improve in social functioning at a faster rate than TAU, even after therapy ended. No significant group main effect or group-by-time interaction was found for any of the other 6 outcome measures, so the groups did not differ significantly at the 12-month follow-up, and growth rates between CBSST and TAU were similar for these other outcomes.

Medications at Follow-Up

Analysis of covariance for chlorpromazine equivalent at 12-month follow-up, with baseline antipsychotic dose in milligram chlorpromazine equivalent per day as a covariate, showed a marginally significant difference between the groups ($F = 3.87$, $df = 1,57$; $p = .054$, $\eta^2 = 0.06$) with mean chlorpromazine equivalent dosage lower in the CBSST group (mean = 421.27, SD = 263.74) than in the TAU group (mean = 648.06, SD = 595.61). Analysis of covariance with baseline anticholinergic dosage (mg benztropine equivalent dosage/day) as a covariate showed that the groups did not differ significantly in mean benztropine equivalent dosage at 12-month follow-up ($F = 1.15$, $df = 1,57$; $p = .288$, $\eta^2 = 0.02$; CBSST: mean = 1.88, SD = 3.41; TAU: mean = 1.58, SD = 2.12). The groups also did not differ in the percentage of participants who started or increased their dosage of any mood medication between baseline and 12-month follow-up (CBSST = 17%, TAU = 15%; $\chi^2 = 0.27$, $df = 1$, $p = .869$).

Table 1. Descriptive Statistics for Schizophrenia Outpatients at Each Assessment Point

	CBSST Group		TAU Group	
Outcome Measure	N	Mean (SD)	N	Mean (SD)
ILSS[a]				
Baseline	32	0.699 (0.117)	34	0.701 (0.107)
Treatment end	29	0.729 (0.096)	32	0.694 (0.123)
12-Month follow-up	30	0.730 (0.083)	33	0.675 (0.133)
UPSA[a]				
Baseline	33	0.715 (0.183)	36	0.668 (0.170)
Treatment end	32	0.730 (0.190)	32	0.743 (0.174)
12-Month follow-up	27	0.720 (0.150)	31	0.700 (0.181)
CMT				
Baseline	33	13.0 (6.1)	37	12.4 (7.0)
Midtreatment	33	19.5 (9.5)	37	12.5 (6.1)
Treatment end	32	21.6 (9.4)	33	12.6 (5.5)
6-Month follow-up	31	16.7 (8.6)	32	11.9 (6.9)
12-Month follow-up	31	17.6 (9.1)	33	12.6 (7.1)
BCIS[a]				
Baseline	32	4.28 (5.24)	34	5.71 (4.90)
Midtreatment	33	6.79 (6.18)	37	4.46 (5.28)
Treatment end	32	5.69 (5.06)	33	4.36 (5.51)
6-Month follow-up	30	4.33 (5.18)	31	4.90 (4.85)
12-Month follow-up	31	4.61 (5.68)	33	5.15 (7.18)
HAM-D				
Baseline	33	12.6 (7.9)	37	13.5 (8.3)
Midtreatment	33	13.3 (7.7)	37	12.2 (8.6)
Treatment end	32	11.4 (6.3)	33	10.6 (6.3)
6-Month follow-up	31	11.9 (8.4)	32	11.2 (9.0)
12-Month follow-up	31	9.7 (5.5)	33	11.3 (6.8)
PANSS Total				
Baseline	33	50.8 (12.8)	37	55.8 (15.0)
Midtreatment	33	53.4 (14.3)	37	52.4 (13.5)
Treatment end	32	51.6 (11.0)	33	52.2 (14.2)
6-Month follow-up	31	55.8 (19.1)	32	53.1 (16.7)
12-Month follow-up	31	52.9 (17.9)	33	55.2 (13.5)
PANSS Positive				
Baseline	33	11.7 (4.5)	37	13.7 (5.1)
Midtreatment	33	14.2 (6.2)	37	13.1 (5.4)
Treatment end	32	13.2 (5.4)	33	12.9 (4.6)
6-Month follow-up	31	13.9 (6.9)	32	14.2 (6.0)
12-Month follow-up	31	12.8 (6.6)	33	14.1 (5.0)
PANSS Negative				
Baseline	33	14.1 (5.0)	37	15.2 (5.8)
Midtreatment	33	13.5 (4.0)	37	14.0 (5.3)
Treatment end	32	12.9 (3.8)	33	13.7 (5.2)
6-Month follow-up	31	15.1 (5.9)	32	13.3 (5.8)
12-Month follow-up	31	14.6 (6.8)	33	13.8 (4.8)

[a]For these measures, observations were missing at baseline due to examiner error.

