

Results of an Innovative University-based Recovery Education Program for Adults with Psychiatric Disabilities

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Abstract This study examined the effectiveness of an educational approach to psychiatric rehabilitation called the Recovery Center. Using a quasi-experimental design we recruited 97 intervention and 81 comparison participants and examined the intervention's impact on health, mental health, subjective, and role functioning outcomes. Results suggested that this intervention was effective in improving subjective outcomes, especially empowerment and recovery attitudes, both of which received primary emphasis in the intervention. The Recovery Center, which integrates a bio-psychosocial framework with psycho-educational interventions shows promise as a complement to traditional mental health services in developing readiness for rehabilitation and promoting recovery among individuals with severe psychiatric disabilities.

Keywords Educational intervention · Recovery · Mental health services · Bio-psychosocial · Serious mental illness · Psychoeducation

Introduction

The rehabilitation of individuals with psychiatric disabilities has been the subject of research and program development for decades (Anthony et al. 2002) and the recent federal mandate to transform mental health services has resulted in a paradigm shift toward “recovery-oriented” services [Davidson et al. 2006; New Freedom Commission on Mental Health 2003; Substance Abuse and Mental Health Services Administration (SAMHSA) 2005]. As part of that transformation, evidence-based interventions and best practices that promote overall health, role recovery and community integration are being developed and are taking hold (Bond et al. 2004; Hutchinson et al. 2006b; Mead and Copeland 2000; Mueser et al. 2003; Noordsy et al. 2002; Resnick et al. 2004).

A recovery orientation requires that programs and practices identify and build upon “each individual’s assets, strengths, and areas of health and competence to support the person in managing his or her condition while regaining a meaningful, constructive sense of membership in the broader community” (Davidson et al. 2006, p. 24). The growing consensus that the goal of services must be the recovery and reintegration of people with psychiatric disabilities (Brown and Tucker 2005) has required programs and practitioners to develop collaborative, multidisciplinary services to increase and restore the functional, mental, social, spiritual, and physical health of individuals with serious mental illnesses (Hutchinson et al. 2006b). However, despite these calls, there remains a dearth of

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recovery-oriented programs and services that have been systematically evaluated and described in the literature.

The purpose of this study was to evaluate a unique university-based, educationally oriented program known as the Recovery Center, and examine its effects on a variety of health, mental health and subjective outcomes for individuals with psychiatric disabilities. We hypothesized that individuals who participated in the Recovery Center would demonstrate significantly more positive recovery and rehabilitation outcomes when compared to a comparison group that received mental health services-as-usual.

Intervention Underpinning

Several theoretical and conceptual frameworks guided the development, implementation, and evaluation of the Recovery Center. Incorporation of theory across these dimensions was critical for delivering and evaluating a truly comprehensive program (Glanz et al. 2002) and grounding the intervention in components that have been corroborated through research as being important in the processes of recovery from serious psychiatric disability. These processes have been identified both through empirical literature (Onken et al. 2007) as well as through a broad-based and interdisciplinary consensus process and include: self-determination; the development of hope, meaning and purpose, empowerment; and a holistic approach to the delivery of services (SAMHSA 2005). In addition to being consistent with evidenced-based service delivery (National Cancer Institute 2005), our emphasis on theory was also designed to foster greater precision in measurement of constructs and enable us to gain a better understanding of how the intervention worked.

The Recovery Center program is broadly based on the principles of psychiatric rehabilitation, which has found that people with mental illnesses can and do recover (Anthony et al. 2002) and argues that the values articulated above (e.g., self-determination, personal growth, hope, and so forth) coupled with a focus on skill development are essential. The Recovery Center also drew upon tenets inherent in psychology and its bio-psychosocial conceptualization of mental illness, which goes beyond symptoms and disease to underscore the interplay among the biological–psychological–social–spiritual–intellectual domains. This approach is based on accumulating evidence of a “mind–brain–body interaction” that can affect health and overall quality of life (Ray 2004). The underlying principles of the Recovery Center and the focus on multiple dimensions are consistent with a recovery-oriented delivery of services (O’Donnell 1989; Xie et al. 2005).

The Recovery Center also relied on adult learning theory, which postulates that educational activities should capitalize on the strengths and limitations of its

participants, that adults should be challenged to move to increasingly advanced stages of personal development, and that learners should have as much choice as possible in the educational setting (Cross 1981). Classes were psycho-educational in nature, which has long been considered an empirically supported intervention that can be used to increase knowledge of mental illness, recovery, and to address quality of life issues in a mode that is generally acceptable to individuals with psychiatric disabilities and their families (McFarlane 1997; Mueser et al. 2003; Sibitz et al. 2007). Educational approaches have more recently proliferated as a way to develop not only knowledge, but competencies, empowerment, and readiness for role recovery (Brown et al. 2006; Copeland 2002; Ridgeway et al. 2002), in keeping with a recovery orientation (Mead and Copeland 2005; Mueser et al. 2002; Resnick et al. 2004). Further, individuals with psychiatric disabilities have themselves emphasized the importance of education as a tool and process to assist them in gaining the competencies needed to assume full citizenship and recover from the consequences of their illness (SAMHSA 2005).

