

**EFFECT OF STRENGTHS MODEL
VERSUS ASSERTIVE
COMMUNITY TREATMENT
MODEL ON PARTICIPANT
OUTCOMES AND UTILIZATION:
TWO-YEAR FOLLOW-UP**

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Community-based treatments for persons with serious mental illnesses have consistently proven to be effective. While most studies evaluate assertive community treatment (ACT) programs collectively, distinct models offer different approaches to improving participant outcomes. This study specifically examined the Strengths model versus more traditional ACT programs. Multivariate analyses tested changes in utilization, symptomology, and clinical outcomes. Both ACT and Strengths reduced inpatient days while increasing outpatient care. Though all patients improved clinically, Strengths demonstrated a significantly greater advantage with symptomology reduced by half. Findings support both treatment models, but additional clinical gains may be obtained from the Strengths approach.

INTRODUCTION

In the last two decades, there have been important changes in mental health care for persons with serious mental illnesses with the field moving away from systems of long-term institutional care to largely community-based treatment. As part of that trend, specialized models of care designed to improve outcomes for persons with serious mental illnesses have been developed. Program models such as assertive community treatment (ACT), first developed by Stein and Test (Stein & Test, 1980), have gained wide recognition in the mental health field. Assertive community treatment is a comprehensive model for delivering care to persons with serious mental illnesses in the community. The care in this model includes treatment, support,

and rehabilitation services, and can be considered training in community living (Phillips et al., 2001). The persons eligible for this form of care are often those with the most severe and persistent mental illnesses with the greatest degree of functional impairment and poorest quality of life.

With the policy shift toward treatment in the community and the development of specialized programming for persons with serious mental illnesses, a number of studies have been conducted to address the effectiveness of the variety of models of care now in the field (Burns et al., 1999; Drake et al., 1998; Lehman, Myers, Johnson, & Dixon, 1995; Zautra, Eblen, & Reynolds, 1986). There have been numerous studies evaluating ACT

programs (Anthony, Cohen, Farkas, & Cohen, 1988; Burns et al., 1999; Chamberlain & Rapp, 1991; Collins, Ellsworth, Casey, Hickey, & Hyer, 1984; Collins et al., 1985; Curtis, Millman, Struening, & D'Ercole, 1992; Darling & Davidson, 1987; Deci, Santos, Hiott, Schoenwald, & Dias, 1995; Dincin et al., 1993; Drake & Burns, 1995; Goethe, Dornelas, & Fischer, 1996; Hornstra, Bruce-Wolfe, Sagduyu, & Riffle, 1993; Lehman et al., 1982; Lucas, Atwood, & Hagaman, 1993; Melle et al., 1996; Regier, Shapiro, Kessler, & Taube, 1984). Research has shown that ACT-model care is cost-effective compared with other types of care for individuals with serious mental illnesses and extensive previous hospitalization (Essock, Frisman, & Kontos, 1998; Lehman et al., 1999; Wolff, Helminiak, & Diamond, 1995), and patients in these programs generally have greater satisfaction than those in other programs such as clinical case management under controlled conditions (Burns & Santos, 1995).

Blow and colleagues (Blow et al., 2000) conducted one of the first studies to simultaneously evaluate the effectiveness of four specialized treatment models (intensive community case management, day treatment, intensive inpatient rehabilitation, standard care) for patients with serious mental illnesses. A total of 861 patients with serious mental illnesses, primarily schizophrenia and bipolar disorder, and 150+ days of hospitalization or 5+ hospitalizations in the previous year were evaluated at three-year follow-up. Since fidelity to program type is an important issue, process data was collected to determine the fidelity of each program to the model of care developed, ensure that programs followed the treatment models, and compare programs within the same model (inpatient rehabilitation, day treatment, assertive community treatment). Three-year outcome data on utilization and functioning demonstrated important im-

provements in functioning for seriously mentally ill veterans enrolled in assertive community treatment and enhanced inpatient treatment programs compared to those in day treatment or traditional standard care programs (Blow et al., 2000). This large study at 12 Veterans Health Administration (VHA) facilities comparing multiple program types, evaluated the ACT model programs as one group, and found that they were particularly effective in promoting positive patient outcomes.