Abbreviations: BCIS = Beck Cognitive Insight Scale; CBSST = Cognitive Behavioral Social Skills Training; CMT = Comprehensive Module Test; HAM-D = Hamilton Rating Scale for Depression; ILSS = Independent Living Skills Survey; PANSS = Positive and Negative Syndrome Scale; TAU = Treatment as Usual; UPSA = University of California, San Diego Performance-Based Skills Assessment.

DISCUSSION

In this randomized controlled trial of CBSST added to pharmacologic TAU for older people with schizophrenia or schizoaffective disorder, significant benefits were found

Table 2. Results of Multilevel Model Analysis in a Randomized Controlled Trial of CBSST Versus Treatment as Usual in Schizophrenia Outpatients

Outcome Measure	N CBSST	N TAU	Variable	Denominator df	Parameter Estimate	t Statistic
ILSS[a]	32	36	Intercept	98.97	0.679	
			Group	98.41	0.056	2.15*
			Time	92.67	–0.001	–1.74
			Group by time	79.65	0.003	2.09*
UPSA[a]	33	36	Intercept	108.87	0.727	
			Group	110.51	–0.011	–0.25
			Time	123.88	0.002	1.69
			Group by time	124.11	–0.003	–1.31
CMT	33	37	Intercept	86.83	13.014	
			Group	83.89	5.93	3.18**
			Time	225.96	0.032	0.54
			Group by time	110.13	0.074	0.82
BCIS[a]	33	37	Intercept	116.57	4.74	
			Group	111.77	–0.205	–0.17
			Time	232.38	–0.011	–0.22
			Group by time	106.48	–0.041	–0.58
HAM-D[b]	33	37	Intercept	123.61	3.021	
			Group	118.59	–0.001	–0.01
			Time	242.57	–0.019	–1.94
			Group by time	98.48	–0.006	–0.42
PANSS Total[c]	33	37	Intercept	92.02	3.953	
			Group	88.83	–0.005	–0.08
			Time	230.97	–0.00008	–0.04
			Group by time	100.09	0.001	0.43
PANSS Positive[c]	33	37	Intercept	89.12	2.593	
			Group	86.26	–0.09	–0.93
			Time	229.65	0.004	1.38
			Group by time	101.3	–0.003	–0.71
PANSS Negative[c]	33	37	Intercept	99.64	2.529	
			Group	95.75	–0.005	0.85
			Time	232.5	0.07	–1.79
			Group by time	104.64	0.007	1.57

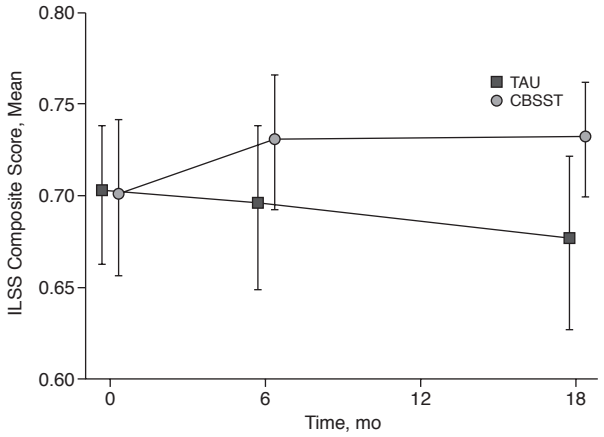
[a]For these measures, observations were missing at baseline due to examiner error.
[b]For multilevel model analysis, a square root transformation was used.
[c]For multilevel model analysis, a natural logarithm transformation was used.
*$p < .05$.
**$p < .01$.
Abbreviations: BCIS = Beck Cognitive Insight Scale; CBSST = Cognitive Behavioral Social Skills Training; CMT = Comprehensive Module Test; HAM-D = Hamilton Rating Scale for Depression; ILSS = Independent Living Skills Survey; PANSS = Positive and Negative Syndrome Scale; TAU = Treatment as Usual; UPSA = University of California, San Diego Performance-Based Skills Assessment.

for CBSST skill learning and self-reported performance of living skills in the community that were sustained 1 year after the therapy ended. Two of the 3 outcome measures that improved significantly during CBSST treatment continued to show significant improvement 1 year later (ILSS and CMT, but not BCIS). These benefits were observed despite returning to TAU without any booster therapy. Given that functional impairments persist in this older, very chronic outpatient population, despite relatively good pharmacologic control of psychotic symptoms, the significant maintenance of improvement found in self-reported everyday living skills is quite noteworthy.

