

Recent Suicide Attempt and the Effectiveness of Inpatient and Outpatient Substance Use Disorder Treatment

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Background: The present study investigated whether or not the effect of treatment setting (inpatient or outpatient) on 6-mo follow-up substance use varied for suicidal and nonsuicidal patients. In particular, the study tested the hypothesis that treatment setting would have no differing effect for nonsuicidal participants, but for suicidal participants, inpatient setting would be more closely associated with positive outcomes than the outpatient setting.

Methods: A national sample of patients presenting for treatment of substance use disorders in the Veterans Administration healthcare system was selected to participate in the study. A total of 1289 participants provided complete data on psychiatric and substance-related problems at baseline and 6-mo follow-up.

Results: At baseline, 4% ($n = 53$) of the sample reported having made a suicide attempt within the past 30 days. Those who reported a suicide attempt were no more likely to have been treated in an inpatient setting than in an outpatient setting. A significant interaction between baseline suicide attempt and treatment setting was found, such that nonsuicidal patients reported similar patterns of substance use when treated in inpatient or outpatient settings, but suicidal patients were significantly more likely to have better substance-related outcomes at 6-mo follow-up if they were treated in inpatient compared with outpatient settings.

Conclusions: Suicidal patients displayed substantial improvement after substance use disorders treatment and seem particularly responsive to treatment in inpatient settings.

Key Words: Suicide, Alcohol, Substance use, Treatment, Matching

INITIAL REVIEWS OF comparisons between inpatient and outpatient treatment for substance use disorders (SUDs) concluded that treatment setting was generally unrelated to treatment outcome (Holder et al., 1991, Miller and Hester, 1986). Subsequent reviews (e.g., Finney et al., 1996) have highlighted the importance of examining mediators and moderators of setting effects to better understand the relationship between treatment setting, patient characteristics, and treatment outcomes.

Several recent studies have directly investigated whether patient characteristics interact with the treatment setting to influence posttreatment outcomes. Rychtarik et al. (2000) found that patients with more severe alcohol problems reported a greater reduction in alcohol use at 18 mo after treatment when treated in inpatient settings compared with

outpatient settings; in contrast, patients with low levels of alcohol use reported better drinking-related outcomes when treated in outpatient settings rather than inpatient treatment. Additionally, participants low in cognitive functioning reported fewer alcohol-related problems over time when treated in inpatient settings compared with outpatient settings.

McKay et al. (2002) reported that 3 wk of inpatient treatment before outpatient SUD treatment was associated with greater improvements in substance use compared with outpatient treatment alone. Additionally, those patients with the greatest substance use severity benefited most from inpatient treatment. In a study by Pettinati et al. (1999), patients with greater alcohol-related problems at baseline were more likely to be abstinent 3 mo after treatment when they received treatment in inpatient as compared with outpatient settings; however, this difference diminished over time. Cocaine users with more severe problems who stayed longer in inpatient settings (i.e., >3 mo) had better outcomes, whereas longer outpatient treatment predicted the best outcomes for persons with medium problem severity (Simpson et al., 1999).

Moos et al. (2000) reported that individuals with comorbid psychiatric and SUDs engaged in more substance use

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during treatment, had higher rates of termination of treatment, were less likely to be employed, and reported more distress and more psychiatric symptoms at 1-yr follow-up when they were treated only in an outpatient setting compared with similar patients who received inpatient treatment before outpatient SUD treatment. This result is consistent with the finding that symptom severity in substance users with comorbid psychiatric disorders interacted with treatment intensity to predict substance use at 1-yr follow-up, such that patients with more severe psychiatric and substance abuse symptoms only reported a significant reduction in substance use when they received high-intensity treatments (Timko and Moos, 2002).

