



Three-year recovery outcomes for long-term patients with co-occurring schizophrenic and substance use disorders

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Abstract

Little is known about the expected treatment outcomes of patients with co-occurring schizophrenic and substance use disorders. This paper reports 3-year outcomes for 152 patients with schizophrenia or schizoaffective disorder and substance use disorders, all of whom received integrated dual disorders treatments in the New Hampshire Dual Diagnosis Study. Outcomes are defined as positive coping behaviors identified by consumers as indicators of recovery. Participants improved steadily in terms of controlling symptoms of schizophrenia, actively attaining remissions from substance abuse, increasing competitive employment, increasing social contacts with non-substance abusers, and improving life satisfaction. Though successful in reducing hospitalization and homelessness, they did not increase time in independent living situations. Outcomes were only weakly interrelated, suggesting that recovery is a multidimensional concept. Neither psychotic diagnosis (schizophrenia vs. schizoaffective disorder) nor substance abuse diagnosis (alcohol vs. other drug disorder vs. both) was related to outcomes. However, these patients with co-occurring schizophrenic and substance use disorders did significantly less well than patients with co-occurring bipolar and substance use disorders in terms of hospitalization, independent living, and quality of life. Overall, the findings provide a hopeful long-term perspective for dual diagnosis patients.

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1. Introduction

Epidemiologic data show clearly that individuals with schizophrenia have high rates of lifetime and current substance use disorders (Regier et al., 1990).

Numerous clinical studies show similar high rates (e.g., Drake et al., 1990; Duke et al., 1994; Mueser et al., 1990; Ziedonis and Trudeau, 1997). Research also establishes clearly that patients with schizophrenia and current substance abuse are highly prone to adverse consequences, including poor treatment response (Bowers et al., 1990), relapse (Swofford et al., 1996), hospitalization (Haywood et al., 1995), HIV infection (Cournos et al., 1991), hepatitis C

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infection (Rosenberg et al., 2001), suicide (Bartels et al., 1992), and a variety of psychosocial difficulties, such as violence (Swartz et al., 1998), victimization (Goodman et al., 2001), incarceration (Abram and Teplin, 1991), homelessness (Caton et al., 1994), and family difficulties (Dixon et al., 1995). In this paper, we use the term “schizophrenia” to denote schizophrenia and schizoaffective disorder, and we use the term “substance abuse” synonymously with substance use disorder to refer to substance abuse and dependence on alcohol or other drugs (except nicotine).

Although the strong associations between comorbid substance abuse and adverse outcomes suggest pessimism regarding course and treatment, the outcomes of treated patients with co-occurring schizophrenia and substance abuse are not well understood, in part because treatments improved significantly during the 1990s (Drake et al., 2004a; Mueser et al., *in press*). Furthermore, schizophrenia patients with co-occurring disorders have generally been omitted from pharmacological trials, except when they are in full remission from substance abuse. Nevertheless, several studies suggest that patients with schizophrenia and substance abuse may respond well to clozapine (Buckley et al., 1994; Drake et al., 2000; Zimmet et al., 2000).

Because patients with schizophrenia and substance abuse present a complex set of interwoven problems and treatment needs, a consensus has developed in favor of combining mental health and substance abuse treatments, which is termed integrated treatment (Center for Substance Abuse Treatment, *in press*; National Institute of Drug Abuse, 1997; New Freedom Commission on Mental Health, 2003; Substance Abuse and Mental Health Services Administration, 2002; U.S. Department of Health and Human Services, 1999). Furthermore, a rapidly expanding body of research on integrated psychosocial treatments, including 26 recent controlled trials, indicates that integrated treatment is effective and that many of these patients have positive outcomes (Drake et al., 1998, 2004b; Mueser et al., *in press*).

The term “recovery” has emerged as a central theme for mental health consumers and providers over the past decade. Unfortunately, the definition of recovery in mental health differs from that used in medicine (absence of illness) and substance abuse (prolonged abstinence). Mental health consumers’

writings (Deegan, 1988; Ralph, 2000) and testimonies (New Freedom Commission on Mental Health, 2003) assert that recovery includes not just controlling illnesses but also moving beyond illnesses to pursue independent, active, and satisfying lives in the community. Following the lead of consumers, the President’s New Freedom Commission on Mental Health (2003) defined recovery as living, learning, working, and participating fully in one’s community. Although measuring recovery in ways that are consistent with consumer definitions is fraught with difficulties, researchers are beginning to address the task (Drake et al., 2004b; Robinson et al., 2004).