One year after the end of treatment, patients who had received CBSST reported that they performed functioning activities (ILSS) significantly more frequently than patients in TAU. The medium treatment effect size for self-reported living skills (ILSS; d = 0.50) at 12-month follow-up was comparable to effect sizes found for positive symptoms in other studies at early follow-up (0.40–0.93)[12–14] and comparable to the general effectiveness of CBT for other disorders in meta-analytic reports (d = .65).[45] Several other studies of younger adults with schizophrenia also found significant improvements in functioning in CBT.[5,46–48] These promising results suggest that aspects of CBT interventions that specifically target functioning (e.g., challenging thoughts that interfere with skill execution) should be strengthened, and functional outcome measures should be included in clinical trials of CBT for psychosis. Research should also attempt to identify factors that may moderate the impact of CBT on functioning (e.g., neurocognitive impairment; insight).

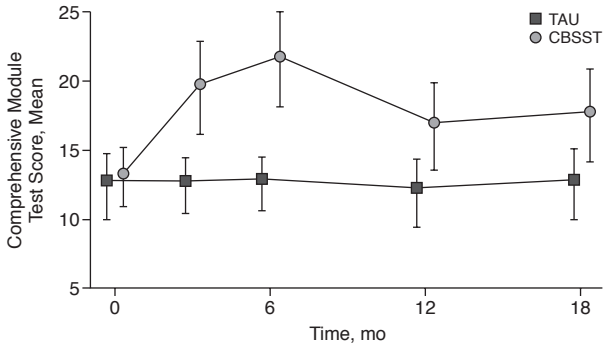
No significant benefit was found for general everyday skill capacity on a performance-based proxy measure of functioning (UPSA), but CBSST did not specifically train the subjects on the skills measured on the UPSA. The patients were trained on social communication and problem-

Figure 1. Self-Reported Living Skills as Mean Independent Living Skills Survey (ILSS) Composite Scores for Participants With Complete Data at Each Assessment Point



[a]Error bars are ± 2 SEM.
Abbreviations: CBSST = Cognitive Behavioral Social Skills Training, TAU = Treatment as Usual.

Figure 2. CBSST Skills Acquisition as Mean Comprehensive Module Test (CMT) Scores for Participants With Complete Data at Each Assessment Point



[a]Error bars are ± 2 SEM.
Abbreviations: CBSST = Cognitive Behavioral Social Skills Training, TAU = Treatment as Usual.

solving skills, but the focus of CBSST was more on removing barriers (e.g., negative attributions and self-efficacy beliefs) that interfere with skill execution in the real world, rather than on training in specific skills per se. CBSST helps clients challenge thoughts that interfere with community functioning (e.g., "I will be harmed if I go out"; "It won't be fun"; "I won't be able to do it"). By challenging illness-related thoughts (e.g., paranoia) and beliefs that interfere with the execution of everyday activities, patients were more likely to engage in these activities and use the skills they had.

The present study did not find a significant treatment group effect on positive or negative symptoms at end of treatment or 12-month follow-up. Psychotic symptoms, however, were not the primary target of CBSST, and this study sample was not a medication-resistant, highly symptomatic sample. In general, studies of CBT for schizophrenia that have found significant improvement in psychotic symptoms only included people with persistent moderate-to-severe symptoms, despite adequate pharmacologic treatment.[11–13,49] The absence of significant benefit for psychotic symptoms in this CBSST trial was likely due to the fact that the symptoms were well controlled by medications at baseline (47% percent of the sample did not report even mild hallucinations or delusions), and thus there was a floor effect on PANSS ratings. It is worth noting, however, that the severity of symptoms did not differ significantly between CBSST and TAU at follow-up, even though the mean chlorpromazine equivalent dosage was 227 mg/day lower in the CBSST group than in the TAU group.

A majority of prior CBT studies in schizophrenia used an individual therapy format, but some promising results have been reported using a group format[5,50–53] or combined group and individual therapy.[2,54] One important difference between group and individual CBT formats is that groups often emphasize skills training over detailed case formulation. There is less time in groups to fully explore the unique content and history of each patient's core beliefs, delusional system, and hallucinations. This might have contributed to a lack of significant impact on symptoms in our study. Groups, however, can help normalize symptoms, impact social support systems, and allow practice of communication and other social skills with peers, which may be important for interventions, such as CBSST, that target social functioning. Future studies might compare interventions that use a comprehensive case formulation with interventions that do not, in order to determine the importance of this element for different patient subgroups and different outcomes.