Although the exact moderators of setting effects are not yet clear, patient attributes that fall into the general categories of severity of substance use and severity of psychiatric symptoms appear to be associated with differential responses to treatment setting. One possible indicator of severity that could consequently influence the strength of setting effects is the report of a recent suicide attempt. Elevated rates of psychopathology and substance-related problems have been consistently reported in both veteran (Ilgen et al., in press; Windle, 1994) and nonveteran samples of substance abusers with a history of at least one suicide attempt (Johnsson and Fridell, 1997, O'Boyle and Brandon, 1998, Preuss et al., 2003, Roy et al., 1990). Substance-abusing veterans with a history of suicide attempt within the past year met criteria for roughly four times as many psychiatric diagnoses and were more likely to use multiple substances than were those substance users without a suicide attempt (Anderson et al., 1995). While investigating the impact of treatment setting on SUD outcomes, Harrison and Asche (1999) found that suicidal patients reported better 1-yr outcomes when treated in inpatient settings as opposed to outpatient settings. Although that study was not primarily focused on suicidality, these findings indicate that suicidality may serve as a moderator of treatment setting effects on SUD outcomes.

Reported rates of suicide attempts in individuals with SUDs range from 3% in the past 30 days (Moos et al., 1998) to lifetime rates of 45% (Anderson et al., 1995; Johnsson and Fridell, 1997). Despite the high frequency of suicide attempts in substance users, treatment after a suicide attempt has not been well studied (Cornelius et al., 2004). In the secondary findings of Harrison and Asche (1999) on the impact of treatment setting, these authors reported that suicidal SUD patients were more likely to receive treatment in inpatient settings. However, other data indicate that substance-dependent individuals with a history of suicide attempt do not receive any more SUD or psychiatric treatment during the course of a 5-yr follow-up period than do other substance users without an attempt (Johnsson and Fridell, 1997). In a sample of Scandinavians with SUDs who attempted suicide, the quantity and setting of care did not change substantially after a suicide attempt, with the majority of this treatment occurring in outpatient settings

(Suominen et al., 1999). These authors argue that information about a recent suicide attempt in substance users could be better utilized to guide treatment for these individuals.

To evaluate the utility of using the report of a recent suicide attempt to influence the choice of treatment setting, the treatment response of patients who report a recent suicide attempt in these settings needs to be evaluated.

Our primary hypotheses are as follows: 1) A recent suicide attempt is a marker of patients with high substance use and psychiatric severity (attributes associated with better responsiveness to inpatient than outpatient treatment in several recent studies). 2) A recent suicide attempt does not predict patients' treatment setting in the current clinical context. 3) A recent suicide attempt will moderate the effect of treatment setting such that nonsuicidal patients will report similar patterns of substance use at follow-up when treated in inpatient or outpatient settings, but suicidal patients will report better substance-related outcomes at 6-mo after treatment in inpatient compared with outpatient settings.

METHODS

Sample Selection and Characterization

A national sample of 55 Veterans Administration (VA) substance use treatment programs was randomly selected to participate in a project to evaluate an efficient system for monitoring SUD patients' outcomes and care. Four methadone maintenance programs were excluded from the present study because their focus was primarily pharmacologic, leaving a sample of 51 programs. Within each treatment site, an effort was made to recruit up to 50 new patients with random selection. To be eligible for participation in the study, these patients were required to have received no formal SUD treatment within the 90 days before treatment entry. A total of 1930 participants were assessed in one of five addiction treatment settings: 244 inpatient, 404 residential, 284 domiciliary, 548 standard outpatient, and 450 intensive outpatient. All baseline assessments were conducted between February 1, 2001, and January 31, 2002. The specific characteristics of each program are described below.

Inpatient treatment (5 programs). These programs provided acute, in-hospital care, including detoxification and stabilization services. On average, program directors reported that patients stayed 22.8 days (SD = 6.7) per treatment episode, spent an average of 15.6 hr (SD = 15.5) in individual or group SUD treatment, and spent 3.8 hr (SD = 1.3) in 12-step treatment per wk. On average, approximately 62% (SD = 52.1) of patients received some form of psychiatric treatment during their inpatient treatment episode.

