# Integrated Treatment of Comorbid Depression and Substance Use Disorders

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***Objective:*** The goals of this 6-month prospective study were to evaluate the effect of a current diagnosis of depression on the course and outcome of addiction treatment and to determine whether patients with depression received or required additional treatment compared with those without depression.

***Method:*** On entering addiction treatment, 75 men and 45 women with substance use disorders were assessed by clinical and semistructured interviews, Global Assessment Scale, Hamilton Rating Scale for Depression, Beck Depression Inventory, and revised 90-item Symptom Checklist.

***Results:*** Forty-three patients (35.8%) met DSM-IV criteria for a current depressive disorder at intake into addiction treatment. The depressed patients had significantly ($p < .0001$) higher levels of psychopathology at intake. However, contrary to previous studies, they fared as well as the nondepressed patients in terms of all addiction outcome measures and all indicators of psychiatric status at 6 months. During the 6-month follow-up period, the depressed patients received more treatment than the nondepressed patients. Specifically, they had more psychiatric appointments, and they were more likely to require inpatient detoxification and to be prescribed new antidepressant medication regimens.

***Conclusion:*** Depression comorbidity may not have had a negative impact on the course and outcome of addiction treatment because the dual disorder was identified at the initial assessment, and integrated psychiatric care was available. It may be that additional treatment compensated for greater psychopathology among dual-disorder patients.

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An elevated prevalence of depression exists among individuals with substance use disorders in the general population.[1–4] The estimates of depression comorbidity are even higher in addiction treatment populations.[5–9] Some individuals may use psychoactive substances to mitigate symptoms of depression,[10] while others may experience dysphoria secondary to chronic substance use, intoxication, or withdrawal.[11,12] Some individuals may suffer from both depression and substance use disorders as a result of common risk factors, increased genetic vulnerability through assortative mating, or chance.[13]

There is no clear consensus regarding the effect of comorbid depression on the course and outcome of substance use disorders. Several studies have indicated that patients with depression and substance use disorders have worse prognoses than those with no depression, including a decreased rate of remission, an increased vulnerability for relapse, higher readmission rates, and a need for more inpatient and outpatient treatment services.[14–19] For example, Greenfield et al.[16] reported that among 101 patients hospitalized for treatment of alcohol dependence, a diagnosis of major depression at admission to hospital predicted shorter times to first drink and relapse after treatment. Hasin et al.[20] followed 127 patients with concurrent major depression and alcohol dependence for 5 years and found that remission of depressive symptoms increased the chance of remission of alcoholism.

Fewer studies have suggested that depression may convey a better prognosis.[21–24] Rounsaville et al.[23] followed 227 patients seeking treatment for alcohol dependence and initially found that women with a lifetime diagnosis of depression had better drinking outcomes 1 year after treatment. In a further follow-up of the same patients over an additional 2 years, lifetime depression was associated with reduced intensity of drinking in both men and women.[22] Finally, a significant number of studies have found no association between depression and addiction outcome measures.[25–30]

The inconsistent results regarding the impact of depression on the course of substance use disorders, and the outcome of addiction treatment, may be attributed to methodological differences. Some studies included only men in their samples.[12,17,30,31] Other studies failed to distinguish between primary mood and substance-induced mood dis-

orders,[22,23] between current and lifetime diagnoses of depression,[22,23,28,30] or between subsyndromal depressive symptoms and a diagnosis of major depression.[15,30]

The contradictory findings may also be attributed to differences among the treatment programs participating in outcome studies. Most studies do not account for the relationship between treatment variables and addiction outcomes and cannot determine whether specific mental health interventions have affected the prognoses of the depressed patients.[15,16,20,22,24] Therefore, the presumption that psychiatric patients fare worse in standard addiction treatment may be explained as a failure to modify or augment treatment for patients with greater psychopathology. Some addiction programs offer more intensive care to their patients with comorbid mental disorders (i.e., pharmacotherapy, psychiatric outpatient visits, and inpatient treatment) than to those without; other programs do not have these resources and are unable to accommodate the psychiatric needs of dually diagnosed patients. It is possible that more intensive treatment may compensate for greater psychopathology in dual-disorder patients.[14,28,32]

The objectives of this 6-month prospective study of 120 patients entering addiction treatment were to evaluate the effect of a current diagnosis of depression on the course and outcome of addiction treatment and to determine whether patients with depression received or required additional treatment compared with those without depression.