However, intensive community case management programs can operate from somewhat differing theoretical tenets while following the same basic model of care (Marty, Rapp, & Carlson, 2001). In the study conducted by the Serious Mental Illness Treatment Research and Evaluation Center (Blow et al., 2000), the ACT programs studied were either predicated on the model of care originally developed by the Program for Assertive Community Treatment (Becker, Meisler, Stormer, & Brondino, 1999; Stein & Test, 1980) or on the Strengths model of care (Rapp, 1998).

The Assertive Community Treatment (ACT) model, first developed by Stein and Test, has received extensive research attention in both the VHA (Vannicelli, 1984) and community mental health systems (Anthony et al., 1988; Burns et al., 1999; Chamberlain et al., 1991; Darling & Davidson, 1987; Collins et al., 1984; Collins et al., 1985; Curtis et al., 1992; Deci et al., 1995; Dincin et al., 1993; Drake & Burns, 1995; Goethe et al., 1996; Hornstra et al., 1993; Lehman et al., 1982; Lucas et al., 1993; Melle et al., 1996; Regier et al., 1984). Most recent research on both effectiveness and costs of community-based programs for persons with serious mental illnesses has focused on the ACT models (Stanard, 1999) that are based on the program developed in Wisconsin by Stein and Test. However, questions remain whether re-

lying on one model of care or one theoretical approach is sufficient to meet the complex needs of patients with serious mental illnesses (Test, 1992) or if varying theoretical approaches to community case management could produce comparable outcomes in terms of utilization and patient functioning when compared to the original PACT program model (Collins et al., 1984). This question is particularly relevant with the emergence of new support and services models such as the Strengths-based approach (Saleebey, 1996).

Although there are a number of evaluation studies and clinical perspective articles addressing alternative theoretical models, including the potential effectiveness of the Strengths model of psychiatric care for persons with serious mental illnesses (Kishardt, 1993; Rapp & Wintersteen, 1989; Rapp, 1998). In addition, at least one review article delineates differences between the ACT and Strengths program approaches (Saleebey, 1996). However, patient outcomes using the Strengths approach have not been compared directly to patient outcomes in the traditional ACT model.

The Strengths model was developed because of concerns that traditional case management and other assertive community treatment and case management models of care emphasized impairments and limits related to the illnesses and did not, at least from a theoretical perspective, take into account patients' personal assets that could be mobilized to meet individual goals (Saleebey, 1996). The Strengths model is based on the idea that support and services should be focused on the individual's positive internal qualities and abilities, the strengths that assist the patient to function in the community (Rapp, 1993; Saleebey, 1996). The principles of the Strengths model were summarized by Mueser, et al. (Mueser, Bond, Drake, & Resnick, 1998) and include: 1) the focus

is on individual strengths rather than on pathology; 2) the case manager-patient relationship is primary and essential; 3) interventions are based on patient self-determination; 4) the community is viewed as an oasis of resources, not as an obstacle; 5) patient contact takes place in the community, not in the office; and 6) people with mental illnesses can continue to learn, grow, and change.

In practical terms, one of the main differences between the ACT and Strengths models is that, in the Strengths model, the patient works primarily with one professional health care clinician while, in the ACT model of care, the 'case manager' is actually a team of providers (e.g. physician, nurse, social worker, care manager) who all interact with the patient in the community. In the ACT approach, treatment plans are centered on reducing symptoms and negative personal and social consequences of actions, emotions, and thoughts. The focus of Strengths treatment plans is often on the individual making and finding membership in the community. The differences between the two program types appear subtle but, because they deal with a fundamental view of the patient and their capacities, they are potentially substantial, and a systematic comparison of these approaches would benefit the treatment field.

