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Evaluating the Effectiveness of Cognitive-Behavioral Treatment of Residual Symptoms and Impairment in Schizophrenia

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This study evaluated the effectiveness of cognitive-behavioral interventions in the treatment of persons with schizophrenia who experienced significant residual symptoms and impaired functioning despite their adherence to medication. The study used an aggregated AB single-system research design across 22 participants to evaluate change in clinical outcomes. Standardized measures of psychosocial functioning, severity of symptoms, attainment of treatment goals, and severity of the impact of illness on self-concept were used to assess change during the course of 18 months of treatment. Of the clients, 86% made statistically significant improvement in psychosocial functioning; 82% of the clients made statistically significant reduction in severity of psychiatric symptoms. All 22 clients exceeded the expected level of attainment of treatment goals. There was a statistically significant reduction in the negative impact of illness on sense of self. Findings support the effectiveness of cognitive-behavioral interventions in schizophrenia.

Keywords: cognitive-behavioral therapy; schizophrenia; single-system research

Schizophrenia can be a devastating disorder affecting 2.6 million people in the United States. Hallucinations, delusions, negative symptoms, and significant social impairment and disability characterize the disorder. Neurobiological deficits make persons with schizophrenia vulnerable to stress. The course of illness fluctuates and is marked by periods of stability and improvement, as well as exacerbations of illness and relapse. Longitudinal studies indicate there is great variability in course and outcomes in schizophrenia, and the timing and quality of psychosocial intervention play a significant role in clinical outcomes (Hogarty, Kornblith, Greenwald, DiBarry, Cooley, Ulrich, et al., 1997).

Antipsychotic medications are frequently helpful in reducing psychotic symptoms and relapse; however, many clients continue to experience persistent distress and disabilities. Almost 50% have persistent psychotic symptoms even when adhering to pharmacological treatment (Dickerson, 2000). Many persons with schizophrenia have residual symptoms and disabilities that persist throughout their lives.

The social work profession has a long and distinguished history of intervention development and research in treatment of persons with schizophrenia that have incorporated a variety of cognitive, behavioral, and psychoeducational interventions. Significant innovations in treatment have been developed by social workers in assertive community treatment (Stein & Test, 1980; Test & Stein, 2000), family psychoeducation (Anderson, 1977; Anderson, Hogarty, & Reiss, 1980; Anderson, Reiss, & Hogarty, 1986), behavioral treatment (Wong, 1996; Wong, Woolsey, & Gallegos, 1987), sociotherapy (Hogarty, Goldberg, Schooler, & Ulrich, 1974) and personal therapy (Hogarty et al., 1997).

Recent developments in cognitive-behavioral treatment (CBT) in the United Kingdom have resulted in a promising approach for treating schizophrenia. There is accumulating evidence from these controlled clinical trials that CBT is effective in reducing psychotic symptoms, increasing adherence to medication, improving response of chronic residual symptoms, and as an adjunct to inpatient treatment (Beck & Rector, 2001; Dickerson, 2000; Gould, Mueser, Bolton, Mays, & Goff, 2001; Norman & Townsend, 1999). A meta-analysis of these studies (Gould et al., 2001) reports an average effect size of 0.65 indicating a strong treatment effect. Two studies with follow-up analyses indicate that clients continued to make gains over time after treatment ended. Beck and Rector's (2001) review of the literature found that CBT

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- in conjunction with medication is more effective than standard care or medication
- is more effective compared to supportive psychotherapies
- is more effective in the acute stage of illness than standard care

They concluded that CBT adds 20% to 50% improvement in treatment gains compared to control groups.

