Intensity of Acute Services, Self-Help Attendance and One-Year Outcomes among Dual Diagnosis Patients*

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ABSTRACT. Objective: This study of dual diagnosis patients examined the associations of the intensity of acute care services and 12-step self-help group attendance with substance use and mental health outcomes. **Method:** Participants (n = 230; 96% men) received treatment in one of 14 residential programs and were evaluated with the Addiction Severity Index at discharge (98%) and at 1-year follow-up (80%). **Results:** High service intensity in acute treatment was associated with better substance use and family/social outcomes both at discharge and at 1 year when patients' intake status was controlled. More attendance at 12-step self-help groups was also associated with better patient substance use and psychiatric outcomes, both during and following treatment. The benefits of more 12-step group attendance, however, depended on whether acute treatment was of low or high service intensity. More 12-step group attendance during treatment was associated with better alcohol and drug outcomes at discharge only among patients treated in low-service-intensity programs; and more attendance postdischarge was associated with better psychiatric and family/social functioning at 1 year only among patients receiving low-service-intensity care. **Conclusions:** We suggest potential means by which high-service-intensity acute care programs might better facilitate patients' postdischarge use of 12-step self-help groups to benefit outcomes. (*J. Stud. Alcohol* **65:** 274-282, 2004)

ADDICTION AND PSYCHIATRIC treatment systems are being challenged by increasing numbers of dual diagnosis patients (Burnam et al., 1995; Lehman et al., 1994). Compared with patients who have only substance abuse or psychiatric problems, patients with both problems demonstrate increased service usage as well as housing instability and legal difficulties (Drake et al., 1996; Jerrell and Ridgely, 1995). To relieve the strains on acute care services, providers are looking for less intensive modes of service delivery and informal systems of care, such as self-help programs, to help dual diagnosis patients.

Service intensity in acute care

In acute dual diagnosis treatment, the extent to which patients receive intensive services reflects the extent to which health, treatment and recreational services are offered by the program. Overall, mental health patients treated in programs with higher service intensity have better outcomes than do patients treated in low-intensity programs. Alterman et al. (1993) reported that dual diagnosis patients who received more treatment services showed more improvement at a 7-month follow-up. Rosenheck and Seibyl (1997) also found associations between more intensive treatment and improvement at 3 months after discharge in their study of patients with chronic severe substance use disorders and psychiatric problems. Dual diagnosis patients who received more intensive substance abuse and family-related services during an inpatient stay consistently had fewer psychological symptoms at discharge (Ouimette et al., 1998). An aim of this study was to compare the extent to which dual diagnosis patients treated in high-service-intensity or low-service-intensity programs had improved at discharge and at a 1-year follow-up on alcohol, drug, psychiatric and family/social outcomes.

12-step group attendance

In addition to the intensity of acute treatment, another component of understanding dual diagnosis patients' outcomes during and following treatment is the extent of their participation in self-help. An important component of the system of care for patients with substance use disorders is 12-step self-help groups; however, there is not yet consensus on the extent to which 12-step group participation is helpful to individuals with both substance use and psychiatric disorders.

Studies have hypothesized that self-help may not be appropriate for dual diagnosis patients because some 12-step groups may view taking psychotropic medication as a form of substance use or reject the stigma of having members

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who are labeled mentally ill (Mowbray et al., 1995). Moreover, dual diagnosis patients may view their psychiatric problem as primary, whereas 12-step group members are likely to view substance use as the primary problem (Ouimette et al., 2001). Despite these hypotheses, empirical evidence shows that dual diagnosis patients are as likely as patients with only substance use disorders to attend, be accepted by, feel comfortable in and benefit from self-help groups (Kurtz et al., 1995; Meissen et al., 1999).

