

# A group intervention which assists patients with dual diagnosis reduce their drug use: a randomized controlled trial

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## ABSTRACT

**Background.** There is a well-recognized association between substance use and psychotic disorders, sometimes described as ‘dual diagnosis’. The use of substances by people with psychosis has a negative impact in terms of symptoms, longitudinal course of illness and psychosocial adjustment. There are few validated treatments for such individuals, and those that do exist are usually impracticable in routine clinical settings. The present study employs a randomized controlled experimental design to examine the effectiveness of a manualized group-based intervention in helping patients with dual diagnosis reduce their substance use.

**Method.** The active intervention consisted of weekly 90-min sessions over 6 weeks. The manualized intervention was tailored to participants’ stage of change and motivations for drug use. The control condition was a single educational session.

**Results.** Sixty-three subjects participated, of whom 58 (92%) completed a 3-month follow-up assessment of psychopathology, medication and substance use. Significant reductions in favour of the treatment condition were observed for psychopathology, chlorpromazine equivalent dose of antipsychotics, alcohol and illicit substance use, severity of dependence and hospitalization.

**Conclusions.** It is possible to reduce substance use in individuals with psychotic disorders, using a targeted group-based approach. This has important implications for clinicians who wish to improve the long-term outcome of their patients.

## INTRODUCTION

There is a well-recognized association between substance use and psychotic disorders, sometimes described as ‘dual diagnosis’. Approximately one half of individuals in the community with a psychotic disorder have a substance use disorder, and the same proportion of those who abuse substances have a psychiatric disorder (Schneier & Siris, 1987; Regier *et al.* 1990; Fowler *et al.* 1998; Siegfried, 1998). The special

needs of this group of patients have been increasingly recognized in Great Britain, the United States and Australia (Dawe & Mattick, 1997; Department of Health, 2002). These include increased symptoms of depression, suicidal ideation and psychosis (Strakowski *et al.* 1994; Krausz *et al.* 1996; Dixon, 1999), reflected in higher admission rates to psychiatric units (Martinez-Aravelo *et al.* 1994).

There have been relatively few studies of the effectiveness of interventions specifically for substance use in people with psychotic disorders, but there is a general consensus that such interventions require an integrated approach addressing both issues (Drake *et al.* 1998; Drake

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& Mueser, 2000; Department of Health, 2002). We are not aware of any published group-based randomized controlled trials specifically targeting substance use in people with psychosis. The virtues of a group-based approach include the positive impact of group belonging, the sharing of information about harm-reduction strategies by members of the group, and cost effectiveness.

Another line of research that impacted on the design of the current study, was that examining psychotic individuals' reasons for substance use. We believed that knowledge of individuals' reasons for use could be usefully employed both in engagement, and therapeutically in the group-based intervention. A number of studies have investigated motivations for substance use in psychosis (Test *et al.* 1989; Dixon *et al.* 1991; Warner *et al.* 1994; Baigent *et al.* 1995; Mueser *et al.* 1995; Addington & Duchak, 1997; Fowler *et al.* 1998; Spencer *et al.* 2002). These findings have not to our knowledge been explicitly applied to the treatment of substance use in patients with dual diagnosis. Spencer *et al.* (2002) found that 'dealing with negative affect' and 'enhancement' motives actually maintained substance use disorders and acted as the mediator between symptoms and psychological dependence, making them a legitimate target for therapeutic intervention.

The current study, therefore, aimed to evaluate the effectiveness compared to standard treatment, of a manualized group intervention explicitly addressing motivations for use, in helping patients with dual diagnosis reduce their substance use.

## METHOD

### Subjects

Participants were recruited from three major community mental health services in Western Australia (Fremantle Mental Health Service, Rockingham Kwinana Health Service and Peel Health Service). Inclusion criteria were: (1) an Axis I diagnosis (ICD-10; WHO, 1994) of a non-organic psychotic disorder; (2) currently using alcohol or illicit drugs; (3) a willingness to discuss drug use in a group setting; (4) ability to converse in English without an interpreter; (5) absence of developmental disability sufficient to impair participation in the group process and (6) meeting ICD-10 criteria for harmful use

and/or dependence, and being rated as having on-going drug use on the Severity of Dependence Scale (SDS), the Drug Abuse Screening Test (DAST; Skinner, 1982), and/or Opiate Treatment Index (Darke *et al.* 1992). Subjects were excluded from the study if they were already receiving treatment for substance use from another agency, or had previously received any group-based treatment for their substance misuse or psychosis. Participants were paid AU\$20 for each follow-up assessment they completed. The research ethics committee of Fremantle Hospital approved the protocol, including the payment procedure. Each participant signed a consent form after being informed about the purpose of the study.