Although these CBT studies predictably have some methodological limitations (Bouchard, Vallieres, Roy, & Maziade, 1996; Dickerson, 2000; Gould et al., 2001), there are two major clinical issues that have not been addressed in the literature. First, there has been very limited use of outcome measures of functioning and virtually no reports of significant changes in psychosocial functioning. The focus of treatment has been on the reduction of psychotic symptoms through the use of brief focused interventions. The average length of treatment in reviewed studies was 18 weeks, and the average number of session was 13. Schizophrenia is a long-term disorder in which clients face multiple psychosocial challenges, and their treatment needs change over time. Symptom reduction can be achieved fairly quickly, but recovery and improved functioning involve a longer process.

Second, the experience of living with schizophrenia and dealing with illness-related stresses, such as stigma, demoralization, repeated hospitalizations, and limited resources, has powerful negative effects on the individual's self-concept, self-esteem, and sense of efficacy. However, there have been no studies that evaluate the effect of treatment on the subjective experience of persons with schizophrenia. Estroff (1991) emphasized that focusing on the impact on self of persons with schizophrenia is critical for the successful long-term treatment of schizophrenia. Similarly, Strauss (1989) highlighted the need to understand the interaction of person and disorder: how the person's goals and feelings regarding illness and self influence the course of the disorder.

The concept of engulfment is particularly helpful in understanding how a person's self-concept is transformed by the experience of mental illness. Engulfment is an intrapsychic response to labeling and stigma. Engulfment occurs through the progressive role constriction in which persons successively lose valued social roles until only a chronic mentally ill identity remains (Estroff, 1991). Engulfment has been linked to increased hospitalizations, psychotic symptoms, chronicity of illness, hopelessness, and lowered self-esteem and efficacy (McCay & Seeman, 1998). Several authors have highlighted the important role psychotherapy can play in the

long-term recovery of persons with schizophrenia (Bradshaw, 1997; Davidson & Strauss, 1992).

The only reports of long-term treatment of schizophrenia in the recent CBT literature are a series of direct replication single-system studies of the intervention by the same practitioner (Bradshaw, 1997, 1998, 2000, in press). Results indicated significant improvement in psychosocial functioning, reduction in psychiatric symptoms, and achievement of treatment goals during the course of 1.5 to 3 years of treatment. However, because of the AB design and homogeneous samples, inferences of causality and generalizability of findings are limited.

Although replication is a critically important scientific activity—especially in single-system research—replication is infrequently done (Bloom, Fischer, & Orme, 1999; Kazdin, 1995). The successful replication of research results is an important next step in research in the use of long-term CBT in persons with schizophrenia. Similarly, the social work profession has promoted the use of single-system designs in intervention research, but there has been relatively little use of single-system designs in social work. During the last 2 decades there have been only a few published single-system reports by agency practitioners, and social work faculty have produced no more than three studies a year (Reid, 1994).

The present study is a systematic replication in which the CBT intervention is applied by different practitioners in different community mental health settings with a diverse sample of persons with schizophrenia. The purpose of the study was to evaluate the effectiveness of CBT with persons with schizophrenia who experience significant residual psychotic symptoms and functional impairment in spite of adherence to antipsychotic treatment regimes. In addition, the study attempted to address the limitations of previous studies in examining the impact of CBT on psychosocial functioning and the sense of self in persons with schizophrenia. Hypotheses of the study are:

Hypothesis 1: Clients will have a statistically significant reduction in symptomatology from baseline to completion of treatment.

Hypothesis 2: Clients will have a statistically significant improvement in psychosocial functioning from baseline to completion of treatment.

Hypothesis 3: Clients will exceed expected attainment of treatment goals (a score of more than 50 on the Goal Attainment Scale) by the end of the treatment period.

Hypothesis 4: Clients will have statistically significant improvement in improved self-concept.

All analyses involved two-tailed tests with alpha set at 0.05.

METHODS

The study used a single-system AB multiple baseline design across 22 participants to evaluate change in clinical outcomes. The AB design included a (A) baseline phase (B) and cognitive-behavioral intervention phase. A pretest/posttest design (OXO) was used to evaluate the attainment of treatment goals and self-concept.