Lastly, the Recovery Center was influenced by the Transtheoretical Model (Prochaska et al. 1992) and more specifically its stages of change construct, which was viewed as especially important given its focus on readiness or intention to change behavior, an often critical feature of role recovery (Cohen et al. 2000). To that end, courses were intentionally designed to address different stages of change and provide motivational activities to help people increase their commitment and capacity to change across different areas of their life. In sum, the Recovery Center was grounded in several different theoretical perspectives that reflect the process of recovery and the complex and multidimensional nature of psychiatric disabilities.

Methods

Sample

Participants recruited for the study included 178 adults (85 men and 93 women) who ranged in age from 20 to 65 (mean 43; SD = 9.67). Of these participants, 97 were in the intervention group and 81 in the comparison group. Eighty percent of participants were white and 70% were single and had never been married. In terms of the highest level of school completed, 23% had obtained a high school diploma or GED, 28% had attended some college, and close to 35% had obtained a Bachelor’s or Graduate degree. Close to 60% of participants lived in independent housing and 31% lived in either assisted or supported housing, such as in a group home, cooperative apartment, or independent apartment with

ongoing supported housing services. All participants were receiving mental health services at the time of recruitment and had a diagnosis of a serious and persistent mental illness (e.g., major depression, schizophrenia or related disorder). Additional information about study participants appears in Table 1.

Measures

Measures for this study were selected to represent a broad approach to examining outcomes and to focus on the numerous domains inherent in the multidimensional view of recovery. Outcome measures were dictated both by the nature of the intervention (which was focused across life

domains, including health, mental health and psychosocial outcomes) and also by numerous large-scale studies that have conceptualized recovery outcomes broadly and have examined both functional and symptomatic outcomes (cf. Liberman et al. 2002; Cook et al. 2005; Mueser et al. 2002; Rogers et al. 1997). For example, a review by Mueser and his colleagues on recovery-oriented illness management found that such interventions can reduce symptoms and relapse while improving quality of life. Other large-scale studies have indicated that rehabilitation and recovery interventions can affect role functioning outcomes (Cook et al. 2005) while numerous studies have suggested that self-esteem and self-efficacy, quality of life and other subjective and objective measures of recovery

Table 1 Demographic and clinical characteristics of study participants at baseline and differences between groups

Variable	Experimental (N = 97)		Comparison (N = 81)		Differences between groups		
	N	%	N	%	Test statistic	df	P-value
Age (mean ± SD years)	40.7 ± 9.2		45.1 ± 9.7		$t = 3.02$	166	.003
Gender					$\chi^2 = 1.69$	1	.19
Male	42	43.3	43	53.1			
Female	55	56.7	38	46.9			
Race					$\chi^2 = 1.35$	1	.24
White	81	83.5	62	76.5			
Non-white	16	16.5	19	23.5			
Marital status					$\chi^2 = 2.1$	2	.35
Single/never married	73	76.0	58	71.6			
Separated/divorced/widowed	14	14.6	18	22.2			
Married/living with partner	9	9.4	5	6.2			
Highest level of education ^a					$\chi^2 = 4.17$	2	.12
Less than high school	6	6.3	12	14.8			
High school	21	21.9	20	24.7			
Post-high school	69	71.9	49	60.5			
Housing status					$\chi^2 = 6.7$	2	.04
Independent	64	66.0	39	48.1			
Assisted/supported	30	30.9	35	43.2			
Homeless	3	3.1	7	8.6			
Education status					$\chi^2 = .68$	1	.41
Enrolled	12	12.5	7	8.6			
Not enrolled	84	87.5	74	91.4			
Employment status					$\chi^2 = .52$	1	.47
Employed	26	28.3	19	23.5			
Not employed	66	71.7	62	76.5			
Disability benefits					$\chi^2 = 1.23$	1	.27
SSI or SSDI	75	77.3	68	84.0			
No SSI or SSDI	22	22.7	13	16.0			
Self-reported diagnosis					$\chi^2 = 4.55$	1	.03
Schizophrenia spectrum disorder	26	26.8	34	42.0			
Non-schizophrenia spectrum disorder	71	73.2	47	58.0			

Note: Percentages for the comparison group do not sum to 100% because of rounding error; Ns vary due to missing data

are important outcomes that can be affected by such interventions (Cook et al. 2005; Shern et al. 2000; Hutchinson et al. 2006a; Arns and Linney 1995). The results of studies are by no means unequivocal however in dictating which of many psychosocial outcomes should be studied. For example, Torrey et al. (2000) found no changes in self-esteem among individuals with severe mental illness in a supported employment intervention.

Therefore, given our conceptualization of recovery, the lack of definitive research about which outcomes can be affected by such interventions, and the complex nature of this intervention, we chose to broadly measure a variety of outcomes. Our outcome measures included largely standardized instruments measuring symptoms, role functioning, and subjective outcomes, assessed at baseline 6 and 12 months assessment point.

