



Published in final edited form as:

Community Ment Health J. 2003 August ; 39(4): 281–297.

Predictors of Retention in Dual-Focus Self-Help Groups

Alexandre B. Laudet, Ph.D.,

National Development and Research Institutes, Inc., New York, NY.

Stephen Magura, Ph.D.,

National Development and Research Institutes, Inc., New York, NY.

Charles M. Cleland, Ph.D.,

National Development and Research Institutes, Inc., New York, NY.

Howard S. Vogel, C.S.W., and

Mental Health Empowerment Project, Inc., Albany, NY.

Edward L. Knight, Ph.D.

ValueOptions, Colorado Springs, CO

Abstract

Attendance at 12-step groups has been found useful in maintaining abstinence from substance use; many members disengage early, missing out on potential benefits. New 12-step based groups have emerged to address the recovery needs of the many substance users with psychiatric comorbidity. Little is known about factors associated with retention in 12-step, especially in this population. This study sought to identify predictors of retention over a one-year period among members of a dual-focus 12-Step fellowship (N = 276). Using multivariate analysis, the following baseline characteristics were associated with greater retention one year later: older age, more lifetime arrests, abstinence in the pre-baseline year, more psychiatric symptoms in the pre-baseline year, not taking psychiatric medication, being more troubled by substance abuse than by mental health, and greater level of self-efficacy for recovery; residing in supported housing and being enrolled in outpatient treatment at follow-up were also significantly associated with better retention. Clinical implications to enhance retention in specialized 12-step groups are discussed.

Keywords

dual-diagnosis; comorbidity; 12-step; self-help; recovery

INTRODUCTION

A growing body of evidence indicates that participation in 12-step groups such as Alcohol and Narcotics Anonymous are helpful in maintaining abstinence (e.g., Humphreys et al., 1999; Kaskutas et al., 2002; Laudet et al., 2000a; McCrady & Miller, 1993; Moos et al., 1999; Timko et al., 2000) and increases the likelihood that gains made during treatment are reinforced and sustained (Etheridge et al. 1999; Fiorentine & Hillhouse, 2000). One of the major tenets of 12-

Address correspondence to Alexandre Laudet, Ph.D., National Development and Research Institutes, Inc., 71 West 23rd St., 8th Floor, New York, NY, 10010; e-mail: laudet@ndri.org..

Addictions Services is a special section within *Community Mental Health Journal* devoted to issues relating to addictions practice in community settings. The intent of the section is to stimulate interest and dialogue regarding dual diagnosis and addictions programs and populations.

Anyone wishing to submit articles for consideration for this column should contact Wesley E. Sowers, M.D., St. Francis Medical Center, the Center for Addiction Services, 2 East 400-45th Street, Pittsburgh, PA 15201-1198.

step programs is that addiction is a lifelong condition and that recovery requires ongoing 12-step attendance (e.g., Morgenstern & McCrady, 1993; Kingree, 1995). Empirical findings from a post-treatment follow-up study among users of illicit drugs speaks to the importance of consistent 12-step attendance in maintaining abstinence (Fiorentine, 1999). The forty percent of participants who attended 12-step groups consistently over the 2 year study period maintained a high rate of abstinence, whereas abstinence rates dropped significantly among the 26% of subjects who stopped attending.

The effectiveness of 12 step-groups may be somewhat compromised by low retention rates. Findings from the few available studies suggest declines in attendance beginning 3 to 6 months after initiation of attendance (e.g., Kissin et al., 2000; McKay et al., 2001). Alcoholics Anonymous (1990) has noted that results from successive Triennial Membership Surveys show 'a slow attrition of newcomers during the first year' and acknowledged this phenomenon as 'a challenge to AA' (for discussion, see McIntire, 2000). In light of the apparent benefits of sustained 12-step group attendance (see above), a better understanding of what leads to retention and dropout may suggest strategies to help recovering individuals maintain attendance. Little is known about factors associated with sustained attendance at 12-step group (e.g., Fiorentine 1999; Mankowski et al., 2001; Weiss et al., 2000). Existing studies have focused mainly on members' background characteristics; that is unfortunate because identifying predictors of attendance (or non-attendance) that are amenable to intervention could provide clinicians with strategies to enhance clients' utilization of such support groups. Greater problem severity has consistently emerged as a predictor of 12-step attendance (e.g., Brown et al., 2001, Emerick et al., 1993; Humphreys et al., 1999; Kelly et al., 2000; McKay et al., 1998; Morgenstern et al., 1997). Results for other background characteristics including race and gender have been inconsistent (Humphreys et al., 1991; Kessler et al., 1997; Kaskutas, 1999; Mankowski et al., 2001). Cognitive constructs examined as potential predictors of subsequent 12-step affiliation have generally been those previously identified as predictors of better substance abuse outcome, most notably coping and self-efficacy (central to cognitive-behavioral therapy), and motivation for change (a frequent target of addiction treatment—e.g., Kadden et al., 1992). Greater levels of coping and motivation for change are associated with greater subsequent levels of 12-step affiliation (Humphreys et al., 1999; Kelly et al., 2000; Mankowski et al., 2001; Morgenstern et al., 1997). Self-efficacy, examined in two studies using relatively small samples, did not emerge as a significant predictor of affiliation (Kelly et al., 2000; Morgenstern et al., 1997). Finally, McKay and colleagues (1998) examined a large number of potential predictors of subsequent 12-step attendance (demographics, personality characteristics, clinical, environmental and cognitive processes) using a 2-year prospective design. Only abstinence at baseline and greater duration of substance use (problem severity) emerged as significant predictors.