Residential treatment (nine programs). Residential programs were based in residential rehabilitation centers. They were distinguished from inpatient programs by being less

Table 1

	No follow-up data available (n = 641)	Follow-up data available (n = 1289)	Overall (N = 1930)	
Age				
Mean (SD)	45.84 (7.78)	48.32 (9.06)	47.51 (8.73)	$t = 34.0$; $p < .01$
Gender				
% Female	49 (8%)	114 (9%)	163 (8%)	$\chi^2 = 2.0$; NS
Marital status				
% Partnered	52 (8%)	265 (21%)	317 (17%)	$\chi^2 = 49.19$; $p < 0.01$
Number with a recent suicide attempt	25 (4%)	53 (4%)	78 (4%)	$\chi^2 = 0.025$; NS
ASI psych composite	0.37 (.25)	0.39 (.26)	0.38 (0.25)	$t = 5.48$; $p < .05$
ASI alcohol composite	0.41 (0.28)	0.41 (.28)	0.41 (0.28)	$t = 0.10$; NS
ASI drug composite	0.21 (0.16)	0.18 (.16)	0.19 (0.16)	$t = 18.11$; $p < .01$

ASI, Addictions Severity Index.

medicalized, having lower staffing levels, and longer lengths of stay. Program directors estimated that patients in residential treatment programs stayed for 48.3 days (SD = 40.1) per treatment episode, spent an average of 25.0 hr (SD = 10.1) in individual or group SUD treatment, and spent 4.0 hr (SD = 1.4) per wk in 12-step treatment, and 33.3% (SD = 33.8) of patients received some form of psychiatric treatment.

Domiciliary treatment (six programs). These programs provided longer-term treatment in programs that relied heavily on patient participation and skills training. Based on program director report, the average length of stay for domiciliary patients was 72.5 days (SD = 51.5), with an average of 15.0 hr (SD = 21.2) spent in formal SUD treatment and 3.8 (SD = 2.4) hours per wk in informal/12-step treatment, and 50.0% (SD = 32.2) of patients received some form of psychiatric treatment.

Intensive outpatient treatment (13 programs). These programs consisted of day treatment and SUD partial hospital programs. Most of these programs were designed to treat patients 5 days per wk. Program directors reported that patients within these programs stayed in treatment for 37.8 days (SD = 48.1), spent an average of 11.0 hr (SD = 5.9) in individual or group SUD treatment, and spent 2.3 (SD = 1.9) hr per wk in 12-step treatment, and 39.1% (SD = 38.8) of patients received some form of psychiatric treatment.

Standard outpatient treatment (18 programs). Standard outpatient programs provided less intensive, ambulatory SUD treatment. According to program directors, patients remained in treatment for an average of 135.3 days (SD = 146.1), spent an average of 6.6 hr (SD = 7.4) in individual or group SUD treatment, and spent 1.3 hr (SD = 1.5) per wk in 12-step treatment, and 42.4% (SD = 29.8) of patients received some form of psychiatric treatment.

All eligible participants were categorized as either receiving inpatient or outpatient treatment by grouping patients based on similar levels of structure and intensity. Thus, all patients in inpatient, residential, or domiciliary settings were categorized into the *inpatient* category, and all patients in intensive outpatient and standard outpatient settings, into the *outpatient* category.

Attempts were made to contact all patients by mail and phone to collect follow-up data 6 mo after the administra-

tion of the baseline assessment. VA records indicated that 12 participants had died during the follow-up period. Follow-up data were available for 1289 (67%) of the remaining, eligible individuals, and the mean length of follow-up was 6.7 mo (SD = 1.9). Comparisons of baseline measures of participants with and without follow-up data indicated that, on average, participants without follow-up data were 3 yr younger, more likely to be single, reported more drug-related problems, and reported fewer psychiatric problems as measured by the Addictions Severity Index (ASI) composite scales than those with follow-up data available (Table 1). Of particular relevance to the present study, the rate of recent suicide attempt at baseline was 4% in both groups. A logistic regression predicting the availability of follow-up data (no/yes) based on suicide attempt, treatment setting, and suicide attempt by treatment setting indicated that rates of follow-up did not differ significantly among the four groups: no suicide attempt outpatient (70%), no suicide attempt inpatient (64%), suicide attempt outpatient (79%), and suicide attempt inpatient (59%).