Although the Strengths model of care is gaining acceptance and being used for a variety of issues from serious mental illnesses and alcohol dependence to the care of older adults, there have been no studies comparing it directly to the traditional ACT programming approach. The SMITREC Long Term Mental Health study provided a unique opportunity to do a first comparison of this relatively new approach to care with an established successful approach, assertive community treatment, in a difficult-to-treat group.

The purpose of this study was to conduct an analysis of two intensive community case management models of care used by the Veterans Health Administration. This paper examines two-year patient outcomes in the Strengths model of care compared to the traditional ACT model for patients with serious and persistent mental illnesses. This study provides a basis from which to consider the importance of theoretical approach when working with one of the most complex groups treated in the health care system.

METHODS

Study Design

This study uses a subset of the larger SMITREC longitudinal data on specialized programming for patients with serious and persistent mental illnesses in the Veterans Health Administration (see Blow et al., 2000, for complete study design). This subset includes patients enrolled in the assertive community treatment arm of the study. These patients include those in the traditional ACT programs based on the Wisconsin model (Stein & Test, 1980) compared to those enrolled in the community-based Strengths program. Patients were enrolled as participants in the larger specialized treatment study beginning in 1991 and continuing through 1995 in a rolling enrollment format. Assessments were conducted at enrollment and every six months thereafter for two years. Inpatient and outpatient health services utilization is available for all veterans from 1987 on through the national VHA databases so that there is data available pre-enrollment in specialized treatment. Clinical data from providers, information from participant interviews, and service utilization data on participants are included in this analysis.

Clinical assessments of psychiatric symptomology and functional ability were

provided through a series of assessments completed by each participant's primary mental health provider at entry into the treatment program and at follow-ups. Clinicians were trained to use the clinician assessment by project personnel using a standardized protocol including didactic material, videotapes, and role-plays. As part of the training, clinicians were taught standardized methods for administering the Brief Psychiatric Rating Scale (BPRS), Global Assessment of Functioning (GAF), and Instrument Activities of Daily Living (IADL) scales. Interrater reliability was established on these scales during training. Ongoing individual and group telephone conferences and booster meetings with project training staff were conducted to ensure fidelity to the program types, the goals of the project, and methods to administer interview questionnaires to the participants. Assessment addressed those aspects of patient functioning that are likely to affect patient dependence on institutional care and capacity for remaining in the community upon discharge (i.e. symptom severity and functional impairment).

Sample. There were 225 participants originally enrolled in the ACT and Strengths programs included in this sub-study sample. Of the 225 enrolled participants, 11 died (5%; 7 in the ACT model programs, and 4 in the Strengths program; $\chi^2 = 3.6, ns$), and 40 others were lost to follow-up at two years, leaving 174 participants (77%) eligible for follow-up. At the 2-year follow-up, there were 81 participants in the Strengths-based intensive community case management model at one large site, and 93 in the other ACT-based intensive community care management model at four smaller sites. The treatment team composition across sites was comprised of physician, nurse, social work, and nurse's aide staff. This is the norm in the VHA for programs working with persons who have serious and per-

sistent mental illnesses. Resources across VHA sites are generally similar, particularly for intensive community-based outpatient programs such as the ones in this study.

Inclusion criteria for the project were:

- 1) eligibility for VHA hospital care;
- 2) DSM-III-R diagnosis of psychosis (schizophrenia, bipolar disorder, other mood disorders including major depression with psychosis, organic psychosis); and
- 3) 150 or more documented days of hospitalization in the past year *or* five or more admissions during the past year. The diagnostic categories were chosen to reflect the severity of illness consistent with long-term use of psychiatric care.

Table 1 describes the demographic characteristics of this sample by program (ACT; Strengths). Subsample demographics were comparable to those of the larger sample in the SMITREC study (Blow et al., 2000). The average age was 49.5 years, and predominantly white (81%), male (97%), never married (52%) and diagnosed with schizophrenia (86%). There was a relatively low prevalence of diagnoses for co-occurring substance use disorders (27%).