TWELVE-STEP GROUPS AND DUAL-DIAGNOSIS

A large percentage of substance abusers have a comorbid mental health disorder (e.g., Kessler, 1995). Such dually-diagnosed persons typically have poorer outcomes (e.g., Gonzalez & Rosenheck, 2002) and face more challenges than those with a "single" disorder (e.g., Laudet et al., 2000b). Twelve-step attendance among dually-diagnosed persons has received little empirical attention. Findings from two studies suggest that the demonstrated benefits of 12-step groups extend to this population (Gonzalez & Rosenheck, 2002; Moos et al., 1999). The American Psychiatric Association (1995) has recommended that substance users who take psychoactive medications be referred to support groups where such therapy is recognized and encouraged as useful. Alcoholics Anonymous hold special meetings and two 12-step based fellowships have emerged specifically to address dual-diagnosis recovery needs (Dual Recovery Anonymous—DRA, Hazelden, 1993 and Double Trouble in Recovery—DTR, Vogel et al., 1998; see later discussion). The few studies examining attendance at dual-focus

12-step based groups have reported satisfactory participation levels (e.g., Powell et al., 1996; Kurtz et al., 1995). Only one effectiveness study has been conducted; findings indicate that dual-focus group attendance is associated with better recovery outcomes: less substance use and better medication adherence, the latter being associated with lower symptom severity (Magura et al., 2002).

Two studies examined the role of psychiatric diagnosis in 12-step attendance among dually-diagnosed persons. The first reported no difference in 12-step group attendance across diagnostic categories (Pristach & Smith, 1999). In the second, absence of psychotic disorder was a significant predictor of past 90 days 12-step group attendance (Bogenschutz & Akin, 2000), lending support to Noordsy et al.'s (1996) suggestion that attendance may be more common among those diagnosed with an affective disorder than with schizophrenia. Further, unlike studies among non-comorbid alcoholics (e.g., Humphreys et al., 1994 and 1998b) and dually-diagnosed persons (Bogenschutz and Akin, 2000), Kurtz found no relationship between level of impairment (severity) and 12-step attendance. In that sample, individuals with higher levels of education were more likely to participate in 12-step group meetings. The association between higher education level and 12-step group attendance was replicated recently by Mankowski and colleagues (2001) in a sample of substance abusers. The purpose of this paper is to identify predictors of retention in dual-focus 12-step groups during a one year follow-up period.

METHODS

Setting

Study participants were recruited at Double Trouble in Recovery meetings (DTR) throughout New York City. DTR is a mutual aid program adapted from the 12-step program of recovery specifically to address the recovery needs of dually-diagnosed persons (Vogel et al., 1998). DTR was started in New York State in 1989 and currently has over 200 meeting in 14 states, with the most currently in New York, Georgia, Colorado and New Mexico. New groups are started either by dually-diagnosed persons or by professionals who believe that mutual help fellowships are a useful complement to formal treatment. Meetings are held weekly in community-based organizations (e.g., psychosocial clubs, YMCA's), outpatient treatment programs, inpatient units and in supported housing for persons with severe mental illness—group homes and apartment programs. All DTR groups are led by recovering dually-diagnosed persons.

Participants

Potential study participants were recruited at 24 DTR meetings. All DTR members who had been attending for one month or longer were eligible. Participation was voluntary based on informed consent; the NDRI Institutional Review Board approved the study. The study employed as interviewers several members of the DTR fellowship who received training in interview skills and were closely supervised in their research activities. An estimated 14% of group members declined to participate; the main reasons cited for declining to be interviewed were a concern about confidentiality (especially in groups held in a treatment facility), length of the interview and scheduling conflicts. (According to group facilitators, DTR members who declined to participate were not newer to the groups or less involved than were those who participated; no mention of concerns about potential breach of anonymity were made either to the researchers or DTR groups leaders.) A total of 310 baseline interviews were conducted during January–December 1998 and 276 one-year follow-up interviews were conducted a year later, for a follow-up rate of 90% (276/306) of those remaining alive (4 died). These 276 subjects constitute the sample for the present study. Reasons for no follow-up were: unable to locate or contact (19), refused (6), residential treatment out of state (4), incarcerated (1). The

interviews required about 2 hours; participants received \$35 for their time at baseline and \$40 at follow-up.

The sample was 73% male; 58% black, 25% white, 17% other ethnicity; 50% lived in a supported living residence at follow-up. Their mean age was 40.8 years (s.d. = 8.5), ranging from 20 to 63 years. The median educational attainment in this sample was completion of 12th grade (high school). Sixty-one percent graduated from high school or received a GED. Sixty-eight percent reported at least one arrest (lifetime) and 48% had more than one arrest. Self-reported primary psychiatric diagnoses were: schizophrenia (35%), major depression (24%), bipolar (24%), other (17%). Most of the participants (89%) were receiving treatment for substance abuse, mental health, or both at follow-up.

Study Measures

The interview was a semi-structured instrument administered at study intake (“baseline”) and one year later (“follow-up”) as part of a broader prospective longitudinal study of the effectiveness of self-help for dually-diagnosed persons. The variables examined were those that prior theory or research has linked to 12-step group attendance. The measures used in this analysis were sociodemographics (as described above) and indices based either on Likert-scaled or dichotomous response items. Alpha reliability coefficients are reported for those indices intended to measure a unitary construct. The following baseline variables were considered as potential predictors of DTR retention at follow-up:

Length of Prior DTR Attendance. How long participants had been attending DTR at baseline.

Substance Abuse Severity. (1) Age first started using drugs and alcohol; (2) Length of time using drugs and alcohol regularly; (3) Ever in inpatient treatment for substance use (yes/no); (4) number of separate enrollments in outpatient or day treatment for substance abuse.