Subjects were drawn from a service that operates within a case management model, which assisted in ensuring high attendance rates amongst participants. Case managers were encouraged to follow-up the progress of their clients during the course of the treatment and to encourage attendance at the groups. All usual clinical interventions were offered irrespective of allocation to case or control group.

### Measures

The following domains were assessed at baseline and at three month follow-up after conclusion of the group: (1) psychopathology; (2) quantity of drug use; (3) level of drug and alcohol abuse and dependence. All instruments were recommended by an Australian review of assessment instruments for alcohol and drug problems and psychiatric disorders (Dawe *et al.* 2002).

Psychopathology was measured using the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962), and the self-reported Brief Symptom Inventory (BSI; Derogatis, 1993). The total score of the BPRS and the Global Severity Index (GSI) from the BSI were used as global measures of psychopathology. The independent rater (N.P.) was trained on the BPRS and had scored within acceptable limits from two 'gold standard' interviews before rating subjects in the study.

The four measures of substance use were:

(1) The Severity of Dependence Scale (SDS; Gossop *et al.* 1995), a five-item self-report questionnaire designed to measure the degree of psychological dependence experienced by users

of different types of illicit drugs (Gossop *et al.* 1995). It focuses on impaired control of drug use, anxiety about use, and perceived difficulty in stopping.

(2) The Drug Abuse Screening Test (DAST; Skinner, 1982), a 20-item self-report screening instrument designed to identify individuals who have a drug use problem (excluding alcohol). Designed to assess the extent of problems related to drug misuse, the instrument relates to the individual's use of drugs; physical (withdrawal symptoms) and medical complications; and emotional and personal problems associated with drug use (Skinner, 1982; Gavin *et al.* 1989). A cut-off score of 6 or 7 indicates a diagnosis of drug use disorder. The screening test was used as an outcome measure by measuring drug use over the previous 3 months.

(3) Alcohol Use Disorder Identification Test (AUDIT; Dawe & Mattick, 1997), a 10-item self-report instrument designed to screen for a range of drinking problems, in particular hazardous and harmful consumption. A score of 8–10 is associated with harmful drinking, and a score of 13 or more is likely to indicate alcohol dependence (Dawe & Mattick, 1997).

(4) Polydrug Use was calculated by adding the total number of substances used from the Opiate Treatment Index (Darke *et al.* 1992) which includes alcohol, cannabis, amphetamine, cocaine, hallucinogens, inhalants and heroin (range 1–7).

Diagnoses according to ICD-10 criteria were generated using the Operational Criteria Checklist (OPCRIT; McGuffin *et al.* 1991), using all available clinical information. Patient hospitalization status was recorded at intake into the treatment programme and at the 3-month follow-up period. Medication use was ascertained from the treating medical officer, checked against pharmacy charts and converted to Chlorpromazine equivalent doses, using the British National Formulary guidelines (British Medical Association, 2002). Duration of substance use and psychosis co-morbidity was measured in four increments: 1 = less than 1 month; 2 = between 1 month and 1 year; 3 = between 1 and 5 years; and 4 = more than 5 years.

### Study design and procedure

Participants were recruited from May 2000 to December 2001 from the three participating

sites (Fremantle Mental Health Service, Rockingham Kwinana Health Service and Peel Health Service). Participants who met selection criteria were randomized into treatment or control conditions. Randomization was performed prior to any assessments being undertaken, by allocating alternate consenting patients to either the control or intervention group.

All participants received standard community mental health services, including case management, routine outpatient services and a daytime rehabilitation programme and supported accommodation, if needed. Those randomized to the control condition received a single hour-long session of education regarding drug use, encompassing consequences of drug use for people with a psychotic illness, and harm minimization strategies; this is considered 'usual practice' in these treatment settings.