Indicative of the inclusion criteria, this group of participants was severely impaired and utilized a substantial amount of health services. For both programs combined at baseline, the mean BPRS score was 18.7, with an overall level of functioning per the GAF of only 46.4. In addition, the average number of positive and negative symptoms was 8.4 and 3.4, respectively. The participants in this subsample averaged 260.5 inpatient days. In terms of outpatient visits, the mean number of total visits per year at baseline was 40.6. The ranges were predictably wide, because some of the veterans remained hospitalized for the entire year while others used over 300 outpatient psychiatric visits.

Table 1—Descriptive Statistics (population)

CATEGORICAL VARIABLES	LEVEL	N	%
Diagnosis	Schizophrenia	149	85.6
	Bipolar Disorder	11	6.5
	Mood Disorder	9	5.2
	Dementia	5	2.9
Ethnicity	Black	17	9.8
	White	141	81.0
	Other	16	9.2
Marital Status	Divorced/Separated	59	34.1
	Married/Widowed	24	13.5
	Never Married	91	52.4
Gender	Female	6	3.4
	Male	168	96.6
Alcohol or Drug Diagnosis	No	127	73.1
	Yes	47	26.9

Attrition Analysis

A number of published studies have documented attrition rates for ACT programs at between 5 and 53%. (Mueser et al, 1998). However, recognizing the potential issues raised by differential attrition in the 2-year follow-up rate (88.6% for ACT versus 67.5% for Strengths), an attrition analysis was conducted to determine if participant differentials between those lost and retained could have produced a "drop-out bias" in the results. Overall, no age difference existed between the lost and retained groups. Secondly, concerning the outcome measures, only a few of the variables indicated minor differences. In general, those participants who were lost from the study tended to be only slightly but not significantly healthier than individuals followed over the entire study period (e.g. 13.1 outpatient mental health stops for those lost vs. 15.4 for those retained). Given the small magnitude of these differences, the attrition rates appeared to produce no bias.

Reasons for attrition other than death were: veterans could not be located (they were no longer receiving VHA ser-

vices according to national VHA databases and next of kin or other contacts did not know where they were), veterans refused to complete assessments, and veterans could not be interviewed due to incarceration or non-VA institutionalization.

Measures

Variables compared were the Brief Psychiatric Rating Scale (BPRS) (total score; positive and negative symptoms), Global Assessment of Functioning (GAF), Global Life Satisfaction (GLS), Activities of Daily Living (ADL), Instrument Activities of Daily Living (IADL), total inpatient days, total outpatient visits, inpatient medical, psychiatric, and nursing home days.

The Brief Psychiatric Rating Scale (BPRS) is a widely used, standardized measure of the severity of 19 symptoms (Overall & Gorham, 1962) with scores of 0 (not present) to 6 (extremely severe) for each item. The reliability coefficients reported for total pathology were 0.80 or greater for 10 of 13 studies (Hedlund & Vieweg, 1980). Positive and negative symptoms have shown internal consistencies of 0.81 and 0.91, respectively

Table 2a—Multivariate Model results (repeated measures analyses)

OUTCOME VARIABLE	PROGRAM	TIME			PROGRAM EFFECT	PROGRAM EFFECT	TIME EFFECT	POST-HOC
		T ₀ MEAN	T ₂ MEAN	MEAN %Δ				
INPATIENT								
Alcohol/Drug Day	IPCC	0.11	0.08	27.35	.7783	.8081	.7841	.9863
	Strengths	0.67	0.42	37.31				
Nursing Home Day	IPCC	23.70	12.56	47.20	.2703	.5027	.8237	.7485
	Strengths	11.51	9.76	15.20				
OUTPATIENT								
Global Outpatient Visits	IPCC	52.28	211.67	289.96	.1432	.0259	.1438	.0268
	Strengths	24.85	146.54	490.17				
Alcohol/Drug Visits	IPCC	0.28	0.05	82.14	.9616	.8540	.4600	.3879
	Strengths	11.04	10.04	10.33				
Psychiatric Stops	IPCC	21.92	154.09	602.97	.0029	.0949	.0001	.0140
	Strengths	8.20	77.14	840.73				
Medical Stops	IPCC	3.69	15.74	320.56	.2385	.3867	.0923	.2855
	Strengths	15.27	10.63	225.08				
CLINICAL								
IADL	IPCC	0.975	1.021	4.72	.4032	.3553	.0028	.2555
	Strengths	0.965	0.911	5.60				
BPRS	IPCC	20.02	17.67	11.74	.0001	.0705	.0934	.0001
	Strengths	17.28	9.88	42.82				
GIS	IPCC	4.74	4.58	3.58	.8127	.1523	.3653	.4816
	Strengths	4.43	4.78	7.90				
Positive Symptoms	IPCC	8.69	7.09	18.41	.0308	.2061	.1616	.0019
	Strengths	7.97	6.57	42.66				