Clients

Clients in the study were recruited from the county mental health case management system. Inclusion criteria for entry into the study included

- valid diagnosis of schizophrenia based on meeting *DSM-IV* criteria
- age between 18 and 60 years
- adherence with prescribed neuroleptic medication
- persistent symptoms causing distress and impaired functioning despite adequate trials of antipsychotic medication. An adequate trial of medication was defined as use of medication for at least 6 months with no evidence of poor adherence, a dose equivalent or greater to 300mg daily of chlorpromazine and at least 2 weeks of 600mg daily
- persons with mental retardation, organic brain syndrome, or a primary diagnosis of alcoholism or drug abuse were excluded.

The consulting psychiatrist and the clinical social workers made independent diagnoses in their intake notes. The researcher reviewed all the initial diagnoses given and found a 100% concurrence on diagnosis.

The county case managers consecutively referred 30 clients for ongoing outpatient therapy to two local non-profit mental health facilities that offered aftercare and support services to persons with severe and persistent mental illness. Informed consent was obtained, and the 30 clients were assigned to outpatient CBT treatment.

Eight clients dropped out of the study. The age of the 22 clients who completed the study ranged from 26 to 46 years. The average age was 30 ($SD = 5.9$). All but one of the clients were high school graduates, and two had at least one year of college study. Of the clients, 43% were women, 57% were men. Of the clients, 54% were Caucasian, 18% African American, and 28% were Hispanic. The average length of illness was 12 years ($SD = 4.7$). All clients were unemployed and on disability assistance (SSI). Of the clients, 24% lived alone, 24% with family members, and 52% in board and care facilities. Comparison of clients who dropped out of the study and who

completed the study revealed no significant differences on age, length of illness, race, or gender.

To establish sufficient baseline data and baselines of different lengths clients were assigned to either a 6-month, 9-month, or 12-month baseline period. During the baseline phase, clients continued to receive the standard care provided by the county mental health system. Services consisted of quarterly case reviews with the case manager who assessed need and provided referrals for basic resources, such as transportation, housing, and medical care. Clients were also seen quarterly for medication checks with the clinic psychiatrist. Following a 6-month baseline assessment period, the CBT intervention was introduced for clients 1 through 7. At 9-month baseline, the CBT intervention was introduced for clients 8 through 14. At 12-month baseline, the CBT intervention was introduced for clients 15 through 22.

Treatment Conditions

All clients continued to be seen quarterly for medication monitoring by their psychiatrists and quarterly by their case managers to monitor treatment needs and progress.

In addition, clients were seen for weekly outpatient CBT for 18 months. Sessions lasted up to 1 hour. The CBT treatment model included development of the therapeutic alliance, provision of education regarding illness, and the use of cognitive and behavioral interventions.

Engagement in therapy focused on developing a collaborative understanding of the development of symptoms using the normalizing procedures that emphasize the importance of vulnerability, stress, and coping and formulation of treatment goals and process (Kingdom & Turkington, 1994). Behavioral assessments focused on identifying reoccurring stresses, signs of stress and prodromal symptoms of relapse, and teaching behavioral skills to manage stress and physiological arousal. Specific behavioral interventions to cope with stress were progressive relaxation, meditation, exercise (primarily walking) and scheduling activities (Beck, 1984). Cognitive assessments identified habitual stressful situations and maladaptive cognitive strategies. Three cognitive interventions were used to improve cognitive coping skills. First, thought stopping and distraction techniques were taught to manage psychotic symptoms (Dickerson, 2000). Second, cognitive restructuring methods were used to promote positive adaptive coping statements that replace negative thoughts and beliefs (Beck, 1984). Third, positive self-appraisal training was used to enhance self-esteem (Bradshaw, 1998). Clients were