The intervention group was given a specialized dual diagnosis programme over 6 weeks that combined drug use and mental health interventions. This consisted of weekly group sessions, lasting 1½ h, tailored specifically to the participants' stage of change according to the model of Prochaska & DiClemente (1986), as well as their reasons for drug use according to the Substance Use Scale for Psychosis (SUSP; Spencer *et al.* 2002). Each group had two facilitators and no more than six participants. The intervention group was a closed cohort group where no rolling admissions were allowed into the group after treatment had commenced. Consecutive subjects after the commencement of a programme were required to wait 4–8 weeks for the next programme to begin.

The treatment manual outlined each session in detail so that core aspects of the intervention were covered with all participants. The intervention encompassed peer support, motivational enhancement strategies, harm minimization and relapse prevention paradigms. Different topics were addressed each week, in the following sequence: (1) psycho-education on drug use and mental health; (2) reasons for use; (3) reasons to change; (4) harm reduction strategies; (5) coping with high-risk situations and assertiveness training; and (6) planning for the future. The delivery of treatment was based on a treatment manual that was developed and piloted with the first group (James *et al.* 2002). This manual served as the guide for all future groups.

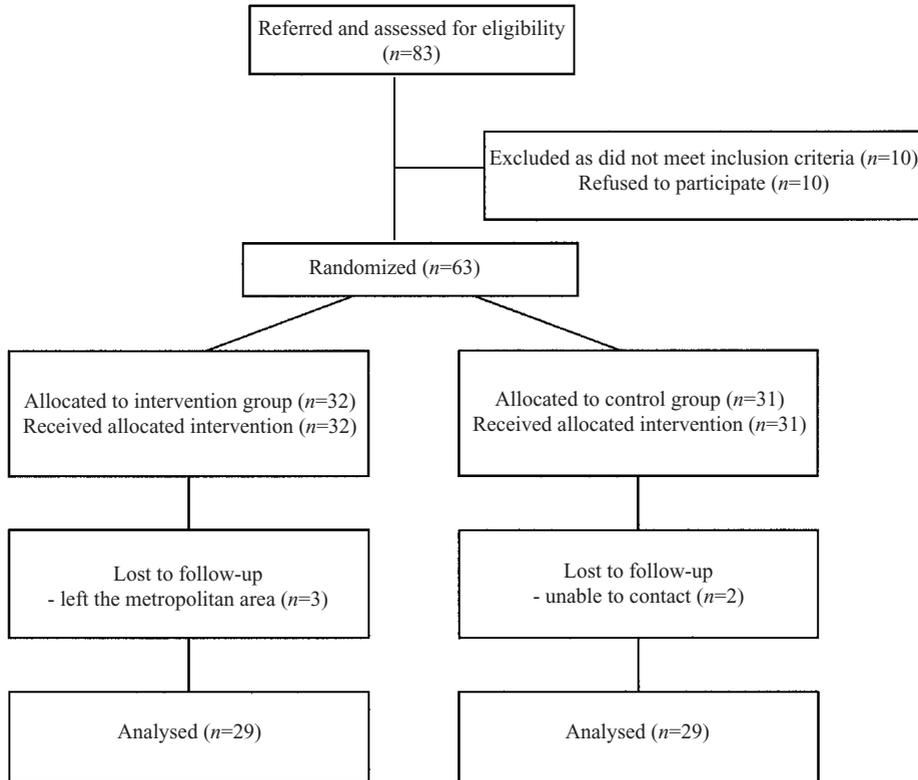


FIG. 1. Flow diagram of subjects' progress through the trial.

Treatment fidelity was ensured by strict adherence to the manual, as well as one of the originators of the manual (W.J. or G.K.) co-facilitating all subsequent groups. Before (and after) randomization, all subjects had received standard community-based treatment for their mental health problem.

Subjects were assessed at intake and 3 months after receiving their final group session. Controls were assessed in the same time frame. An independent rater (N.P.) made all follow-up assessments, 'blind' to the randomization outcome or treatment received by subjects.

### Analysis

Participant demographics, length of co-morbidity, mental health service use, psychopathology, chlorpromazine equivalent dose and substance use at baseline were assessed for statistical equivalence between intervention and control subjects. A two-tailed repeated measures analysis of variance under the General Linear

Model (SPSS v. 11.00) was used for psychopathology and substance use variables from intake to 3 months. Time by group interactions were examined. *Post-hoc* paired *t* tests were used to indicate which group contributed to change over the treatment period. Wilcoxon Signed Rank tests were used to examine hospitalization status of subjects in each group from intake to follow-up.