Fiorentine (1999) found that more frequent 12-step meeting attendance was associated with less drug use at a 2-year follow-up of substance abuse outpatients. Moos and Moos' (2004) study of problem drinkers, on the other hand, found that the frequency of participation in Alcoholics Anonymous (AA) was a weak predictor of outcomes and that a longer duration of AA attendance was associated with better short- and long-term alcohol-related outcomes and psychological and social functioning. Moos and Moos' results suggest that duration or continuity of 12-step group attendance may be of more importance to recovery than the frequency of attending meetings. We therefore assessed the *amount* of attendance (i.e., the number of 12-step meetings attended) during acute treatment and between discharge and the 1-year follow-up. We also assessed two other aspects of 12-step group attendance during and after acute treatment: the *duration* of attendance (i.e., the number of weeks between the first and last meeting attended) and the *frequency* of attendance (i.e., the number of meetings attended per week).

Acute treatment and self-help

Acute treatment and 12-step programs may be used by patients as integrated recovery activities (Fiorentine and Hillhouse, 2000). Research has found that more attendance at 12-step groups during formal treatment is associated with better substance use and functioning outcomes at treatment discharge (Fiorentine and Hillhouse, 2000; Ouimette et al., 1998), but self-help participation during treatment may not be linked to postdischarge outcomes. The number of 12-step meetings dual diagnosis patients attended during an acute phase of treatment had no association with outcomes at a 1-year follow-up (Ouimette et al., 1999). Patients who attend self-help meetings after discharge from formal treatment, however, are more likely than those who do not to maintain abstinence, and more attendance is associated with greater improvement in substance use and functioning outcomes (Christo and Franey, 1995; Fiorentine, 1999; Miller et al., 1997; Ouimette et al., 1999).

This study examined the extent to which more self-help attendance was beneficial to dual diagnosis patients' outcomes during and following formal treatment by assessing outcomes at discharge and at a 1-year follow-up. In addition, we asked if and how 12-step group attendance was influenced by the intensity of acute treatment; that is, when patients receive a high intensity of acute care services, do they also tend to participate more in self-help groups? Alternatively, do patients participate more in self-help groups when treatment services are less intensive, perhaps as compensation for a lower intensity of care? We considered these questions in regard to the during-treatment and postdischarge periods.

We also examined the benefits of more 12-step group attendance in relation to the intensity of formal treatment; that is, when acute care is intensive, does 12-step group attendance during or after treatment have additional, synergistic benefits; or is 12-step group attendance more helpful when acute treatment is of low rather than high intensity because self-help participation plays a compensatory role?

In summary, the questions of this study were: (1) Are patients in high-service-intensity programs more likely to improve, both during and after acute treatment, than patients in low-intensity programs? (2) Is high- or low-service-intensity treatment associated with more 12-step meeting attendance during and following treatment? (3) Is more 12-step meeting attendance during and after acute care of greater benefit to patients' outcomes when services are of low or of high intensity?

Method

Procedure

Study participants were dual diagnosis patients who were admitted to one of 14 residential substance abuse programs that treated patients with comorbid psychiatric disorders. Seven programs were affiliated with the Department of Veterans Affairs (VA), and seven were community programs that contracted with the VA to provide treatment services for veterans. The latter seven programs also provided services to nonveterans. The programs, located throughout the United States, were rated on service intensity, a measure taken from the Residential Substance Abuse and Psychiatric Programs Inventory (RESPPI) that assesses the availability of 31 health and treatment services and 10 social-recreational services within the program (Timko, 1995; Timko et al., 2000a). The item scores of the measure are summed, and raw scores are converted to percentage scores (0% to 100%).

Each program was classified as high intensity or low intensity. High-intensity programs scored above the median (72.8%) of a national sample of hospital programs on Service Intensity; low-intensity programs scored below the hospital program median on this measure (Timko, 2003; Timko et al., 2002b). In the national sample, the internal consistency of the measure was good (Cronbach's alpha = 0.81) (Timko et al., 2002b). The seven high-intensity programs were more likely than the seven low-intensity pro-

grams to provide different types of substance abuse (e.g., detoxification, pharmacotherapy), psychiatric (e.g., regularly scheduled psychiatrist and/or psychologist hours, psychoeducation), counseling (e.g., couples/family, vocational), rehabilitation (e.g., work therapy; social skills, daily living skills training) and social-recreational (e.g., team sports, movies) services (Timko et al., 2002b).