Measures

Addictions Severity Index. The Addictions Severity Index (ASI) provides indices (referred to as "composite scores") of alcohol, drug use, and psychiatric symptoms within the 30 days before assessment. These indices are widely used and have demonstrated sound psychometric properties in both interview (McLellan et al., 1992) and self-report (Rosen et al., 2000) form. All participants received a self-report version of the ASI at baseline and 6-mo follow-up. An ASI psychiatric composite index item asks patients whether or not they have made a suicide attempt in the past 30 days. This item was used to categorize patients based on the report of a recent suicide attempt. To obtain baseline scores on this index that were not biased by the inclusion of this item, baseline and follow-up ASI psychiatric severity indices were computed without including responses to questions about attempts or suicidal ideation. Items related to the frequency of alcohol and drug use in the past 30 days were used to determine abstinence at follow-up. For the present study, abstinence was defined as no reported use of either alcohol or drugs in the past 30 days. Finally, supple-

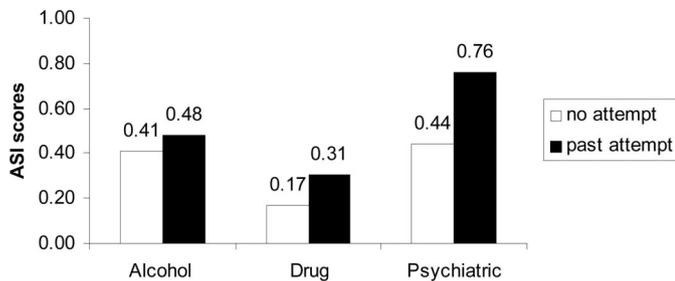


Figure 1. Patients with a recent attempt report significantly more pathology on ASI alcohol, drug and psychiatric scales than did those without a suicide attempt.

mentary analyses used two specific ASI items: the number of days of the last 30 spent in a controlled environment (i.e., hospital, other treatment setting, or jail) and patient rating of importance of treatment for drug or alcohol problems ranging from 1 (not at all important) to 5 (extremely important). These items were selected to explore the possibility that the amount of time in a controlled environment at follow-up or the level of baseline motivation could better explain the primary findings than baseline suicidality.

Data Analyses To test whether or not the report of a recent suicide attempt could serve as an indicator of increased psychiatric and substance use severity (hypothesis 1), a series of ANOVAs were conducted comparing suicidal and nonsuicidal patients on ASI indices of alcohol, drug use, and psychiatric symptoms. A logistic regression analysis was used to investigate whether or not a recent suicide attempt predicted treatment setting (hypothesis 2). A series of 2×2 ANCOVAs was used to test for the impact of treatment setting and a report of a recent suicide attempt on the ASI indices of alcohol, drug use, and psychiatric problems. Each ANCOVA included the specific ASI index at follow-up as the criterion to be predicted and the ASI baseline score on the same index as a covariate. Post hoc comparisons were performed to clarify the nature of significant results. Finally, logistic regression was used to test whether treatment setting and report of a recent suicide attempt interacted in relation to abstinence at follow-up (hypothesis 3).

RESULTS

Hypothesis 1: A Recent Suicide Attempt Is Related to Psychiatric Severity and Substance Use at Baseline

We examined whether or not a recent suicide attempt could serve as an indicator of increased psychiatric and substance use severity at baseline. The results of these analyses are reported in Figure 1. The report of a recent suicide attempt was associated with higher ASI alcohol [$F(1, 1284) = 3.8, p < 0.05$], ASI drug [$F(1, 1284) = 40.1, p < 0.01$] and ASI psychiatric indices [$F(1, 1284) = 67.5, p < 0.01$].