Health and Mental Health Status: Psychiatric Symptoms, Mental Health Functioning, and General Health

(A) *The Symptom Checklist-90-R* (Derogatis 1994) is a widely used self-report instrument assessing psychiatric symptoms that has been used in dozens of studies. Respondents rate how much they were distressed by specific symptoms in the past week. It provides both global indices of severity of distress and a variety of subscales, including several that are particularly relevant for the participants in this study (e.g., somatization, obsessive-compulsive symptoms, depression, anxiety, hostility, phobias, paranoid ideation, and psychoticism). Good to excellent internal consistency and split half coefficients have been reported (Brophy et al. 1988; Schmitz et al. 1999; Schmitz et al. 2000). The scale's developer reports internal consistency coefficient alphas ranging from .77 for the psychoticism subscale to .90 for the depression subscale and test-retest reliabilities range from .68 to .90 (Derogatis 1994). Factorial validity and convergent-divergent have also been demonstrated (Derogatis 1994).

(B) *The SF-36 Health Survey* (version 2; Ware et al. 1995a) is designed to capture self-reported health and mental health status including: limitations in activities because of physical health or emotional problems; bodily pain; general health perceptions; vitality (energy and fatigue); psychological distress; and well-being. Respondents rate their experience with physical and mental health in the previous 4 weeks. Excellent reliability and internal consistency have been found with this widely used scale with reliability statistics generally at least .80 or above (McHorney et al. 1993, 1994; Ware et al. 1995a, 1995b). Studies have yielded content, concurrent, criterion, construct, and predictive validity (McHorney et al. 1993, 1994; Ware et al. 1995a, b).

(C) *The Behavior and Symptom Identification Scale* (Basis-32; Eisen et al. 1994) is a 32-item scale designed to measure the outcomes, functioning, and symptoms of persons diagnosed with psychiatric conditions. Respondents rate the degree of difficulty they experience in mood, anxiety, suicidality, self-understanding, interpersonal and role functioning, daily living skills, psychotic symptoms, impulsivity and substance use. An overall average score is calculated in addition to total scores for each of the five subscales. The Basis-32 has been demonstrated to be a reliable and valid measure of functioning and global symptomatology in psychometric testing (Sederer and Dickey 1996). Internal consistency coefficients for the full scale have been reported at .89 and have been found to range from .43 to .80 for the five sub-scales (Eisen et al. 1994).

Self-Concept, Quality of Life, Empowerment, and Recovery Attitudes

(A) *The Tennessee Self Concept Scale* (Fitts and Warren 1996) measures six areas of one's self-concept using self-report on 100 items (physical, moral, personal, family, social, and academic/work). High internal consistency has been reported for the total self-concept score (alpha = .95) as well as for each subscale (ranging from .81 to .87; Fitts and Warren 1996). A sum of these subscales yields a total score for self-concept, which was used in this study.

(B) *The Brief Quality of Life Interview* (Lehman et al. 1994) assesses both objective and subjective quality of life across multiple domains, including housing, employment, social, and family life, on a seven-point Likert scale ranging from Terrible to Delighted. The objective and subjective measures have been found to be relatively independent. The scale has demonstrated adequate test-retest reliability coefficients (.41–.95) and internal consistency (alpha = .79–.88) as well as construct and predictive validity (Sederer and Dickey 1996). We present findings for the first global item (How do you feel about your life in general) of the instrument for analysis in this article as noted in Table 2.

(C) *The Empowerment Scale* (Rogers et al. 1997, 2007) is a 28-item instrument designed to measure subjective feelings of personal empowerment. The scale has been demonstrated to have good internal consistency (alpha = .86) as well as good factorial validity and known groups' validity as measured by the scale's ability to differentiate among groups of consumers of mental health services, hospitalized individuals and college students (Rogers et al. 1997).

(D) *The Personal Vision of Recovery Questionnaire* (PVRQ; Ensfield 1998; Ensfield et al. 1999) measures personal beliefs about recovery using 24 items. Factor analysis confirmed five factors presumed to be associated

Table 2 Examples of course offerings of the Recovery Center in each domain

Physical health
Tai-chi
Nutrition
Conscious-eating
Supported fitness
Healthy lifestyle
Personal development
Journaling
Peer support training (Meta Services 2002)
Personal connectedness
Recovery workshop (Spaniol et al. 2005)
Wellness recovery action planning (WRAP)
Employment
Career planning
Coping at work
Surviving social security
Introduction to microsoft office
Education
Internet use
Introduction to the computer
The ABC's of writing: A seminar
Introduction to web design

with recovery: (1) support ($\alpha = .70$); (2) personal challenges ($\alpha = .65$); (3) affirmation ($\alpha = .57$); (3) professional assistance ($\alpha = .63$); and (5) action and help-seeking ($\alpha = .61$). Convergent validity was assessed by comparing the instrument with several other measures of community living, support and life satisfaction (Ensfield 1998; Ensfield et al. 1999).

(E) *The Recovery Attitudes Questionnaire* (RAQ-7; Borkin et al. 2000) is a seven-item scale measuring attitudes towards recovery. Internal consistency is reported by the authors to be .84 for the total score while test-retest reliability was reported at .67 for the total score. Factorial validity and concurrent validity were also established (Borkin et al. 2000). The authors established known groups validity by comparing mental health clients, mental health professionals and students on their recovery attitudes and obtained results in the expected direction.

All of the standardized tests described above rely on self-report. Additional information about the scaling for each instrument appears in Table 3.