## METHOD

### Subjects

The sample included 75 male and 45 female patients who sought treatment at the McGill University Health Centre Addictions Unit, Montreal, Canada. The Addictions Unit provides comprehensive ambulatory care to adults with all forms of psychoactive substance use disorders; it pursues a treatment philosophy of total abstinence and provides integrated care for comorbid psychiatric disorders. Subjects were consecutively recruited on entering treatment. All patients were eligible for the study, as there were no exclusion criteria. Patients were explained the study's procedure as well as the risks and benefits of standard treatment; 120 provided written informed consent, and 2 declined to participate.

### Procedure

Initial interviews were conducted by trained addiction therapists to collect detailed information on demographic and substance use characteristics. Current and lifetime psychiatric diagnoses were established using the Structured Clinical Interview for DSM-IV (SCID-IV).[33] Overall level of functioning was rated using the Global Assessment Scale (GAS).[34] Depression severity was rated using the Hamilton Rating Scale for Depression (HAM-D).[35] Subjects also completed questionnaires measuring psychological distress (Beck Depression Inventory [BDI],[36] Symptom Checklist-90 [SCL-90R][37]) and provided a urine sample for drug screening (cloned enzyme donor immunoassay [CEDIA]). All initial assessments were reviewed by an Addictions Unit psychiatrist (D.A.C.), who conducted a brief interview with each subject to screen for suicidal ideation, psychosis, or other psychiatric conditions that necessitated immediate intervention.

During the 6-month follow-up study, subjects were offered standard treatment: outpatient detoxification, one or two 90-minute psychoeducational group therapy sessions per week, four or more 50-minute supportive individual therapy sessions, and urine drug screens throughout treatment. The 90-minute weekly group therapy sessions combined psychoeducational, supportive, and relapse prevention interventions. The group sessions helped patients adjust to an alcohol- and drug-free lifestyle, examine the function that alcohol/drugs have served in their lives, identify and cope with high-risk situations, develop an appropriate social support system, and resolve problems that impede psychological growth and social adjustment. The 50-minute weekly individual psychotherapy sessions were based on the principles of motivational interviewing.[38] The individual sessions emphasized and promoted self-efficacy and personal responsibility for change, evaluated and enhanced the motivational level of the patient and readiness for change through an empathetic counseling style, and educated the patients about strategies that produce change and prevent relapses.

All addiction therapists had > 5 years of experience as addiction counselors and held degrees in nursing, occupational therapy, or psychology; they met weekly with psychiatrists to discuss their patients' progress and any need for psychiatric interventions. Psychiatric treatment was provided if indicated by the initial psychiatric assessment or if later requested by the patient's addiction therapist. If subjects were unable to tolerate or adhere to outpatient detoxification regimens, they were offered inpatient detoxification. Subjects were encouraged, but not required, to attend mutual help groups, such as Alcoholics Anonymous.

At 3 and 6 months, all subjects, including those who had dropped out of treatment, were recontacted and invited to attend follow-up interviews. Follow-up interviews were independent from treatment visits and were conducted by a research assistant who was uninvolved in clinical care. Subjects were questioned regarding the outcome of treatment (retention in treatment, abstinence, and substance consumption), psychiatric symptoms (HAM-D, BDI, and SCL-90R), and psychosocial functioning (GAS). They were again asked to provide a urine sample for drug screening. Individuals who were unable or reluctant to return for follow-up visits were interviewed on the telephone.

