

Outcomes and Service Use Among Homeless Persons With Serious Mental Illness and Substance Abuse

Gerardo Gonzalez, M.D.

Robert A. Rosenheck, M.D.

Objective: This study compared baseline characteristics and clinical improvement after 12 months among homeless persons with a diagnosis of serious mental illness with and without a comorbid substance use disorder. **Methods:** The study subjects were 5,432 homeless persons with mental illness who were participating in the Center for Mental Health Services' Access to Community Care and Effective Services and Supports (ACCESS) program. Analysis of covariance was used to compare clients who had dual diagnoses and those who did not and to identify any association between service use and clinical improvement. **Results:** Follow-up data were available for 4,415 clients (81 percent). At baseline, clients with dual diagnoses were worse off than those without dual diagnoses on most clinical and social adjustment measures. Clients with dual diagnoses also had poorer outcomes at follow-up on 15 (62 percent) of 24 outcome measures. However, among clients with dual diagnoses, those who reported extensive participation in substance abuse treatment showed clinical improvement comparable to or better than that of clients without dual diagnoses. On measures of alcohol problems, clients with dual diagnoses who had a high rate of participation in self-help groups had outcomes superior to those of other clients with dual diagnoses. Clients with dual diagnoses who received high levels of professional services also had superior outcomes in terms of social support and involvement in the criminal justice system. **Conclusions:** Homeless persons with dual diagnoses had poorer adjustment on most baseline measures and experienced significantly less clinical improvement than those without dual diagnoses. However, those with dual diagnoses who received extensive substance abuse treatment showed improvement similar to those without at 12 months. (*Psychiatric Services* 53:437-446, 2002)

Homeless persons who have both mental illness and a diagnosis of substance abuse are an especially difficult population to treat, because their problems are numerous and severe (1-6). Many studies have evaluated the treatment

of homeless persons with serious mental illness (7-10), and at least six controlled studies have specifically examined intensive treatment approaches for those with comorbid substance abuse. Burnam and colleagues (11), using an experimental

design, found little benefit in intensive residential or outpatient treatment. However, Drake and colleagues (12), using a quasi-experimental design, found better outcomes with integrated treatment. In a reanalysis of data from the sample in the study by Drake and colleagues, Trumbetta and associates (13) found that frequent contact with members of Alcoholics Anonymous (AA) or Narcotics Anonymous (NA) was associated with a reduction in alcohol use.

In a sample of homeless veterans with dual diagnoses, a fourth study (14) compared outcomes between residential treatment programs for substance abuse and programs that specifically addressed both psychiatric and substance use disorders. Integrated treatment appeared to be associated with better outcomes, although differences were modest. That study, like the others, did not use random assignment, and the outcome assessments were based on global ratings completed by treating clinicians.

Nuttbrock and colleagues (15) compared the outcomes of homeless persons with dual diagnoses who were treated in a highly demanding and structured therapeutic community and those who were treated in community residences and found that the demanding therapeutic community was more effective. However, Blankertz and colleagues (16), who also compared a structured therapeutic community with a psychosocial rehabilitation residential program that promoted social integration, found significantly better outcomes for par-

The authors are affiliated with the department of psychiatry of Yale University School of Medicine in New Haven and with the Veterans Affairs Medical Center in West Haven, Connecticut. Send correspondence to **Dr. Gonzalez** at VA Connecticut Medical Center, Building 36, 950 Campbell Avenue, West Haven, Connecticut 06516 (e-mail, gerardo.gonzalez-haddad@yale.edu).

ticipants in the latter program. However, both these studies suffered from a high attrition rate (86 percent and 50 percent, respectively), making the validity of their findings uncertain.

Despite the methodological limitations of these studies, the results suggest that intensive treatment may improve outcomes for homeless persons who have both psychiatric and substance use problems. In addition, although most of the studies addressed the impact of various professional services, only one study (13) assessed the benefit of self-help groups, such as AA and NA, which have been reported to be underused by and ineffective for persons with severe mental illness (17).

Walsh and colleagues (18) found that participation in AA without hospital treatment did not reduce the likelihood of an eventual hospitalization among employed persons who abused alcohol. However, Longabaugh and colleagues (19) found that participation in AA was associated with superior outcomes, especially among clients who had strong social support for dealing with their drinking problems before they entered treatment. However, neither of these studies included homeless persons with comorbid mental illness.

In this study we used data from the Center for Mental Health Services' Access to Community Care and Effective Services and Supports (ACCESS) program (20), a five-year, 18-site demonstration program to evaluate baseline characteristics and outcomes of homeless persons with both severe mental illness and substance abuse and to assess the association between substance abuse treatment and improvement in various domains.

Our study addressed four questions. First, how do clients who have dual diagnoses differ from those who do not in their overall community adjustment at baseline? Second, how do the outcomes of these two groups of clients differ at one-year follow-up when baseline differences are controlled for? Third, does self-perceived need for substance abuse treatment and receipt of treatment services improve outcomes among clients with dual diagnoses? And finally, is improvement in outcomes as-

sociated more strongly with participation in self-help groups such as AA and NA or with receipt of professional services?

Methods

The ACCESS program

In September 1993 nine states were awarded about \$17 million through the ACCESS program to enable 18 communities to test strategies for fostering cooperation among agencies and reducing fragmentation of service systems. Each of the 18 sites enrolled 100 homeless persons with severe mental illness each year. The localities that received funds were



Is

improvement

in outcomes associated more strongly with participation

in self-help groups such as

Alcoholics Anonymous and

Narcotics Anonymous or

with receipt of

professional

services?