TABLE 1: Interpretation of GPI and RFS Scores

Score	GPI: Severity of Symptoms	Score	RFS: Psychosocial Functioning
8	Extreme	1 to 4	Severe impairment of functioning
7	Severe	5 to 8	Marked impairment of functioning
6	Marked	9 to 12	Limited functioning
5	Substantial	13 to 16	Marginal functioning
4	Moderate	17 to 20	Moderate functioning
3	Mild	21 to 24	Adequately functioning
2	Slight	25 to 28	Optimal functioning
1	Minimal		
0	Absent		

NOTE: GPI = The Global Pathology index of the Hopkins Psychiatric Rating Scale; RFS = The Role Functioning Scale.

trained to identify three positive events in their life each day. They then generated a list of positive words and qualities that described the event and identified positive qualities in themselves that were associated with the event.

Outcome Measures

The Global Pathology index (GPI) of the Hopkins Psychiatric Rating Scale (Derogatis, 1974) was used to assess severity of psychiatric symptoms. The GPI is a 0- to 8-point rater-based behaviorally anchored scale that describes overall severity of symptoms. The GPI has reported reliability of $\alpha = 0.85$. The Role Functioning Scale (RFS) (Goodman, Sewell, Cooley, & Leavitt, 1993) was used to assess psychosocial functioning. The RFS is a rater-based measure consisting of four subscales: work, social, family, and independent living. Each subscale is a 7-point behaviorally anchored scale. The total scale score (0 to 28) was used in this study. The RFS has reported reliability of $\alpha = .78$. The Goal Attainment Scale (GAS) (Kiresuk & Sherman, 1968) was used to assess achievement of treatment goals. In GAS, five goals were selected, and behavioral descriptions of functioning for various levels of goal achievement were individually developed with each client. A score ranging from -2 (regression in goal attainment) through 0 (attainment of goal) to $+2$ (exceeds standards) is given for each goal based on the client's attainment. Ratings for GAS were based on patient and therapist observations. Goal attainment scores were calculated by summing the scale score values and using the GAS conversion key for equally weighted scales to determine the GAS score. A score of 50.00 represents the expected level of goal attainment in this measure. The RFS, GPI, and GAS were chosen because they had been used in earlier pilot studies, and all are validated measures commonly used in other intervention studies and recommended for use in practice research (Toseland

& Rivas, 1984). Interpretation of the RFS and GPI are presented in Table 1. The Modified Engulfment Scale (MES) (McCay & Seeman, 1998) assesses the extent to which the self-concept is transformed by the experience of mental illness. The MES is a 24-item client self-report scale. Scores range from 24 to 120 with higher scores indicating higher levels of engulfment. The MES has reported reliability of $\alpha = 0.75$.

Each client had a county case manager and psychiatrist who provided baseline GPI and RFS data on a quarterly basis after entry into the study. The case managers, psychiatrists, and therapists obtained the GPI and RFS data on a quarterly basis throughout the 1.5-year treatment period. GAS and MES were done as a pretest/posttest assessment. The psychotherapists and case managers who made the ratings of symptomatology, psychosocial functioning, and goal attainment were all MSW practitioners. The case managers involved in the study had 5 years' experience in mental health. The therapists, case managers, and psychiatrists received 5 hours of training in use of the RFS, GPI, and GAS.

The county case managers, county medication clinic psychiatrists, and outpatient mental health clinic therapists completed the clinical ratings based on data obtained in their regular quarterly meetings with each client. Each rater scored the outcome measures independently and sent the scores to the research team. There was no discussion between raters about scale scoring. Interrater reliability was high: for the GPI intraclass correlation coefficient was 0.87 and for the RFS was 0.93.

Quality Assurance

Two MSW licensed clinical social workers were recruited from each of the mental health facilities and trained to provide the CBT treatment in this study. Their average length of work in mental health was 5 years.

They received 48 hours of training in the CBT model during a 6-month period and were taught to use the treatment protocol designed for the study. As part of their training, they each provided CBT to three nonstudy clients and participated in weekly individual and group supervision to review their work with these clients prior to the start of the study. Therapists continued to receive individual and group supervision throughout the treatment period.