### Power calculations

Because of the limited number of studies in this area, we based our initial power calculations on the basis of clinically significant (20%) change on the main rating scales employed (see above). We were also able to perform a *post-hoc* power calculation based on the measures of overall functioning used by Barrowclough *et al.* (2001) in their randomized controlled experimental study of a one to one treatment programme for patients with dual diagnosis (published after our trial had commenced). Using COMPARE2 in

Table 1. Tests for pre-treatment equivalence between Treatment and Control groups

	Treatment	Controls	Test	Sig.
<b>Demographics</b>				
Age	28.50 (±7.06)* (n = 32)	26.87 (±8.32) (n = 31)	<i>t</i> = 0.838	<i>p</i> = 0.405
Male	23 (71.9%)	22 (71.0%)	$\chi^2 = 0.006$	<i>p</i> = 0.936
Female	9 (28.1%)	9 (29.0%)		
Schizophrenia	20 (62.5%)	16 (51.6%)	$\chi^2 = 0.762$	<i>p</i> = 0.383
Other Psychotic Disorders	12 (37.5%)	15 (48.4%)		
Co-morbidity (range 1 = < 1 month; 2 = 1 month – 1 year; 3 = 1–5 years; 4 = 5 years +)	3.65 (±0.60)	3.48 (±0.78)	<i>t</i> = -0.974	<i>p</i> = 0.334
Mental Health Service use (in months)	53.80 (±55.47) (n = 31)	51.22 (±63.23) (n = 30)	<i>t</i> = -0.407	<i>p</i> = 0.685
<b>Psychopathology</b>				
BPRS (range 18–126)	35.28 (±10.56) (n = 32)	34.29 (±8.48) (n = 31)	<i>t</i> = 0.410	<i>p</i> = 0.684
GSI (range 0–4)	1.34 (±0.81) (n = 32)	1.40 (±0.89) (n = 31)	<i>t</i> = 0.014	<i>p</i> = 0.989
Chlorpromazine equivalent dose (range 0–1500 mg)	460.03 (±329.81) (n = 30)	402.26 (±275.05) (n = 31)	<i>t</i> = 0.748	<i>p</i> = 0.457
<b>Substance use</b>				
SDS (range 0–18)	7.41 (±3.67) (n = 31)	6.75 (±3.46) (n = 29)	<i>t</i> = 0.716	<i>p</i> = 0.477
DAST (range 0–20)	11.26 (±5.05) (n = 30)	9.10 (±4.66) (n = 29)	<i>t</i> = 1.707	<i>p</i> = 0.093
AUDIT (range 0–40)	11.68 (±10.19) (n = 29)	12.65 (±8.22) (n = 29)	<i>t</i> = -0.397	<i>p</i> = 0.693
POLYTOT (range 1–7)	2.15 (±0.67) (n = 32)	2.09 (±0.70) (n = 31)	<i>t</i> = -0.343	<i>p</i> = 0.733

\* Standard deviations indicated in parentheses (±); BPRS, Brief Psychiatric Rating Scale; GSI, Global Severity Index from the Brief Symptom Inventory; SDS, Severity of Dependence Scale; DAST, Drug Abuse Screening Test; AUDIT, Alcohol Use Disorder Identification Test; POLYTOT, number of different substances used. Mental Health Service use analysis performed on square root transformations, raw scores presented.

the WINPEPI program (Abramson & Gahlinger, 2001), we estimated we would require a minimum of 29 subjects in each group to have an 80% chance of detecting a difference at the 95% significance level.

## RESULTS

### Patient characteristics

The overall structure of the study is depicted in Fig. 1. Eighty-three subjects were assessed for eligibility. Nine subjects were excluded as they did not have schizophrenia, schizophrenia spectrum or bipolar affective disorder, and one because of being too psychiatrically unwell. Of subjects meeting inclusion criteria (*n* = 73), 10 subjects refused to participate in the study after being offered an appointment for assessment. Sixty-three subjects were therefore assessed at intake into the study, all of whom were randomized to the intervention and control groups (32 and 31 respectively). Twenty-nine subjects in each group were followed-up at 3 months (*n* = 58). This represented 79% of subjects eligible to participate in the study and 92% of those allocated to the intervention and control groups. On average, subjects in the intervention group attended 4.7 of the six sessions.