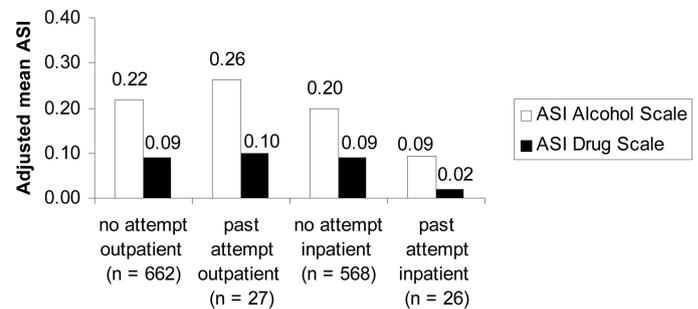


Figure 2. ASI alcohol and drug scales of suicidal patients who received treatment in inpatient settings were significantly lower than all other participants.

Hypothesis 2: Individuals Who Report a Recent Suicide Attempt Are Not More Likely to Receive Treatment in Inpatient Settings Than Those Who Do Not Report a Recent Attempt

A logistic regression analysis revealed that the report of a recent suicide attempt was not related to the setting where substance abuse treatment was provided [$Wald(1, 1286) = 0.17, n.s.$]. Among patients who did not report a recent suicide attempt, 54% received substance abuse treatment in an outpatient setting, and of those participants who reported a recent suicide attempt, 51% received treatment in an outpatient setting.

Hypothesis 3: A Recent Suicide Attempt Will Moderate the Effect of Treatment Setting

Adjusted means of ASI alcohol and drug composite scales at follow-up, controlling for baseline values on the same scales, of individuals with and without a recent suicide attempt in inpatient and outpatient treatment are presented in Figure 2. To test for an interaction effect, one needs to control for the main effects of the components of the interaction term. Patients who received inpatient treatment reported significantly lower 6-mo alcohol ASI scores than did patients who received outpatient treatment [$F(1, 1283) = 11.8, p < 0.01$]; no significant main effects for recent suicide attempt were found. A history of a suicide attempt at baseline interacted with treatment setting to predict alcohol use at follow-up [$F(1, 1283) = 7.23, p < 0.01$]. Post hoc analyses controlling for baseline ASI alcohol scales revealed that those participants who reported a recent suicide attempt and were treated in inpatient settings had lower ASI alcohol composite scores at follow-up than did those patients with a recent attempt treated in outpatient settings [$F(1, 50) = 9.1, p < 0.01$] and those nonsuicidal patients treated in inpatient settings [$F(1, 589) = 5.9, p < 0.05$].

A significant main effect of treatment setting was found [$F(1, 1283) = 8.69, p < 0.01$], such that patients who received inpatient treatment had lower ASI drug composite scores at 6-mo follow-up than did patients who received outpatient treatment, after controlling for baseline ASI drug composite score (Fig. 2). Additionally, the baseline

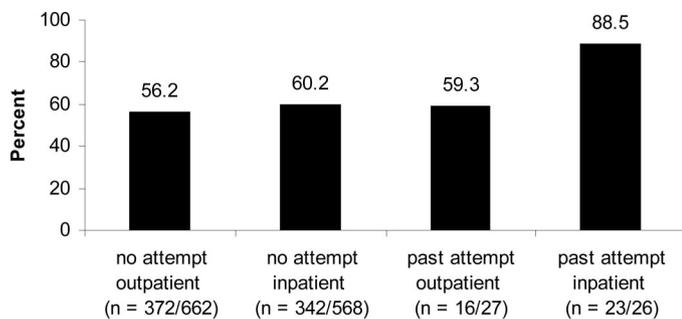


Figure 3. The rate of abstinence 6 mo after treatment was significantly higher for suicidal patients treated in inpatient settings than for all other patients.