Instrumental Role Functioning: Vocational, Educational, and Living Status

(A) *Recovery Center Intake Form and Status Update*: In addition to the standardized measures described above, the research team developed a questionnaire to capture

information on participants' vocational and educational status as well as demographic and clinical status. Demographic items included: gender, marital status, ethnicity and race, age, level of educational attainment, receipt of disability benefits. Residential and employment status were collected using rank-ordered scales ranging from independent housing to homelessness (in the case of residential status) and independent employment to no activity (in the case of employment; Arns et al. 2001). We also collected psychiatric diagnosis and use of psychotropic medications via self-report.

Research Design

A quasi-experimental research design was used (Campbell and Stanley 1963) to examine the effects of this recovery education intervention on: (1) health outcomes such as perceptions of general health, (2) psychiatric symptoms and mental health functioning; (3) empowerment, recovery attitudes, and quality of life; and (4) instrumental role functioning such as vocational and education status. All study procedures were reviewed and approved by the University's Institutional Review Board prior to enrollment of participants.

Procedures

Recruitment

Participants for both the intervention and comparison arms were recruited into the study in five consecutive waves beginning in 1999 and lasting until 2004, with each wave of recruitment corresponding to a new yearly cycle of the intervention. Ethical considerations based upon the program's philosophy emphasizing self-determination prevented us from employing random assignment to treatment condition and would have been antithetical to the Recovery Center's focus on choice. Thus, recruitment for the two arms of the study occurred separately, though all participants were recruited from similar types of mental health, psychosocial and rehabilitation programs in the greater Boston area. Staff from the Center visited programs and described either participation in the intervention arm and recruited individuals for that portion of the study, or visited separate programs and recruited for the services-as-usual arm of the study.

Individuals who expressed an interest in either arm of the study were screened by research and program staff to determine whether they met the study criteria. Both intervention and comparison group participants were included in the study if they: (1) had a diagnosis of serious and persistent mental illness (e.g., schizophrenia and related disorders, major depression, bipolar disorder, or other

Table 3 Repeated measures analysis of differences between the experimental and comparison group over time^a

Outcome	Baseline		6-Month follow-Up		12-Month follow-Up		Time*group Interaction		
	E (N = 97)	C (N = 81)	E (N = 97)	C (N = 81)	E (N = 97)	C (N = 81)	F	df	P-value
	Mean (SD) ^b	Mean (SD) ^b	Mean (SD) ^b	Mean (SD) ^b	Mean (SD) ^b	Mean (SD) ^b			
Symptom Checklist-90^c									
Somatization	1.01 (.81)	.95 (.85)	1.09 (.87)	.96 (.83)	1.03 (.80)	.95 (.75)	.56	2	.5731
Obsessive/compulsive	1.52 (.92)	1.30 (.93)	1.47 (.96)	1.36 (.93)	1.40 (.88)	1.31 (.76)	1.50	2	.2256
Interpersonal sensitivity	1.37 (.98)	1.25 (1.04)	1.31 (.95)	1.20 (1.02)	1.19 (.82)	1.30 (.95)	6.33	2	.0021
Depression	1.52 (1.03)	1.31 (.96)	1.45 (.96)	1.26 (.92)	1.45 (.91)	1.33 (.95)	1.48	2	.2298
Anxiety	1.19 (.96)	1.11 (1.03)	1.11 (.93)	1.10 (.98)	1.05 (.95)	1.19 (1.03)	1.90	2	.1519
Hostility	.76 (.85)	.81 (.91)	.74 (.81)	.75 (.87)	.70 (.74)	.77 (.85)	.67	2	.5121
Phobic anxiety	.82 (.93)	.87 (.96)	.76 (1.01)	.86 (.89)	.67 (.89)	.93 (.88)	4.46	2	.0125
Paranoid ideation	1.03 (.85)	1.17 (.98)	1.09 (.92)	1.11 (1.03)	1.03 (.82)	1.23 (.98)	2.33	2	.0997
Psychoticism	.82 (.72)	.94 (.91)	.79 (.71)	.89 (.86)	.76 (.68)	.95 (.82)	2.46	2	.0873
SF-36^d									
Energy*	40.2 (21.4)	49.2 (20.43)	41.3 (18.35)	50.6 (16.76)	41.6 (21.55)	49.3 (20.96)	.16	2	.8525
Physical	73.6 (22.9)	72.3 (25.9)	73.0 (24.94)	70.2 (26.08)	71.3 (23.3)	73.6 (27.4)	.52	2	.5977
Role—physical	54.4 (40.3)	63.8 (38.4)	60.3 (40.31)	64.4 (36.94)	50.0 (43.30)	57.5 (40.08)	.13	2	.8741
Role—emotional	42.3 (40.7)	44.4 (40.8)	53.3 (40.25)	47.8 (39.58)	47.9 (40.13)	50.6 (41.06)	.24	2	.7884
Emotional well being	50.2 (21.0)	56.2 (21.4)	51.6 (19.91)	56.3 (19.36)	53.6 (20.89)	54.4 (18.9)	2.35	2	.0978
Social	55.2 (27.0)	62.7 (26.6)	60.1 (25.00)	59.2 (24.13)	58.0 (25.72)	60.8 (27.8)	.88	2	.4180
Pain*	63.8 (25.9)	73.1 (24.6)	68.5 (24.69)	69.4 (26.00)	63.7 (26.30)	68.4 (27.38)	1.50	2	.2247
General health	55.8 (22.5)	53.7 (22.1)	56.4 (20.19)	54.6 (21.50)	54.8 (23.61)	58.9 (20.51)	.50	2	.6044
Basis-32^e									
Tennessee self concept ^f	307.3 (44.7)	309.7 (45.9)	311.8 (37.1)	309.9 (41.1)	309.7 (41.3)	315.0 (40.6)	.90	2	.4073
Quality of life ^{g,*}	3.95 (1.47)	4.44 (1.56)	4.32 (1.35)	4.59 (1.52)	4.44 (1.32)	4.53 (1.38)	4.49	2	.0121
Empowerment ^h	2.81 (.34)	2.81 (.35)	2.89 (.29)	2.76 (.28)	2.87 (.31)	2.79 (.27)	3.68	2	.0268
PVRQⁱ									
Support	1.94 (.44)	2.07 (.63)	1.88 (.45)	2.09 (.50)	1.97 (.44)	2.06 (.52)	3.88	2	.0219
Personal challenges	2.46 (.46)	2.57 (.50)	2.39 (.50)	2.60 (.44)	2.39 (.48)	2.53 (.52)	1.36	2	.2586
Affirmation	1.96 (.45)	2.06 (.60)	1.91 (.44)	2.14 (.60)	1.97 (.42)	2.12 (.60)	3.14	2	.0451
Assistance	3.09 (.54)	2.97 (.63)	3.06 (.60)	3.11 (.54)	2.98 (.54)	2.98 (.67)	1.27	2	.2820
Action	1.95 (.48)	2.00 (.56)	1.87 (.49)	2.05 (.56)	1.96 (.49)	2.03 (.49)	1.79	2	.1695
Recovery attitudes ^j	1.88 (.47)	1.93 (.49)	1.77 (.56)	1.93 (.45)	1.79 (.46)	1.93 (.55)	.42	2	.6571