Psychiatric Severity. Ever received inpatient psychiatric treatment (yes/no) and if so, more or less than five times.

Psychiatric Medications. “Are you currently taking any medication(s) for a mental health disorder?” (Yes/no).

Substance Abuse in the Past Year. A summary variable was created based on responses to past year and past month substance use: (1) no substance use, (2) use in the past year but not in the past month, and (3) use in the past month.

Psychiatric Symptoms in the Past Year. We used the proportion of the 13 symptoms experienced in the year before baseline from the Colorado Symptoms Index (CSI), a scale developed specifically for persons diagnosed with severe and persistent mental illness (Shern et al., 1994). Sample items: “Have you felt depressed?” “Have you felt like seriously hurting someone?” (alpha = .86).

Primary Problem. One item: “Overall, what would you say has caused you the most difficulties?” Response categories: Substance abuse, mental health, both equally, and not sure.

Reasons for Attending DTR. Participants rated the extent to which each of 11 items was among their goals in coming to DTR. The items were developed from ethnographic interviews conducted during the pilot phase of the study reported elsewhere (Vogel et al., 1998). Sample items: “To improve mental health,” “To improve financial situation,” “To get/stay clean and sober.” Ratings were made on a 4-point Likert-type scale (not at all, a little, moderately, very much). The variable was the unweighted average of the 11 items, with higher scores reflecting greater number of reasons for attending (alpha = .84).

Internal Motivation for Change. Assessed using 11 items from the Treatment Motivation Questionnaire (TMQ; Ryan et al., 1995) adapted to the DTR context. Sample items: “I came to DTR because it is important to me;” and “I accept the fact that I need help and support.” An unweighted average of the 11 items was used where the higher scores reflect greater internal motivation for change ($\alpha = .85$).

Recovery Self-Efficacy. Fifteen items adapted from the Health Locus of Control scale (Wallston et al., 1976). Ten items were phrased towards high self-efficacy (e.g., “I am directly responsible for my recovery”; “Whenever I pick up, it’s because I haven’t done what I’m supposed to do”); the remaining five items reflected low-self-efficacy (e.g., “There’s really not much I can do by myself to get better”) and were reversed prior to analyses. The summary score was the un-weighted average of the 15 items; higher scores reflect higher self-efficacy ($\alpha = .63$).

Coping was assessed using the 15-item Mental Health Confidence Scale (Carpinello et al., 2000) originally developed for use in studies of psychiatrically diagnosed populations. Participants rated their level of confidence with the ability to deal with potentially difficult or stressful situations (16 items, e.g., “deal with symptoms of your illness,” “deal with feeling lonely”). An unweighted average was created to form an overall coping index where a higher score reflects greater coping ($\alpha = .90$).

Challenges in Recovery. Difficulties in dealing with mental health, addiction and recovery were assessed using 15 items from an inventory developed for the study and described in more detail elsewhere (Laudet et al., 2002b). Sample items: “Dealing with feelings (anger, pain, shame, etc.),” “Having money problems,” “Not being understood.” The response categories were on a 4-point Likert-type scale. The overall difficulty index was the unweighted average of the 15 items where higher scores reflect greater difficulty ($\alpha = .93$).

Follow-up variables included in the analyses were:

Supported Housing. We used a summary variable: supported housing at follow-up (yes/no).

Treatment Status. Summary of treatment enrollment (outpatient substance abuse, mental health or dual-diagnosis programs) at follow-up (yes/no).

Retention in DTR, the dependent variable in this study. The variable representing the number of months participants attended DTR meetings between baseline and follow-up was highly skewed and may not have been appropriate for ordinary least squares regression. The great majority (83%) of those attending DTR at the one-year follow-up had attended weekly meetings continuously since baseline. Therefore, we chose a simple indicator of current attendance at follow-up (yes/no) as the measure of the dependent variable. Among participants who were currently attending, median number of DTR months was 12, compared to 5 months among those not currently attending.

Analysis Plan and Statistical Techniques

The goal of the analyses was to identify a concise set of non-redundant predictors of DTR retention at the one-year follow-up. Because the dependent variable is dichotomous, a logistic regression model is appropriate. The analyses were performed with R Version 1.4.1, using generalized linear modeling tools (Ihaka & Gentleman, 1996). The first step in the analyses was to describe the zero-order and unique associations between the predictors and attendance. Zero-order correlations describe the relation between a single predictor and dependent variable when that single predictor is not required to compete with other predictors. Unique relations indicate whether a single variable can add to the prediction of the dependent variable when all other predictors have been controlled. Thus, a predictor with a significant zero-order relation

will not necessarily be uniquely related to the dependent variable; further, it is possible for a predictor that does not have a significant zero-order relation with the dependent variable to play an important role in the prediction when other variables are considered. It is important to include such suppressor variables (Cohen & Cohen, 1983) in prediction models because they improve the performance of other predictors by removing irrelevant variance in the dependent variable.

The next step in the analyses was model selection, aimed at identifying a model that best fits the available data set. Because prior 12-step group attendance has been identified as a significant predictor of continued attendance (e.g., Mankowski et al., 2001), this variable was used as covariate. The remaining 24 variables, including those without significant zero-order relations, were included in the stepwise analysis because of the possibility of suppressor variables.

RESULTS

Correlates of DTR Retention at Follow-Up

Seven baseline variables were significantly associated ($p \leq .05$) with better DTR retention at one-year follow-up (Table 1): self-reported abstinence from drugs and alcohol in the year before baseline; greater psychiatric severity (history of inpatient psychiatric treatment), not being on psychiatric medications at baseline, more psychiatric symptoms in the year before baseline, greater levels of internal motivation for change, self-efficacy, and difficulties in recovery. In addition, being in outpatient treatment and living in a supported residence at follow-up were also associated with better DTR retention.