During the study, all sessions were audiotaped. Audiotapes were reviewed using the Cognitive Therapy Rating Scale (CTRS) (Vallies, Shaw, & Dobson, 1986) to determine an adequate level of technical competency in the sessions. The CTRS includes a general section on interviewing skills and items that focus specifically on cognitive therapy. In the general interviewing section a score from 20 to 24 indicates a quality interview. A score of 39 or more is defined as an adequate level of technical competence in cognitive-behavioral methods. Review of case notes was done quarterly to monitor fidelity to the treatment methods.

A random stratified sample of 36 tapes was used to ensure a representative number of tapes from selected subsets of tapes. The stratification variables were therapist and time of entry into the study. Tapes were first sorted by therapist. For each therapist, three tapes were then randomly selected from each time of entry into study (6-month baseline, 9-month baseline, 12-month baseline) resulting in nine tapes for each therapist.

Clients were also asked to complete the Consumer Satisfaction Questionnaire (CSQ) short version (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) at the end of treatment. This well-established measure of satisfaction with mental health services consists of eight 4-point Likert scale questions. The CSQ scale ranges from a low of 8 to a high of 32. Several questions of the CSQ are specifically relevant to the issue of acceptability of treatment by clients. These include the following: "Did you get the kind of service you wanted?" "To what extent did the treatment meet your needs?" "Did the treatment you received help you deal more effectively with your problems?"

Data Analysis

Due to the large number of lines and data points generated by 22 cases, graphs of data can be complex and difficult to interpret. Nugent, Sieppert, & Hudson (2001) recommended in studies with complicated graphs to use the mean time path to represent the data. The mean time path is composed of the mean scores for each data point across time. The mean time paths for the aggregate data and for

each of the three multiple baseline phases are presented. Visual analysis of these data was then done to identify trends in the baseline and intervention phases.

Statistical analysis of data from each case was performed using SINGWIN, a program for analyzing single-system design data (Bloom et al., 1999). The Huitema and McKean test (Huitema, 1991) assessed autocorrelation. Autocorrelated data were found in the intervention phase of Cases 4 and 22. The first differences transformation was used to remove the autocorrelations in the data so the required assumptions for statistical analysis were met. The first differences transformation was successful in removing the linear trend, and the autocorrelations for the transformed data were not statistically significant.

To evaluate statistical significance of change in each case, *t* tests comparing baseline and intervention phase means were used. Effect sizes were calculated for each case to determine the magnitude of change from the baseline phase to the intervention phase. The *d* index (to measure the size of the treatment effect) (Bloom et al., 1999) was used to calculate effect sizes because it is more precise when there are a small number of baseline observations.

RESULTS

Psychosocial Functioning (RFS)

Visual inspection of RFS data (cf. Figure 1) in the 6-month baseline group showed a slightly increasing baseline trend followed by an immediate change in level (discontinuity) between the baseline and intervention phase. The increasing slope in the intervention phase indicated a pattern of strong improvement in functioning. Visual inspection of RFS data in the 9-month and 12-month baseline groups showed a slightly decreasing baseline trend followed by an immediate change in level (discontinuity) between the baseline and intervention phase. An increasing slope in the intervention phase indicated a pattern of strong improvement in functioning.

Of the cases, 86% ($n = 19$) made statistically significant improvement during the course of treatment; 14% ($n = 3$) showed some improvement. No client score was the same or worse from baseline. Effect sizes ranged from 0.09 to 5.29. The average effect size for the study was $M = 2.20$, $SD = 1.20$. These effect sizes reflect a large magnitude of change from baseline to intervention. This change is two standard deviations higher than the baseline mean and indicates that the average client improved psychosocial functioning scores by 48%.

