Current Evidence on Integrated Treatment for Serious Mental Disorder and Substance Misuse

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Substance misuse in people with serious mental disorders has wide-ranging negative impact. The multiplicity of problems suggests that this comorbidity is better conceptualized as a type of complex disorder than by "dual diagnosis".

Introduction

Over the past two decades, extensive research has shown that individuals with serious mental illness such as schizophrenia, bipolar disorder, and treatment refractory major depression are at substantially increased risk for co-occurring drug and alcohol use disorders. For example, most population surveys indicate lifetime rates of alcohol or drug misuse in the general population in the U.S., Europe, and Australia of approximately 15 %, compared with 40–50 % in people with serious mental illness (Kessler et al., 1996; Mueser et al., 2000; Regier et al., 1990; Teesson, Hall, Lynskey, & Degenhardt, 2000). Rates of current or recent substance misuse in people with serious mental illness are also high, typically falling between 25 and 40 % (Mueser, Bennett, & Kushner, 1995).

Vulnerability to substance misuse in people with serious mental illness is associated with many of the same factors as in the general population. Male gender, younger age, single marital status and lower education have all been related to a higher likelihood of substance use disorder in people with serious mental illness, as in the general population (Kavanagh et al., 2004a; Mueser, Yarnold, & Bellack, 1992; Mueser et al., 1990). Also consistent with general population correlates are observations that a family history of substance misuse (Noordsy, Drake, Biesanz, & McHugo, 1994), a history of conduct disorder during childhood (Hodgins, Tiihonen, & Ross, 2005) and a diagnosis of antisocial personality disorder (Mueser et al., 1999) are linked to higher risks of substance misuse in people with psychotic disorders.

One of the few unique associations between client characteristics and vulnerability to substance use disorders is a relationship between premorbid social functioning and substance misuse. While in the general population there is no established relationship between social competence and vulnerability to addiction, *higher* premorbid social functioning is associated with an *increased* risk of substance misuse among people with serious mental disorders (Arndt, Tyrrell, Flaum, & Andreasen, 1992; Salyers & Mueser, 2001). This association may appear counterintuitive at first, because premorbid social functioning is a robust predictor of a more benign course of schizophrenia (Zigler &

Glick, 1986). A plausible interpretation of this finding is that individuals with better premorbid social functioning are more likely to be exposed to social use of substances and be offered illicit drugs, and to have the skills to develop and maintain a regular supply than are those who are socially withdrawn or avoidant (Cohen & Klein, 1970; Mueser, Drake, & Wallach, 1998).

In line with an association with better premorbid social functioning, there is also evidence that people with psychosis and co-occurring substance misuse have better average social functioning and less severe negative symptoms than those with schizophrenia alone (Kirkpatrick et al., 1996; Mueser et al., 1990; Salyers & Mueser, 2001). The direction of this relationship is difficult to disentangle. As in pre-illness phases, this may reflect a greater risk of exposure and regular use of substances in more intact individuals. Alternatively, with some drugs (e.g., nicotine) this effect may partly be via beneficial effects of the substance on cognitive functioning and motivation. Social functioning may also be enhanced by a tendency for social use of intoxicating drugs to offer tolerant and low-demand social contact. Social facilitation is a frequently reported motive for substance use in persons with serious mental illness (Addington & Duchak, 1997; Dixon, Haas, Weiden, Sweeney, & Frances, 1991; Mueser, Nishith, Tracy, DeGirolamo, & Molinaro, 1995).

Effects of Substance Misuse on Psychotic Disorders

Problems with substance use in the general population are defined in terms of continued use despite a negative impact on the person's health, social or role functioning (e.g., in work, parenting, or school). In substance dependence, indications of impaired control and other signs of physical dependence are seen. Among people with psychotic disorders, even relatively modest levels of substance use can have all these effects, and interact with the course of illness (Drake & Brunette, 1998). Substance misuse frequently interferes with medication adherence (Miner, Rosenthal, Hellerstein, & Muenz, 1997) and contributes to increased symptoms, relapses, and rehospitalization (Drake, Mueser, Clark, & Wallach, 1996; Linszen, Dingemans, & Lenior, 1994). Compared to persons with a mental disorder alone, co-occurring substance misuse and mental illness also confers increased risks of housing instability and homelessness (Drake, Osher, & Wallach, 1991), financial problems, family burden (Dixon, McNary, & Lehman, 1995; Salyers & Mueser, 2001), exposure to infectious disease (Rosenberg et al., 2001), violence (Swartz et al., 1998), involvement in the criminal justice system (Teplin, 1994), and demoralization and suicidality (Bartels, Drake, & McHugo, 1992).

There is now substantial evidence that substance use not only causes a more severe course of mental disorder; it can also trigger the onset of a psychotic disorder in vulnerable individuals. Drug

use is associated with an earlier age of onset of psychosis (Kavanagh et al., 2004a; Salyers & Mueser, 2001; Tsuang, Simpson, & Kronfol, 1982). This effect is of great importance, given the vocational and social learning and role transitions that occur in late adolescence and early adulthood, and evid-ence showing that the age on onset of psychosis is strongly predictive of long-term functional outcomes (Häfner, 2000; Häfner, Maurer, Löffler, & Riecher-Rössler, 1993). Furthermore, cannabis use has been prospectively linked to the development of schizophrenia in five large population studies, with the extent of use showing a dose-dependent relationship to risk of illness (Andréasson, Allebeck, Engström, & Rydberg, 1987; Arseneault et al., 2002; Fergusson, Horwood, & Swain-Campbell, 2003; Henquet et al., 2005; van Os et al., 2002). This effect remains after control for potentially confounding variables. