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The Impact of Drug Use in Social Networks of Patients with Substance Use and Bipolar Disorders

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Abstract

In this exploratory analysis, we assessed the effect of drug use among social network members on recovery from drug dependence in patients with co-occurring bipolar disorder. Patients (n=57) enrolled in a group therapy study completed assessments over 15 months. Patients with 0–1 drug users in their social networks at intake had few days of drug use during treatment and follow-up, whereas those with ≥ 2 drug users had significantly more days of drug use. Multivariate analysis showed that patients who consistently named multiple drug users in their social networks had a marked increase in drug use over 15 months, while those who never or occasionally named multiple drug users had a small decline in drug use over time. Multiple drug users in social networks of treatment-seeking drug dependent patients with co-occurring bipolar disorder may indicate poor drug use outcomes; efforts to reduce the association with drug users may be useful. This clinical trial has been registered in a public trials registry at clinicaltrials.gov (identifier is NCT00227838).

1. Introduction

Substance use is influenced by environmental factors,¹ which may include availability of substances and quality of social networks; a social network is a set of people and the relationships among them.² One potentially important area of social network influence is the effect of substance use by members of one's social network on one's own substance use.³ Therefore, understanding the impact of substance users in social networks might help to improve clinical outcomes in patients receiving treatment.

Substance abuse treatment programs commonly warn patients that the presence of substance users in their social networks may serve as a trigger for relapse to drug use.⁴ Clinical studies do, in fact, suggest that having social network members who drink alcohol^{5–6} or who are supportive of one's drinking⁷ are negative prognostic factors for alcohol use. A recent study showed that having a greater percentage of abstinent network members, particularly having multiple non-drinkers, predicted abstinence at 12-month follow-up (but not at 6-month follow-up) among drug-dependent patients.⁸ Community studies similarly suggest that

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Declaration of Interest

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having drug users (i.e., users of substances other than alcohol) in the social network influence drug use, as shown in a review of research with adolescents,³ although these data are largely cross-sectional. Conversely, having peers who promote abstinence may serve as a protective factor against drug use. Among adult intravenous drug users in the community followed for one year, those who continued drug use were 4.3 times more likely than those who were abstinent to have reported drug users in their social networks at intake, after adjusting for demographic and treatment variables.⁹

Some studies have examined the influence of the number of drug users in social networks on current drug use. Buchanan and Latkin followed heroin and cocaine users in the community who were in contact with other drug users, for an average of 9 months; they found that those who quit using drugs had a greater reduction in the number of drug-using network members than did those who continued to use drugs.¹⁰ Similarly, Wasserman and colleagues reported that, among patients receiving opioid maintenance treatment, having fewer cocaine users in social networks was associated with abstinence from cocaine after 3 months.¹¹ Zywiak and colleagues found that cocaine-dependent patients who abstained from drugs at follow-up had a greater percentage of social network members who abstained from alcohol and drugs 3 and 6 months after intake; whereas those who relapsed showed no change in abstinence among social network members.¹² These findings suggest that not only the presence, but also the number of drug users in social networks warrant further examination.

Both community¹³ and clinical¹⁴ studies have reported high rates of co-occurrence of substance use disorder and bipolar disorder. Studies of patients with bipolar disorder report that lower levels of social supports were associated with recurrence of mood episodes over a 1-year follow-up period.^{15–16} Research on the social networks of dually-diagnosed populations suggests similar associations; a recent literature review on relapse to substance use in dually-diagnosed patients concluded that relapse risks include having drug-using members in social networks.¹⁷ Greater social support for patients with co-occurring bipolar and drug use disorders has been found to be associated with better psychological functioning and less heroin and cocaine use at 6-month follow-up.¹⁸ Also, dually-diagnosed patients have been shown to experience greater support from non-substance users when they are working toward abstinence than when they are not.¹⁹ This research provides some evidence that support from non-substance users is important for good outcomes in dually-diagnosed patients.