This report examines the 3-year course of 152 patients with co-occurring schizophrenic and substance use disorders in the New Hampshire Dual Diagnosis Study. We specifically address six questions: (1) what is the course of illness and outcome for these patients with co-occurring disorders? (2) What is the course of their hospital and outpatient treatment utilization? (3) Can we define recovery as a set of positive outcomes consistent with consumer definitions? (4) How are different recovery outcomes related to each other? (5) How do recovery outcomes for schizophrenia patients compare to those of bipolar patients who had similar comorbidities and received similar treatments? Although various findings from the New Hampshire Dual Diagnosis Study have been reported previously, this report is the first to present findings for schizophrenia patients alone, to identify recovery outcomes and a recovery composite, and to examine the relationships between outcomes.

2. Methods

2.1. Overview

The New Hampshire Dual Diagnosis Study is a prospective, long-term follow-up study of patients with severe and persistent mental illness (chronic schizophrenia, schizoaffective disorder, or bipolar disorder) and co-occurring substance use disorder. The participants entered a 3-year randomized controlled trial of two forms of care management between 1989 and 1992. All participants received integrated dual disorders treatment (Mueser et al., 2003) from their respective mental health centers. This paper

examines the 3-year course of treatment and outcomes for patients with co-occurring schizophrenia (schizophrenia or schizoaffective disorder) and substance use disorder (abuse or dependence).

2.2. Study group

The original participants included 223 patients with co-occurring disorders from 7 of New Hampshire's 10 community mental health centers. These patients were similar to other patients with severe mental illnesses and substance abuse in the New Hampshire public mental health system at the time of study entry (Drake et al., 1998). Of the original cohort, 119 were diagnosed with schizophrenia and 50 with schizoaffective disorder; 152 of these 169 participants (89.9%) completed 3 years in the study, 8 dropped out or were lost to follow-up, and 9 died. We report here on the 152 participants who completed 3 years.

2.3. Procedures

Participants were recruited to the study through informational meetings with patients, families, and mental health professionals. Interested patients met with a research interviewer to confirm eligibility criteria, based on a research diagnostic interview and a review of clinical records by research psychiatrists. After providing written informed consent for all research procedures, participants completed baseline assessment procedures and were randomly assigned within site to one of two forms of care management, assertive community treatment or standard case management, both of which entailed integrated mental health and substance abuse treatments (Teague et al., 1998). At study entry (baseline) and every 6 months throughout the 3-year follow-up, researchers assessed each participant by conducting urine toxicology tests, administering 1.5-h structured interviews, and collecting clinician ratings of substance use disorder.

2.4. Measures

Research psychiatrists established diagnoses of co-occurring severe mental illness and substance use disorder using the Structured Clinical Interview for DSM-III-R (Spitzer et al., 1988). At baseline, the

research interview included items from the Uniform Client Data Inventory (Tessler and Goldman, 1982) to assess demographic information; the Time-Line Follow-Back (Sobell et al., 1980) to assess days of alcohol and drug use over the previous 6 months; the medical, legal, and substance use sections from the Addiction Severity Index (ASI) (McLellan et al., 1980); detailed chronological assessment of housing history and institutional stays using a self-report calendar supplemented by outpatient records and hospital records (Clark et al., 1996); the Quality of Life Interview (QOLI) (Lehman, 1988) to assess objective and subjective dimensions of quality of life; the Expanded Brief Psychiatric Rating Scale (BPRS) (Lukoff et al., 1986) to assess current psychiatric symptoms; and management information systems data to assess service utilization. To the QOLI questions on social function, we added a similar question on "regular contact with friends who do not use alcohol or other drugs," because patients consistently report that this behavior represents the key social challenge in attaining stable remission. In addition, we conducted urine toxicology screens in our laboratory using EMIT enzyme immunoassay (Syva-Behring) to assess drugs of abuse. Follow-up interviews contained the same instruments, without reassessing demographic and lifetime information. Reliabilities on all scales were satisfactory, with intraclass correlation coefficients ranging from 0.94 to 1.00 for interrater reliabilities and from 0.41 to 0.94 for test-retest reliabilities.