Unique Effects

All variables identified as potential predictors of DTR attendance at follow-up were entered into a logistic regression analysis to determine which of the variables had a unique effect on retention after controlling for all other variables under consideration. As can be seen in Table 1, baseline variables with unique effects on DTR retention were: more arrests before baseline, abstinence in the preceding year, not taking psychiatric medications, more mental health symptoms in the preceding year, and greater level of self-efficacy; treatment enrollment and living in a supported residence at follow-up also had a unique effect on DTR retention.

Stepwise Model Selection

The logistic regression model with all 25 predictor variables included several variables with no effect on attendance, as well as highly correlated variables from the same general domain. For example, motivation for change and self-efficacy were highly correlated ($r = .50, p < .01$). Some methodologists (Harrell, 2001) have recommended that stepwise selection be conducted only when the pool of independent variables, as a whole, leads to a significant improvement in prediction over a null model (one with no predictors). Thus, it is important to note that, as a whole, the full model with 25 predictors led to a significant improvement in fit compared with the null model (LR chi-square with 31 df = 85.68, $p < .01$).

To build a more concise model with non-redundant predictors, a forward stepwise selection procedure was used with pre-baseline DTR attendance as covariate. The final model is presented in Table 2 (significant variables at $p < .05$ only are included in Table 2). The following baseline characteristics were associated with greater likelihood of DTR retention at one-year follow-up: older age, greater number of lifetime arrests, abstinence in the preceding year, not taking psychiatric medication, more psychiatric symptoms in the pre-baseline year, being more troubled by substance abuse than by mental health, and greater level of self-efficacy for

recovery; further, residing in supported housing and being enrolled in outpatient treatment at follow-up were also significantly associated with better DTR retention.

DISCUSSION

This appears to be the first study to investigate attendance at 12-step based groups among dually-diagnosed persons using a prospective longitudinal design. Nearly three-quarters of participants—all of whom were attending DTR at baseline—were still attending one year later. Findings on variables associated with DTR retention at one-year follow-up are generally consistent with previously identified predictors of 12-step attendance among “single disorder” substance users. Older age and greater history of arrests were significantly associated with better DTR retention; these 2 variables had previously been identified as significant predictors of greater frequency of 12-step attendance among outpatient substance abuse treatment clients (Brown et al., 2001). Past year abstinence was also a significant predictor of greater DTR retention, consistent with McKay et al.’s (1998) report discussed earlier. Experiencing more psychiatric symptoms in the year preceding baseline was significantly associated with better DTR retention at follow-up. Very little is known about the association between mental health severity and 12-step attendance among dually-diagnosed persons; among single disorder substance users, greater problem severity has consistently predicted more 12-step participation, as discussed earlier.

The pattern of findings regarding the association of mental health and substance use with DTR retention is noteworthy: greater DTR retention was predicted by more psychiatric symptoms and by abstinence from substance use at baseline but also by being more troubled by substance use than by mental health. There has been little research about the association between mental health and substance use among dually-diagnosed persons in recovery. We reported elsewhere that at baseline, ‘fear of picking up’ was rated as ‘very difficult to deal with’ by 44% of participants whereas 25% only rated ‘coping with mental health disorder’ as very difficult (Laudet et al., 2002b). We put forth that participants may have developed coping strategies to deal with mental health issues since most had a long history of mental illness. On the other hand, achieving and maintaining abstinence from drug/alcohol requires adaptation to changes in lifestyle and social network as well as requiring changes in cognitive processes (e.g., the need to resist drug cues), so that participants remaining abstinent may be quite challenging. (We note that here, challenges in recovery, the variable that assessed difficulties experienced in the areas of mental health and substance use, yielded a significant zero-order correlation with DTR retention, although the variable was not retained in the final regression model.)

The finding that not taking psychiatric medications at baseline was associated with better DTR retention at follow-up was unexpected. It may be that participants who experience mental health symptoms but do not take psychiatric medications rely more on DTR to deal with their psychiatric problems. Alternatively, the finding may be due in part to a measurement issue: the broad phrasing of the question (“Are you currently taking any medication(s) for a mental health disorder? Yes/ no) did not distinguish between being prescribed psychiatric medication and medication adherence. (The study did not conduct chart reviews to determine prescription status.)

Overall, the picture emerging from current findings is one where persons who are older, have presumably experienced more severe consequences of drug use (more arrests), experienced more psychiatric symptoms, are abstinent but experience difficulties with substance use issues, are more likely to remain involved in DTR. In their study of factors associated with frequency of 12-step attendance among outpatient drug treatment clients, Brown et al. (2001) concluded that 12-step groups “attract individuals who seem prime candidates for the support and assistance these groups can provide to long-term efforts at abstinence” (p. 156). Dual-focus

groups may be particularly attractive to individuals who need recovery support but whose psychiatric illness severity may make attendance at traditional 12-step meetings uncomfortable or unhelpful. While available findings about attendance at traditional 12-step groups among dually-diagnosed persons are inconsistent, there are reports that dually-diagnosed persons who are newcomers to 12-step meetings often find them alienating and unempathetic (Jerrell & Ridgely, 1995; Noordsy et al., 1996; Powell et al., 1996). Traditional 12-step fellowships may not be suitable for some persons with severe psychiatric disorders (Bartels and Thomas, 1991). The high retention rate reported here suggest that 12-step based meetings that are specifically designed to address both mental illness and substance abuse may be an attractive source of recovery support attractive to such individuals. In addition to the variables discussed thus far, the analyses identified three additional predictors of DTR retention: self-efficacy for recovery and being in outpatient treatment or supported residence at follow-up.