Given the literature reviewed, anecdotal evidence,²⁰ and the focus in community treatment settings²¹ on the importance of breaking ties with substance users in order to improve substance use outcomes, we explored the relation between the presence of drug users as social network members at intake and subsequent drug use in a population of patients with co-occurring substance dependence and bipolar disorder. We predicted that those patients with more drug users in their social networks at study intake would have more days of drug use over the 15-month follow-up period. Because of the nature of our population, we examined two secondary questions: whether or not mood outcomes were related to either drug use or the presence of bipolar disorder among social network members.

2. Methods

2.1. Patients

This analysis used data collected for a 3-month treatment study, with a 1-year post-treatment follow-up, comparing an integrated group therapy to standard group drug counseling for patients with co-occurring substance dependence and bipolar disorder.²² Patients were recruited from McLean Hospital programs, advertisements, fliers, and clinician referrals. Inclusion criteria were (1) current diagnoses of bipolar disorder and substance dependence

other than nicotine, (2) substance use within 60 days of intake, (3) a mood stabilizer regimen for ≥ 2 weeks, and 4) ≥ 18 years of age. Exclusion criteria were (1) current psychosis, (2) current danger to self or others, (3) concurrent group treatment, and (4) residential treatment restricting substance use. For this analysis, we excluded 4 patients from the original study who had no lifetime drug use disorder (i.e., they had alcohol dependence only) and reported no drug use during the study. The research protocol was approved by the McLean Hospital Institutional Review Board. Study procedures were reviewed with patients and written informed consent was obtained at the initial appointment.

2.2. Assessments

The Important People interview (IP)²³ is designed to assess the relation between social networks and alcohol use, as has been reported.^{6–7} Subjects are asked to name people important to them with whom they have been in recent contact, regardless of how well liked the person is; for each person named, data are collected on how often they were in contact, how important and how supportive they were, if they lived in the same household, their relationship to the patient (e.g., family, spouse, friend, or coworker), and their alcohol use. We modified the measure to examine drug use and bipolar disorder in social networks by adding items parallel to the alcohol-related questions; also, we reduced the maximum number of network members from 12 to 8 and the time frame at intake from the last 6 months to the last 3 months, so that each repeated measure referred to the same time interval. The IP interview was administered at intake and every 3 months for 15 months. The presence of social network members with drug use and bipolar disorder was the focus of our analysis.

The main outcome was the number of days of drug use per month, obtained from the Addiction Severity Index²⁴ using the Timeline Follow-Back method.²⁵ To examine 15 months of drug use, we computed a mean of days using drugs per month. A secondary outcome measure was the number of weeks ill with a mood episode, determined through the Structured Clinical Interview for DSM-IV²⁶ and the Longitudinal Interval Follow-Up Evaluation.²⁷ To examine mood episodes over 15 months, we computed a total number of weeks ill for each patient.

2.3. Data analysis

To examine and compare continuous dependent variables, we conducted independent t-tests (for dichotomous independent variables) and 1-way analyses of variance (for independent variables with >2 categories). To investigate how the number of drug users in social networks over time influenced drug use outcomes, we performed a mixed model analysis; this model examined the effect of multiple drug users across 6 time points (intake and every 3 months until month 15) on change in days of drug use (every 3 months from intake to month 15), adjusted for treatment condition. Data were analyzed with SPSS v.17.0.

3. Results

3.1. Baseline characteristics

The sample of 57 patients was 59.6% male and mostly white (91.2%). Mean age was 37.3 (standard deviation (sd)=10.6) years. Almost half of the sample had completed college (47.4%), and almost half were currently employed (47.4%). Most patients were not currently married (75.4%).