To supplement the substance abuse assessments, clinicians (case managers) rated participants every 6 months on three rating scales: the Alcohol Use Scale (AUS) (Drake et al., 1990), the Drug Use Scale (DUS), and the Substance Abuse Treatment Scale (SATS) (McHugo et al., 1995). The AUS and DUS are five-point scales based on DSM-III-R criteria for severity of disorder: 1=abstinence, 2=use without impairment, 3=abuse, 4=dependence, and 5=severe dependence. The SATS is an eight-point scale that indicates progressive participation in treatment and movement toward stable remission from substance abuse according to Osher and Kofoed's (1989) model of treatment and recovery: 1–2=early and late stages of engagement, 3–4=stages of persuasion, 5–6=stages of active treatment, and 7–8=stages of relapse prevention and recovery. This model prescribes, first,

that patients are first engaged in a working alliance (engagement stage); second, that they are helped to develop motivation for abstinence (persuasion stage); third, that they participate in actively eliminating substance abuse (active treatment stage); and, finally, that they continue to address their vulnerability to relapse and addressing other goals in their lives (relapse prevention stage). Both assertive community treatment and standard case management teams used this stagewise approach in helping patients move through the recovery process.

To establish consensus ratings of substance abuse, a team of three independent raters, blind to study condition, considered all available data on substance use disorder (from interview rating scales, clinician ratings, and urine drug screens) to establish separate ratings on the AUS, DUS, and SATS scales, following procedures validated previously (Drake et al., 1996). To determine the interrater reliabilities, researchers independently rated a randomly selected subgroup of 32% of the patients (433 observations on 65 patients). Intraclass correlation coefficients were high for all three scales: 0.94 on the AUS, 0.94 on the DUS, and 0.93 on the SATS.

To develop a measure of recovery, we examined several different domains of outcome (symptoms of schizophrenia and of substance use disorder, aspects of adult role performance, and quality of life), selected variables that corresponded to consumers' positive definitions of recovery, and defined cut-points based on the criterion of clinical meaningfulness or common sense. For psychiatric symptoms, absence of clinically significant symptoms (no BPRS subscale average >3) indicates that the individual has learned to control symptoms using medications and other strategies. For substance abuse, having attained the late active treatment stage or better (SATS>5) indicates that the individual has attained a clinically meaningful remission and is actively working on long-term abstinence. For community integration, independent housing (>80% of days residing in one's own housing) means the individual is not just avoiding institutionalization and homelessness but is living independently and is therefore responsible for rent and housing decisions. Competitive employment (any competitive job in year three) means working in a job that is in an integrated work setting, that pays at least minimum wage, and that is contracted to the

individual directly rather than to a program or mental health agency. Because many dually diagnosed consumers report that the key challenge for recovery is making friends who are not substance abusers, we used regular contact (at least weekly) with peers who are not substance abusers as a measure of social recovery. Finally, because most definitions of recovery involve some notion of quality of life, we included expressing general satisfaction with one's life (>5 on the QOLI global satisfaction rating). As a summary of an individual's recovery, we simply added together the number of scores above threshold on these six items.

2.5. Data analysis

Two sets of data analyses were conducted. First, to examine the course of change, we plotted mean score of each outcome over the 3-year study period. The time effects were modeled with generalized estimating equation (GEE) methods (Liang and Zeger, 1986) using the SAS Proc Genmod procedure (SAS, 2000). Analyses for three living situation variables (jail/prison, homelessness, and independent living) and competitive work status were based on yearly data; other variables were modeled based on semiannual data. Second, the relationships among the six major outcomes were assessed with simple bivariate correlations.

3. Results

3.1. Baseline characteristics

Table 1 shows baseline characteristics of the 152 patients with schizophrenia or schizoaffective disorder who completed 3 years in the study and thus form the core group for these analyses. All but five were Caucasian, over three-fourths were male, and over two-thirds had never married. Because these patients were in the public mental health system due to severe and persistent mental illness, they had been ill for a considerable length of time (on average, 12 years with mental illness and over 15 years with substance abuse). They abused the substances that were most prevalent in New Hampshire at the time (alcohol, cannabis, and cocaine). On average, substance abuse

Table 1
Baseline characteristics for 152 patients with schizophrenia and schizoaffective disorder and co-occurring substance use disorder