report of a suicide attempt [$F(1, 1283) = 4.71, p < 0.05$] was associated with a lower ASI drug composite score at 6-mo follow-up, controlling for baseline ASI drug composite score. A significant interaction was found [$F(1, 1283) = 7.23, p < 0.01$], such that those individuals who reported a recent suicide attempt at baseline and received inpatient treatment reported significantly less drug use and related problems at follow-up than did those who reported a recent attempt and received outpatient treatment [$F(1, 50) = 5.9, p < 0.05$] and than patients who received inpatient treatment and did not report a suicide attempt at baseline [$F(1, 589) = 9.0, p < 0.01$].

No main effects or interaction effects were found for the ASI psychiatric composite scale at 6-month follow-up.

Suicide Attempts, Treatment Setting, and Abstinence

To investigate the role that overall abstinence played in the results described, a logistic regression was performed with complete abstinence from alcohol and all other substances measured by the ASI (except nicotine) in the month before follow-up as the criterion. Figure 3 provides the percentages of participants in the four groups who were abstinent from alcohol and other substances at 6-mo follow-up.

In analyses of rates of abstinence from all substances, receiving inpatient treatment predicted a higher rate of abstinence [$Wald(1, 1277) = 5.21, p < 0.05$], and a history of a recent suicide attempt predicted a higher rate of abstinence [$Wald(1, 1277) = 6.84, p < 0.01$]. Additionally, a significant interaction between treatment setting and report of a recent suicide attempt was found [$Wald(1, 1277) = 4.12, p < 0.05$]. Post hoc χ^2 analyses indicated that recent attempters were more likely to be abstinent if they received inpatient treatment than if they received outpatient treatment ($\chi^2 = 7.86, p < 0.01, n = 53$). Additionally, those with a recent suicide attempt who received inpatient treatment were more likely than nonattempters who received inpatient treatment to be abstinent at follow-up ($\chi^2 = 8.38, p < 0.01; n = 594$).

Supplementary Analyses

Exploratory analyses were conducted to investigate whether or not other variables could better account for the

primary findings. Specifically, we examined the strength of the primary findings after accounting for age, severity of other psychiatric symptoms, level of motivation to quit alcohol or other substances at baseline (as measured by a single item on the ASI), length of follow-up period, and days spent in a controlled environment before follow-up assessment. Two ANCOVAs were conducted with follow-up ASI alcohol scale and follow-up ASI drug scale as the dependent measures and baseline scores of these measures plus the five potential confounding variables listed earlier as covariates. In both sets of analyses, the interaction between treatment setting and a history of suicide attempt remained significant. Finally, the primary analyses were repeated after excluding all participants who reported any SUD treatment in a controlled environment within 30 days of the follow-up assessment, and again the findings were essentially unchanged.

It is important to note that the ASI composite scores were not normally distributed. Although ANOVAs and ANCOVAs tend to be robust with regard to skewed distributions (Wildt and Ahtola, 1978), the data were transformed by using the square root of the ASI composite scores and reanalyzed. All of these analyses yielded results similar to those described above, and thus, the nontransformed data are presented to aid in interpretation of the results.

Likewise, to explore the role that missing data might have played in the present findings, we imputed the missing data by using the model-based multiple imputation procedure described by Schafer (1997) and used the imputed data to replicate our primary analyses. Usual methods of handling missing data (e.g., mean imputation) have been shown to introduce bias to analyses. To minimize any possible bias and to maximize the number of cases used in the analyses, we used the model-based multiple imputation procedure that has been shown to provide more efficient, accurate, and reliable inferences than ad hoc methods (Schafer, 1997). The results with the imputed data were nearly identical to those described above, with all interactions between suicide attempt and treatment setting remaining significant.