Bridgeport and New Haven, Connecticut; the Edgewater-Uptown and Lincoln Park–Near North areas of Chicago; Sedgwick and Shawnee counties, Kansas; St. Louis and Kansas City, Missouri; Mecklenburg and Wake Counties, North Carolina; the West and Center City areas of Philadelphia; Fort Worth and Austin, Texas; Richmond and Hampton–Newport News, Virginia; and the uptown and downtown areas of Seattle. This study used the Case Managers Rating Scale (21) and focused exclusively on clients who were accepted

into the case management cohort of the program. All of these clients met specified criteria for both mental illness and homelessness.

Eligibility criteria and data sources

Participants were eligible for case management if they were homeless, had serious mental illness, and were not involved in ongoing community treatment. Clients who were identified as having severe mental illness that was due solely to the secondary effects of substance abuse were not eligible. The criteria for homelessness and mental illness have been described elsewhere, along with validating data (22). A case management referral form was used to document the duration of homelessness at the time of referral to case management as well as the client's psychiatric and substance-related diagnoses.

Clients who met the program's eligibility criteria and who gave written informed consent were evaluated with a comprehensive baseline interview. These clients were reinterviewed three and 12 months after the initial baseline assessment. Participants were recruited between May 1994 and July 1997. The study protocol and the consent forms were approved by the institutional review board of each of the participating sites.

Definition of dual diagnosis

Clients were considered to have dual diagnoses if, in addition to meeting the study's inclusion criteria, they were given a diagnosis of alcohol or drug dependence by the referring clinician and also received from a second clinician a rating of 3, 4, or 5—indicating abuse, dependence, or severe dependence, respectively—on the Clinical Rating Scale (23) for alcohol use and for drug use. A total of 2,175 clients (43 percent) met both diagnostic criteria; 607 (12 percent) had only alcohol abuse or dependence, 455 (9 percent) had only drug abuse or dependence, and 1,113 (22 percent) had both alcohol and drug abuse or dependence. Of the clients with dual diagnoses who had only drug abuse or dependence, 297 (73 percent) reported using cocaine, 266

(65 percent) reported using marijuana, 62 (15 percent) reported taking opiates, and 61 (15 percent) reported using other substances during the previous month.

Measures

Personal characteristics that were measured included age, sex, race, income, degree of social support, duration of the current episode of homelessness, and housing status during the 60 days before each interview. Psychiatric status was assessed with self-reported symptoms of depression (24) and psychosis (25) as well as interviewer ratings of psychotic behavior on standardized scales. Psychiatric, alcohol, and drug problems were assessed with composite scores from the Addiction Severity Index (ASI) (26). Diagnoses were based on the working clinical diagnoses of the admitting clinicians on the case management teams.

Service use was assessed with a series of 23 questions about the use of various types of health and social services during the 60 days before the interview. A second series of questions addressed receipt of public support payments and services from public housing agencies. At baseline, clients were asked to indicate their need for a variety of services, one of which was their need for substance abuse services.

Analyses

The analyses proceeded in several stages. First, we compared the sociodemographic and baseline clinical characteristics of the two groups of clients by using chi square tests and t tests. Measures for which significant differences were found between the groups were included as covariates in subsequent multiple regression analyses. Next, repeated-measures analysis was used to assess the significance of improvement between baseline and the 12-month follow-up on multiple measures in seven domains: psychiatric problems, alcohol and drug problems, service use, community adjustment, income, illegal activities, and housing status.

We then used a series of analyses of covariance (ANCOVAs) that controlled for baseline characteristics to

examine differences in improvement between clients with dual diagnoses and those without. A final series of analyses was designed to identify factors that might be associated with greater improvement among persons with dual diagnoses. In the first, we considered whether clients with dual diagnoses who perceived that they needed substance abuse services at baseline fared better than the less-motivated clients with dual diagnoses or whether they had outcomes similar to those of clients who did not have dual diagnoses.

■

*The
clients with
dual diagnoses had
spent significantly more
days homeless and reported
more involvement with the
criminal justice system
and a lower subjective
quality of
life.*

■

Next, to evaluate the impact of substance abuse services, a nominal variable was developed through the following two-stage process. First, we constructed a continuous variable that represented use of substance abuse services throughout the year by summing participation in self-help groups, counseling, and sobering programs reported by each individual at baseline, at three months, and at 12 months. Counseling sessions are individual interventions that focus on reducing or stopping substance use, whereas sobering programs are more intensive interventions, usually delivered by a multidisciplinary team, that promote abstinence and address re-

lated areas of impaired community functioning.

We then divided the sample into four mutually exclusive groups: persons without dual diagnoses (2,370 clients, or 57 percent), persons with dual diagnoses and no use of substance abuse services (528 patients, or 13 percent), persons with dual diagnoses and substance abuse service use below the median of 32 visits among service users (low use; 626 patients, or 15 percent), and persons with dual diagnoses and substance abuse service use above the median of 32 visits (high use; 612 patients, or 15 percent). Using a modified form of this classification, we developed two similar variables to address participation in self-help groups and use of professional services. The medians used to develop these variables were 21 visits for self-help groups and 16 visits for professional services.

To determine whether there was an association between improvement in outcomes and greater use of services and whether clients with dual diagnoses and high service use had outcomes comparable to those of clients without dual diagnoses, a series of ANCOVAs was conducted in which the dependent variables were the outcomes described above, and the independent classification variables were those described in the previous paragraph. Finally, an ANCOVA was also used to determine the differential impact within the dual diagnosis group of the receipt of professional services and participation in self-help groups.