Bold = statistically significant ($p < .05$)

(Nicholson, Chapman, & Neufeld, 1995). Individual items ranged between 0.63 and 0.83. Scores can range from 0 to 114, with higher scores indicating greater symptomology and poorer functioning. This study used a 0–6 scale that conforms both to the original instrument as designed and the initial larger study for this project (Blow et al., 2000). For comparability purposes, we maintained this metric. For example, our mean BPRS of 18.7 is equivalent to about a score of 37, indicative of a moderately severe symptomology.

The second instrument assessed impairment in functional capacity, that is, impairment in a patient's ability to perform instrumental activities of daily living (IADL), such as upkeep of their home, shopping, and social activities (Paveza et al., 1990). Lawton and Brody reported joint reliability correlations ranging from 0.85–0.91 for various patient populations (Lawton & Brody, 1969; Pfeffer, Kurosaki, Harrah, Chance & Filos, 1982). The scale is the mean of eight items with possible scores of 0, 1, 2, and 3 for each item and a range of 0–3 for

the scale; higher scores indicate poorer functioning.

The Global Assessment of Functioning (GAF), equivalent to Axis V in the DSM-IV is an overall clinical assessment taking into consideration both psychiatric and functional abilities. The reliability across nine different samples of subjects ranged from 0.61 to 0.91 (indicating fair to excellent) (Goldman, Skodol & Lave, 1992). Reliability is higher when interviewers have received specific and more standardized training regarding conducting and scoring the GAF. Scores on

Table 2b—Multivariate Model results—ANCOVAs (non-repeated)

OUTCOME VARIABLE	PROGRAM	1Y MEAN	2Y MEAN	MEAN %Δ	PROGRAM EFFECT	PostHoc
INPATIENT						
Total Inpatient Days	IPCC	264.33	187.81	60.78	.0001	.0986
	Strengths	256.16	147.23	42.52		
Psychiatric Days	IPCC	102.55	49.97	80.53	.9173	.6730
	Strengths	56.04	25.94	57.28		
Medical Days	IPCC	4.60	4.98	3.26	.0149	.0136
	Strengths	74.53	29.23	60.78		
CLINICAL						
Negative Symptoms	IPCC	4.65	4.04	11.21	.0001	.0001
	Strengths	2.04	4.06	48.04		

Bold = statistically significant ($p < .05$)

this single-item construct can range from 1 to 90. Higher scores indicate better functioning.

Analysis

A repeated measures analysis of covariance (MANCOVA) approach was used to compare adjusted means on all outcomes variables, by program, over time from baseline through year two. First, an ANOVA (analysis of variance) explored baseline differences by program type. In general, because the participants in the Strengths program were significantly younger and had better functioning than the participants in the other ACT-based programs, the analysis controlled for the three variables that explained the largest number of baseline differences between the traditional ACT and Strengths approaches—functional status comprised of GAF, and ADL scores, and age (53.6 in ACT vs. 44.9 in Strengths). Due to missing data in some variables, not all subsets sum to the total number of subjects in the study.