Potential participants were approached by a project assistant who introduced the project and extended an invitation to participate. All participants signed an informed consent form after receiving a complete description of the study. They were evaluated with the Addiction Severity Index (ASI; McLellan et al., 1992) during an initial 3-5 day period of stabilization.

The ASI is a structured, 40-minute clinical research interview that assesses seven problem areas, four of which are reported here: alcohol use, drug use, psychiatric and family/social. We focused on these four areas because they most directly assess the dual disorders for which patients entered treatment (Mowbray et al., 1997) and because studies have supported the validity of indices in these domains in particular (Bovasso et al., 2002; Weisner et al., 2000). Two kinds of scores are produced for each area. The first, composites, represents a summary of specific indices that reflect the patient's status at baseline and outcome. In each area, objective questions are asked that measure the number, extent and duration of problem symptoms in the patient's lifetime and in the past 30 days. The patient also supplies a subjective report of the recent (past 30 days) troublesomeness and importance of treatment for the problem area. The rationale for using the 30-day period is based on the importance of measuring both outcome status (i.e., the condition of the patient at the time of assessment) and improvement (i.e., change from pretreatment to posttreatment) (McLellan et al., 1992). Assessment methods that may provide a more representative indication of a patient's status than the prior 30 days (e.g., timeline followback procedures) are not as useful for comparing a patient's status pre- and posttreatment and are therefore less useful for assessing the degree of improvement shown by the patient.

The second type of ASI scores is severity ratings that represent global clinical judgments of the patient's problems and are used for initial treatment planning and referral. The 10-point severity ratings provide valid, reliable (i.e., internally consistent and consistent across testing occasions and raters), independent and clinically useful estimates of problem severity, which is operationally defined as the extent to which the patient needs additional treatment (McLellan et al., 1985; Stoffelmayr et al., 1994). In each domain, severity ratings of 2 or higher represent a moderate to extreme problem, with treatment indicated or necessary.

To be eligible for the study, patients were required to score ≥2 on the (1) alcohol and/or drug and (2) psychiatric ASI problem severity indices (i.e., patients had to have at least moderate substance use and psychiatric problem severity). Eligible patients were also required to be clinically evaluated by program staff as appropriate for community residential care (i.e., not a danger to themselves or others).

Participants

Of 263 potential participants, 230 (87.5%) provided informed consent and met eligibility criteria. Patients in low- or high-service-intensity programs did not differ on sociodemographic characteristics. Most of the 230 participants were men (96.5%). At intake to treatment participants were on average (SD) 45.44 (7.01) years old. The majority of participants were white (48.7%) or black (47.0%); 1.7% were Hispanic, and 2.6% classified themselves as "other." Only 22.6% of participants were married at intake. Participants had completed a mean (SD) of 12.83 (1.92) years of education. Most participants were employed (68.7%); 15.2% were students, retired or disabled and 16.1% were unemployed. In the month prior to treatment intake, the average income was $918 ($1,716). Prior to intake, most of the participants lived with family or friends (57.0%); 25.2% lived alone, 3.9% lived in a controlled environment and 13.9% had no stable living arrangement.

Program clinicians evaluated patients, using their routine diagnostic procedures as part of regular clinical care. In their medical record, patients had from one to four substance use-related diagnoses (mean [SD] number = 1.70 [0.77]). Most commonly, patients had abuse/dependence of alcohol alone (33%); alcohol and cocaine (20%); cocaine alone (10%) or alcohol, cocaine and cannabis (8%). Patients had from one to three psychiatric diagnoses (mean [SD] =1.08, [0.28]). The most common of these disorders were major depression (19%), bipolar (16%), posttraumatic stress disorder (PTSD) (11%) or another anxiety disorder (11%), schizophrenia (8%) and dysthymia (8%). On average, patients had been treated (inpatient, residential and/or outpatient) 2.88 (3.88) previous times for their substance use problems and 4.69 (8.10) times for their psychiatric problems.