Self-efficacy, the belief that one is capable of attaining desired goals, is posited by social learning theory as a key regulatory mechanism in determining human action (Bandura, 1995). This is similar to the reformulated model of learned helplessness that explains action or lack of it by a person's attributions about the extent of control over his/ her situation (Abramson et al., 1978). Mental illness remains highly stigmatized in society (Surgeon General, 2000) and the low expectations of patients held by some professionals may contribute to low self-efficacy (Leete, 1989). Recovery from dual-diagnosis presents the individual with multiple challenges that may seem insurmountable: at baseline, 58% of DTR participants in this study reported that it was 'very' or 'moderately' difficult to deal with the fear of never getting better, and 52% gave similar ratings to "feeling helpless" (Laudet et al., 2002b). Thus recovery is a demanding process, sometimes described by recovering persons as 'a full-time job.' This is particularly true for dually-diagnosed persons who must manage two chronic, stigmatized disorders. Self-efficacy theory predicts that individuals will not adopt new behaviors if they believe themselves likely to fail (Bandura, 1995). For the work of recovery to proceed—attending 12-step meetings, attending treatment, changing habits, friends and surroundings (people, places and things)-, one must believe that success is possible. Attending DTR meetings is part of the work of recovery for dually-diagnosed persons; only if they believe that they can effect change in their lives are they likely to continue participating. Clinicians, family members, friends as well as peers in recovery can greatly contribute to the recovery process by encouraging dually-diagnosed persons to view themselves as effective agents of change in their own life.

We should briefly address what may be an apparent contradiction between self-efficacy to recover and engaging in a recovery program that requires one begins by admitting "powerlessness"—Step One: "We admitted we were powerless over alcohol—that our lives had become unmanageable" (AA World Services, 1939/1976). In 12-step recovery programs, powerlessness over one's disorder refers to the inability to change by relying solely on willpower. Antze (1976) identified the primary therapeutic function of admitting powerlessness to be dispelling group members' "sense of agency" while encouraging realism about personal limitations. Thus, while admitting powerlessness over one's problem is the first step toward recovery, the program puts forth a set of steps that offer hope that recovery is attainable as well as tools and support to achieve recovery. Present findings that experiencing difficulty with substance abuse, experiencing symptoms (the problems) and having high levels of self-efficacy for recovery are associated with subsequent DTR retention (working on recovery) are therefore consistent with the 12-step program.

Finally, being enrolled in outpatient treatment and living in supported housing at follow-up were associated with greater likelihood of continuing DTR attendance. This is consistent with recent findings obtained from 'single disorder' substance-using participants indicating that individuals discharged to supported housing following inpatient substance abuse treatment

were more likely to attend 12-step group than those who were living independently (Mankowski et al., 2001). A possible explanation may be that the stability and structure provided by treatment and supportive housing may increase the desire to work on recovery issues including attending DTR. Another plausible explanation for this finding is the availability of meetings. In New York City, the majority of DTR meetings are held in outpatient treatment programs and supported housing for individuals with mental illness. While clients/residents are not mandated to attend, the availability of a meeting on the premises may enhance the likelihood of attendance compared with persons who live independently and must walk or take public transportation to attend. (We reported elsewhere that not having a meeting to go to and transportation difficulties were among the most frequent reasons given by participants for not attending at follow-up [author citation].) This differs from traditional 12-step fellowships such as NA that hold a great number of meetings in the community, publish meeting lists that are easily available on the telephone, through other members, as well as on the Internet. DTR meetings are more restricted in availability and also not widely publicized. Thus dually-diagnosed persons are most likely to come into contact with DTR in the context of formal treatment or supported living. At baseline, two-thirds of participants reported having first heard about DTR in the context of formal treatment (author citation). We suggest that one strategy to enhance the likelihood of exposure to and attendance at DTR among dually-diagnosed persons is for clinicians working in treatment programs and supported living residences to inform and educate clients about such groups and to support them in starting up DTR groups at their facilities. This recommendation is consistent with those made several researchers investigating 12-step participation among 'single disorder' substance users. Most recently Brown et al. (2001) have noted the need to hold 12-step meetings where formal services are delivered in order to enhance the linkage between such services and cost-free support for clients who need it the most.

This study has several limitations that must be considered in interpreting findings. First, the sample was restricted to persons who had been attending DTR for a minimum of one month at recruitment and may differ in clinical or background characteristics, from the general population of dually-diagnosed persons who have never attended DTR or who dropped out after attending one or two meetings, limiting the generalizability of findings. Second, although prospective longitudinal in design, the data remain essentially correlational and do not allow to establish causation. While alternative interpretations cannot definitely be ruled out, the fact that overall findings are consistent with previous report obtained among single disorder persons suggests that this design limitation may not significantly compromise the interpretation of results presented here. Finally, an additional limitation is the use of dichotomous and of non-standardized measures for some of the constructs, the latter being due to the need to tailor the interview to the particular study population and topics.

Acknowledgements

The authors gratefully acknowledge the cooperation of the DTR members whose experiences contributed to this paper, as well as that of the agencies where the study participants were recruited.

The work reported here was supported by NIDA Grant R01 DA11240 (PI: S. Magura).

References

- Abramson LY, Seligman MEP, Teasdale JD. Learned hopelessness in humans: critique and reformulation. *Journal of Abnormal Psychology* 1978;87:49–74. [PubMed: 649856]
- Akaike H. Information measures and model selection. *Bulletin of the International Statistical Institute* 1983;50:277–290.
- Alcoholic Anonymous. AA 1989 membership survey. New York: Alcoholics Anonymous World Services; 1990.