Results

Sample characteristics

Of 5,432 enrollees for whom baseline data were complete, follow-up data were available on one or more measures at 12 months for 4,415 (81 percent). Clients for whom follow-up data were available differed significantly ($p < .05$) on several baseline sociodemographic, clinical, and community-adjustment measures from clients who were lost to follow-up. Clients who were not included in the final analysis were more likely to be younger, to be white, to be male, to have a diagnosis of major depressive or anxiety disorder, and to have a

Table 1

Sociodemographic and baseline clinical characteristics of homeless persons with serious mental illness with and without a comorbid substance use disorder

Variable	Entire sample (N=5,060)		With dual diagnoses (N=2,183)		Without dual diagnoses (N=2,877)		Test statistic	df	p
	N or mean±SD	%	N or mean±SD	%	N or mean±SD	%			
Age (years)	38.7±9.5		38.03±8.54		38.83±10.23		t=3.04	5,013	.002
Sex							$\chi^2=86.08$	1	.001
Male	2,689	60.9	1,522	69.7	1,639	57			
Female	1,724	39.1	661	30.3	1,238	43			
Marital status							$\chi^2=7.84$	2	.02
Married	227	5.2	91	4.2	170	5.9			
Never married	2,249	51	1,132	51.9	1,473	51.3			
Other	1,930	43.8	960	44	1,229	42.8			
Race							$\chi^2=71.54$	5	.001
White	1,814	41.1	783	35.9	1,323	46			
Black	2,148	48.7	1,169	53.6	1,237	43			
Hispanic	220	5	114	5.2	158	5.5			
Other	229	5.2	117	5.4	157	5.5			
Number of years of education	11.5±2.5		11.34±2.49		11.76±2.63		t=5.79	4,799	.001
Psychiatric diagnosis									
Major depression	2,102	47.9	1,168	53.5	1,307	45.4	$\chi^2=32.33$	1	.001
Bipolar disorder	879	20	431	19.8	565	19.6	$\chi^2=.02$	1	ns
Schizophrenia	1,658	37.8	724	33.2	1,155	40.2	$\chi^2=26.03$	1	.001
Posttraumatic stress disorder	679	15.4	378	17.3	399	13.9	$\chi^2=11.35$	1	.001
Anxiety disorder	792	18	426	19.5	498	17.3	$\chi^2=3.99$	1	.046
Alcohol dependence	1,878	42.6	2,376	81.7	553	14.4	$\chi^2=3,057.1$	1	.001
Drug dependence	1,637	37.1	2,112	72.6	529	13.8	$\chi^2=2,411$	1	.001
Severity of mental illness									
Psychiatric score on									
Addiction Severity Index ^a	.52±.24		.57±.22		.49±.25		t=-11.98	4,759	<.001
Psychosis ^b	11.24±9.3		12.78±9.33		10.14±9.24		t=-10.02	5,058	<.001
Depression ^c	3.1±1.97		3.6±1.8		2.92±2.02		t=-12.45	4,929	<.001
Overtly bizarre behavior ^d	10.9±8.15		10.79±8.15		11.18±8.18		t=1.69	5,059	ns
Severity of substance abuse									
Alcohol score on Addiction									
Severity Index ^e	.14±.2		.25±.25		.07±.13		t=-29.5	3,046	<.001
Days of intoxication in past									
30 days	1.94±5.5		3.72±7.04		.65±2.94		t=-18.3	2,686	<.001
Drug score on Addiction									
Severity Index ^f	.06±.1		.12±.13		.03±.07		t=-27.09	3,108	<.001
Total days of drug use in									
past 30 days	3.03±9.4		5.69±12.57		1.12±4.92		t=-16.08	2,692	<.001
Community adjustment									
Feelings about life ^g	3.2±1.7		3.11±1.68		3.37±1.7		t=4.72	3,880	<.001
Days of homelessness in									
past 60 days	37.8±20.95		38.42±20.67		37.18±21.19		t=-2.08	5,052	.038
Total monthly income	\$325.50±\$417.60		\$334.15±\$417.40		\$314.35±\$423.80		t=-1.65	5,032	ns
Days of work in past									
30 days	1.8±5.06		1.8±4.9		1.8±5.1		t=-.39	4,118	ns
Social support ^h	1.8±2.2		1.86±2.11		1.84±2.21		t=-.339	4,806	ns
Illegal activities									
Days in jail or prison	1.6±7.2		1.9±7.9		1.4±6.7		t=-2.4	3,437	.01
Illegal income in past month	\$17.24±\$210.60		\$29.04±\$243.70		\$7.39±\$159.80		t=-3.6	3,551	<.001
Charges and arrests for minor									
crimes in past 60 days	.07±.2		.1±.3		.05±.2		t=-5.87	3,121	<.001
Charges and arrests for major									
crimes in past 60 days	.05±.2		.09±.2		.03±.18		t=-6.92	2,845	<.001

^a Possible scores range from 0 to 1, with higher scores indicating more severe mental illness.

^b Possible scores range from 0 to 40, with higher scores indicating a greater severity of symptoms in the past 30 days.

^c Possible scores range from 0 to 5, with higher scores indicating a greater severity of symptoms of serious depression in the past 30 days.

^d Possible scores range from 0 to 52, with higher scores indicating a greater severity of mental illness as observed by the interviewer.

^e Possible scores range from 0 to 1, with higher scores indicating a more severe alcohol problem.

^f Possible scores range from 0 to 1, with higher scores indicating a more severe drug problem.

^g Possible scores range from 1 to 7, with higher scores indicating greater satisfaction with life.

^h Possible scores range from 0 to 6, with higher scores indicating greater levels of social support.

poorer subjective quality of life, and they were less likely to have been contacted through outreach efforts and to have reported strong social support. No significant differences in psychiatric symptoms, substance use, housing, income, or employment were observed.

Baseline differences

Baseline sociodemographic and clinical data for the entire sample and for the subgroups of clients with and without dual diagnoses are summarized in Table 1. Enrollees with dual diagnoses were slightly younger and had slightly less education on average, were more likely to be African American or male, and were less frequently married than those who did not have dual diagnoses. Initial clinical assessment showed that those who had dual diagnoses were more likely to have a diagnosis of major depressive disorder, posttraumatic stress disorder, or anxiety disorder and less likely to have a diagnosis of schizophrenia.