Groups also can be more cost-effective than individual therapy. In the present study, CBSST group sessions were 2 hours per week for 6 months. This amount of treatment contact was greater than comparable individual CBT approaches in the United Kingdom, which were typically only 1 hour per week for 6 to 9 months.[11,12] More intensive interventions, such as CBSST, may be needed to improve functioning. Some U.S. approaches that targeted functioning were years long.[55] The intensity of the CBSST intervention mitigates, but does not eliminate, the cost-efficiency of the group format. CBSST groups typically had 6 or 7 members who attended a mean of 44 hours of treatment, which was about 15% of the therapist time that would have been needed to treat the same number of patients in individual therapy (about 260 hours).

Improvement in cognitive insight[29] or belief flexibility[30] may be a mechanism of symptom change in CBT. Patients in CBSST showed significantly greater cognitive insight than patients in TAU at the end of treatment,[4] but

this improvement in cognitive insight was not maintained at 12-month follow-up. Gains in cognitive insight (BCIS R-C Index) were also significantly correlated with reduction in positive symptoms at end of treatment for patients in the CBSST group.[4] It is possible that patients who became more objective, willing to examine cognitive distortions, and open to corrective feedback from others showed greater reduction in positive symptoms in CBSST. However, after contact with the therapists and other group members ended, cognitive insight returned to baseline levels and was comparable to TAU. It is possible that active discussion and feedback from others about thought processes is required to achieve and maintain a self-reflective approach to anomalous experiences. Consistent with this hypothesis, we previously reported[20] that the amount of improvement in cognitive insight with CBSST was significantly correlated with the extent of client participation in group discussions. Longer duration of treatment and/or booster sessions may help maintain gains in cognitive insight. There may also be a subgroup of people who are less likely to maintain improvements in cognitive insight, so possible moderators (e.g., executive neurocognitive abilities) should be examined.

Strengths of this study included an understudied patient population (middle-aged and older), randomization to treatments, blind raters, groups well matched at baseline on all variables, a manualized intervention, treatment fidelity monitoring,[4] broad outcome measures, good attendance and excellent retention of participants (92% of the baseline sample was included in the 1-year follow-up analyses), and multilevel modeling analyses. Limitations included a moderately small sample size, lack of control for nonspecific therapist contact factors, and exclusion of participants with active substance dependence, which may impact generalization. We are currently conducting a randomized trial with a larger sample, active supportive contact control, no exclusion for comorbid substance dependence, and broader functional outcome measures with more personalized goal attainment scaling methods,[56] which might better capture change in multidimensional and individualized aspects of functioning.

Drug names: benztropine (Cogentin and others), chlorpromazine (Thorazine, Sonazine, and others).