Note: If the total scale showed no difference between E and C groups, no subscale analysis was performed. For all comparisons we adjusted for age, housing status and psychiatric diagnosis

^a Adjusted for age, housing status and diagnosis; presented with imputed data based on last observation carried forward (LOCF)

^b Mean values are presented as non-adjusted means

^c The SCL-90 is measured on a five-point scale ranging from 0 to 4 measuring level of distress; higher scores indicate more distress about various symptoms

^d The SF-36 Health Functioning Scale uses various scales and polychotomous items. These items are converted to a 0-100 scale and summed so that higher scores represent better outcomes

^e The Basis 32 is measured on a five-point scale ranging from 0 to 4 measuring level of difficulty; higher scores indicate more difficulty with symptoms and functioning

^f The Tennessee Self Concept Scale is a 100-item questionnaire with items measured on a five-point scale ranging from “Completely False” to “Completely True”. The scores presented in this table are summed; higher scores indicate higher self-concept

^g The Quality of Life measure is based on one item: “How do you feel about your life in general?” which is measured on a scale from 1 to 7 (Terrible to Delighted); higher scores indicate greater perceived quality of life

^h The Empowerment Scale is a 28-items instrument with items measured on a four-point scale from Strongly Agree to Strongly Disagree; higher scores indicate greater perceived empowerment

ⁱ The PVRQ is measured on a five-point scale ranging from Strongly Agree to Strongly Disagree; lower scores indicate greater perceptions of recovery

^j The RAQ is measured on a five-point scale ranging from Strongly Agree to Strongly Disagree; lower scores indicate greater perceptions of recovery

* There is a statistically significant difference between intervention and comparison groups at baseline for these outcomes, $P < .05$

psychotic disorders), (2) were at least 18 years of age at the time of recruitment, and (3) expressed a willingness to participate in the study. Participants who reported active and severe substance use were excluded. This recruitment process resulted in relatively equal numbers of people in each group, with the exception of one recruitment period (wave 1: 20 vs. 15; wave 2: 19 vs. 17; wave 3: 15 vs. 7; wave 4: 22 vs. 19; and wave 5: 21 vs. 23 participant versus comparison participants, respectively).

To reduce selection bias and ensure that the intervention and comparison groups would be similar in demographic, clinical, and other critical characteristics, we first recruited participants for the comparison group from similar programs as the intervention group and then during later waves of the study used a matching procedure and screened potential comparison participants based upon their similarity to key demographic and clinical factors of participants in the intervention arm. Because each wave of participants was relatively small, matching could not be performed using a methodology such as propensity scores (D'Agostino 1998). (We further discuss baseline differences between the intervention and comparison groups on demographic and clinical factors and how we controlled for those differences in the section “Data Analysis.”)

Data Collection

Assessments were conducted at baseline, 6 and 12 months post-baseline (the length of the intervention) and each interview was approximately 90 min in length. Every participant reviewed and signed an IRB-approved informed consent during the first face-to-face interview and was paid \$25.00 for each interview they completed. Interviews were conducted face-to-face using trained interviewers who were solely involved in data collection and monitoring efforts and were not involved in implementation of the intervention. Retention in the study was relatively good, with 92% of the intervention and 95% of the comparison participants completing interviews at 6 months and 85% of the intervention and 82% of the comparison participants completing interviews at 12 months.