As expected, clients with dual diagnoses were far more likely to have a diagnosis of alcohol or drug abuse or dependence than clients without dual diagnoses, although some of the clients without dual diagnoses also received substance abuse diagnoses as a result of the strict definition of dual diagnosis that we used. At baseline, clients with dual diagnoses showed significantly poorer clinical status and community adjustment than clients without dual diagnoses. The clients with dual diagnoses had significantly higher scores on the psychiatric composite index of the ASI and on measures of symptoms of both psychosis and depression. They also had higher scores on all substance abuse measures, although the clients without dual diagnoses showed some problems on these measures as well. The clients with dual diagnoses had spent significantly more days homeless and reported more involvement with the criminal justice system and a lower subjective quality of life.

Twelve-month outcome measures

Table 2 presents the results of a repeated-measures analysis of variance of the variables in seven domains be-

Table 2

Changes in mean scores between baseline and 12-month follow-up in a sample of 4,415 homeless persons with serious mental illness and results of repeated-measures analysis of variance

Variable	Overall change (%)	Repeated-measures analysis of variance		
		Value	df	F
Mental illness				
Psychosis	-36.9	.82	1, 4,126	905***
Depression	-43	.75	1, 4,124	1,361.7***
Psychiatric score on Addiction Severity Index	-27.2	.98	1, 3,896	52.53***
Substance abuse or dependence				
Alcohol score on Addiction Severity Index	-24.9	.93	1, 3,992	209.6***
Total days of intoxication	-30.9	.99	1, 4,062	37.67***
Drug score on Addiction Severity Index	-39.4	.93	1, 4,026	299.5***
Total days of drug use	-33.7	.98	1, 4,106	45.09***
Homelessness				
Days of homelessness	-73.8	.47	1, 4,118	4,581***
Not homeless for 30 days	605.6	.68	1, 4,135	1,885.2***
Community adjustment				
Feelings about life	29.3	.81	1, 4,087	901.8***
Social support	15.2	.98	1, 4,109	54.93***
Number of persons to whom client feels close	10	.99	1, 4,112	27.97***
Financial issues				
Total income	42.2	.94	1, 4,042	253.1***
Public support	37.8	.94	1, 4,120	222.4***
Days of work	86.4	.96	1, 4,106	157.9***
Has a representative payee	105.7	.92	1, 4,135	356.8***
Illegal activities				
Days in jail or prison	116.2	.98	1, 4,111	77.4***
Illegal income	-81.3	.99	1, 4,119	18.1***
Charges and arrests for minor crimes	-54	.98	1, 4,135	71.2***
Charges and arrests for major crimes	-5.9	.99	1, 4,117	8.02**
Service use				
Number of core services	10.2	.95	1, 4,135	191.5***
Total days of service use	14	.99	1, 4,129	21.65***
Psychiatric outpatient services	30.1	.98	1, 4,122	52.53***
Substance abuse outpatient services	-14.3	.99	1, 4,118	4.26*

*p=.03

**p<.005

***p<.001

tween baseline and 12-month follow-up for the sample, along with the average percentage change for each variable. The repeated-measures analysis of variance showed that, overall, both groups improved significantly on all measures of clinical status and community adjustment, with one exception: for both groups, there was a significant increase in the number of days spent in jail or prison at 12 months. This may reflect incarceration for crimes that occurred before the participants enrolled in the study.

Table 3 presents the results of com-

parisons of changes between the two groups over 12 months, with baseline differences controlled for. Clients without dual diagnoses improved significantly more than clients with dual diagnoses on 15 (62 percent) of 24 outcome measures, and clients with dual diagnoses did not show greater improvement on any measure. The dual diagnosis group had significantly less reduction in self-reported symptoms of depression. In addition, even though substance use problems were more severe in the dual diagnosis group at baseline, these clients had a smaller reduction

Table 3

Adjusted mean values of change in scores from program entry to 12-month follow-up among homeless persons with serious mental illness with and without a comorbid substance use disorder^a

Variable	With dual diagnoses (N=2,877)	Without dual diagnoses (N=2,183)	t	df	p
Mental illness					
Psychosis	-4.02	-4.30	-1.12	24, 3,882	ns
Depression	-1.27	-1.48	-3.06	23, 3,882	.002
Psychiatric score on Addiction Severity Index					
Severity Index	-.14	-.15	-1.4	23, 3,784	ns
Substance abuse or dependence					
Alcohol score on Addiction Severity Index	-.03	.05	-.36	24, 3,765	<.001
Total days of intoxication	-.28	-.84	-3.55	24, 3,824	<.001
Drug score on Addiction Severity Index	-.02	-.03	-4.02	24, 3,793	<.001
Total days of drug use	-.67	-1.33	-2.8	24, 3,861	.005
Homelessness					
Days of homelessness	-27.02	-28.35	-1.96	23, 3,881	.04
Not homeless for 30 days	.31	.38	4.8	24, 3,889	<.001
Community adjustment					
Feelings about life	.85	1.03	3.08	24, 3,851	.002
Social support	.28	.30	.19	24, 3,869	ns
Number of persons to whom client feels close	.46	.49	.18	24, 3,870	ns
Financial support					
Total income	123.1	149.03	1.8	24, 3,812	ns
Public support	87.58	108.10	1.69	24, 3,876	ns
Days of work	1.51	1.65	.55	24, 3,865	ns
Has a representative payee	.14	.12	1.34	24, 3,889	ns
Illegal activities					
Days in jail or prison	2.53	1.48	2.39	24, 3,873	.01
Illegal income	-14.65	-16.20	-.77	24, 3,875	ns
Charges and arrests for minor crimes	-.03	-.05	-3.05	23, 3,890	.002
Charges and arrests for major crimes	.01	-.03	-4.7	23, 3,873	<.001
Service use					
Number of core services	.12	.24	2.85	23, 3,890	.004
Total days of service use	1.32	1.42	.19	23, 3,884	ns
Psychiatric outpatient services	1.26	2.15	2.19	23, 3,881	.028
Substance abuse outpatient services	.26	-.68	4.03	23, 3,877	.001