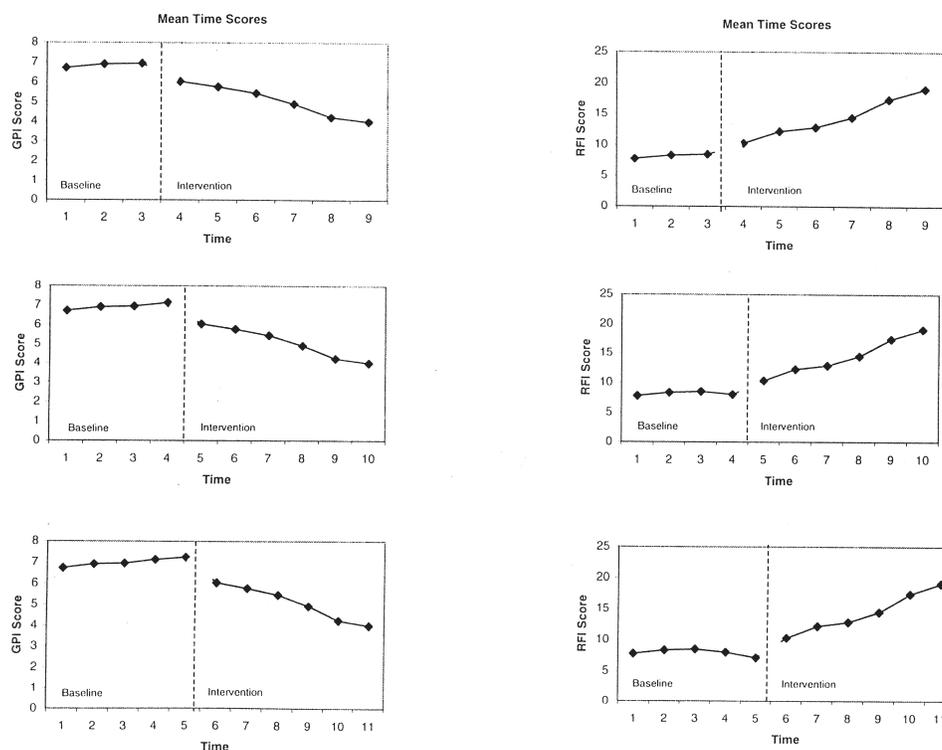


Figure 1: RFS and GPI Trend Lines

Severity of Psychiatric Symptoms (GPI)

Visual inspection of GPI data (cf. Figure 1) in all three baseline groups showed a slightly increasing baseline trend followed by an immediate change in level (discontinuity) between the baseline and intervention phase. A decreasing slope in the intervention phase indicated a strong pattern of reduction of severity of symptoms.

Of the cases, 82% ($n = 18$) made statistically significant improvement during the course of treatment; 18% ($n = 4$) showed some improvement. No client score was the same or worse from baseline. Effect sizes ranged from -0.02 to -3.76 . The average effect size for the study was $M = -2.07$, $SD = 1.12$. These effect sizes reflect a large magnitude of change from baseline to intervention. This change is two standard deviations higher than the baseline mean and indicates that the average client reduced severity of symptomatology scores by 48%.

Goal Attainment (GAS)

Comparison of GAS pretreatment to posttreatment scores found 86% ($n = 19$) of the cases exceeded the expected level of goal achievement (scores above 50); 14% ($n = 3$) showed some improvement. No client score was the same or worse from baseline. Clients who made

clinically meaningful achievement of such goals are moving to independent living, obtaining part-time or full-time employment, increasing social support networks, and improving relationships with family members. For the aggregate data, the pretreatment mean was 20.64 ($SD = 0.5$), and the posttreatment mean was 67 ($SD = 10.76$). This was statistically significant ($t[21] = -20.34$, $p < .000$). GAS case data is presented in Table 2.

Engulfment (MES)

The mean MES pretreatment score was 95 ($SD = 12.24$). This score represents a high level of engulfment of self-concept into a primarily mentally ill self-concept. The posttreatment mean score was 66.36 ($SD = 10.21$). The difference from pretest to posttest was statistically significant ($M = 28.63$, $SD = 13.51$, $t(21) = 9.94$, $p < .000$). MES case data is presented in Table 2.