Table 1. Demographic and Substance Use Characteristics of the Sample at Intake

| Characteristic | Depressed (N = 43) | Nondepressed (N = 77) | Total (N = 120) | p Value |
|---|---|---|---|---|
| Age, y, mean ± SD | 41.7 ± 11.5 | 40.2 ± 10.2 | 40.8 ± 10.6 | NS |
| Sex, % (N) | | | | < .0001 |
| Male | 37.2 (16) | 76.6 (59) | 62.5 (75) | |
| Female | 62.8 (27) | 23.4 (18) | 37.5 (45) | |
| Race, % (N) | | | | NS |
| White | 97.7 (42) | 87.0 (67) | 90.8 (109) | |
| Visible minority | 2.3 (1) | 13.0 (10) | 9.2 (11) | |
| Marital status, % (N) | | | | NS |
| Single | 51.2 (22) | 36.4 (28) | 41.7 (50) | |
| Married | 30.2 (13) | 44.2 (34) | 39.2 (47) | |
| Divorced | 14.0 (6) | 16.9 (13) | 15.8 (19) | |
| Education, % (N) | | | | NS |
| High school graduate | 81.4 (35) | 71.4 (55) | 75.0 (90) | |
| University graduate | 34.9 (15) | 14.3 (11) | 21.7 (26) | |
| Employment, % (N) | | | | NS |
| Employed | 25.6 (11) | 51.9 (40) | 42.5 (51) | |
| Unemployed | 41.9 (18) | 32.5 (25) | 35.8 (43) | |
| Primary drug, % (N) | | | | NS |
| Alcohol | 62.8 (27) | 49.3 (38) | 54.2 (65) | |
| Benzodiazepines | 11.6 (5) | 9.1 (7) | 10.0 (12) | |
| Cocaine | 14.0 (6) | 31.2 (24) | 25.0 (30) | |
| Opiates | 11.6 (5) | 10.4 (8) | 10.8 (13) | |
| No. of years of drug dependence, mean ± SD | 9.7 ± 8.2 | 9.3 ± 7.7 | 9.4 ± 7.9 | NS |
| No. of days of drug use in past mo, mean ± SD | 15.7 ± 13.2 | 14.6 ± 12.7 | 15.0 ± 12.8 | NS |

Table 2. Psychiatric Status of the Sample at Intake[a]

| Indicator of Psychiatric Status | Depressed (N = 43) | Nondepressed (N = 77) | Total (N = 120) | p Value |
|---|---|---|---|---|
| BDI score, mean ± SD | 26.4 ± 9.7 | 17.8 ± 9.5 | 20.8 ± 10.4 | < .0001 |
| HAM-D score, mean ± SD | 23.3 ± 5.8 | 13.9 ± 6.7 | 17.2 ± 7.8 | < .0001 |
| GAS score, mean ± SD | 48.6 ± 6.1 | 54.8 ± 8.4 | 52.6 ± 8.2 | < .0001 |
| Use of antidepressant at intake, % (N) | 51.2 (22) | 5.2 (4) | 21.7 (26) | < .0001 |
| Current comorbid anxiety disorder, % (N) | 16.3 (7) | 18.2 (14) | 17.5 (21) | NS |
| Current comorbid personality disorder, % (N) | 37.2 (16) | 33.8 (26) | 35.0 (42) | NS |

[a]Abbreviations: BDI = Beck Depression Inventory, GAS = Global Assessment Scale, HAM-D = Hamilton Rating Scale for Depression.



### Statistical Analyses

Data collected at the initial and follow-up visits were coded and entered into a patient database using the scientific software program RS/1 (version 4.3.1, BBN Software Products, Cambridge, Mass.). All statistical analyses were conducted using the microcomputer version of SPSS (version 7.5., SPSS, Chicago, Ill.). Associations were examined using the chi-square test for categorical data, and comparisons between groups or timepoints were assessed using analysis of variance (ANOVA) techniques, including those for multiple variables and repeated measures. Post hoc tests were conducted using Tukey or t tests with a Bonferroni correction. Relationships between demographic variables, alcohol and drug use, psychiatric variables, and addiction outcome measures were assessed using multiple and hierarchical regression techniques. Data on retention in treatment were analyzed using the SPSS Survival program. Variables that predict treatment retention were assessed in a Cox proportional hazards regression model using SPSS.

## RESULTS

### Sample Description

Among the 120 patients with substance use disorders, 43 patients (35.8%) met DSM-IV criteria for a current depressive disorder (primary depression [N = 26] and substance-induced depression [N = 17]); 77 patients (64.2%) did not meet criteria for a depressive disorder. For the purpose of this analysis, patients with substance-induced depression were combined with patients with primary depression, because their baseline mean BDI, HAM-D, and GAS scores did not differ significantly from those of the primary depressed group. The combined group will hence be referred to as the depressed group.