Experimental Intervention

The Recovery Center is based at a large private University in an urban setting and is part of a college that focuses on rehabilitation and a larger center that focuses specifically on psychiatric rehabilitation for adults with serious psychiatric disabilities. The Recovery Center was implemented as a service demonstration project designed to test the feasibility and preliminary effectiveness of this innovative intervention and was initially funded jointly by grant and foundation funds and more recently by

foundation funds. The Recovery Center is not funded by Departments of Mental Health or Rehabilitation nor was the Center eligible for insurance reimbursement.

Once individuals were recruited, screened, and baseline assessments were performed, participants (referred to in the Recovery Center as students) worked with an advisor to choose up to four courses each semester. Courses fell into four domains: (1) physical health; (2) personal development, (3) employment, and (4) education (see Table 2 for examples of courses within each of these domains).

Each class was 90-min long and met weekly with the exception of supported fitness classes, which met three times per week. Duration of the classes was 12 weeks, modeled on a typical educational semester and three 12-week semesters (fall, spring, summer) were offered each calendar year. Participants were only required to take the Recovery Workshop, which was a two semester-long course and beyond this one requirement, participants were able to select up to three other courses per semester based on their own interests and recovery needs. Analysis of process data from a portion of the intervention participants suggested that for the year of study participation (i.e., baseline to the 12-month follow-up) individuals participated in an average of 110 h of classes (SD = 66.19). Average attendance per course during the study was 60%.

Courses were team taught by individuals in the fields of social work, public health, occupational therapy, rehabilitation counseling, medicine, exercise science, theology, and technology, with 16 of the 26 teachers being consumers of mental health services. All instructors received weekly group and individual supervision on skill teaching and providing support to individuals with psychiatric disabilities in an educational setting.

Comparison Intervention

Individuals in the comparison group were receiving mental health treatment “services-as-usual” including a mix of psychosocial rehabilitation services, psychopharmacology, general mental health services, and in some cases residential and case management services. Participants were eligible to join the Recovery Center after their completion in the study.

Data Analysis

Independent *t*-tests (for continuous variables) and chi-square tests (for categorical variables) were used to compare the intervention and comparison participants on demographics, clinical characteristics, and functioning (e.g., financial status, employment, education, housing status, and psychiatric diagnosis) at baseline. Repeated measures Analysis of covariance (ANCOVA) was used to

compare changes in outcome variables between groups over time thus taking advantage of the longitudinal data while statistically controlling for certain variables as described below. An alpha level of .05 was considered significant for all statistical analyses. Missing data at follow up were imputed which we considered a conservative approach to the analyses. Analyses were conducted using SAS 9 and SPSS 15.

Results

Baseline Findings

Statistical tests were conducted to compare the groups at baseline for initial differences, which was particularly important given that random assignment to each study arm was not feasible (as described in the section “[Methods](#)”; see [Table 1](#) for baseline comparisons). Given the tests performed, only a small number suggested significant differences at baseline. Results indicated that on average, participants in the intervention group were significantly younger than those in the comparison group (40.7 ± 9.2 vs. 45.1 ± 9.7 years), were more often living independently (66% vs. 48%) and were less likely to have a diagnosis of schizophrenia or schizoaffective disorder (26.8% vs. 42%). Differences were noted in reported quality of life and in the Pain and Energy subscales of the SF-36 (see [Table 3](#) for baseline means and for significant baseline differences). Therefore, we statistically adjusted for baseline age, housing status, and psychiatric diagnosis as well as the baseline measure of the corresponding outcome variable.

Health and Mental Health Status

There were time-by-group interactions in some subscales of the SCL-90 which assesses the amount of distress a respondent feels about various types of symptoms. Overall, on both the interpersonal sensitivity and phobic anxiety subscales, intervention participants exhibited a reduction in levels of distress over time that the comparison subjects did not. Intervention participants reported greater distress at 6 months on the interpersonal sensitivity items and less distress at 12 months than comparison participants. On the phobic anxiety items, intervention participants reported less distress both at 6 and at 12 months than comparison participants. Effect sizes of the difference in changes over time between the intervention and comparison groups for interpersonal sensitivity from baseline to the 6 months was .05 while the similar effect size of the difference from baseline to 12 months was .51. For the phobic anxiety subscale, effect sizes for the same time periods were .01 and .39, respectively.

There were no significant differences on the following subscales of the SCL-90: somatization, obsessive compulsive behavior, depression, anxiety or hostility. Trends were noted in the paranoid ideation and psychoticism subscales with the intervention participants expressing less distress about these categories of symptoms both at the 6 and 12 month assessments.

The SF-36, also a measure of health, mental health and functioning, suggested no significant differences between the intervention or comparison participants on the majority of subscales. On the emotional well-being subscale a trend was apparent such that the intervention group improved over time while the comparison participants remained approximately the same but these differences did not reach statistical significance. On the Basis-32, which measures symptoms and functioning, there were no significant time-by-group interactions overall or on any subscales.