This repeated-measures approach allowed observation of any interaction effects between Time and Program, in

addition to the main effects of each separately. For all significant ($p < .05$) interactions, a post-hoc analysis using Tukey's adjustment for simultaneous comparisons was conducted in regard to the mean outcome differences.

Because there was one larger Strengths model program and 4 smaller traditional ACT programs, analyses were conducted to determine if the size of the program could be acting as a confounder affecting the results. There were no significant changes in 2-year outcomes (e.g., utilization or clinical symptoms) based on size of program, so the analyses were conducted comparing the Strengths model program with the 4 ACT model programs together.

RESULTS

Table 2 presents detailed findings from the multivariate analysis, in which the outcome variables are grouped by type of analysis, utilization domain, and clinical measures. In addition to adjusted baseline and 2-year means, plus a per-

centage-change difference, the table provides significance values for both the main effects (program, time) and the Time*Program interaction. Beginning with the latter, highest order effect, a significant result indicates one program produced a differential improvement in that outcome measure over time. A secondary but equally important result of interest is the separate Time and Program effects, indicating whether *one program* or *both* programs appeared to show greater improvements.

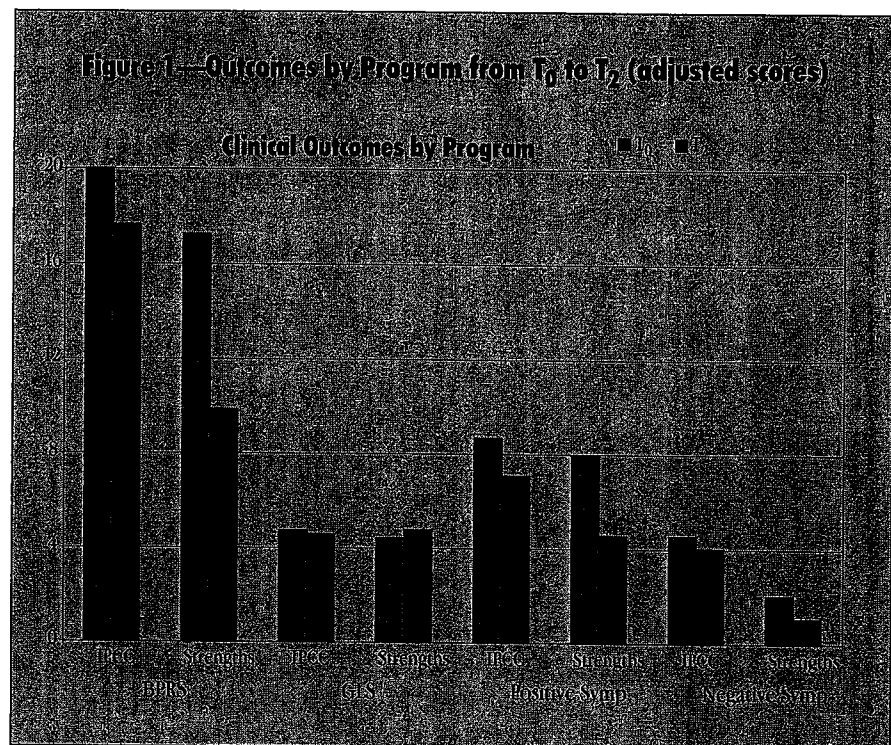
Service Utilization

A MANOVA was used to compare inpatient and outpatient utilization between the Strengths and ACT programs; only outpatient psychiatric visits showed a significant Time*Program effect. As expected given the nature of intensive programs, both dramatically increased use of outpatient psychiatric care, with the number of visits rising 600–840%. However, Strengths participants used outpatient care at a higher rate compared with the traditional ACT group (Tukey post-hoc $p < .014$).