The demographic and substance use characteristics of the depressed and nondepressed groups at intake are presented in Table 1. The depressed group differed from the nondepressed group only in terms of sex, as the depressed group was predominantly female ($\chi^2 = 18.27$, df = 1, $p < .0001$). Otherwise there were no significant differences with regard to demographic or substance use variables.

The psychiatric characteristics of the depressed and nondepressed groups at intake are presented in Table 2. Both groups had clinically significant levels of psychiatric symptomatology at intake: the mean ± SD BDI score of the overall sample was 20.82 ± 10.37 (moderate-severe depressive symptoms), the mean HAM-D score was 17.25 ± 7.82 (moderate depressive symptoms), and the mean GAS score was 52.56 ± 8.19 (moderate symptoms or moderate difficulty in psychosocial functioning). The depressed group had significantly higher BDI ($F = 21.41$, df = 1,115; $p < .0001$) and HAM-D scores ($F = 58.60$, df = 1,118; $p < .0001$) and significantly lower GAS scores ($F = 17.81$, df = 1,118; $p < .0001$). They were also more likely than the nondepressed group to be taking antidepressant medications at intake ($\chi^2 = 34.40$, df = 1, $p < .0001$). (N.B. Subjects were considered to be taking antidepressant medications if they had received an adequate dose of medication for at least 1 month.)

Review of treatment files revealed that during the 6-month follow-up period, subjects attended a mean ± SD

**Table 3. Utilization of Treatment at 6 Months**

| Treatment | Depressed (N = 40) | Nondepressed (N = 74) | Total (N = 114) | p Value |
|---|---|---|---|---|
| No. of individual therapy sessions, mean ± SD | 6.8 ± 5.7 | 5.4 ± 4.9 | 5.9 ± 5.2 | NS |
| No. of group therapy sessions, mean ± SD | 14.2 ± 14.0 | 12.9 ± 12.4 | 13.4 ± 12.9 | NS |
| No. of psychiatric appointments, mean ± SD | 4.4 ± 3.5 | 2.4 ± 1.8 | 3.1 ± 2.6 | .0001 |
| Inpatient detoxification, % (N) | 22.5 (9) | 8.1 (6) | 13.2 (15) | .02 |
| New antidepressant regimen started during treatment, % (N) | 62.5 (25) | 8.1 (6) | 27.2 (31) | < .0001 |

of 13.4 ± 12.9 group therapy sessions, 5.9 ± 5.2 individual therapy sessions, and 3.1 ± 2.6 psychiatric appointments (Table 3). (Six patients were lost to follow-up) Overall, 13.2% of subjects required inpatient detoxification, and 27.2% were prescribed new antidepressant medication regimens. (N.B. Subjects were considered to have received a new regimen if [1] a new antidepressant medication was initiated, [2] a second medication was added, or [3] the dose of an existing medication was increased. Selective serotonin reuptake inhibitors [e.g., paroxetine] were the most commonly prescribed antidepressant medications.) The depressed group received more treatment than the nondepressed group; specifically, they had more psychiatric appointments ($F = 15.42$, $df = 1,112$; $p = .0001$), were more likely to require inpatient treatment ($\chi^2 = 5.46$, $df = 1$, $p = .02$), and were more likely to be prescribed new antidepressant medication regimens ($\chi^2 = 36.27$, $df = 1$, $p < .0001$).

### Outcome of Addiction Treatment at 6 Months

Of the 120 patients, 110 (91.7%) with substance use disorders participated in the 6-month follow-up interviews (78 face-to-face and 32 telephone interviews). The outcome of treatment at 6 months is summarized in Table 4. The depressed group fared as well as the nondepressed group in terms of all addiction outcome measures at 6 months.

When the sample was divided into 3 groups (nondepressed, primary depression, and substance-induced depression), there were no differences among groups in terms of any of the key addiction outcome measures (i.e., rate of early dropouts, duration of active treatment, duration of continuous abstinence, frequency of drug use at 6 months, change in drug use [quantity × frequency] over 6 months, or rate of positive urine drug screens over 6 months).