Quality Assurance

The mean number of sessions for the 22 clients who completed treatment was 50 (range 39 to 67). There were no significant differences in the number of sessions between centers or in baselines scores. The average

TABLE 2: GAS Scores

Case	Pretreatment MES	Posttreatment MES	Pretreatment GAS	Posttreatment GAS
1	101	64	20.98	79.02
2	99	59	19.85	71.11
3	110	84	19.85	79.02
4	87	59	20.98	80.15
5	92	55	20.98	64.51
6	90	63	20.98	71.11
7	105	61	20.98	64.51
8	99	76	20.65	71.11
9	112	64	20.98	64.51
10	105	67	19.85	46.37
11	103	100	19.85	46.37
12	82	66	20.98	46.37
13	70	60	20.98	71.11
14	93	69	20.98	79.02
15	114	54	20.98	64.51
16	89	64	20.65	60.88
17	88	60	19.85	80.15
18	106	70	19.85	60.88
19	72	58	20.98	80.15
20	83	66	20.98	60.88
21	106	71	20.98	66.13
22	86	70	20.98	66.13
	<i>M</i> = 95.0 <i>SD</i> = 12.24	<i>M</i> = 66.0 <i>SD</i> = 10.21	<i>M</i> = 20.64 <i>SD</i> = 0.5	<i>M</i> = 67.0 <i>SD</i> = 10.76

NOTE: GAS = The Goal Attainment Scale; MES = Modified Engulfment Scale.

satisfaction score in the study was 30 ($SD = .96$) indicating a very high level of overall satisfaction with treatment. The mean CTRS rating for the four therapists was 40.64 ($SD = 3.58$). The individual CTRS ratings for each therapist were 38.44 ($SD = 5.81$), 40.44 ($SD = 1.74$), 41.4 ($SD = 2.06$), and 42.22 ($SD = 3.58$). There were no significant differences between therapists in CTRS ratings.

APPLICATIONS TO SOCIAL WORK PRACTICE

This study contributes to the growing evidence of the efficacy of CBT interventions with medication-resistant psychotic symptoms of schizophrenia, and it compares well with results previously published in this area (Sensky et al., 2000). Taken collectively these studies highlight the important role CBT can play in treating medication-adherent clients who continue to experience residual symptoms.

Given the limited focus on psychosocial functioning in the literature, the observed improvements in RFS and GAS scores are especially important clinical findings. It is likely that the improvements in psychosocial functioning and attainment of important life goals by clients in this study were due, in part, to length of treatment. This suggests the need for long-term intensive interventions to

improve long-standing multiple impairment in functional abilities.

This initial report of the effect of treatment on the engulfment process in severe mental illness is promising. High levels of engulfment were significantly reduced in this sample. These findings highlight the clinical importance of understanding and working with the impact of schizophrenia on the self and should be critical targets of cognitive-behavioral intervention (Davidson & Strauss, 1992). Future research is needed to replicate these results and expand outcomes to include other subjective experience outcomes, such as self-esteem and self-efficacy. It appears that individuals with long histories of illness, severe impairments in functioning, and continuing distress from psychotic symptoms can benefit from long-term individual CBT.

In multiple baseline designs across participants, causal inferences may be made if (a) there is a stable and flat baseline that shows no trend of improvement and (b) changes in behavior occur only after the intervention is applied (Bloom et al., 1999). In this regard, the results for GPI scores are clear: all three means for multiple baseline groups show no trend of improvement, and changes only occurred after the intervention was applied. The results for RFS scores are somewhat ambiguous because the 6-month multiple baseline group had a slight trend of

improvement in the baseline phase. The other two multiple baseline groups showed no trend of improvement, and changes only occurred after the intervention was applied. In addition, in all three baseline groups for GPI and RFS, there was an immediate change in level (discontinuity) between the baseline and intervention phases. These discontinuities between phases are an important indicator of change in the clinical outcomes and support the idea that the intervention may have produced the change (Bloom et al., 1999).