The majority of patients (70.2%) were diagnosed with current drug and alcohol dependence; the remainder had current alcohol dependence only (21.1%) or current drug dependence only (8.8%). The most common drugs used in the past month were marijuana (38.6% of the

study sample) and cocaine (22.8%), with ≤ 5 patients using each of the following: heroin, other opioids, benzodiazepines, other sedative-hypnotics, inhalants, and stimulants. At intake, patients reported their typical substance use per month over the past 6 months: mean=16.4 (sd=10.5) days of substance use, including 9.4 (sd=11.3) days of drug use and 10.8 (sd=10.3) days of alcohol use, with some days using both drugs and alcohol. Most patients (77.2%) were diagnosed with bipolar I disorder; the remainder had bipolar II disorder (15.8%) or bipolar disorder not otherwise specified (7.0%).

3.1.1. Social networks at intake—With a maximum of 8 people who could be named as “important” members of social networks on the IP interview, patients reported an average of 6.7 (sd=1.3) important people at intake; 1.4 (sd=1.5, range=0–7) had used drugs in the last 3 months. Almost everyone named a family member (91.2%) and a friend (91.2%), with fewer naming a spouse or other sexual partner (28.1%), a therapist or other treater (21.1%), a contact from work (17.5%), or someone from a self-help group (7.0%).

Most patients (63.2%) named at least 1 drug user, with most of those (61.1%) naming at least 2 drug users. Of the patients who reported ≥ 1 drug user, 41.7% named ≥ 1 family member as a drug user and 72.2% named ≥ 1 friend as a drug user. Most of the patients who named a drug user (66.7%) had daily contact with the drug users they named, including 19.4% who lived in the same household.

3.2. The relation between number of drug users at intake and drug use over the next 15 months

We hypothesized that patients with more drug users as social network members at intake would have more days of drug use during the next 15 months. As shown in Figure 1, those with no drug users or 1 drug user reported very low amounts of subsequent drug use (< 2 days per month on average), whereas those reporting ≥ 2 drug users showed considerably greater drug use (4.1–15.3 times greater), suggesting a threshold effect rather than a linear relationship between number of drug users and subsequent drug use of the patient. To confirm that the visual interpretation was statistically significant, we examined 15 months of drug use by number of drug-using social network members at intake (0, 1, or ≥ 2). Number of drug users in the social network was related to mean drug use over 15 months ($F(2, 56)=8.16, p<0.001$). Post hoc t-tests showed that those naming 0–1 drug users reported similar amounts of subsequent drug use (means=1.2 days, sd=2.4 versus 1.5 days, sd=3.4; $t(33)=-.31, p<.76$), whereas those reporting ≥ 2 drug users had significantly more days of drug use (mean=7.9 days, sd=8.9) than those naming no drug users ($t(24.1)=-3.40, p<0.002$) or 1 drug user ($t(29.3)=3.03, p<0.005$) in their networks. Figure 2 shows that patients reporting 0–1 drug users at intake had fewer days of drug use at each month during the study, when compared to patients naming ≥ 2 drug users at intake. Given this threshold effect, the subsequent analyses compared patients with 0–1 drug users in their social networks to patients with multiple (i.e., ≥ 2) drug users.

3.3. The relation between multiple drug users and drug use over 15 months

To examine the relation between multiple drug users in social networks and drug use over the 15-month study period, patients were categorized by the frequency with which they named multiple drug users in their social networks: “always” included those who named multiple drug users at each assessment (15.8%), “never” included those who never named ≥ 2 drug users on an assessment (45.6%), and “occasional” included those who named ≥ 2 drug users at least once, but not at every assessment (38.6%). Patients who always named multiple drug users named an average of 3.6 (sd=1.3, range=2–7) drug users at each assessment.