DISCUSSION

Patients who reported a suicide attempt within 1 mo of substance abuse treatment within the Department of VA healthcare system also indicated more psychiatric problems and more severe patterns of alcohol and other substance use than did those without a recent attempt. Despite these differences, individuals reporting a recent suicide attempt were no more likely to receive inpatient treatment than were those without a recent suicide attempt. In general, patients who received inpatient treatment reported less problematic alcohol and other substance use at 6-mo follow-up than did those who received outpatient treatment. This setting effect was much stronger in patients who

reported a suicide attempt than in those who did not report an attempt at baseline. When taken together, these findings indicate that information about a recent suicide attempt is both informative about current problems and predictive of treatment response; yet substance abuse treatment providers, when making the choice of inpatient or outpatient treatment, may underutilize this information.

The finding that patients in substance abuse treatment with a recent suicide attempt are more likely to report higher levels of substance abuse and psychiatric problems than those patients without a recent attempt is consistent with past research in the VA (Anderson et al., 1995; Ilgen et al., 2004; Wilde, 1994) and non-VA samples (e.g., Preuss et al., 2003). Similar to past research on the treatment of suicidal individual with SUDs (Johnson and Fridell, 1997), it did not appear that the treatment received by substance abusers was distinctly different for those with and without a recent suicide attempt. Although it is not known whether treatment providers were aware of the patient's report of a recent suicide attempt, it appears that, on average, the VA substance abuse treatment system does not make clear adjustments in the treatment setting based on suicidality.

As hypothesized, patients with a recent suicide attempt reported the greatest reduction in alcohol and drug abuse when they received treatment in inpatient compared with outpatient settings. These findings replicate those of Harrison and Asche (1999) who reported that suicidality moderated the effect of treatment setting after testing for interactions between multiple patient factors and treatment setting. This finding is consistent with the American Society of Addiction Medicine patient placement criteria (American Society of Addiction Medicine, 2001), recommending inpatient treatment for patients with severe psychopathology or at high risk for self-injury.

Given the elevated levels of psychiatric problems and substance use in those who reported a recent suicide attempt in the present sample, our findings are similar to past reports that more intensive treatments were associated with better substance-related outcomes in patients with more severe substance abuse (e.g., Rychtarik et al., 2000) and psychiatric symptoms (Moos et al. 2000), but without similar improvements in psychiatric symptoms (Timko and Moos, 2002). The psychiatric problems of many suicidal SUD patients may be deep seated and may have a course of improvement that is more extended than that of substance use after SUD treatment. Also, psychiatric conditions were not the focus of most of the programs (inpatient or outpatient) that participated in this SUD outcomes monitoring project.

Despite these similarities, the exact nature of the interaction between symptom severity and treatment setting was different in the present study than in past work. In general, past studies that found an interaction between psychiatric severity and treatment intensity (e.g., Harrison and Asche, 1999; Rychtarik et al. 2000; Moos et al., 2000) reported that the general tendency for more severe patients to report

worse outcomes than nonsevere patients diminished as the intensity of the treatment increased. Curiously, in the present study, the patients with the lowest reported rates of substance-related problems at follow-up were those with a suicide attempt at baseline who received inpatient treatment. In fact, 88.5% ($n = 23$) of those individuals with a recent suicide attempt who received inpatient treatment reported abstinence from all substances in the past 30 days at 6-mo follow-up. Thus, the interaction was found as hypothesized, but it appears to be due, in large part, to the unexpectedly positive response of the group with the most severe problems at baseline.

Although the positive response to treatment of those who reported a recent suicide attempt was greater than was expected, others have found a positive relationship between baseline psychiatric problems and positive substance use outcomes at follow-up (Kranzler et al., 1996). For example, Curran et al. (2000) reported that baseline depression had a protective effect on alcohol relapse. These authors hypothesized that their results were due to a combination of greater distress at baseline and greater use of psychiatric treatment by those with severe depression.