Follow-up assessments

Patients were followed at program termination; that is, upon leaving against medical advice or at discharge (98%), and at 4 months (90%) and 1 year (80%) postintake. They were assessed with the ASI at each follow-up, yielding a composite score ranging from 0 to 1 in each of the four problem areas. Analyses showed that patients who participated in follow-ups did not differ from those who did not on baseline demographic characteristics or ASI composite scores.

At each follow-up, participants' use of VA outpatient and inpatient/residential services for substance use or psy-

chiatric problems was assessed from the VA National Patient Care Database and Patient Treatment File. Participants' use of comparable non-VA services was assessed by self-report from a study-provided health care diary. Admissions were verified by contacting the facility that provided care. Comparisons of patients in low- or high-service-intensity programs found no difference in the proportions of those obtaining continuing outpatient care subsequent to discharge and of those in acute care. Patients in high-intensity programs were more likely to obtain additional inpatient/residential services, but differences in length of stay were small.

In accordance with methods we used previously in an 8-year study of initially untreated alcoholic individuals (Timko et al., 2002a), participants were asked at each follow-up if they had attended any 12-step group meetings (e.g., Alcoholics Anonymous [AA], Cocaine Anonymous [CA], Narcotics Anonymous [NA]) since they had completed the last interview. The month and year when the last interview was completed were provided. Participants who answered "yes" (76% at discharge, 53% between discharge and 1 year) were asked to provide the following information regarding the follow-up period: dates of first and most recent meeting attended and number of meetings attended. Because acute care treatment programs may include a 12-step meeting component, participants were specifically instructed to consider this component separately. These data were used to determine the amount, duration and frequency of respondents' attendance at 12-step groups during treatment, and between discharge and the 1-year follow-up. Previous studies suggest that self-reports of 12-step group attendance are reliable and valid (Humphreys et al., 1998; Morgenstern et al., 1997; Tonigan et al., 1996, 2003).

Results

Overview of analyses

T tests were conducted to compare patients in high-service-intensity or low-service-intensity treatment programs on the ASI domains of alcohol use, drug use, psychiatric functioning and family/social functioning at intake, and on 12-step meeting attendance during acute treatment and following discharge from acute treatment. For patients in high-intensity programs, repeated measures multivariate analyses of variance (RMANOVAs) were conducted, comparing their ASI composite scores between intake and discharge, and between discharge and the 1-year follow-up. Comparable analyses were conducted for patients in low-intensity programs. Multiple regression analyses were conducted to examine if and how 12-step meeting attendance contributed to better patient outcomes when intensity of acute treatment was considered. On the ASI, lower composite scores represent better outcomes.

Treatment intensity and patients' symptom severity and outcomes

T tests compared patients in high- or low-intensity programs on ASI composites at intake to treatment. Patients in high-intensity programs were comparable to patients in low-intensity programs on the severity of their alcohol and drug problems. Compared with patients in low-intensity programs, however, those in high-intensity programs had more severe psychiatric ($t = 7.98$, 228 df, $p < .001$) and family/social ($t = 2.39$, 228 df, $p < .05$) problems, as well as a longer stay ($t = 2.27$, 228 df, $p < .05$, means = 5.5 vs 4.0 weeks) in acute care.

RMANOVAs examined patients' changes on ASI scores. Patients in high-service-intensity programs improved in the alcohol, drugs and psychiatric domains from intake to discharge ($F = 68.66$, 51.04, 60.53, respectively, 1/108 df, $p < .001$) and from discharge to the 1-year follow-up ($F = 20.07$, 11.96, 17.88, respectively, 1/88 df, $p < .001$). They also improved from intake to discharge on family/social functioning ($F = 22.73$, 1/108 df, $p < .001$). Patients in low-service-intensity programs improved from intake to discharge in the alcohol, drugs and psychiatric domains ($F = 42.29$, 30.19, 15.51, respectively, 1/113 df, $p < .001$) and in the family/social domain ($F = 5.22$, 1/113 df, $p < .03$). They improved from discharge to 1 year on drug use ($F = 5.82$, 1/92 df, $p < .02$) only. If the Bonferroni correction were applied to account for multiple tests (i.e., four outcomes at two follow-ups), only those significant at $p < .006$ would hold among these findings.