First, we examined the relation between multiple drug users in social networks and drug use throughout the study period (see Figure 3). Patients in the “always” category had the most drug use throughout the study (mean=13.6 days/month, $sd=7.8$), whereas those in the “never” category had the least drug use (mean=1.1 day/month, $sd=2.0$), and those in the “occasional” category had intermediate drug use (mean=3.6 days/month, $sd=6.2$; $F(2, 56)=20.44$, $p<0.001$). Post-hoc t -tests showed that patients in the “always” category had significantly more days of drug use than those in the “never” category ($t(8.4)=-4.76$, $p<0.001$), as well as the “occasional” category ($t(29)=-3.77$, $p<0.001$); there was no statistically discernible difference between patients in the “never” and “occasional” categories ($t(24.9)=-1.88$, $p<0.08$).

We next considered the effect of multiple drug users on changes in days of drug use over 15 months, while also adjusted for treatment condition. A mixed model analysis showed that differences in social networks (shown in Figure 3) were significantly associated with changes in drug use throughout the study ($F(2, 47.0)=26.50$, $p<.001$). Patients in the “always” category significantly increased their drug use throughout the study period relative to patients in the “never” category ($t(47.2)=-6.34$, $p<.001$) and patients in the “occasional” category ($t(46.7)=-7.03$, $p<.001$). These results indicate that patients in the “always” category had an average rate of increase in drug use of approximately 2.7 days per month during the study period, whereas those in the “never” or “occasional” categories remained relatively stable, showing very modest rates of decrease (-0.1 and -0.3 days per month, respectively). Treatment condition was not significant.

3.4. The relation among bipolar disorder, drug users in networks, and mood outcomes

Approximately one-quarter of patients (22.8%) named social network members with bipolar disorder at intake. Weeks ill with bipolar disorder during the 15-month study period following intake (i.e., 60 weeks; overall mean=34.5% of weeks ill, $sd=26.1$) did not vary by (a) the presence of network members with bipolar disorder at intake or (b) the presence of multiple drug users in social networks at intake. Adherence to mood stabilizers was quite high, ranging from 85–90% at baseline and during treatment and follow-up.

4. Discussion

4.1. Summary of findings

This paper examined the effect of having drug users as social network members on the drug use of patients with co-occurring substance dependence and bipolar disorder. First, we found that reporting multiple (i.e., at least 2) drug users as network members at intake was predictive of more days of drug use over the course of the next 15 months, compared to those patients naming 0–1 drug users. Our sample reported rates of drug users in their networks at intake similar to results reported elsewhere¹⁹ for dually-diagnosed patients (63% vs. 65%, respectively). We also found that patients who named multiple drug users at every point during the study had more drug use over 15 months than those who never or only occasionally named multiple drug users. Finally, we found that patients with multiple drug users over 15 months considerably increased their drug use over time, while those who did not name multiple drug users showed a slight decline in drug use. Mood episodes did not vary by the presence of multiple drug users or people with bipolar disorder in social networks.

Our finding that patients who enter treatment reporting ≥ 2 drug users in their social networks have a worse prognosis for subsequent drug use is potentially clinically important; since 25% of our sample reported only 1 drug user in their networks at intake, it is worthwhile for clinicians to note that such patients might have better treatment outcomes

than those who report ≥ 2 drug users. Moreover, those who maintain contact with multiple drug users over time are likely to use drugs more often than those who do not consistently maintain these contacts.

4.2. Possible explanations for the study results

Although research has shown that the presence of drinkers in social networks has a negative impact on alcohol treatment outcome,⁶ the impact of the number of drug users has not been examined in a treatment-seeking population. In one study of drug users, the difference in relapse rates between those patients who knew ≥ 1 drug user and those who knew no drug users did not reach statistical significance.²⁸ The reason for this lack of significance may be that the presence of ≥ 2 drug users is necessary for a significant negative prognostic effect. Given the prevalence of current drug use at 8.0%,²⁹ perhaps having a single drug user in one's social network is not uncommon.