- American Psychiatric Association. Practice Guidelines for the Treatment of Patients with Substance Abuse Disorders: Alcohol, Cocaine, Opioids. *American Journal of Psychiatry* 1995;152 (Nov suppl): 1–59.
- Antze P. The role of ideologies in peer psychotherapy organizations. Some theoretical considerations and three case studies. *J Appl Behav Sci* 1976;12:322–346.
- Atkinson AC. A note on the generalized information criterion for choice of a model. *Biometrika* 1980;67:413–418.
- Bandura, A. *Self-Efficacy: The Exercise of Control*. New York: Freeman; 1995.
- Bartels S, Thomas W. Lessons from a pilot residential treatment program for people with dual diagnoses of severe mental illness and substance use disorder. *Psychosocial Rehabilitation Journal* 1991;15(2): 19–30.
- Bogenschutz M, Akin S. 12-step participation and attitudes towards 12-step meetings in dual diagnosis patients. *Alcoholism Treatment Quarterly* 2000;18(4):31–45.
- Bozdogan H. Model selection and Akaike's information criterion (AIC): The general theory and its analytical extensions. *Psychometrika* 1987;52:345–370.
- Brown B, O'Grady K, Farrell E, Flechner I, Nurco D. Factors associated with frequency of 12-step attendance by drug abuse clients. *American Journal of Drug & Alcohol Abuse* 2001;27(1):147–160. [PubMed: 11373032]
- Carpinello SE, Knight EL, Markowitz FE, et al. The development of the Mental Health Confidence Scale: A measure of self-efficacy in individuals diagnosed with mental disorders. *Psychiatric Rehabilitation Journal* 2000;23:236–243.
- Cohen, J.; Cohen, P. *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum; 1983.
- Emerick, CD.; Tonigan, JS.; Montgomery, H.; Little, L. Alcoholics Anonymous: What is currently known?. In: McCrady, BS.; Miller, WR., editors. *Research on Alcoholics Anonymous: Opportunities and alternatives*. New Brunswick, NJ: Alcohol Research Documentation, Center of Alcohol Studies, Rutgers-The State University of New Jersey; 1993. p. 41-76.
- Etheridge RM, Craddock SG, Hubbard RL, Rounds-Bryant JL. The relationship of counseling and self-help participation to patient outcomes in DATOS. *Drug and Alcohol Dependence* 1999;57:99–112. [PubMed: 10617095]
- Fiorentine R. After drug treatment: Are 12-step programs effective in maintaining abstinence? *Am J Drug Alcohol Abuse* 1999;25(1):93–116. [PubMed: 10078980]
- Fiorentine R, Hillhouse MP. Exploring the additive effects of drug misuse treatment and twelve-step involvement: Does twelve-step ideology matter? *Substance Use and Misuse* 2000;35(3):367–397. [PubMed: 10714452]
- Gonzalez G, Rosenheck R. Outcomes and service use among homeless persons with seriously mental illness and substance abuse. *Psychiatric Services* 2002;53(4):437–446. [PubMed: 11919357]
- Hazelden Foundation. *The Dual Diagnosis Recovery Book*. Author; Minn, MI: 1993.
- Humphreys, K. Factors predicting attendance at self-help groups after substance abuse treatment. Unpublished master's thesis, University of Illinois; Urbana: 1991.
- Humphreys K, Huebsch PD, Finney JW, Moos RH. A comparative evaluation of substance abuse treatment: V. Substance abuse treatment can enhance the effectiveness of self-help groups. *Alcoholism Clinical & Experimental Research* 1999;23(3):558–563.
- Humphreys K, Kaskutas LA, Weisner C. The relationship of pre-treatment Alcoholics Anonymous affiliation with problem severity, social resources and treatment history. *Drug & Alcohol Dependence* 1998;49:123–131. [PubMed: 9543649]
- Humphreys K, Mavis BE, Stöffelmayr BE. Are twelve-step programs appropriate for disenfranchised groups? Evidence from a study of posttreatment mutual help group involvement. *Prevention in Human Services* 1994;11:165–180.
- Ihaka R, Gentleman R. R: A language for data analysis and graphics. *Journal of Computational and Graphical Statistics* 1996;5:299–314.
- Jerrell JM, Ridgely MS. Comparative effectiveness of three approaches to serving people with severe mental illness and substance use disorders. *Journal of Nervous and Mental Disorders* 1995;183:566–576.