REFERENCES

1. Chadwick P, Birchwood M. The omnipotence of voices: a cognitive approach to auditory hallucinations. Br J Psychiatry 1994;164:190–201
2. Drury V, Birchwood M, Cochrane R, et al. Cognitive therapy and recovery from acute psychosis: a controlled trial, 1: impact on psychotic symptoms. Br J Psychiatry 1996;169:593–601
3. Garety PA, Kuipers L, Fowler D, et al. Cognitive behavioral therapy for drug-resistant psychosis. Br J Med Psychol 1994;67:259–271
4. Granholm E, McQuaid JR, McClure FS, et al. A randomized, controlled trial of Cognitive Behavioral Social Skills Training for middle-aged and older outpatients with chronic schizophrenia. Am J Psychiatry 2005;162:520–529
5. Gumley A, O'Grady M, McNay L, et al. Early intervention for relapse in schizophrenia: results of a 12-month randomized controlled trial of cognitive behavioral therapy. Psychol Med 2003;33:419–431
6. Kuipers E, Fowler D, Garety P, et al. London-East Anglia randomized controlled trial of cognitive-behavioural therapy for psychosis, 3: follow-up and economic evaluation at 18 months. Br J Psychiatry 1998;173:61–68
7. Kuipers E, Garety P, Fowler D, et al. London-East Anglia randomized controlled trial of cognitive-behavioral therapy for psychosis, 1: effects of the treatment phase. Br J Psychiatry 1997;171:319–327
8. Sensky T, Turkington D, Kingdon D, et al. A randomized controlled trial of cognitive-behavioral therapy for persistent symptoms in schizophrenia resistant to medication. Arch Gen Psychiatry 2000;57:165–172
9. Tarrier N, Beckett R, Harwood S, et al. A trial of two cognitive-behavioral methods of treating drug-resistant residual psychotic symptoms in schizophrenic patients: 1, outcome. Br J Psychiatry 1993;162:524–532
10. Tarrier N, Sharpe L, Beckett R, et al. A trial of two cognitive behavioral methods of treating drug-resistant residual psychotic symptoms in schizophrenic patients, 2: treatment-specific changes in coping and problem-solving skills. Soc Psychiatry Psychiatr Epidemiol 1993;28:5–10
11. Dickerson FB. Cognitive behavioral psychotherapy for schizophrenia: a review of recent empirical studies. Schizophr Res 2000;43:71–90
12. Gould RA, Mueser KT, Bolton E, et al. Cognitive therapy for psychosis in schizophrenia: an effect size analysis. Schizophr Res 2001;48:335–342
13. Rector NA, Beck AT. Cognitive behavioral therapy for schizophrenia: an empirical review. J Nerv Ment Dis 2001;189:278–287
14. Zimmermann G, Favrod J, Trieu VH, et al. The effect size of cognitive behavioral treatment on the positive symptoms of schizophrenia spectrum disorders: a meta-analysis. Schizophr Res 2005;77:1–9
15. Bellack AS, Mueser KT. Psychosocial treatment for schizophrenia. Schizophr Bull 1993;19:317–336
16. Benton MK, Schroeder HE. Social skills training with schizophrenics: a meta-analytic evaluation. J Consult Clin Psychol 1990;58:741–747
17. Liberman RP. Psychosocial treatments for schizophrenia. Psychiatry 1994;57:104–114
18. Penn DL, Mueser KT. Research update on the psychosocial treatment of schizophrenia. Am J Psychiatry 1996;153:607–617
19. Pilling S, Bebbington P, Kuipers E, et al. Psychological treatments in schizophrenia, 2: meta-analyses of randomized controlled trials of social skills training and cognitive remediation. Psychol Med 2002;32:783–791
20. Granholm E, Auslander L, Gottlieb JD, et al. Therapeutic factors contributing to change in cognitive-behavioral group therapy for older persons with schizophrenia. J Contemp Psychother 2006;36:31–41
21. McQuaid JR, Granholm E, McClure FS, et al. Development of an integrated cognitive-behavioral and social skills training intervention for older patients with schizophrenia. J Psychother Pract Res 2000;9:149–156
22. Bartels SJ, Forester B, Mueser KT, et al. Enhanced skills training and health care management for older persons with severe mental illness. Community Ment Health J 2004;40:75–90
23. Pratt SI, Mueser KT, Driscoll M, et al. Medication nonadherence in older people with serious mental illness: prevalence and correlates. Psychiatr Rehabil J 2006;29:299–310
24. Patterson TL, Mausbach BT, McKibbin C, et al. Functional Adaptation Skills Training (FAST): a randomized trial of a psychosocial intervention for middle-aged and older patients with chronic psychotic disorders. Schizophr Res 2006;86:291–299
25. Jeste DV, Alexopoulos GS, Bartels SJ, et al. Consensus statement: the upcoming crisis in geriatric mental health: challenges and opportunities. Arch Gen Psychiatry 1999;56:848–853
26. Jeste DV, Twamley EW, Eyler Zorrilla LT, et al. Aging and outcome in schizophrenia. Acta Psychiatr Scand 2003;107:336–343
27. Heaton RK, Gladsjo JA, Palmer BW, et al. Stability and course of neuropsychological deficits in schizophrenia. Arch Gen Psychiatry 2001;58:24–32
28. Green MF. What are the functional consequences of neurocognitive deficits in schizophrenia. Am J Psychiatry 1996;153:321–330
29. Beck AT, Baruch E, Balter JM, et al. A new instrument for measuring insight: the Beck Cognitive Insight Scale. Schizophr Res 2004;68:319–329
30. Garety PA, Freeman D, Jolley S, et al. Reasoning, emotions, and