^a Covariates included in the model to adjust the mean changed scores were sex, age, marital status, ethnicity, educational level, major depression, post-traumatic stress disorder, depression, HIV status, psychiatric score on the Addiction Severity Index, days of homelessness, duration of homelessness for current episode, social support, charges and arrests for minor crimes, self-perceived need for core services, number of clients not seeking needed services, use of outpatient services for substance abuse, use of psychiatric outpatient services, total days of service use, and number of core services.

after 12 months on all substance abuse measures. At the 12-month follow-up, the clients with dual diagnoses also had a smaller reduction in the number of days of homelessness and had spent fewer days housed. In the domain of community adjustment, clients with dual diagnoses reported less improvement in subjective quality of life, spent more days in jail or prison, and had a smaller reduction in the number of charges and arrests for criminal activity. Finally, clients with dual diagnoses had a smaller increase in total use of health services and use of psychiatric services, although they showed a greater increase in the use of substance abuse services.

Perceived need for substance abuse services

Outcomes for the subgroup of dual diagnosis clients who perceived a need for substance abuse treatment when they entered the program showed that improvement in this group was comparable to that among clients without dual diagnoses on the alcohol composite index of the ASI and on symptoms of depression. In addition, improvement on these two measures was greater than that for clients with dual diagnoses who did not perceive a need for substance abuse treatment at baseline ($t=2.05$, $df=25$, $3,746$, $p=.03$; $t=1.95$, $df=24$, $3,863$, $p=.05$, respectively). The differences for other measures were not significant.

Use of substance abuse services

As Table 4 shows, clients with dual diagnoses who were rated as having a high use of substance abuse services showed greater improvement on measures of psychosis, social support, and the number of people to whom they felt close than clients in each of the other two dual diagnosis subgroups and clients without dual diagnoses. These high service users showed greater clinical improvement than the other clients with dual diagnoses and showed improvement equal to that of clients without dual diagnoses on symptoms of depression, number of days of alcohol intoxication, subjective quality of life,

Table 4

Adjusted mean values of change in scores from program entry to 12-month follow-up among homeless persons with serious mental illness with and without a comorbid substance use disorder and with various levels of use of substance abuse services^a

Variable	Without dual diagnoses (N=2,370)		With dual diagnoses		Model p
	No service use (N=528)	Low service use (N=626)	High service use (N=612)		
Mental illness					
Psychosis	-4.3	-3.44	-3.71	-4.9 ^{b,c}	.003
Depression	-1.47 ^c	-1.29	-1.1	-1.42 ^c	.001
Psychiatric score on Addiction Severity Index	-.15	-.13	-.13	-.15	ns
Substance abuse					
Alcohol score on Addiction Severity Index	-.05 ^{c,d}	-.04	-.02	-.42	<.001
Total days of intoxication	-.86 ^{b,c}	-.33	.19	-.67 ^c	<.001
Drug score on Addiction Severity Index	-.03 ^{c,d}	-.03 ^{c,d}	-.02	-.01	<.001
Total days of drug use	-1.35 ^{c,d}	-.80	-.60	-.50	.03
Homelessness					
Days of homelessness	-28.27	-26.76	-27.91	-26.55	ns
Not homeless for 30 days	.38 ^{b,c,d}	.31	.31	.29	<.001
Community adjustment					
Feelings about life	1.02 ^{b,c}	.72	.81	1.02 ^{b,c}	.003
Social support	.29	.08	.3	.47 ^b	.03
Number of persons to whom client feels close	.47	-.18	.37	1.16 ^{b,c,e}	<.001
Financial support					
Total income	147.18	123.84	127.57	126.94	ns
Public support	106.9	94.28	82.12	91.71	ns
Days of work	1.64	1.45	1.83	1.22	ns
Has a representative payee	.12	.10	.15	.17 ^{b,c,e}	.009
Illegal activities					
Days in jail or prison	1.52 ^{b,c}	3.17	3.57	1.01 ^{b,c}	<.002
Illegal income	-15.42	-17.28	-14.93	-10.44	ns
Charges and arrests for minor crimes	-.05 ^{b,c}	-.02	-.02	-.03	.02
Charges and arrests for major crimes	-.02	0 ^e	.03 ^{d,e}	-.01 ^c	<.001
Service utilization					
Number of core services	.24 ^{b,c}	-.05	.01	.39 ^{b,c,e}	<.001
Total days of service use	1.32	-1.55	-.81	6.18 ^{b,c,e}	<.001
Psychiatric outpatient services	2.1 ^c	.1	.2 ^b	3.52 ^{b,c,e}	<.001
Substance abuse outpatient services	-.79	-1.77	-.84	3.36 ^{b,c,e}	<.001

^a Covariates included in the model to adjust the mean changed scores were sex, age, marital status, ethnicity, educational level, major depression, post-traumatic stress disorder, depression, HIV status, psychiatric score on the Addiction Severity Index, days of homelessness, duration of homelessness for current episode, social support, charges and arrests for major crimes, charges and arrests for minor crimes, self-perceived need for core services, and number of clients not seeking needed services.