Self-esteem, Quality of life, Empowerment, and Recovery Outcomes

There was no significant time-by-group interaction on the Tennessee Self Concept Scale or its subscales suggesting no statistically significant differences between intervention and comparison groups over time. There was a significant time-by-group interaction on the quality of life item which measures overall satisfaction with life. Although the mean Quality of Life score was higher for the comparison participants at each time point, intervention participants showed greater improvement over time in reported quality of life. Effect sizes of the difference in changes over time between the intervention and comparison groups from baseline to the 6 months was .18 while the similar effect size of the difference from baseline to 12 months was .41.

There was a statistically significant time-by-group interaction on the Empowerment Scale with intervention participants reporting feeling more empowered than those in the comparison group at both 6 and 12 months. Furthermore, the intervention group improved from baseline to the 6-month point, and remained roughly unchanged between the 6 and 12-month assessments while empowerment scores of the comparison group declined from baseline to 6 months and then remained roughly unchanged between the 6 and 12-month assessments. Effect sizes of the difference in changes over time between the intervention and comparison groups from baseline to the 6 months on the Empowerment Scale was .47 while the effect size of the difference from baseline to 12 months was .41.

There were significant differences between groups over time on the overall Personal Visions of Recovery Scale and its Support and Affirmation subscales; the intervention group reported better Support and Affirmation scores at 6

and 12 months than the comparison group. The intervention group also improved from baseline to 6 months and then remained approximately unchanged from 6 to 12 months while the comparison group was roughly unchanged on the Support subscale over time and reported negative changes over time on the Affirmation subscale. Effect sizes of the difference in changes over time on the total PVRQ between the intervention and comparison groups from baseline to 6 months was .45 while the effect size of the difference from baseline to 12 months was .20. Similar effect sizes for the Affirm subscale were .47 and .33, respectively, .03 for both 6 and 12 months for the Support scale.

We did not find a significant time-by-group interaction on the Recovery Attitudes Scale.

Outcomes Related to Role Functioning

We examined whether the intervention participants were employed or engaged in educational programs in greater proportions than the comparison participants after the intervention. In addition to examining dichotomous status variables (i.e., employed versus unemployed), we collapsed our seven-point, rank-ordered scale of employment into the following three categories: (1) independent employment (indicating employment in a job on the open market without assistance from a vocational specialist); (2) assisted or supported employment (meaning a job on the open market but with the assistance of a job coach or other formal supports); and (3) productive vocational activity (representing volunteer work or sheltered employment).

Results of chi-square analyses suggested no significant differences between the intervention and comparison groups in terms of whether they were employed (a dichotomous variable) at the 6 or the 12-month assessment points ($\chi^2 = .006$, $df = 1$, $P = .54$; $\chi^2 = .68$, $df = 1$, $P = .40$, respectively). Approximately 39–42% in each group reported some kind of vocational activity at 6 and 12 months. We also examined level of employment as described above (i.e., independent, support, transitional employment) at the 6 or 12-month assessment points and found no differences between groups ($\chi^2 = 2.03$, $df = 2$, $P = .36$; $\chi^2 = .99$, $df = 2$, $P = .61$, respectively). Similarly, we examined whether a greater proportion of individuals in the intervention group were engaged in an educational program in the community (such as a vocational training program, college course, or adult education course, over and above their involvement in the Recovery Center). Results of our chi-square analyses suggested no significant differences between the intervention and comparison groups in their engagement in an educational program at the 6-month assessment point (11% vs. 9% in a program, $\chi^2 = .48$, $df = 1$, $P = .35$). At the 12-month assessment point, the results were suggestive, however,

they did not reach statistical significance (11% vs. 20% in a program, $\chi^2 = 1.73$, $df = 1$, $P = .138$), with almost twice as many intervention participants enrolled in an educational program as comparison participants.

Discussion

The impact of an innovative, University-based and recovery-oriented program on various health, mental health, subjective, and role functioning outcomes was tested using a quasi-experimental design. Participants were individuals with severe psychiatric disorders and with substantial mental health histories and functional disability. Given that there were few empirical studies to guide us in evaluating the effects of this new program, we considered our efforts to be largely exploratory rather than definitive testing of effectiveness.

Findings from this study suggest that participation in the Recovery Center had a significant impact on several subjective outcomes such as perceived levels of personal empowerment and attitudes toward recovery, particularly those items having to do with feeling efficacious, supported and affirmed. Given that the primary emphasis of the program was on the values of hope, self-determination, and finding meaning in life, it is logical to see these effects borne out in the analyses. The intervention also had positive effects on certain clinical and health related outcomes including distress surrounding interpersonal sensitivity and phobic anxiety. Trends were also noted in decreased distress in relation to psychotic symptoms and paranoid thoughts. Overall, however, the intervention appeared to have a greater effect on empowerment and recovery rather than clinical symptoms, which is reasonable in that the intervention did not focus on symptom reduction.

Despite our original hypotheses, the intervention appeared to have limited impact on vocational functioning, as we observed no significant differences between the intervention and comparison participants in the proportion of those involved in vocational activities or in the level of their vocational involvement. Participants in both groups experienced increases in their vocational activity over time, but we did not observe a differential trend over time for improvement among the intervention participants. Our failure to find a difference in vocational outcomes between groups appears to contradict anecdotal information we gathered during the interviews in which participants in the intervention condition reported more awareness of, and interest in, the pursuit of vocational activities. Similarly, we observed a trend for individuals in the intervention group to be more involved in educational activities at one year post baseline, though this finding did not reach the level of statistical significance. Whether the increase in

educational activity would translate into improvements in vocational outcomes is difficult to determine without long-term follow-up data.