Treatment intensity and 12-step meeting attendance

T tests compared patients in high- or low-service-intensity programs on the amount, duration, and frequency of 12-step meetings they attended during treatment (between intake and discharge) and after treatment (between discharge and the 1-year follow-up). Patients in high-service-intensity programs had more 12-step meeting attendance during treatment as measured by amount (mean [SD] = 47.90 [39.37] meetings), duration (mean = 5.32 [5.24] weeks) and frequency (mean = 8.74 [4.94] meetings per week) than did patients in low-service-intensity programs (amount, mean = 15.03 [17.89]; duration, mean = 3.56 [4.20]; frequency, mean = 3.82 [3.58]) ($t = 7.93$, 2.71, 8.24, respectively, 223 df, $p < .01$). Patients in low-service-intensity programs had more 12-step meeting attendance subsequent to discharge as measured by amount (mean [SD] = 41.89 [93.60] meetings), duration (mean = 12.79 [18.02] weeks) and frequency (mean = 1.26 [2.39] meetings per week) than did patients in high-service-intensity programs (amount, mean = 17.96 [45.82]; duration, mean = 5.36 [11.03]; frequency, mean = 0.75 [1.78]) ($t = 2.26$, 3.45, 3.26, respectively, 182 df, $p < .05$).

Predicting outcomes at discharge

We conducted multiple regression analyses to predict ASI outcomes at discharge. Block 1 of the analysis entered the intake value of the outcome variable to control for severity of patients' illness; Block 2 entered the service intensity of the patient's acute treatment program; Block 3 entered the number of weeks the patient was in acute treatment to control for length of stay; Block 4 entered the amount, duration or frequency of 12-step meetings attended between intake to treatment and program discharge; and Block 5 entered the interaction of program service intensity by the index of 12-step group attendance—amount, duration or frequency—entered in Block 4. The results are presented in Table 1. The table shows that patients in high-service-intensity programs had better outcomes in the domains of drug use and family/social functioning. Patients with a longer stay in acute care also had better alcohol and drug outcomes at discharge.

A greater amount of 12-step meeting attendance during treatment was associated with better psychiatric outcomes at discharge, whereas a longer duration of 12-step meeting attendance during treatment was associated with better alcohol use outcomes. Frequency of 12-step meeting attendance was not associated with any ASI composite score at discharge.

The interaction of service intensity by 12-step meeting amount was associated with alcohol and with drug composite scores. Plotting the interactions showed that a greater amount of meeting attendance was associated with better alcohol and drug outcomes among patients treated in low-service-intensity programs. There was no association between meeting amount and alcohol or drug outcomes among patients treated in high-intensity programs.

Consistent with these results, the interaction of service intensity by 12-step meeting duration was also associated with alcohol and with drug use scores. Again, plotting the interactions showed that a longer duration of meeting attendance was associated with better alcohol and drug outcomes among patients treated in low-service-intensity programs, and that there was no association of duration with alcohol or drug outcomes among patients treated in high-intensity programs. Table 1 also shows that the interaction of service intensity by 12-step meeting frequency was associated with family/social functioning at discharge, such that more frequent attendance was related to better functioning for patients in low-, but not in high-, service-intensity programs.

TABLE 1. Regressions predicting ASI composite scores at discharge

Predictors	ASI domain			
	Alcohol	Drugs	Psychiatric	Family/ social
Blocks 1, 2 and 3				
Intake value of outcome	.56‡	.62‡	.63‡	.61‡
Service intensity	-.10	-.15†	-.03	-.13*
Treatment length of stay	-.29‡	-.14*	-.07	-.06
Blocks 4 and 5				
Amount of 12-step, intake-discharge	-.13	-.04	-.22†	.02
Interaction: Service Intensity × Amount	.38*	.37*	.27	.25
Blocks 4 and 5				
Duration of 12-step, intake-discharge	-.36*	.02	.08	.07
Interaction: Service Intensity × Duration	.22*	.22*	-.05	-.06
Blocks 4 and 5				
Frequency of 12-step, intake-discharge	-.10	-.04	-.08	-.06
Interaction: Service Intensity × Frequency	-.08	-.01	.04	.29*

Notes: Values are standardized beta coefficients. For service intensity: 0 = low, 1 = high.
*$p < .05$; †$p < .01$; ‡$p < .001$.