Multiple and hierarchical regression analyses were conducted to determine independent predictors of outcome. Relevant demographic and clinical variables were factored into the analyses, including sex, primary drug,

**Table 4. Addiction and Psychiatric Outcome Measures at 6 Months[a]**

| Outcome Measure | Depressed (N = 39) | Nondepressed (N = 71) | Total (N = 110) | p Value |
|---|---|---|---|---|
| Early dropouts (< 45 d of treatment), % (N) | 15.4 (6) | 25.4 (18) | 21.8 (24) | NS |
| Duration of active treatment (d), mean ± SD | 126.1 ± 66.8 | 120.8 ± 68.8 | 122.7 ± 67.8 | NS |
| Duration of continuous abstinence (d), mean ± SD | 60.1 ± 39.2 | 47.4 ± 39.6 | 51.8 ± 39.8 | NS |
| No. of days of substance use in previous month, mean ± SD | 8.4 ± 12.6 | 7.9 ± 10.1 | 8.0 ± 11.0 | NS |
| Change in use (quantity × frequency) | –31.5% | –25.0% | –27.3% | NS |
| Rate of positive urine drug screens | 23.4% | 27.0% | 25.7% | NS |
| BDI score at 6 mo, mean ± SD | 12.7 ± 10.0 | 12.2 ± 10.1 | 12.4 ± 10.0 | NS |
| HAM-D score at 6 mo, mean ± SD | 13.6 ± 8.6 | 12.6 ± 8.8 | 13.0 ± 8.7 | NS |
| GAS score at 6 mo, mean ± SD | 57.7 ± 10.0 | 58.8 ± 9.0 | 58.4 ± 9.3 | NS |

[a]Abbreviations: BDI = Beck Depression Inventory, GAS = Global Assessment Scale, HAM-D = Hamilton Rating Scale for Depression.

frequency of drug use at intake, depression diagnosis, anxiety diagnosis, total and subscale scores on psychometric measures (HAM-D, BDI, SCL-90R, and GAS), and use of antidepressant medication at intake. Stepwise regression revealed that the frequency of drug use at intake was the best predictor of all addiction outcome measures at 6 months, including duration of active treatment ($R^2 = 0.034$, $p = .04$), duration of continuous abstinence ($R^2 = 0.095$, $p = .002$), frequency of drug use at 6 months ($R^2 = 0.159$, $p < .001$), change in drug use (quantity × frequency) over 6 months ($R^2 = 0.067$, $p = .01$), and rate of positive urine drug screens over 6 months ($R^2 = 0.321$, $p < .001$). The frequency of drug use at intake, combined with primary drug, accounted for 22.3% of the variance in the frequency of drug use at 6 months ($p < .001$) and 46.8% of the variance in the rate of positive urine drug screens over 6 months ($p < .001$). None of the psychiatric variables were independent predictors of outcome.

### Psychiatric Status at 6 Months

At intake, the depressed group had moderate-to-severe levels of psychiatric symptomatology, as measured by BDI, HAM-D, and GAS scores (see Table 2). By 6 months, their scores were in the mild-to-minimal range on all 3 measures and were no different from the scores of the nondepressed group (see Table 4). Repeated-measure ANOVAs were conducted to compare the depressed and nondepressed groups over time (i.e., at intake and at 3 and 6 months). Analyses revealed that the depressed group experienced a greater rate of improvement in psychiatric symptomatology than the nondepressed group. Significant

group × time interactions indicated that the depressed group had a more rapid decline in their BDI ($F = 4.44$, $df = 2,64$; $p = .016$) and HAM-D scores ($F = 9.98$, $df = 2,66$; $p < .001$) and a more rapid increase in their GAS scores ($F = 3.31$, $df = 2,66$; $p < .043$).

## DISCUSSION

Among the 120 patients with substance use disorders, 43 patients (35.8%) met DSM-IV criteria for a current depressive disorder (i.e., primary depression [N = 26] and substance-induced depression [N = 17]). The elevated rate of comorbid depression is similar to that found in other studies of addiction treatment populations.[5–9] The 45 female patients had significantly higher rates of comorbid depression than the 75 male patients. The sex ratio for the prevalence of depression was approximately 2:1, which is consistent with large community surveys of individuals with[3] and without substance use disorders.[39]