Variables	Mean/ count	Standard deviation/ percent
Age (years)	32.4	7.2
Race (White)	147	96.7%
Sex (male)	118	77.6%
Marital (never married)	104	68.4%
Education (completed high school or higher)	94	61.8%
Age at first psychiatric encounter	20.2	6.2
Diagnosis		
Schizophrenia	107	70.4%
Schizoaffective disorder	45	29.6%
Age of onset for alcohol or drug abuse	16.9	5.1
Substance use disorder		
Current alcohol use disorder (present)	124	82.7%
Current cannabis use disorder (present)	68	45.0%
Current cocaine use disorder (present)	23	15.2%
Other drug use disorder (present)	26	17.2%

began more than 3 years before first psychiatric contacts.

3.2. Three-year outcomes

Table 2 shows that the participants improved in several areas over time. Given the number of tests, we interpret as significant only differences at $p \leq 0.01$. Although participants entered the study as outpatients rather than during an episode of illness or hospitalization and were therefore relatively stable, their psychiatric symptoms, particularly symptoms of thought disorder, improved significantly over time. Participants also improved dramatically in terms of substance abuse, with 40.4% in full remission at 3 years. The table shows analyses for the full sample, but separate analyses restricted to those with an alcohol diagnosis ($n=107$) or those with a drug diagnosis ($n=67$) revealed that time effects on alcohol or drug measures were highly significant for the respective subgroups on all measures except number of days using drugs. For example, for drug users, the ASI drug composite score decreased from 0.14 at the baseline to 0.09 at the endpoint (Chi-square=6.17, $df=1$, $p=0.013$).

Measures of living situation show significant reductions in rates of hospitalization and homeless-

ness, but no increase in independent living days, because many participants were living in structured settings, such as group homes, rather than independently. Participants increased their rates of competitive employment and decreased their overall number of activities. They also increased their rate of regular contacts with non-substance-abusing friends. Participants reported greater satisfaction with their lives overall, but the changes in specific areas of quality of life were too small to achieve significance. There were no significant differences in outcomes based on the random assignment to different forms of care management, the diagnostic distinction between schizophrenia and schizoaffective disorder, and the diagnostic distinctions between alcohol abuse, drug abuse, and both alcohol and drug abuse (not shown in the table).

Table 2 shows that participants steadily increased in stage of substance abuse treatment and in attaining full remissions over 3 years. At the beginning of the study, nearly all of the participants were not yet engaged in treatment or were in the persuasion stage, indicating that they were in pre-motivational stages of change with respect to substance abuse. Over time, many steadily moved into active treatment and relapse prevention stages, both indicating progress toward achieving abstinence, and many achieved full remissions for 6 months or more. At the same time, however, a large proportion at each follow-up was in the persuasion, or motivation, stage. Moreover, the course of substance abuse was characterized by continued fluctuations of remissions and relapses. Over 3 years, 63.8% (97 of the 152) entered full remissions (defined by DSM-III-R as at least 6 months without any signs of abuse or dependence), but 48.9% (44 of 90 with at least 1 year of follow-up after attaining full remission) relapsed within 1 year.

3.3. Service utilization

Table 3 shows the longitudinal pattern of service utilization. Participants decreased their inpatient hospital use (though not significantly, due to large variance) as they increased their outpatient service utilization after they entered the study. In particular, they increased outpatient case management contacts and medication visits. Partial hospitalization increased briefly but did not change significantly over time.

Table 2
Three-year outcomes for patients with schizophrenia and schizoaffective disorder and substance use disorder ($n=152$)