^b Significantly different from clients with no service use, $p < .05$

^c Significantly different from clients with low service use, $p < .05$

^d Significantly different from clients with high service use, $p < .05$

^e Significantly different from clients without dual diagnoses, $p < .05$

number of days spent in jail or prison, and number of charges and arrests for major crimes. Thus high service use appeared to close the outcome gap between the two groups of clients on several measures. Participation in self-help groups was highly correlated with use of professional services ($r = .51, p < .001$), suggesting that these interventions are complements to rather than substitutes for each other.

Perceived need, self-help groups, and professional services

In the final model, we simultaneously examined the relationship be-

tween outcomes and perceived need for substance abuse services, use of professional services, and participation in self-help groups among clients with dual diagnoses. The results are summarized in Table 5. High use of professional services was associated with a significantly greater reduction in the number of arrests and charges for major crimes and with an increase in the number of persons to whom clients felt close. A high level of participation in self-help groups was associated with greater improvement on the alcohol composite index of the ASI and the

number of days of alcohol intoxication. When measures of service use were included in the model, perceived need for treatment was not associated with greater improvement on any measure, which suggests that the effect of perceived need for treatment is mediated by level of service use.

Discussion

In this study we found that homeless persons with severe mental illness and a diagnosis of substance use disorder were at a greater disadvantage at baseline than other homeless

Table 5

Adjusted mean values of change in scores from program entry to 12-month follow-up among homeless persons with serious mental illness and a comorbid substance use disorder, by perceived need for treatment, receipt of professional services, and participation in self-help groups^a

Variable	Need for treatment		Sobering and counseling services			Self-help groups		
	Yes (N=807)	No (N=857)	No use (N=528)	Low use (N=424)	High use (N=814)	No use (N=641)	Low use (N=580)	High use (N=545)
Mental illness								
Psychosis	-4.53	-4.77	-4.15	-4.77	-5.03	-4.75	-4	-5.19
Depression	-1.37	-1.5	-1.51	-1.28	-1.51	-1.43	1.34	-1.53
Psychiatric score on Addiction Severity Index	-0.16	-0.16	-0.14	-0.15	-0.17	-0.18	-0.14	-0.15
Substance abuse								
Alcohol score on Addiction Severity Index	-0.09	-0.1	-0.1	-0.1	-0.08	-0.1	-0.07	-0.12 ^b
Total days of intoxication	-1.5	-1.8	-2.5	-1.7	-0.8	-0.8	-1.35	-2.87 ^{b,c}
Drug score on Addiction Severity Index	-0.056	-0.054	-0.04	-0.06	-0.05	-0.07 ^b	-0.04	-0.05
Total days of drug use	-2.68	-2.25	-1.88	-2.53	-2.9	-3.28	-1.9	-2.18
Homelessness								
Days of homelessness	-27.06	-27.16	-25.98	-27.33	28.02	-28.36	-27.87	-25.1
Not homeless for 30 days	.32	.2	.26	.3	.3	.34	.28	.27
Community adjustment								
Feelings about life	.93	.87	.87	.89	.93	.77	.85	1.07
Social support	.28	.39	.3	.44	.25	.14	.28	.5
Number of persons to whom client feels close	.45	.22	-0.36	.08	1 ^{b,c}	.2	.1	.3
Financial support								
Total income	118.4	87.7	132.05	58.02	119.3	69.05	130.5	109.8
Public support	80.92	71.38	105.53 ^b	40.22	82.7	56.16	100	72
Days of work	1.6	1.4	1.6	1.03	1.8	1.4	1.9	1.1
Has a representative payee	.12	.12	.08	.14	.15	.12	.13	.12
Illegal activities								
Days in jail or prison	2.57	4.04	4.53	3.78	1.6	2.83	4.4	2.68
Illegal income	-24.52	-27	27	26	23	28	26	22
Charges and arrests for minor crimes	-0.05	-0.05	-0.03	-0.08	-0.05	-0.07	-0.03	-0.06
Charges and arrests for major crimes	-0.01	-0.005	-0.02	.02	-0.04 ^b	-0.008	-0.01	-0.01

^a Covariates included in the model to adjust the mean change scores were sex, age, marital status, ethnicity, educational level, major depression, post-traumatic stress disorder, bipolar disorder, schizophrenia, anxiety disorder, depression, HIV status, psychiatric score on the Addiction Severity Index, reason for homelessness, days of homelessness, duration of homelessness for current episode, social support, charges and arrests for major crimes, charges and arrests for minor crimes, self-perceived need for core services, therapeutic alliance, and number of clients not seeking needed services.

^b Significantly different from low-use group

^c Significantly different from no-use group

clients and showed less improvement over 12 months of treatment. However, intensive use of substance abuse services appeared to be associated with a significant reduction in the improvement gap between clients who had dual diagnoses and those who did not. When use of services provided by substance abuse professionals was compared with use of services obtained through self-help groups, the former was associated with fewer legal problems and more social support, and the latter was associated with greater improvement in alcohol abuse.

Baseline characteristics and outcomes

Many studies have identified the sociodemographic characteristics and numerous problems of homeless persons with severe mental illness who also have a diagnosis of a substance use disorder (1-5,27,28). However, most of these studies did not make baseline statistical comparisons or evaluate outcome data of clients with and without dual diagnoses, and nearly all the study samples were limited to one sex. Our results show that homeless persons with severe mental illness who have

co-occurring substance abuse or dependence appear to have significantly worse psychiatric problems and poorer community adjustment than clients who do not have dual diagnoses and that they show less improvement in these areas during one year of treatment. Thus our study demonstrated the severe problems of these clients and their poorer prognosis with greater breadth and depth than was the case with previous studies. Furthermore, our sample was probably more representative of homeless persons with dual diagnoses than those used in other

studies, because it was drawn from 18 communities in different parts of the United States.