Predicting outcomes at 1 year

We also conducted multiple regression analyses to predict ASI outcomes at the 1-year follow-up. Because preliminary analyses had shown that the amount, duration and frequency of 12-step meetings attended during treatment did not predict any 1-year outcome, these variables were not included in the analyses. Block 1 of the analysis entered the intake value of the outcome variable; Block 2 entered service intensity; Block 3 entered the length of stay (number of weeks) in acute treatment; Block 4 entered the amount, duration or frequency of 12-step meetings patients attended between discharge from treatment and the 1-year follow-up; and Block 5 entered the interaction of program service intensity by the amount, duration or frequency index entered in Block 4. The results are presented in Table 2. Higher service intensity was associated with better outcomes at 1 year in the alcohol, psychiatric and family/social domains.

A greater amount of 12-step meeting attendance between discharge and the 1-year follow-up was associated with better 1-year alcohol use, drug use and psychiatric outcomes. A longer duration of meeting attendance was associated with better alcohol outcomes, and a greater frequency of attendance was associated with both better alcohol outcomes and better psychiatric functioning.

The interactions of service intensity by amount and by frequency of 12-step meetings attended were associated with psychiatric and with family/social outcomes. Plotting the interaction of service intensity by amount or frequency of 12-step meetings on psychiatric outcomes showed that among patients receiving high-intensity services there was little association between meeting attendance and psychiatric functioning. Among patients receiving low-intensity services, on the other hand, a greater amount and frequency

TABLE 2. Regressions predicting ASI composite scores at 1-year follow-up

Predictors	ASI domain			
	Alcohol	Drugs	Psychiatric	Family/ social
Blocks 1, 2 and 3				
Intake value of outcome	.21†	.34‡	.35‡	.17*
Service intensity	-.23†	-.13	-.31‡	-.17*
Treatment length of stay	-.05	-.03	-.01	-.01
Blocks 4 and 5				
Amount of 12-step, discharge-1 year	-.18*	-.16*	-.16*	-.13
Interaction: Service Intensity × Amount	.07	-.01	.19*	.17*
Blocks 4 and 5				
Duration of 12-step, discharge-1 year	-.15*	-.08	-.05	-.05
Interaction: Service Intensity × Duration	.10	-.07	.15	.05
Blocks 4 and 5				
Frequency of 12-step, discharge-1 year	-.19*	-.14	-.15*	-.09
Interaction: Service Intensity × Frequency	.15	.03	.25†	.24†

Notes: Values are standardized beta coefficients. For service intensity: 0 = low, 1 = high.
*$p < .05$; †$p < .01$; ‡$p < .001$.

of meeting attendance was associated with better psychiatric outcomes.

Similar results were obtained when the interactions of service intensity by amount or frequency of 12-step meeting attendance on family/social outcomes were plotted; that is, among patients receiving high-intensity acute care, there was little association between meeting attendance and family/social outcomes, but among patients receiving low-intensity treatment, more meetings and more frequent meeting attendance were associated with better family/social functioning.

Discussion

This study of dual diagnosis patients found that higher service intensity in acute treatment was associated with better outcomes at discharge and at a 1-year follow-up, even when patients' status at intake was controlled. More attendance at 12-step self-help groups during and following treatment was also associated with better patient outcomes. The benefits of more 12-step meeting attendance, however, depended on whether acute treatment was of low or high service intensity.