Variables	Baseline, mean (S.D.)/ count (%)	6 months, mean (S.D.)/ count (%)	12 months, mean (S.D.)/ count (%)	18 months, mean (S.D.)/ count (%)	24 months, mean (S.D.)/ count (%)	30 months, mean (S.D.)/ count (%)	36 months, mean (S.D.)/ count (%)	Level of significance for time effect
<i>Symptoms of schizophrenia and schizoaffective illness</i>								
BPRS ^a —total score	47.66 (14.25)	43.66 (12.03)	43.78 (12.12)	45.03 (13.04)	44.10 (12.00)	42.27 (11.63)	42.57 (11.82)	**
BPRS—affect	2.45 (1.11)	2.34 (1.13)	2.36 (1.07)	2.55 (1.18)	2.52 (1.10)	2.33 (1.14)	2.39 (1.16)	ns
BPRS—anergia	1.99 (1.04)	1.81 (0.98)	1.79 (1.01)	1.70 (0.92)	1.75 (1.03)	1.71 (0.90)	1.62 (0.88)	**
BPRS—thought disorder	2.78 (2.54)	2.42 (1.46)	2.41 (1.40)	2.45 (1.45)	2.36 (1.51)	2.21 (1.23)	2.32 (1.37)	**
BPRS—disorganization	1.37 (0.77)	1.25 (0.64)	1.22 (0.57)	1.24 (0.61)	1.20 (0.54)	1.30 (0.70)	1.25 (0.59)	ns
BPRS—activation	1.51 (0.66)	1.45 (0.67)	1.45 (0.79)	1.39 (0.67)	1.41 (0.75)	1.42 (0.71)	1.33 (0.57)	**
<i>Substance abuse</i>								
AUS ^b	3.29 (1.03)	2.79 (0.98)	2.77 (1.07)	2.71 (1.14)	2.66 (1.07)	2.69 (1.11)	2.58 (1.12)	**
Days of alcohol use	59.98 (61.18)	40.40 (52.73)	41.50 (51.80)	37.10 (49.52)	33.76 (45.63)	43.85 (56.90)	36.40 (51.20)	**
ASI alcohol composite ^c	0.25 (0.22)	0.21 (0.20)	0.19 (0.19)	0.20 (0.21)	0.19 (0.21)	0.19 (0.21)	0.18 (0.20)	**
DUS ^d	2.41 (1.26)	2.23 (1.21)	2.19 (1.19)	2.18 (1.17)	2.10 (1.18)	2.24 (1.21)	2.14 (1.14)	*
Any drug use (yes)	75 (56%)	71 (53%)	74 (53%)	74 (50%)	76 (51%)	79 (56%)	77 (51%)	ns
ASI drug composite—dichotomized (yes) ^e	94 (64%)	86 (64%)	74 (53%)	84 (58%)	86 (59%)	79 (56%)	79 (56%)	*
Full remission ^f in past 6 months	2 (1%)	52 (36%)	50 (33%)	57 (38%)	59 (39%)	52 (37%)	61 (40%)	**
SATS ^g	2.85 (1.05)	3.48 (1.07)	3.85 (1.40)	4.04 (1.57)	4.29 (1.59)	4.38 (1.78)	4.75 (1.78)	**
<i>Living situation</i>								
Hospital stay past 6 months (yes)	74 (49%)	62 (41%)	65 (43%)	56 (37%)	57 (38%)	50 (33%)	50 (33%)	**
Jail/prison past year (yes)	15 (10%)		17 (11%)		19 (13%)		17 (11%)	ns
Homeless past year (yes)	41 (27%)		34 (22%)		19 (13%)		19 (13%)	**
Days of independent living past year ^h	173.63 (154.45)		168.20 (143.28)		164.25 (132.19)		166.36 (159.06)	ns
<i>Functional status</i>								
Competitive job past year (yes)	9 (6%)		22 (14%)		23 (15%)		37 (24%)	**
Social contact with non-abusers (yes)	10 (7%)	20 (14%)	47 (32%)	49 (34%)	57 (39%)	46 (33%)	53 (37%)	**
QOLI ⁱ —daily activities (0–1)	0.50 (0.15)	0.49 (0.15)	0.50 (0.13)	0.49 (0.15)	0.47 (0.16)	0.48 (0.14)	0.47 (0.16)	*
QOLI—social contact (1–5)	2.75 (0.85)	2.79 (0.89)	2.83 (0.82)	2.89 (0.78)	2.80 (0.88)	2.83 (0.86)	2.71 (0.92)	ns
QOLI—family contact (1–5)	3.30 (0.90)	3.23 (1.06)	3.27 (0.98)	3.26 (1.00)	3.25 (0.92)	3.29 (0.98)	3.15 (0.93)	ns
<i>Quality of life^j</i>								
QOLI—general life satisfaction	4.21 (1.49)	4.35 (1.50)	4.37 (1.39)	4.40 (1.37)	4.46 (1.44)	4.67 (1.32)	4.43 (1.35)	**
QOLI—satisfaction with housing	4.90 (1.11)	4.97 (1.03)	5.03 (1.08)	4.94 (1.19)	5.12 (1.01)	5.01 (1.04)	4.99 (1.06)	ns
QOLI—satisfaction with social relations	4.51 (1.22)	4.65 (1.06)	4.55 (1.14)	4.60 (1.06)	4.51 (1.14)	4.54 (1.12)	4.56 (1.17)	ns
QOLI—satisfaction with family relations	4.48 (1.54)	4.65 (1.34)	4.66 (1.40)	4.69 (1.40)	4.76 (1.36)	4.64 (1.28)	4.66 (1.32)	ns
QOLI—satisfaction with leisure	4.37 (1.23)	4.55 (1.16)	4.55 (1.20)	4.57 (1.11)	4.60 (1.15)	4.60 (1.16)	4.52 (1.24)	ns