The next set of analyses examines differences by program only. Using the repeated-measures approach, both programs also greatly increased the utilization of total outpatient visits (including both psychiatric and medical care), from 290–490%. In two other non-repeated ANOVAs, on total inpatient days and medical days, the results were mixed. Although both groups significantly decreased inpatient days, participants in the ACT model reduced total inpatient days of care at a significantly greater rate (61% versus 53%) than the participants in the Strengths model. In addition, while Strengths participants considerably decreased medical days, the ACT participants very slightly increased their use of inpatient medical care. Finally, none of the remaining utilization variables had a significant Time effect.

Clinical Outcomes

Particularly relevant to quality of life issues for persons with serious mental illnesses, the clinical outcomes yielded more pertinent results. Significant Time*Program effects were observed for BPRS scores and positive symptoms. BPRS scores for both groups decreased over the two years of this study. However, the BPRS scores of the participants in the Strengths program decreased from 17.3 to 9.9, compared with a change of 20.0 to 17.7 in the ACT group ($p < .0001$). Further, participants in both models showed reductions in positive and negative symptoms. Participants in the Strengths model reduced positive symptoms by almost 50% (8.0 to 4.6) versus an 18% drop in the ACT programs ($p < .002$). Since the negative symptoms variable was not analyzed as a repeated measure, only a program effect was examined controlling for baseline differences; participants in the Strengths program demonstrated a significant comparative reduction ($p < .0001$), reducing the average score by 48% compared with 11% for ACT partici-



pants. Figure 1 depicts these changes in the adjusted means over time for each program.

To determine if there were any differences in outcomes based on the types of psychotropic medications used in the models, analyses were conducted to determine if prescribing patterns varied by program model. There were no differences in the total amount of psychotropic medications prescribed, the use of depot medications, or the overall atypical antipsychotic medications used ($\chi^2 = 1.07, 2.89, 1.69, ns$). But, there was a difference in polypharmacy (3+ medications/participant) and in Clozapine use. Note that less than 3% of these participants were prescribed Clozapine in the mid to late 1990s. That individuals receiving Clozapine most often were in the Strengths program ($\chi^2 = 5.29, p < .021$) might indicate a more innovative approach to medication use in that program than in the ACT programs. We agree with the reviewer concerning the significant role medication plays in reducing clinical symptoms. It did not, however, seem to

play a differential role in participant outcomes.

Sub-Group Analysis

In order to examine whether either program affected the poorest-functioning participants in this sample differentially, a secondary analysis was conducted. Using the median baseline BPRS as a cut-off score, all 174 participants were categorized into two groups, "most symptomatic" and "least symptomatic." The above analyses were re-run to determine if either program helped one group more than the other (a time effect), or if one program had a greater impact on outcomes from T₀ to T₂ (a time*program effect). Initially, focusing on the most symptomatic, poorest-functioning participants, the only variable in which participants in the Strengths program significantly improved outcomes over the ACT model participants was on Instrumental Activities of Daily Living (IADL) scores ($p < .006$). There were no other significant differences between the models. Over time, neither program had a large effect for the group that was "most symptomatic;" instead, improve-

ments in outcomes were primarily observed in the "least symptomatic," better-functioning group. Since the study inclusion criteria required that all participants have a minimum of 150 inpatient days of hospitalization or five hospitalizations in the year before entry, "least symptomatic" can be considered a relative term that does not connote "healthy." Again, both programs improved overall outcomes for all participants when analyzed together.

DISCUSSION

This study provides one of the first comparisons of the Strengths model of care with an established successful approach in the care of persons with serious and persistent mental illnesses, Assertive Community Treatment (Stein et al., 1980). Phillips pointed out that assertive community treatment programs that use supportive, patient-centered approaches are important in helping participants transition to and remain in the community (Phillips et al., 2001). Both the more traditional ACT model and the Strengths-based model of care exhibit success in a number of the areas important to assisting persons with serious mental illnesses in their integration into the community. In terms of addressing one of the purposes of all intensive specialized programs for persons with serious mental illnesses, to transition individuals with serious mental illnesses from receiving most of their care in institutions to primarily living in the community and receiving care on an outpatient basis, both the Strengths and more traditional ACT models of care were successful with significantly fewer inpatient days and significantly more outpatient visits at 2-year follow-up than at baseline.