In this sample, there was no association between depression and primary drug. This result contrasts with the findings of larger studies,[29] which reported a greater prevalence of depression among patients addicted to opiates and prescription drugs. The small number of opiate- and benzodiazepine-dependent patients included in our sample may have rendered it difficult to observe any significant differences among drug groups. There was also no association between depression and the prevalence of coexisting anxiety disorders. This finding is somewhat surprising and may be due to the diagnostic instruments used in this study, since only mood and substance use disorders components of the SCID-IV were employed during the initial assessment. A more thorough assessment of anxiety symptoms may have yielded a higher prevalence of coexisting anxiety and depressive disorders. It is also possible to attribute the lack of increased anxiety in the depressed group to the subjects' substance use at intake (i.e., self-medication of distressing symptoms with alcohol and drugs that may have masked underlying anxiety disorders).

For the purpose of this study, patients with substance-induced depression were combined with patients with primary depression because (1) their baseline mean HAM-D, BDI, and GAS scores did not differ significantly from those of the primary depressed group and (2) the 2 depressed groups were indistinguishable over the course of addiction treatment. When the sample was divided into 3 groups, nondepressed (N = 77), primary depression (N = 26), and substance-induced depression (N = 17), there were no differences in terms of any of the key addiction outcome measures (i.e., rate of early dropouts, duration of active treatment, duration of continuous abstinence, frequency of drug use at 6 months, change in use [quantity × frequency], or rate of positive urine drug screens over 6 months). However, there may not have been sufficient power to detect a difference between the primary and substance-induced depression groups. Therefore, only the results of the combined depression group are discussed in our article.

Both depressed and nondepressed patients with substance use disorders succeeded in reducing their reported substance use during the course of addiction treatment (see Table 4). The depressed patients fared as well as the nondepressed patients in terms of all addiction outcome measures at 6 months. The lack of impact of depression on outcome is consistent with the results of several recent studies[25,27–30] and with earlier findings.[26] However, our results differ from other studies, in which comorbid depression was associated with worse treatment outcomes.[14–19]

Depression comorbidity may not have had the expected negative impact on the course and outcome of addiction treatment in our study for several reasons. One plausible explanation is that the dual disorder was identified at the initial assessment, and integrated psychiatric care was available. It may be that additional treatment compensated for greater psychopathology among dual-disorder patients. The naturalistic follow-up design allowed for treatment resources to be assigned as needed to depressed and nondepressed patients. Over the 6-month follow-up period, the depressed patients received more treatment compared with the nondepressed patients. Specifically, they had more psychiatric appointments, and they were more likely to require inpatient detoxification and to be prescribed new antidepressant medication regimens. The depressed patients, however, did not receive any additional group or individual psychotherapy sessions in our addiction clinic compared with the nondepressed patients. In other words, they did not simply require a greater intensity or frequency of addiction treatment; instead, they seem to have required a more integrated psychiatric and addiction approach.

Despite a significantly higher level of psychiatric symptomatology at intake, the depressed patients fared as well as the nondepressed patients in terms of all indicators of psychiatric status at 6 months (see Table 4). Over 50% of the depressed patients were already prescribed adequate antidepressant regimens at intake into addiction treatment (i.e., therapeutic doses of antidepressants for longer than 1 month). Despite receiving adequate pharmacologic treatment for depression, the depressed patients still experienced moderate-to-severe levels of psychiatric symptomatology (see Table 2). This finding suggests that antidepressant medications without specific addiction interventions were inadequate to alleviate psychiatric symptoms in patients with comorbid depression and substance use disorders. It is alarming to realize that so many individuals were receiving ineffective treatment and remaining both depressed and addicted.

It seems that neither addiction nor psychiatric interventions on their own were sufficient to meet the treatment needs of these dual-disorder patients. Optimal management of comorbid depressive and substance use disorders may

require both a careful psychiatric assessment at intake into addiction treatment and the availability of integrated psychiatric care during the course of addiction treatment. The supplementation of standard addiction treatment with mental health interventions may compensate for greater psychopathology among dual-disorder patients and may allow them to benefit from treatment in the same manner as other addiction patients. Further research into the treatment of dual-disorder patients is needed to develop efficacious and cost-effective strategies of integrating psychiatric and addiction interventions and to understand the interaction between the treatment of depression and that of substance use disorders.

*Drug name:* paroxetine (Paxil).

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