Table 3
Outpatient and inpatient service utilization in each year ($n=152$)

Variables	Baseline year, mean (S.D.)	Year 1, mean (S.D.)	Year 2, mean (S.D.)	Year 3, mean (S.D.)	Level of significance for time effect
Case management (h)	30.96 (38.45)	80.55 (68.12)	99.64 (90.79)	102.29 (93.28)	**
Medication visits (h)	11.34 (14.19)	19.78 (24.72)	22.65 (28.35)	22.25 (27.09)	**
Partial hospitalization (h)	147.59 (256.37)	206.86 (300.83)	163.15 (257.89)	145.52 (237.82)	ns
Hospitalization (days)	38.01 (61.01)	23.70 (40.97)	29.93 (58.63)	27.20 (62.44)	ns

** $p<0.01$.

3.4. Relationships between outcomes

Table 4 shows a correlation matrix based on selected endpoint variables to illustrate the relationships between different domains of outcomes. Most of the relationships are in the expected directions, but not significant. Due to multiple tests, we again interpret as significant only relationships with $p\leq 0.01$. Total symptoms were negatively correlated with work and quality of life. Stage of substance abuse treatment was positively correlated with social contacts with non-abusers.

3.5. Recovery outcomes

The relative independence of outcomes in Table 3 indicates that recovery is a multidimensional concept. In other words, recovery in one domain does not necessarily transfer to other domains. The rates of attaining a priori thresholds of recovery on individual items at 3-year follow-up were as follows: psychiatric symptom control=46.3%; late active treatment for substance abuse=34.9%; independent living=38.2%; competitive employment=24.3%; regular contact with non-substance abusing friends=37.1%; satisfaction with life=46.7%. Adding items above threshold

together to form a composite recovery outcome score showed highly significant improvements over time ($t=7.35$, $df=151$, $p<0.0001$). As Fig. 1 shows, at baseline only 13.2% of the participants were above threshold for recovery in three or more areas, whereas that percentage more than tripled at 3 years (41.4%). Still, the majority of participants continued to be below threshold on each individual item.

3.6. Comparison with bipolar patients

Finally, we compared outcomes shown in Table 2 for the schizophrenia patients in this study with outcomes for patients diagnosed with severe bipolar illness in New Hampshire Dual Diagnosis Study. The data for the bipolar group are reported elsewhere (Drake et al., 2004b). The two groups had similar rates of co-occurring substance use disorders and many other characteristics at baseline, but the bipolar participants were older (37.5 vs. 32.4, $t=3.98$, $df=201$, $p<0.0001$), had fewer symptoms of anergia (chi-square=7.09, $df=1$, $p<0.01$), thought disorder (chi-square=55.91, $df=1$, $p<0.0001$), and disorganization (chi-square=8.74, $df=1$, $p<0.01$), had higher scores on the Substance Abuse Treatment Scale (chi-square=5.18, $df=1$, $p=0.02$), were more likely to have a

Notes to Table 2:

^a Brief Psychiatric Rating Scale (24–168).

^b Alcohol Use Scale (1–5).

^c Addition Severity Index—alcohol composite (0–1).

^d Drug Use Scale (1–5).

^e Addition Severity Index—drug composite (0–1).

^f Both AUS and DUS scores less than 3.

^g Substance Abuse Treatment Scale (1–8).

^h Independent living consists of the following residential settings: house/trailer, apartment, rooming house, family of origin, group home.

ⁱ Quality of Life Interview.

^j QOLI Satisfaction scales (1–7).