- Kadden, R.; Carroll, K.; Donovan, D.; Cooney, N.; Monti, P.; Abrams, D.; Litt, M.; Hester, R. Cognitive-Behavioral Coping Skills Therapy Manual. Washington, DC: US Government Printing Office; 1992.
- Kaskutas L, Bond J, Humphreys K. Social networks as mediators of the effect of Alcoholics Anonymous. *Addiction* 2002;97(7):891–900. [PubMed: 12133128]
- Kaskutas L, Weisner C, Lee M, Humphreys K. Alcoholics Anonymous affiliation at treatment intake among White and Black Americans. *Journal of Studies on Alcohol* 1999;60(6):810–816. [PubMed: 10606493]
- Kelly JF, Myers MG, Brown SA. Multivariate Process Model of Adolescent 12-step Attendance and Substance Use Outcome Following Inpatient Treatment. *Psychology of Addictive Behaviors* 2000;14(4):376–389. [PubMed: 11130156]
- Kessler RC. The national comorbidity survey: preliminary results and future directions. *International Journal of Methods in Psychiatric Research* 1995;5:139–151.
- Kessler RC, Mickelson KD, Zhao S. Patterns and correlates of self-help group membership in the United States. *Social Policy* 1997;27:27–46.
- Kingree JB. Understanding gender differences in psychosocial functioning and treatment retention. *American Journal of drug and Alcohol Abuse* 1995;11(1):77–92.
- Kissin, W.; Ginexi, EM. The impact of self-help involvement on recovery course. Presented at the 62nd Annual Scientific Meeting of the College on Problems of Drug Dependence; San Juan, PR. June; 2000.
- Kurtz LF, Garvin CD, Hill EM, Pollio D, McPherson S, Powell TJ. Involvement in alcoholics anonymous by persons with dual disorders. *Alcoholism Treatment Quarterly* 1995;12(4):1–18.
- Laudet, A.; Magura, S.; Vogel, H.; Knight, E. Dual Recovery in Self-Help. Poster Presentation at the 61st Annual Scientific Meeting of the College on Problems of Drug Dependence; Acapulco, Mexico. 1999.
- Laudet A, Magura S, Vogel H, Knight E. Support, mutual aid and recovery from dual diagnosis. *Community Mental Health Journal* 2000a;36(5):457–476. [PubMed: 10994680]
- Laudet A, Magura S, Vogel H, Knight E. Recovery challenges among dually diagnosed individuals. *Journal of Substance Abuse Treatment* 2000b;18:321–329. [PubMed: 10812304]
- Laudet A, Magura S, Vogel H, Knight E. Participation in 12-step-based fellowships among dually-diagnosed persons. *Alcoholism Treatment Quarterly* 21(2)in press
- Leete E. How I perceive and manage my illness. *Schizophrenia Bulletin* 1989;15(2):197–200. [PubMed: 2749182]
- Magura S, Laudet A, Mahmood D, Rosenblum A, Knight E. Medication adherence and participation in self-help groups designed for dually-diagnosed persons. *Psychiatric Services* 2002;53(3):310–316. [PubMed: 11875225]
- Mankowski E, Humphreys K, Moos R. Individual and contextual predictors of involvement in 12-step self-help groups after substance abuse treatment. *American Journal of Community Psychology* 2001;29(4):537–563. [PubMed: 11554152]
- McCrary, BS.; Miller, WR. Research on Alcoholics Anonymous: Opportunities and alternatives. New Brunswick, NJ: Alcohol Research Documentation, Rutgers—The State University of New Jersey; 1993.
- McIntire D. How well does AA work? An analysis of published AA surveys (1968–1996) and related analyses/comments. *Alcoholism Treatment Quarterly* 2000;18(4):1–18.
- McKay JR, McLellan AT, Alterman AI, Cacciola JS, Rutherford MJ, O'Brien CP. Predictors of participation in aftercare sessions and self-help groups following completion of intensive outpatient treatment for substance abuse. *J Stud Alcohol* 1998;59:152–162. [PubMed: 9500302]
- McKay JR, Merikle E, Mulvaney FD, Weiss RV, Kopenhaver JM. Factors accounting for cocaine use two years following initiation of continuing care. *Addiction* 2001;96(2):213–225. [PubMed: 11182866]
- Moos R, Finney J, Ouimette PC, Suchinsky R. A comparative evaluation of substance abuse treatment: I. Treatment orientation, amount of care, and 1-year outcomes. *Alcoholism Clinical and Experimental Research* 1999;23(3):529–536.

- Morgenstern J, Labouvie E, McCray BS, Kahler C, Frey R. Affiliation with Alcoholics Anonymous after treatment: A study of its therapeutic effects and mechanisms of action. *Journal of Consulting and Clinical Psychology* 1997;65(5):768–777. [PubMed: 9337496]
- Morgenstern, J.; McCrady, BS. Cognitive Processes and Change in Disease-Model Treatment. In: McCrady, B.; Miller, WR., editors. *Research on Alcoholics Anonymous, Opportunities and Alternatives*. New Brunswick, NJ: Alcohol Research Documentation, Center of Alcohol Studies, Rutgers-The State University of New Jersey; 1993. p. 153-166.
- Noordsy D, Schwab B, Fox L, Drake R. The role of self-help programs in the rehabilitation process of persons with severe mental illness and substance use disorders. *Community Mental Health Journal* 1996;32(1):71–81. [PubMed: 8635319]
- Powell T, Kurtz L, Garvin C, Hill E. A Model of A.A. Utilization by Persons with a Dual Diagnosis. *Contemporary Drug Problems* 1996;23(1):139–157.
- Pristach C, Smith C. Attitudes towards Alcoholics Anonymous by dually-diagnosed patients. *Journal of Addictive Diseases* 1999;18(3):69–76. [PubMed: 10507583]
- Ryan RM, Plant R, O'Malley S. Initial motivations for alcohol treatment: Relations with patient characteristics, treatment involvement, and dropout. *Addictive Behaviors* 1995;20:279–297. [PubMed: 7653312]
- Shern DL, Wilson NZ, Coen AS, et al. Client outcomes II: longitudinal client data from the Colorado treatment outcome study. *The Milbank Quarterly* 1994;72(1):123–148. [PubMed: 8164605]
- Timko C, Moos RH, Finney JW, Lesar MD. Long-term outcomes of alcohol use disorders: Comparing untreated individuals with those in Alcoholics Anonymous and formal treatment. *J Stud Alcohol* 2000;61:529–540. [PubMed: 10928723]
- Venables, WN.; Ripley, BD. *Modern applied statistics with S-Plus*. 3. New York: Springer-Verlag; 1999.
- Vogel HS, Knight E, Laudet AB, Magura S. Double Trouble in Recovery: Self-help for the dually-diagnosed. *Psychiatric Rehabilitation Journal* 1998;21(4):56–364.
- Weiss R, Griffin M, Gallop R, Luborsky L, Siqueland L, Frank A, Onken L, Daley D, Gastfriend D. Predictors of self-help group attendance in cocaine dependent patients. *J Stud Alcohol* 2000;61(5):714–719. [PubMed: 11022811]