There are, however, alternative explanations that challenge the idea that the intervention caused the changes in clinical outcomes in this study. First, the increased attention received by clients in the study could have influenced the outcomes. The lack on a baseline-only comparison makes it impossible to rule out this factor. Because the intervention package utilized multiple interventions, it is also not known what specific factors might have influenced change. Second, there is the potential of multiple treatment interference in that all clients had ongoing contact with a psychiatrist and case manager. The case management model was a low intensity model with quarterly contact that focused on monitoring and referral as needed. The contact with the psychiatrist was limited to brief quarterly visits that were primarily medication checks, and it is unlikely that these visits confound the design to any significant degree.

The impact of medication on outcomes in this sample is unclear. Criteria for admission to the study focused on clients who were medication compliant and receiving adequate pharmacological regimes from baseline throughout the course of treatment. In spite of this, the clients continued to have moderate to severe residual psychiatric symptoms and impairment. Although we monitored medication and changes, not all clients were kept on the same starting medication regime, however no client in the study was changed from traditional phenothiazine medication to the newer atypical class of antipsychotic medication. There remains a possibility that some improvements might be due to medication effects.

Single-case studies have innate problems with external validity. Generalization is limited, and replication of single-case designs is critical to establish generalization of findings. An important feature of this systematic replication study is that it built on previous direct replication case studies and applied CBT treatment to different treatment settings, with treatment provided by multiple therapists to a racially diverse sample. These findings strengthen the base for generalization of findings and also add to the evidence supporting the causal effects of CBT on clinical outcomes (Nugent et al., 2001).

The feasibility of training therapists in the CBT model of schizophrenia was supported. The therapist quality control measure, mean CTRS scores, showed that all four workers in this study provided a technical level of competence in CBT. There were no statistically significant differences in scores between workers. Competence scores were somewhat lower compared to those reported in another study (Sensky et al., 2000). The high satisfaction ratings from the CSQ and high rates of kept appointments indicate that CBT treatment was acceptable and feasible for clients in this sample. All the CBT studies of schizophrenia have been primarily efficacy studies with the therapy provided by experts in controlled research settings in the United Kingdom. These results suggest that CBT can be effectively applied in typical community mental health settings in the United States.

This study adds to the social work research literature in several ways. First, it is one of the few examples of systematic replication to strengthen generalization of findings in single-system designs. Second, in intervention development, the evaluation phase typically demands controlled clinical trials with random assignment that are frequently not feasible in agency settings (Bailey-Simpson & Reid, 1996). The use of a multiple baseline single-system design demonstrated in this study offers a practical addition to evaluation efforts in intervention development research. Third, the measurement package of RFS, GPI, and GAS provides a relevant and easy method to use outcome measures that can be implemented by social workers in agency practice. Fourth, issues of fidelity to treatment, assessing the competence level of the treatment provided, and acceptability to clients are critical issues in the development of new interventions. The use of the CTRS can be a useful tool to measure competence and fidelity to treatment. Similarly, the use of the client satisfaction scale and data regarding drop-out rates and kept appointments are beginning ways to assess the acceptability of treatment to clients. Routine attention to these issues should be incorporated into social work intervention research. Last, the development and evaluation of a new model of intervention adds to the long history of social worker efforts to improve treatment for persons with schizophrenia.

Long-term CBT is a potentially important adjunct to standard pharmacological and psychosocial care. The dissemination and adoption of new empirically supported mental health treatments is essential. Mental health professionals working with schizophrenia need to be trained in CBT. The development of treatment guidelines, protocols, and manuals; the training of staff; and incorporation of these CBT methods into existing mental health settings

are essential next steps to enhance service to persons suffering from schizophrenia.

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