* $p<0.05$.

** $p<0.01$.

Table 4

Pearson product moment correlations between indicators of recovery for schizophrenia and schizoaffective patients at 36 months ($n=152$)

	BPRS ^a total score	SATS	Independent living	Contact with non-abusers	Competitive work
SATS ^b	-0.12	-			
Days of independent living (past 6 months)	-0.00	-0.14	-		
Frequency of social contact with non-abusers	-0.23*	0.25**	0.15	-	
Competitive work (past year)	-0.22**	-0.04	0.14	0.14	-
QOLI ^c —general life satisfaction	-0.52**	0.16	-0.19*	0.09	0.05

^a Brief Psychiatric Rating Scale.^b Substance Abuse Treatment Scale.^c Quality of Life Inventory.* $p<0.05$.** $p<0.01$.

competitive job (chi-square=4.53, $df=1$, $p=0.03$), and had lower scores on several measures of quality of life (general life satisfaction, chi-square=5.96, $df=1$, $p=0.01$; satisfaction with social relations, chi-square=8.49, $df=1$, $p<0.01$; satisfaction with leisure, chi-square=8.54, $df=1$, $p<0.01$). Over time the full group improved on almost every measure, but the bipolar participants showed greater gains (significant group by time interactions) in terms of staying out of the hospital (chi-square=13.22, $df=1$, $p<0.001$), achieving independent living (chi-square=3.80, $df=1$, $p=0.05$), and several measures of quality of life (general life satisfaction, chi-square=7.79, $df=1$, $p<0.01$; satisfaction with social relations, chi-square=6.14, $df=1$, $p=0.01$; satisfaction with family relations, chi-square=5.70, $df=1$, $p=0.02$; satisfaction with leisure, chi-square=4.64, $df=1$, $p=0.03$). The

bipolar group also improved on overall recovery score more than the schizophrenia group (group by time interaction, $F=12.44$, $df=201$, $p<0.001$). Thus, bipolar patients started with better functioning and also improved more over time.

4. Discussion

The 3-year outcomes for participants with schizophrenia and co-occurring substance abuse receiving integrated dual disorder treatments were clearly positive for a large proportion. Despite severe and prolonged disability, many of these individuals were able to achieve control of both disorders, to reduce episodes of hospitalization and homelessness, to achieve success in some aspects of community functioning, and to attain what they perceived as a better quality of life.

At the same time, over half did not achieve a priori thresholds on several measures of recovery, in contradistinction to the bipolar group (Drake et al., 2004b). The schizophrenia patients who do not achieve remission from substance abuse with outpatient treatment might be considered candidates for long-term residential programs, which have been shown to be effective for such patients (Drake et al., 2004a). However, New Hampshire had essentially no long-term residential programs available for dual diagnosis patients at the time of this study.

The observed weak relationships between outcomes from multiple domains indicate that the

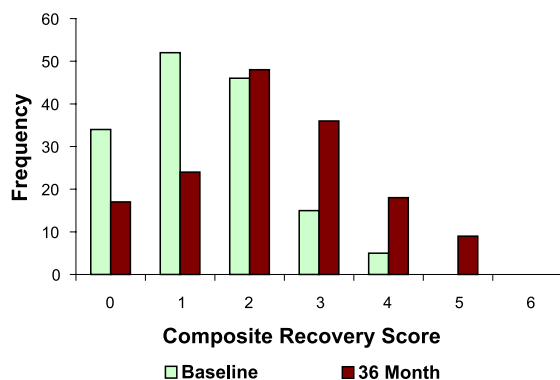


Fig. 1. Frequency distribution of composite scale scores at baseline and 36 months for schizophrenia and schizoaffective patients with co-occurring substance use disorders ($n=152$).

domains are relatively independent. The only strong relationship was between high psychiatric symptoms and poor life satisfaction. Our findings regarding weak relationships between outcomes are consistent with many years of schizophrenia research. [Strauss and Carpenter \(1974\)](#) and [Gurel and Lorei \(1972\)](#) found similar weak relationships among outcome domains for schizophrenia patients many years ago. To these previous findings, we have added the observation that substance abuse and quality of life outcomes are also relatively independent of the other outcome domains. In part, independence of outcome domains reflects the clinical observation that long-term patients progress at different rates in different areas, according to their goals and levels of motivation for change in these different domains ([Mueser et al., 2003](#)). At the same time, the independence of substance abuse recovery from other outcome domains is somewhat surprising, given the strong relationships between substance abuse and negative outcomes for this population ([Drake and Brunette, 1998](#)).