Intensity of services in acute care

Dual diagnosis patients in high-service-intensity programs had poorer psychiatric and family/social functioning at intake than did patients in low-service-intensity programs. This finding is in agreement with suggestions that health care systems are appropriately placing more severely ill dual diagnosis patients in more intensive treatment settings (Alterman et al., 1993; Timko et al., 2000b). Patients in high- and low-service-intensity programs improved during treatment on alcohol and drug use and on psychiatric functioning and continued to show some improvement between discharge and the 1-year follow-up, supporting the notion that the recovery of many dual diagnosis patients may require a slow process of learning a sober and functional lifestyle that cannot be accomplished by acute treatment alone (Drake et al., 1996).

When patients' intake status was controlled, patients in high-service-intensity programs had better outcomes at discharge on drug use and family/social functioning than did patients in low-service-intensity programs. Patients in high-service-intensity programs also had better alcohol, psychiatric and family/social outcomes at the 1-year follow-up. Our findings are consistent with those of other research that report dual diagnosis patients who received enhanced services had better casemix-adjusted clinical outcomes (Alterman et al., 1993; Moos et al., 2000; Ouimette et al., 1997; Timko and Moos, 2002).

12-step group attendance

A greater amount of 12-step meeting attendance during treatment was associated with better psychiatric functioning at discharge, and a greater amount of meeting attendance after discharge from acute care was associated with better alcohol, drug and psychiatric outcomes at 1 year. A longer duration of 12-step meeting attendance during treatment was also associated with better alcohol outcomes at discharge, and a longer duration of attendance postdischarge was related to less alcohol misuse at the 1-year assessment. There was no association of the frequency of 12-step meeting attendance during treatment with patients' discharge outcomes, but greater frequency postdischarge was associated with fewer alcohol and psychiatric problems at 1 year. In this short-term study, we did not find evidence that duration rather than frequency of 12-step group participation is a particularly robust predictor of patients' outcomes (Moos and Moos, 2004).

Although the relationship of 12-step attendance to specific outcomes varied to some extent according to whether attendance was measured in amount, duration or frequency, the results are consistent in showing that more attendance during treatment is beneficial to patients' alcohol and psychiatric outcomes at discharge, and that more attendance following acute care also benefits patients' alcohol, drug and psychiatric problems at 1 year. Dual diagnosis patients clearly derive advantages from 12-step group involvement for both their substance use and mental health problems (Kurtz et al., 1995; Meissen et al., 1999; Ouimette et al., 1999; Rychtarik et al., 2000). Regarding the mechanisms

by which attendance "works," one study found that consistent participation in a 12-step program by persons with dual diagnoses was related to better medication adherence, which in turn was related to a lower likelihood of severe mental illness symptoms and of psychiatric hospitalization during a 1-year follow-up period (Magura et al., 2002). The same researchers also found that two elements of self-help participation—assuming a helper role and learning new attitudes, skills and behaviors from role models or from general information sharing—were related to better abstinence outcomes among members of 12-step groups (Magura et al., 2003).

Service intensity and 12-step group attendance

Patients in high-service-intensity programs had more 12-step meeting attendance during treatment, but less following discharge, than did patients in low-service-intensity programs. A high intensity of services contributes to a goal-oriented (i.e., emphasizing the development of practical social and work skills; Moos, 1997) treatment climate (Moos and Moos 1998; Timko and Moos, 1998) that may help facilitate self-help participation during treatment. Low-service-intensity programs, by contrast, often put more emphasis on maintaining patient activity within the surrounding community (Timko, 1995). Possibly patients' continuing community integration during treatment facilitates greater involvement in 12-step programs after treatment completion. If these speculations are confirmed by future research, they suggest that, to encourage 12-step attendance during treatment, low-service-intensity programs should emphasize patients' abstinence and mental health goals and the use of self-help as a means to achieve those goals. To encourage longer term 12-step meeting attendance, high-service-intensity programs should provide the bridges to the community networks that patients want (Angell, 2003).

Service intensity and 12-step group attendance and outcomes

During treatment, a greater amount and longer duration of 12-step meeting attendance was associated with better alcohol and drug outcomes among patients treated in low-, rather than high-, service-intensity programs. After discharge, a greater amount and frequency of meeting attendance was associated with better psychiatric and family/social functioning at the 1-year follow-up among patients receiving low-, rather than high-, intensity acute care services. Perhaps low-service-intensity programs that explain the importance of active and continuing participation in community support resources and prime individuals for such participation help their patients derive more benefit from 12-step meeting attendance during and following acute care (Humphreys et al., 1999).