Interestingly, we found that patients who reported only 1 drug user and those who named no drug users reported a similar number of days of drug use. One explanation is that a single drug user may be a permanent member of the social network, such as a parent or sibling. While this person's drug use may influence the patient, other drug users may have been dropped by the patient as part of the recovery effort. However, in our sample, only 36% (5/14) of patients with a single drug user at baseline were naming family members (spouse, parent, brother, or child). Further, it is possible that single drug users in the network could have had infrequent contact with the patient. In our sample, however, 50% (7/14) of patients with 1 drug user at baseline had contact at least 3 times/week and 79% (11/14) had at least weekly contact. Since neither possibility appears to account for the similarity in drug use of patients with no drug users and those with one drug user in their networks, future research could try to explicate this finding.

From our analysis, we cannot determine whether drug use increases as a result of involvement with multiple drug users or patients begin to associate with more drug users as their drug use increases. While a review of research with adolescents suggests that having drug-using friends may precipitate drug use,³ this association remains unclear among adults.

In our sample, the number of weeks in an active mood episode did not vary by the presence of drug users or people with bipolar disorder in the network. This is not surprising, given that mood outcomes take considerable time to change, while changes in drug use can occur immediately. Additionally, patients in our trial had a high level of medication adherence, which may have contributed substantially to their relative mood stability.²² Finally, in our previous studies on this population of patients with co-occurring substance dependence and bipolar disorder, changes in drug outcomes have been more substantial than changes in mood outcomes.^{22,30}

4.3. Limitations

There are several limitations to this study, including a modest sample size, with patients who were primarily white, well-educated, and neither psychotic nor acutely suicidal. This sample reported high adherence to bipolar disorder medications, which may further limit generalizability. Also, drug use in this sample may be lower than other drug-dependent populations; this may be due to the fact that patients with major mental illness may be particularly sensitive to negative consequences of substance use.³¹ The social network measure used includes drug-using partners only if they are considered "important" people; it is thus possible that some patients did not report drug users with whom they associated because they were not viewed as "important." However, the fact that most patients did name drug users in their networks suggests that this might not be a limitation of the measure.

Furthermore, this analysis was exploratory, and we thus cannot address the issue of causation.

4.5. Directions for future research

While the IP interview is used to gather information from the patient's point of view, directly interviewing the social network members is one possible direction for further research. Examining the nature of the drug use (e.g., which drug, frequency used, and environment of use), as well as finding out whether or not the patients and social network members use drugs together, would add to the understanding of social network dynamics.

Additionally, although we determined the number of drug users in social networks at each point in the study, future research could examine whether these drug users were the same people at each time point. It could be clinically important to differentiate between patients no longer in contact with drug users and patients whose social network members have discontinued their drug use. Perhaps one type of change results in better clinical outcomes than the other. A study of heroin and cocaine users found that those who quit using drugs reduced the number of fellow users in their networks by a greater magnitude than those who did not quit.¹⁰ The study, however, did not assess whether the drug use status of social network members changed or network members turned over. They did highlight the possibility that those who stop using drugs might avoid other drug users.¹⁰

Our findings suggest that drug use outcomes among patients with co-occurring substance dependence and bipolar disorder might be improved by helping them to develop non-drug using networks. If that is not feasible, however, perhaps encouraging patients to minimize the number of drug users in their networks would be an effective treatment strategy.

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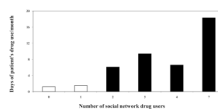


Figure 1.
Mean days of patient's drug use per month over 15 months by number of drug users in social networks at intake. (No patient named 5–6 drug users in their social networks at intake.)

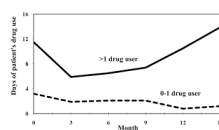


Figure 2.
Mean days of drug use (average per month) over 15 months by number of drug users in social networks at intake

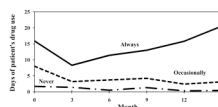


Figure 3.

Mean days of drug use (average per month) over 15 months by the presence of multiple drug users in social networks at each assessment. Patients were sorted by whether they named multiple drug users at each assessment (“always”), at no assessment (“never”), or at some assessments but not all (“occasional”).