The relationship between treatment and recovery is less clear. Overall, the data show that nearly all participants were rapidly engaged in outpatient dual diagnosis services and that hospital use and homelessness were reduced over time as people increased their use of outpatient services. The data indicate that these patients continued to require substantial outpatient treatments and supports to remain out of institutional settings over 3 years. Quality of services and specific services are also undoubtedly important. In a separate analysis using the larger study group, we found that in centers where the assertive community treatment model was implemented with high fidelity, substance abuse outcomes were much better than in centers with poor implementation ([McHugo et al., 1999](#)). We also reported earlier that schizophrenia patients in this study group who received clozapine experienced dramatic improvements in substance abuse outcomes compared to those on other antipsychotic medications ([Drake et al., 2000](#)).

Although the mental health consumer concept of recovery continues to be difficult to define and measure, assessment of functional improvements is clearly feasible. To serve as indicators of recovery, functional outcomes should correspond to meaningful behaviors identified by relevant consumer groups. For

example, people with co-occurring mental illness and substance abuse report that having regular contacts with friends who do not abuse substances is a meaningful social outcome, not increasing the size of their networks or their overall amounts of social contact. We attempted to use consumer writings to select behavioral outcomes that corresponded to other positive behaviors that consumers identify, such as illness control, independent functioning in the community, and quality of life.

The schizophrenia patients reported here, in comparison to the bipolar patients in our comparison group, did not improve as much on proportion of time out of the hospital and on proportion of time living independently in the community. In fact, days in independent living did not improve at all for the schizophrenia participants, and was correlated at follow-up with low levels of life satisfaction. Although surprising in some ways, this finding is consistent with the observation that patients with co-occurring substance use disorders often need and seek out more structured living arrangements and fellowship with peers who are also attempting to maintain abstinence ([Bebout et al., 1997](#); [McCoy et al., 2003](#); [McHugo et al., in press](#)).

Including subjective measures of quality of life is somewhat controversial because these measures tend to be stable over time as people readjust their own expectations ([Diener, 2000](#)). We found improvement in reported overall life satisfaction but not in specific areas of quality of life, which was quite different for the bipolar study participants who reported improvements in almost every area of quality of life. Other attitudinal concepts that are often identified by consumers and could be considered in an index of recovery include hope, self-esteem, and empowerment ([Ralph, 2000](#)).

Several caveats deserve mention. This study group did not approximate a representative sample of people with schizophrenia and substance use disorders, though it was representative of those in treatment in the New Hampshire state mental health system. Further, the New Hampshire mental health system was atypical in offering comprehensive integrated dual disorders treatment during the early 1990s. Currently, however, many state systems are moving to implement integrated treatment programs ([Drake et al., 2001](#)).

Because the findings reported here are not based on random assignment, the longitudinal improvements cannot be definitively attributed to integrated dual disorders treatment. Other possible explanations include regression to the mean and concurrent changes in the New Hampshire mental health system during the same era. For example, the findings regarding competitive employment and regular contacts with non-substance abusers might be partially related to the emphasis on supported employment and self-help that began during these years in New Hampshire. Regarding regression to the mean, other recent studies of comparable individuals with co-occurring disorders show little progress on substance abuse outcomes (Sacks et al., 2003). Furthermore, we do know that the participants in this study received integrated dual disorder treatments (Teague et al., 1998), that improvements were greater in the centers in which integrated dual disorders treatments were delivered with higher fidelity (McHugo et al., 1999), and that recent controlled studies support the effectiveness of integrated dual disorder treatments (Drake et al., 2004a). We therefore believe that integrated dual disorder treatment was important to recovery outcomes.

We have no data on episodes of relapse to sort out the relationships between relapses of mental illness and substance abuse. We also do not have detailed measures of medications, adherence, and blood levels. We are therefore unable to comment on many important aspects of treatment.

Nevertheless, the data shown here provide a hopeful long-term picture for patients with co-occurring schizophrenic and substance use disorders. When these patients receive integrated dual disorders treatments, their outcomes in several domains of recovery, not just symptom control, improve steadily.

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