Low-service-intensity programs are also likely to have relatively few professionally trained staff members, and programs with lower proportions of professional staff tend to have treatment climates emphasizing support, autonomy and personal expression (Timko and Moos, 1998). The combination of reduced professional treatment delivery and a climate that supports individuals' initiative and personal communication may motivate low-service-intensity patients to make gains on functional status through postdischarge 12-step group participation. An essential aspect of self-help is the absence of professional involvement, which is recognized by members as encouragement toward a more active, creative role in their own recoveries while receiving and providing support (Laudet et al., 2000).

Limitations

The findings must be considered in light of the fact that although study participants were spread throughout the United States, all of them were treated in programs that accepted veteran patients. Studies comparing mental health care within and outside the VA suggest that VA-based findings may generalize somewhat better to nonprofit than to for-profit settings, although all three systems share similarities (Calsyn et al., 1990; Rodgers and Barnett, 2000). Mental health services in the VA are generally of similar quality and effectiveness to those in the private sector (Rosenheck et al., 2000). Although the VA patient population has poorer health status than the general patient population (Agha et al., 2000), participants in this study may have been somewhat better off than dual diagnosis patients in other studies, in that most of our participants were employed and had a stable living arrangement. The extent to which our findings will be replicated in studies of patients with different levels of health and social resources and in other health care systems remains to be determined.

Another limitation of this study is that we did not systematically assess how much patients attended specific types of 12-step groups. A review of interviewers' notes suggested that patients primarily attended 12-step groups oriented toward substance misuse rather than psychiatric issues (i.e., AA, CA, NA). Laudet et al. (2000) found that attending a 12-step program for persons with substance use and psychiatric problems was of more benefit to dually diagnosed individuals than was attendance at "traditional" 12-step programs such as AA. Future studies might examine the matching of acute care patients to types of self-help programs as well as to treatment services. Such studies will need to consider the wide heterogeneity of dual diagnosis patients' comorbidity (i.e., the broadly varying types, severity and time courses of psychiatric and substance use disorders) (Lehman et al., 1994; Luke et al., 1996). For example, patients with diagnoses of schizophrenia or affective or paranoid psychoses may not assimilate as readily

into or benefit as much from "nontraditional," dual-focused 12-step programs as patients with other psychiatric disorders (Jordan et al., 2002; Ouimette et al., 1999). In contrast to our method, by which patients were evaluated using the treatment program's routine diagnostic procedures, studies of patients matched to 12-step groups should consider establishing diagnoses in a more structured, standardized manner to enhance the efficacy of matching procedures.

Finally, in this study individuals were not randomly assigned to acute care programs of different service intensity or to different levels of 12-step group attendance. Thus, in part, the benefits we identified reflect the influence of selection and motivational factors. Although our findings probably indicate the real-world effectiveness of dual diagnosis patients receiving high-service-intensity acute care and attending 12-step groups, the naturalistic longitudinal design precludes firm inferences about the causal role of service intensity or self-help meeting participation in producing better outcomes. Each individual's personal and social characteristics impel and interact with use of treatment and self-help resources to jointly influence short-term fluctuations in substance use and functioning. Over the long term, these forces work together to eventually shape individuals' help-seeking and substance-using careers (Hser et al., 1997).

Conclusion

Our findings from dual diagnosis patients concur with results from studies of substance use disorder patients that find acute treatment and 12-step attendance should be used as integrated activities (Fiorentine and Hillhouse, 2000). The challenge is how to maximize the benefits of 12-step program attendance during and following treatment in conjunction with the type of acute care services patients receive. Researchers and clinicians along the continuum of acute care service intensity should continue to investigate and share how 12-step group attendance is facilitated and used to improve patients' substance use and psychiatric symptoms in their treatment settings.

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