In the intervention group, patients with schizophrenia accounted for 63% of the sample, with severe depression with psychotic symptoms accounting for 3%, mania with psychosis, 6%, schizoaffective disorder, 22% and ‘other non-organic psychotic disorders’, 6%. The control group, the respective proportions were 52% with schizophrenia, 6% with severe depression with psychotic symptoms, 29% with schizoaffective disorder, and 13% with other non-organic psychotic disorders. Both groups were equivalent in terms of demographics, duration of co-morbidity, mental health service use, psychopathology, chlorpromazine equivalent dose and baseline substance use, indicating pre-treatment equivalence between the samples (Table 1).

### Treatment outcome at 3-month follow-up

Repeated measures analysis of variance indicated significant group by time interactions for psychopathology on the BPRS, substance use on the DAST and chlorpromazine equivalent dose (Table 2).

*Post-hoc* paired *t* tests indicated that the intervention group showed significantly greater improvement in psychopathology (*t* = 2.04, *df* = 1, 28, *p* = 0.050), drug abuse (*t* = 6.45, *df* = 1, 28,

Table 2. Repeated Measures Analysis of Variance of dependent variables with Group and Time interaction

Dependent variables	Group	Fixed factors		F	Interaction effect
		Time			
		Intake	3 months		
Psychopathology					
BPRS (range 18–126)	Treatment (n=29)	35.41 (±11.08)†	30.48 (±10.68)	7.364	**
	Controls (n=29)	33.93 (±8.61)	38.10 (±11.54)		
GSI (range 0–4)	Treatment (n=31)	1.36 (±0.88)	0.87 (±0.63)	0.865	n.s.
	Controls (n=29)	1.27 (±0.63)	1.12 (±0.77)		
POLYTOT (range 1–7)	Treatment (n=31)	2.16 (±0.68)	1.67 (±0.83)	3.208	n.s.
	Controls (n=29)	2.03 (±0.62)	2.00 (±0.84)		
DAST (range 0–20)	Treatment (n=29)	11.58 (±4.82)	4.96 (±4.49)	16.619	***
	Controls (n=29)	9.10 (±4.66)	8.24 (±5.31)		
CPZ (range 0–1500 mg)	Treatment (n=28)	458.73 (±338.08)	369.38 (±357.33)	7.221	**
	Controls (n=27)	414.95 (±280.37)	514.79 (±327.40)		
AUDIT (range 0–40)	Treatment (n=29)	11.65 (±10.19)	8.34 (±8.35)	1.352	n.s.
	Controls (n=29)	12.65 (±8.22)	11.65 (±7.35)		
SDS (range 0–18)	Treatment (n=28)	7.42 (±3.63)	3.85 (±3.30)	2.205	n.s.
	Controls (n=29)	6.75 (±3.46)	5.20 (±3.82)		

† Standard deviations indicated in parentheses (±), n.s., not significant, \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . BPRS, Brief Psychiatric Rating Scale; GSI, Global Severity Index from the Brief Symptom Inventory; SDS, Severity of Dependence Scale; POLYTOT, number of different substances used; DAST, Drug Abuse Screening Test; CPZ, Chlorpromazine Equivalent Dose; AUDIT, Alcohol Use Disorder Identification Test.

$p = 0.001$ ), and need for medication as expressed in chlorpromazine dose equivalents ( $t = 2.08$ ,  $df = 1, 28$ ,  $p = 0.046$ ). They also showed statistically greater reductions in cannabis use ( $t = 2.59$ ,  $df = 1, 15$ ,  $p = 0.020$ ), poly substance use ( $t = 2.61$ ,  $df = 1, 30$ ,  $p = 0.014$ ), alcohol use ( $t = 2.59$ ,  $df = 1, 28$ ,  $p = 0.015$ ) and severity of dependence ( $t = 4.27$ ,  $df = 1, 27$ ,  $p = 0.001$ ), than controls.

In comparison to the control group, patients who received the intervention had a lower rate of hospitalization at follow-up ( $Z = -2.496$ ,  $p = 0.013$ ;  $Z = -2.837$ ,  $p = 0.005$ ). From the intervention group, of the 11 subjects who were hospitalized at commencement of treatment (negative rank), all patients stayed out of hospital during the 3-month follow-up period. Only two subjects (positive rank) who were not hospitalized at intake required hospitalization at 3 months. From the control group, 17 subjects were hospitalized at intake and not at 3 months while six subjects who were not hospitalized at intake required hospitalization at 3 months. While more subjects were hospitalized at intake from the control group ( $\chi^2 = 4.73$ ,  $df = 1$ ,  $p = 0.032$ ), three times more subjects also required hospitalization at 3 months compared to those who received the group treatment.