Perceived need for substance abuse services

We also found that clinical improvement and the perceived need for services among the clients who had dual diagnoses were significantly associated and that this relationship was mediated by greater service use. This finding suggests that interventions that strengthen clients' motivation or readiness for change (29) may be especially helpful for this population.

Intensive substance abuse treatment

Because clients in this study were participants in the ACCESS program, each client received services from an assertive community treatment team (30) and was actively linked to other needed services. The observation that clients with dual diagnoses who had extensive involvement in sobering programs, counseling sessions, and self-help groups had outcomes that were as good as or significantly better than those of clients without dual diagnoses on eight (30 percent) of 24 measures suggests that these treatments yield substantial benefit for clients with dual diagnoses.

These results are similar to those of other studies that demonstrated better outcomes for persons with substance use disorders when a combination of outpatient mental health treatment and participation in a 12-step group was used than when either approach was used alone (31,32). Moggi and colleagues (33) also observed improvement when combined treatment was used with patients who had dual diagnoses.

In our study, a substantial number of clients with dual diagnoses participated in self-help groups, and those who participated in such groups made extensive use of professional services. Some previous reports have suggested that patients with serious mental illness are reluctant to participate in self-help groups such as AA because they feel alienated or think they will be criticized for taking medications and that they thus may prefer professional services (17,34,35). We showed that per-

sons who have severe mental illness and comorbid substance use disorders not only may be interested in attending such self-help groups but also can benefit from them.

Professional services and participation in self-help groups

We showed that high use of professional substance abuse services—sobering programs and counseling sessions—was specifically associated with a reduction in the number of charges and arrests for major criminal activities and that intensive participation in self-help groups was associated with a reduction in alcohol abuse.

Our findings are consistent with those of previous studies that showed an association between participation in self-help groups and reduced alcohol abuse among homeless persons with severe mental illness and substance abuse (11,13) and among persons with alcohol dependence without mental illness (18). Further studies are needed to replicate these findings.

Limitations

The primary methodological limitation of this observational study was that clients received different levels of services on the basis of their perceived needs or preferences and on the basis of their clinicians' judgment. As a result, the patients who received more extensive services may have differed from the other clients in ways that could have led to better outcomes regardless of participation in treatment. The ideal way to address this problem is to randomly assign patients to different levels of service in an experimental design. We addressed the problem by including as covariates measures that were significantly different across groups at baseline, but it is possible that there were still selection biases.

Second, although participation in self-help groups refers predominantly to participation in AA or NA, other types of self-help groups may be of benefit. Finally, because clients who participated in the follow-up differed on some measures from those who did not, the generalizability of our results is uncertain. However, follow-up data were successfully obtained for 80 percent of the sample, suggesting that

any selection biases were likely to have been of limited importance.

Conclusions

Homeless persons with dual diagnoses showed poorer adjustment on most baseline measures and showed significantly less clinical improvement at 12-month follow-up than clients who did not have dual diagnoses. However, the clients with dual diagnoses who received extensive substance abuse treatment showed improvement at 12 months that was similar to that of the clients who did not have dual diagnoses. The positive results of intensive treatment for this vulnerable population are of special interest in view of recent reductions in funding for intensive community services in many programs. Adequate treatment of this population seems to demand the availability of both intensive clinical services and the facilitation of referrals to self-help groups. ♦

Acknowledgments

This study was funded in part by the Van Ameringen Foundation/American Psychiatric Association Health Services Research Scholar award and under interagency agreement AM-98C1200A between the Substance Abuse and Mental Health Services Administration Center for Mental Health Services and the Department of Veterans Affairs Northeast Program Evaluation Center. The authors thank Brett Kloos, M.A., Suzanne Golub, M.A., Simeon Goodwin, Ph.D., Jacob Tebes, Ph.D., Mardi Solomon, M.A., Sue Pickett, Ph.D., Greg Meissen, Ph.D., Robert Calsyn, Ph.D., Phyllis White, M.A., Janine Johnson, Cheryl Roberts, M.A., Coleman Poses, M.S.W., Laverne Knezek, Ph.D., Deborah Webb, Ph.D., Marilyn Biggerstaff, D.S.W., Peter Brissing, M.S.W., and Jennifer Cahill.

References

1. Bassuk EL, Buckner JC, Perloff JN, et al: Prevalence of mental health and substance use disorders among homeless and low-income housed mothers. *American Journal of Psychiatry* 155:1561–1564, 1998
2. Kasprov WJ, Rosenheck R: Substance use and psychiatric problems of homeless Native American veterans. *Psychiatric Services* 49:345–350, 1998
3. Rahav M, Link BG: When social problems converge: homeless, mentally ill, chemical misusing men in New York City. *International Journal of the Addictions* 30:1019–1042, 1995
4. Caton CL, Wyatt RJ, Felix A, et al: Follow-up of chronically homeless mentally ill