delusional conviction in psychosis. J Abnorm Psychol 2005;114:373–384
31. First MB, Spitzer RL, Gibbon M, et al. Structured Clinical Interview for DSM-IV Axis I Disorders-Patient Edition (SCID-I/P). New York, NY: Biometrics Research, New York State Psychiatric Institute; 1995
32. Foster P. Neuroleptic equivalence. Pharmacology 1989;290:431–432
33. Jeste D, Wyatt R. Understanding and Treating Tardive Dyskinesia. New York, NY: Guilford; 1982
34. Saddock BJ, Saddock VA, eds. Comprehensive Textbook of Psychiatry. Philadelphia, Pa: Lippincott, Williams & Wilkins; 2000
35. Granholm E, McQuaid JR, Auslander L, et al. Group Cognitive-Behavioral Social Skills Training for older outpatients with chronic schizophrenia. J Cognit Psychother 2004;18:265–279
36. Psychiatric Rehabilitation Consultants. Modules in the UCLA Social and Independent Living Skill Series. Camarillo, Calif: Psychiatric Rehabilitation Consultants; 1991
37. Beck AT, Rector NA. Cognitive therapy of schizophrenia: a new therapy for the new millennium. Am J Psychother 2000;54:291–300
38. Kingdon DG, Turkington D. Cognitive-Behavioral Therapy of Schizophrenia. New York, NY: The Guilford Press; 1994
39. Haddock G, Devane S, Bradshaw T, et al. An investigation into the psychometric properties of the Cognitive Therapy Scale for Psychosis (CTS-Psy). Behavioral & Cogni Psychother 2001;29:221–233
40. Wallace CJ, Liberman RP, Tauber R, et al. The Independent Living Skills Survey: a comprehensive measure of the community functioning of severely and persistently mentally ill individuals. Schizophr Bull 2000; 26:631–658
41. Patterson TL, Goldman S, McKibbin CL, et al. UCSD Performance-Based Skills Assessment: development of a new measure of everyday functioning for severely mentally ill adults. Schizophr Bull 2001;27: 235–245
42. Kay SR, Fiszbein A, Opler LA. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. Schizophr Bull 1987;13:261–276
43. Hamilton M. Development of a rating scale for primary depressive illness. Br J Soc Clin Psychol 1967;6:278–296
44. Singer JD, Willett JB. Applied Longitudinal Data Analysis: Methods for Studying Change and Event Occurence. New York, NY: Oxford University Press; 2003
45. Lipsey M, Wilson D. The efficacy of psychological, educational, and behavioral treatment: confirmation from meta-analysis. Am Psychol 1993;48:1181–1209
46. Wiersma D, Jenner JA, van de Willige G, et al. Cognitive behavior therapy with coping training for persistent auditory hallucinations in schizophrenia: a naturalistic follow-up study of the durability of effects. Acta Psychiatr Scand 2001;103:393–399
47. Bradshaw W. Integrating cognitive-behavioral psychotherapy for persons with schizophrenia into a psychiatric rehabilitation program: results of a three year trial. Community Ment Health J 2000;36:491–500
48. Roberts DL, Penn DL, Cather C, et al. Should CBT target the social impairments associated with schizophrenia? J Cognit Psychother 2004; 18:621–630
49. Haddock G, Tarrier N, Spaulding W, et al. Individual cognitive-behavior therapy in the treatment of hallucinations and delusions: a review. Clin Psychol Rev 1998;18:821–838
50. Kingsep P, Nathan P, Castle D. Cognitive behavioral group treatment for social anxiety in schizophrenia. Schizophr Res 2003;63:121–129
51. Wykes T, Parr AM, Landau S. Group treatment of auditory hallucinations: exploratory study of effectiveness. Br J Psychiatry 1999;175:180–185
52. Landa Y, Silverstein SM, Schwartz F, et al. Group cognitive behavioral therapy for delusions: helping patients improve reality testing. J Contemp Psychother 2006;36:9–17
53. Spidel A, Lecomte T, Leclerc C. Community implementation successes and challenges of a cognitive-behavior therapy group for individuals with a first episode of psychosis. J Contemp Psychother 2006;36:51–58
54. Lysaker P, Davis LW, Beattie N. Effects of cognitive behavioral therapy and vocational rehabilitation on metacognition and coping in schizophrenia. J Contemp Psychother 2006;36:25–30
55. Hogarty GE, Anderson CM, Reiss DJ, et al. and the Environmental-Personal Indicators in the Course of Schizophrenia (EPICS) Research Group. Family psychoeducation, social skills training, and maintenance chemotherapy in the aftercare treatment of schizophrenia, pt 2: Two-year effects of a controlled study on relapse and adjustment. Arch Gen Psychiatry 1991;48:340–347
56. Kiresuk TJ, Smith A, Cardillo JE. Goal Attainment Scaling: Applications, Theory, and Measurement. Hillsdale, NJ: Lawrence Erlbaum Associates; 1994