## DISCUSSION

### Comparison with previous work

There remains a major deficit in terms of defining the most effective content, shape and form of interventions that will assist people with substance use co-morbidity control their substance use. Drake *et al.* (1998) reviewed published studies in the area and identified a number of methodological flaws, including non-randomized non-controlled experimental designs, low numbers of participants, lack of standardized assessment instruments, and complex heterogeneous interventions that were sometimes modified over the course of the trial (see James & Castle, 2003). An exception is the recent study by Barrowclough *et al.* (2001), which used a randomized controlled experimental design to evaluate an integrated treatment programme and resulted in a reduction in positive psychotic symptoms and an increase in the proportion of days abstinent from drugs, in a dual diagnosis group. However, the number of subjects was low (17 at end point in the treatment group and 15 in the control group), and the fact that the intervention incorporated motivational interviewing, cognitive behaviour therapy and family or caregiver intervention conducted over

a 9-month period, raises queries about the practicability of generalizing the package for use in routine mental health service settings.

The study presented here addresses many of the shortfalls of previous studies by implementing a carefully articulated intervention, with good treatment fidelity and which is possible to implement in mental health settings without major resource implications. We used a randomized controlled trial (RCT) design and validated assessments performed 'blind' to randomization.

Our findings support the view that integrated treatment is effective for people with psychotic disorders whose illness is complicated by substance use (Drake *et al.* 1998; Siegfried, 1998; Drake & Mueser, 2000; Department of Health, 2002). Integrated interventions incorporate aspects from both mental health and substance use treatments and are delivered simultaneously by the same personnel (Ley *et al.* 2001). We have shown that this approach can be employed in a group-based intervention within routine clinical service settings.

### Strengths of the study

To our knowledge this is the first RCT of a group intervention for this population explicitly incorporating individuals' motivations for substance use (Test *et al.* 1989; Dixon *et al.* 1991; Warner *et al.* 1994; Baigent *et al.* 1995; Mueser *et al.* 1995; Addington & Duchak, 1997; Fowler *et al.* 1998; Spencer *et al.* 2002). Our approach, therefore, integrated the findings of the existing literature on interventions for dual diagnosis with an intervention that targets people's reasons for use. These include using drugs and alcohol to cope with negative affect, for social affiliation and for enhancement purposes (Test *et al.* 1989; Dixon *et al.* 1991; Warner *et al.* 1994; Baigent *et al.* 1995; Mueser *et al.* 1995; Addington & Duchak, 1997; Fowler *et al.* 1998; Spencer *et al.* 2002). We were also able to demonstrate that pre-treatment conditions on patient characteristics, chlorpromazine equivalent dose and psychopathology were the same between the two groups indicating an effective randomization process prior to treatment.

Our retention rates are higher than in most other studies in the field (e.g. Barrowclough *et al.* 2001). We believe this was due to a number of factors, including the fact that subjects

gave informed consent to participate in a group-based intervention, and were thus clearly motivated to address their substance use. Also, we followed up participants between groups with reminder phone calls, and worked closely with individual case managers such that they encouraged attendance at the groups and follow-up assessments. Finally, all subjects were paid to attend the follow-up assessments.

### Limitations of the study

Limitations of the study include small numbers and the impossibility of blinding participants and group facilitators to intervention status. We could also not control for time spent in the group setting, overall therapist contact time, nor did we conduct an independent evaluation of treatment fidelity. Furthermore, we assessed only relatively short-term outcomes. The selection process would not have introduced systematic bias, but does raise questions about generalizability, in that we were clearly targeting a motivated group of patients. The randomization procedure was on the basis of alternative allocation of referred subjects to each arm of the study; this is perhaps not strictly 'random' allocation, but the equivalence of the groups in terms of baseline characteristics suggests it was adequate. We were reliant on self-report measures, given the relative paucity of published research on the psychometrics of substance use measures amongst patients with psychotic disorders. In addition, we were unable to confirm levels of drug or alcohol use using blood or urine samples; however, we do not suspect any systematic bias in this regard, and the fact that (objective) psychopathology ratings improved with reduced reported substance use lends support to the veracity of the findings.

Clearly this work requires replication in different and larger samples of patients from different settings, and by researchers who were not originators of the treatment package.

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