We also suspect that a more precise measurement of incremental changes in the process of returning to work (for example, setting a vocational goal, engaging in career exploration or planning, actively looking for work) would have allowed us to gain a better understanding of the impact of the intervention on employment. Our measurement was unfortunately not refined enough to capture these smaller increments of change.

Although the uniqueness of the Recovery Center makes it difficult to compare our findings and outcomes to similar studies, the results do suggest that the intervention is quite promising for increasing individuals' level of empowerment, decreasing symptoms and emotional distress, improving attitudes towards recovery and perhaps increasing the tendency to become involved in educational activities. Participants had the opportunity through classes in the program to develop awareness of employment and educational roles and goals, to gain knowledge and skills to manage their psychiatric conditions, to develop a sense of personal meaning and mastery, and ultimately to develop readiness for rehabilitation and increase their commitment to making changes in life roles. The classes served as motivational activities that increased self-awareness about recovery and the individual's capacity to make meaningful changes (i.e., the Recovery Workshop, Wellness Recovery Action Planning). In fact, we are aware of no other program like the Recovery Center that is designed for individuals with serious psychiatric disabilities, grounded in educational, rehabilitative and bio-psychosocial frameworks, offering a breadth of recovery-oriented classes and situated in a non-stigmatizing environment.

This study had several methodological limitations, most notably a lack of random assignment to the intervention and comparison conditions that may have compromised interpretation of our findings. Since individuals were recruited separately for the intervention and comparison arms of the study, selection factors could be responsible for some of the differences we observed. In addition, as noted previously, there is some evidence that participants in the intervention group were less disabled than those in the comparison group. Though we statistically adjusted for these differences, such adjustments are not a substitute for random assignment and could threaten the internal validity of the study. In addition, although we did not observe differential attrition in the intervention versus comparison groups, individuals were lost to follow-up which could undermine any explanation of differences observed between the groups. Another methodological limitation may rest in the number of statistical tests conducted. Given the exploratory nature of this study, we cast our net widely

in terms of outcomes, thus necessitating several statistical tests. In any such situation the possibility of spurious findings must be considered. However, we saw reasonably consistent and robust findings in the empowerment and recovery area which suggest that these findings were not due to multiple testing.

Another factor which could have attenuated the effects of the intervention on the outcomes was the less than optimal attendance of individuals in their educational courses (attendance rate in the intervention averaged 60%), which may not be less than expected for this severely disabled population, but may in fact have prevented participants from experiencing the intervention intensively enough to obtain its full benefits. Direct comparisons to other studies of non-attendance, non-adherence, and attrition are difficult to extrapolate from because of differing definitions of those terms, however, numerous mental health researchers have examined and commented on the high rates of non-attendance of individuals with severe psychiatric disabilities in mental health programs, (cf. Coodin et al. 2004; Nose et al. 2003). In addition to the above limitations, measures of recovery attitudes have not been widely validated and thus may not provide the most accurate assessments of outcomes. Lastly, an additional limitation, as alluded to earlier, is the length of the follow-up period. Many research studies on individuals with serious mental illness involve follow-up periods of 18–24 months (cf. Cook et al. 2005; Crowther et al. 2001; Salyers et al. 2004; Mueser et al. 2001, 1998), which may be a more appropriate time frame in which to examine major role changes and other positive changes. Budget constraints prohibited us from following individuals in all waves of the study beyond 12 months and thus from being able to draw conclusions about the long-term impact of the intervention.

Our experience suggests that future studies of the Recovery Center should include the Change Assessment Scale (Prochaska et al. 1992). It became evident to us as the intervention unfolded that many of the intervention activities were actually affecting participants' readiness to change and yet we did not have an adequate assessment of that outcome.

Despite these methodological limitations, the Recovery Center intervention does show promise as a theoretically driven and multidisciplinary model that incorporates the values and principles of a recovery orientation and may be useful to the mental health field as it undergoes the transformation towards a greater emphasis on recovery-oriented programs and services (Onken et al. 2007). It is also a way to provide meaningful work experiences for people with psychiatric disabilities that are further along in their recovery, as more than half of the trainers used in the intervention were self-described as consumers of mental health services.

According to the National Consensus Statement of Mental Health Recovery, the single most important goal for the mental health service delivery system is recovery (SAMHSA 2005). The values of mental health systems and programs that can promote recovery include self-direction, empowerment, hope, person-centeredness, non-linear, and holistic services. Mental health services should consider the whole person, in terms of employment, education, housing, spirituality, physical health, and well-being, as was emphasized by the Recovery Center.

Further research is needed to better understand the long-term impact of this intervention on a range of outcomes and how to sustain its positive effects. Replication would allow us to understand how transferrable the Recovery Center is to different mental health settings, different populations and with different funding streams. Finally, additional studies would allow us to better understand whether and how the change process and readiness for rehabilitation are affected and can be captured.

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