The present study adds to these findings by demonstrating a differential effect of treatment setting on VA patients with SUDs. The importance of this work is increased, given the current context in which large healthcare systems are increasingly shifting away from providing inpatient SUD treatment (McKellar et al., 2004). Thus, before erroneously concluding that treatment setting is unrelated to treatment outcome and before this form of treatment completely disappears, we must make every effort to investigate if treatment setting is particularly important for certain individuals. Several possible reasons exist for the strong positive response of those with a recent attempt who received inpatient treatment. Because these benefits were seen in an interaction between patient and treatment-related factors, explanations for this finding are likely due to a combination of these factors. When looking at the uniqueness of patients with a recent suicide attempt, past research suggests that substance abusers who report a recent suicide attempt are more likely to report aggressive and impulsive personality styles and more depression (Koller et al., 2002). O'Boyle and Brandon (1998) posited that elevated borderline and neurotic traits seen in suicidal substance abusers were likely due to difficulty with affect regulation and managing impulsivity. Additionally, patients with a recent suicide attempt may be more distressed by their current substance use and consequently, more likely to actively engage in treatment. Thus, the positive response of suicidal patients to inpatient treatment may have been due in part to the benefits of the structured treatment environment in helping to manage patients with impulsive behavior and poor affect regulation skills and in helping them link substance use to an impulsive suicide attempt.

It should be noted that although individual inpatient programs vary in their intensity, it is likely that inpatient

treatments are more intense on average than outpatient programs (Monahan and Finney, 1996) and may provide more structure and support that is well suited for suicidal patients. Additionally, reviews of program-level data indicate that patients treated in inpatient and domiciliary programs are slightly more likely to receive psychiatric services, and this may have influenced the response of suicidal patients treated in these settings. Overall, more information is needed about the treatment that was provided and the specific treatment received by suicidal patients to know which factors were most helpful to patients with a recent suicide attempt.

The ability of a report of a recent suicide attempt to accurately identify individuals who may be particularly responsive to a particular treatment setting argues for the utility of this item independent of other diagnostic and treatment-related information. The present study design did not allow for verification of the baseline report of a recent suicide attempt. It is not known in this sample how many false-negatives or false-positives were generated by the ASI question on suicide attempts within the past 30 days.

Additionally, the present results should be interpreted with caution for several reasons. First, the low number of women in the sample and the VA locus of treatment may limit the generalizability of the findings. Additionally, the selection of patients may have influenced the present findings. Suicidal SUD patients treated at SUD treatment programs may not be representative of all suicidal SUD patients. Consequently, results based on this sample may apply to suicidal SUD patients who were considered eligible for SUD treatment after a clinical evaluation by the treatment provider. All assessments of substance use were based on patient self-report, and the present study does not allow for corroboration of this information. The rate of treatment completion in each program also is not known. Thus, the extent to which the present results may have been influenced by differential rates of attrition requires further investigation. Finally, the low number of suicidal patients and the follow-up rate of 67%, although good for an outcomes monitoring system, may influence the stability and generalizability of the present findings. Specifically, overall outcomes may be worse than those reported in the present study because the data presented are based on a limited sample of those patients who could be located and were willing to complete the follow-up evaluation. The follow-up rate for suicidal patients treated in inpatient settings was lower than the follow-up rate for other patients studied. It is possible that different rates of follow-up magnified the observed differences in outcomes. Future research on this topic would benefit from a larger sample of patients with a recent suicide attempt at baseline and a higher follow-up rate for all participants.

The finding that those with a recent suicide attempt were particularly responsive to inpatient treatment, although consistent with one other published report (Harrison and

Asche, 1999), requires further replication in other samples. Additionally, further research should attempt to identify other mediators and moderators of the interaction between a recent suicide attempt and treatment setting (Finney, 1995; Longabaugh and Wirtz, 2001). Despite the need to replicate this finding in a different sample, the strength of the findings and the historical difficulty of identifying patient by treatment setting interactions in the area of substance abuse treatment (for review, see Finney et al., 1996) indicate that this may be an important area for further study.

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