Individuals in both programs also had important clinical improvements over the course of the study indicating that

one of the key ingredients in adjustment in the community with improvements of symptomology and functioning appears to be the intensive follow-up and contact provided by specialized structured community-based programming. The Strengths model showed significantly greater improvements in clinical outcomes in terms of positive symptoms, negative symptoms, BPRS, and global life satisfaction when compared to the ACT-model programs. Theoretically, Strengths targets symptomology, and these results indicate that the Strengths model appears to meet its goals on these measures. It should be noted that participants in both models improved in terms of symptoms from baseline to follow-up. It should also be noted that individuals in the Strengths model were functioning better and had less intense symptomology than those in the ACT programs at baseline. However, in terms of comparative improvements, persons in the Strengths model had greater improvements in symptomology and functioning. The fact that Clozapine was prescribed most often in the Strengths program might indicate a more innovative approach to medication use in that program. Although some differences were found between the programs, it appears that all participants with serious and persistent mental illnesses benefit from intensive community care management programs, and that those with relatively higher functioning to begin with have the most benefits.

Of note was the relatively low percentage of participants (27%) diagnosed with substance use disorders. There was a similar finding in the larger SMITREC study (Blow et al., 2000) with 29% of the veterans with serious mental illnesses having a dual diagnosis. Given that other studies indicating that comorbid substance use disorders are common in this population (up to 75%) (Barry et al., 1995; Blow et al., 1998; Connelly & Fullick, 1998; Drake & Wallach, 1989;

Greenfield, Weiss, & Tohen, 1995), this may represent an underdiagnosis in these programs.

Methodological Strengths and Limitations of the Study

Limitations of the study include concerns about the uniformity of treatment programs in the ACT model of care since the Strengths program was implemented at one larger site and the ACT programs were implemented in smaller sites, the non-random assignment in the larger SMITREC evaluation study, and the dropout rates. Mueser et al (1998) in a review of published studies on assertive community treatment programs noted that 57% of published studies reported use of quasi-experimental methods. Additionally, they documented attrition rates for ACT programs at between 5 and 53%. The attrition rate in this study varied by model, but analyses indicated that differential attrition did not bias the sample.

In any study of clinical programs, variations in staffing, protocols, and program emphasis exist and can affect outcomes. However, training, ongoing "booster" calls and group meetings for training, as well as a process evaluation, were conducted as part of the original larger study to determine if programs maintained fidelity to their program type. The ACT and Strengths programs adhered to the goals of their respective model of care. A limitation in the study was the original assignment of participants to treatment models. One in four veterans were assigned to the Standard Care comparison condition (Blow et al., 2000). The baseline differences in functioning, which resulted from non-random assignment in the larger study's quasi-experimental design, were handled analytically with covariates of functioning measures and demographics. Further research utilizing additional data on the process of care in each program will assess variations and deter-

mine their effect on patient outcomes. This study did not have sufficient numbers in diagnostic categories or sufficient women to determine the role of gender and diagnosis in outcome, limiting generalizability to the types of participants in the study. Future studies should focus on randomized samples with larger numbers of individuals with serious mental illnesses to provide definitive results on specific aspects of each model that lead to more positive outcomes for subgroups of persons with serious mental illnesses.

Implications

Clinicians and researchers have had questions regarding the effectiveness of the Strengths model of care compared with other specialized programming including the ACT model. The results of this study support conceptualizing the use of both the ACT and Strengths models. Potentially, a system of care that can include several theoretical and practical approaches to meet the intense but varied needs of persons with serious mental illnesses may be most effective. With changes in the health care system and the increased focus on outpatient care and community-based living for persons with serious mental illnesses, models of specialized treatment effectively addressing the needs of persons with serious mental illnesses are providing opportunities for improved functioning and better quality of life. Targeting the theoretical and practical approach to care to the level of functioning is one of the next important steps in providing optimal treatment to important and vulnerable individuals with serious mental illnesses in our society.

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