- men. *American Journal of Psychiatry* 150:1639–1642, 1993
5. Fischer PJ, Breakey WR: The epidemiology of alcohol, drugs, and mental disorders among homeless persons. *American Psychologist* 46:1115–1128, 1991
 6. Drake RE, Osher FC, Wallach MA: Homelessness and dual diagnosis. *American Psychologist* 46:1149–1158, 1991
 7. Dickey B, Gonzalez O, Latimer E, et al: Use of mental health services by formerly homeless adults residing in group and independent housing. *Psychiatric Services* 47:152–158, 1996
 8. Hurlburt MS, Hough RL, Wood PA: Effects of substance abuse on housing stability of homeless mentally ill persons in supported housing. *Psychiatric Services* 47:731–736, 1996
 9. Lam JA, Rosenheck RA: Correlates of improvement in quality of life among homeless persons with serious mental illness. *Psychiatric Services* 51:116–118, 2000
 10. Kuno E, Rothbard AB, Averyt J, et al: Homelessness among persons with serious mental illness in an enhanced community-based mental health system. *Psychiatric Services* 51:1012–1016, 2000
 11. Burnam MA, Morton SC, McGlynn EA, et al: An experimental evaluation of residential and nonresidential treatment for dually diagnosed homeless adults. *Journal of Addictive Diseases* 14:111–134, 1995
 12. Drake RE, Yovetich NA, Bebout RR, et al: Integrated treatment for dually diagnosed homeless adults. *Journal of Nervous and Mental Disease* 185:298–305, 1997
 13. Trumbetta SL, Mueser KT, Quimby E, et al: Social networks and clinical outcomes of dually diagnosed homeless persons. *Behavior Therapy* 30:407–430, 1999
 14. KasproW WJ, Rosenheck R, Frisman L, et al: Residential treatment for dually diagnosed homeless veterans: a comparison of program types. *American Journal on Addictions* 8(1):34–43, 1999
 15. Nuttbrock LA, Rahav M, Rivera JJ, et al: Outcomes of homeless mentally ill chemical abusers in community residences and a therapeutic community. *Psychiatric Services* 49:68–76, 1998
 16. Blankertz LE, Cnaan RA: Assessing the impact of two residential programs for dually diagnosed homeless individuals. *Social Service Review* 68:536–560, 1994
 17. Noordsy DL, Schwab B, Fox L, et al: The role of self-help programs in the rehabilitation of persons with severe mental illness and substance use disorders. *Community Mental Health Journal*, 32(1):71–81, 1996
 18. Walsh DC, Hingson RW, Merrigan DM, et al: Treatment options for alcohol abusing workers. *New England Journal of Medicine* 325:775–782, 1991
 19. Longabaugh R, Wirtz PW, Zweben A, et al: Network support for drinking, Alcoholics Anonymous, and long-term matching effects. *Addiction* 93:1313–1333, 1998
 20. Randolph FL: Improving systems through systems integration: the ACCESS program. *American Rehabilitation* 21:36–38, 1995
 21. Neale MS, Rosenheck RA: Therapeutic alliance and outcome in a VA intensive case management program. *Psychiatric Services* 46:719–721, 1995
 22. Rosenheck R, Lam JA: Homeless mentally ill clients' and providers' perceptions of service needs and clients' use of services. *Psychiatric Services* 48:381–386, 1997
 23. Mueser KT, Drake RE, Clark RE, et al: Evaluating substance abuse in persons with severe mental illness. Cambridge, Mass, Human Services Research Institute, 1995
 24. Robins LN, Helzer JE, Croughan J: The National Institute of Mental Health Diagnostic Interview Schedule. *Archives of General Psychiatry* 38:381–389, 1981
 25. Dohrenwend BP: *Epidemiology Research Interview (PERI)*. New York, Columbia University, Social Psychiatry Research Unit, 1982
 26. McLellan AT, Luborsky L, Woody GE, et al: An improved diagnostic evaluation instrument for substance abuse patients: the Addiction Severity Index. *Journal of Nervous and Mental Disease* 168:26–33, 1980
 27. Smith EM, North CS, Spitznagel EL: Alcohol, drugs, and psychiatric comorbidity among homeless women: an epidemiologic study. *Journal of Clinical Psychiatry* 54:82–87, 1993
 28. Susser E, Struening EL, Conover S: Psychiatric problems in homeless men: lifetime psychosis, substance abuse, and current distress in new arrivals at New York City shelters. *Archives of General Psychiatry* 46:845–850, 1989
 29. Prochaska J, DiClemente C: Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology* 51:390–395, 1983
 30. Rosenheck R, Morrissey J, Lam J, et al: Service system integration, access to services, and housing outcomes in a program for homeless persons with severe mental illness. *American Journal of Public Health* 88:1610–1615, 1998
 31. Ouimette PC, Moos RH, Finney JW: Influence of outpatient treatment and 12-step group involvement on one-year substance abuse treatment outcomes. *Journal of Studies on Alcohol* 59:513–522, 1998
 32. Morgenstern J, Labouvie E, McCrady BS, et al: Affiliation with Alcoholics Anonymous after treatment: a study of its therapeutic effects and mechanism of action. *Journal of Consulting and Clinical Psychology* 65:768–777, 1997
 33. Moggi F, Ouimette PC, Moos RH, et al: Dual diagnosis patients in substance abuse treatment: relationship of general coping and substance-specific coping to 1-year outcomes. *Addiction* 94:1805–1816, 1999
 34. Satel SL, Becker BR, Dan E: Reducing obstacles to affiliation with Alcoholics Anonymous among veterans with PTSD and alcoholism. *Hospital and Community Psychiatry* 44:1061–1065, 1993
 35. Weiss RD, Najavits LM: Overview of treatment modalities for dually diagnosed patients: pharmacotherapy, psychotherapy, and 12-step programs, in *Dual Diagnosis and Treatment: Substance Abuse and Comorbid Medical and Psychiatric Disorders*. Edited by Kranzler HR, Rounsaville BJ. New York, Marcel Dekker, 1998

Submissions Invited for Frontline Reports Column

Psychiatric Services invites contributions for Frontline Reports, a column featuring short descriptions of novel approaches to mental health problems or creative applications of established concepts in different settings.

Text should be 350 to 750 words. A maximum of three authors, including the contact person, can be listed; one author is preferred. References, tables, and figures are not used. Any statements about program effectiveness must be accompanied by supporting data within the text.

Material to be considered for Frontline Reports should be sent to the column editor, Francine Courmos, M.D., at the New York State Psychiatric Institute, 1051 Riverside Drive, Unit 112, New York, New York 10032. Dr. Courmos is director of the institute's Washington Heights Community Service.