TABLE 1
Correlates of DTR Retention at Follow-Up

	Attending (<i>n</i> = 195)	Not Attending (<i>n</i> = 81)	χ^2 (Zero- Order)	χ^2 (Unique)
Age at Baseline (Mean, SD)	41.2 (8.2)	39.9 (9.32)	1.27	1.65
Female (%)	25.1	32.1	1.38	1.18
Ethnicity	—	—	2.15	0.64
African American (%)	58.5	56.8	—	—
White (%)	22.6	29.6	—	—
Other (%)	19.0	13.6	—	—
Years of Education (Mean, SD)	12.6 (3.6)	12.9 (3.2)	0.54	0.87
Arrests Before Baseline (Mean, SD)	4.4 (9.2)	3.1 (6.5)	1.53	4.76*
Pre-Baseline DTR Time in Months (Mean, SD)	26.8 (23.8)	24.1 (22.7)	0.80	0.00
Age Started Substance Use (Mean, SD)	15.5 (4.0)	15.5 (4.7)	0.00	0.66
Years of Substance Abuse (Mean, SD)	25.2 (8.6)	23.9 (9.9)	1.07	1.15
Ever Inpatient Treatment for SA (%)	75.4	70.4	0.73	0.47
Inpatient SA Treatment > 5 Times (%)	23.6	28.4	0.69	4.36*
Number of Outpatient SA Treatment Episodes (Mean, SD)	2.6 (2.2)	2.4 (1.9)	0.53	0.07
Drug Use	—	—	7.65*	9.96**
None Last Year (%)	59.5	42.0	—	—
Drug Use Last Year, Not Last Month (%)	32.3	49.4	—	—
Drug Use Last Month (%)	8.2	8.6	—	—
Primary MH Diagnosis	—	—	4.50	3.34
Schizophrenia (%)	39.0	27.2	—	—
Major Depression (%)	21.5	28.4	—	—
Bipolar Disorder (%)	24.1	23.5	—	—
Other (%)	15.4	21.0	—	—
Ever Inpatient Treatment for MH (%)	92.3	82.7	5.18*	1.24
Inpatient MH Treatment > 5 Times (%)	50.8	44.4	0.92*	0.94*
Taking MH Medication at Baseline (%)	90.8	97.5	4.69*	4.11*
Primary Problem-MH/SA	—	—	6.10 [†]	7.08 [†]
MH & SA (%)	50.8	43.2	—	—
MH Only (%)	15.4	24.7	—	—
SA Only (%)	29.7	23.5	—	—
Not Sure (%)	4.1	8.6	—	—
Psychiatric Symptoms (Mean, SD)	.67 (.26)	.54 (.27)	11.84**	7.53**
Reasons for Attending DTR (Mean, SD)	3.7 (.45)	3.5 (.50)	3.27 [†]	0.05
Internal Motivation for Change (Mean, SD)	3.3 (.42)	3.2 (.38)	6.31*	1.75
Recovery Self-Efficacy (Mean, SD)	3.1 (.27)	3.0 (.31)	4.15*	4.09*
Challenges in Recovery (Mean, SD)	2.5 (.81)	2.3 (.69)	5.16*	0.49
Coping (Mean, SD)	3.3 (.44)	3.2 (.49)	3.24 [†]	0.00
In SA/MH Treatment at Follow-Up (%)	93.3	80.2	9.49**	10.95**
Supported Housing at Follow-Up (%)	55.9	34.6	10.55**	9.51**

Notes: MH = Mental health; SA = Substance abuse;

[†]
 $p < .10$,

*
 $p < .05$,

**
 $p < .01$. Degrees of freedom are 3 for primary problem (MH/SA) and primary MH diagnosis. Degrees of freedom are 2 for ethnicity and drug use. Degrees of freedom are 1 for all other variables.

TABLE 2
Summary of Final Stepwise Logistic Regression Model

Predictor	df	LR χ^2	B	S.E.	Wald χ^2	p
Pre-Baseline DTR	1	0.06	0.00	0.0069	0.06	.80
Age at Baseline	1	4.27	0.09	0.0427	3.99	.04*
Pre-Baseline Arrests	1	5.26	0.05	0.0242	4.34	.02*
Drug Use	2	11.35	—	—	10.82	.00**
None vs. Past Year	1	—	-1.15	0.3488	10.78	.00**
None vs. Past Month	1	—	-0.46	0.5646	0.66	.42
Taking MH Medication at Baseline	1	4.79	-1.62	0.8440	3.69	.03*
Psychiatric Symptoms	1	18.18	2.72	0.6670	16.64	.00**
Primary Problem- MH/SA	3	9.39	—	—	9.08	.02*
MH vs. SA	1	—	-1.26	0.4748	7.06	.00**
SA vs. Both	1	—	-0.38	0.3874	0.99	.32
SA vs. Not Sure	1	—	-1.36	0.7276	3.51	.06 [†]
Recovery Self-Efficacy	1	12.43	1.93	0.5684	11.59	.00**
In SA/MH Treatment at Follow-up	1	9.64	1.54	0.5098	9.15	.00**
Supported Housing at Follow-up	1	12.19	1.14	0.3361	11.49	.00**

Notes: MH = Mental health; SA = Substance abuse.

[†]
p < .10,

*
p < .05,

**
p < .01.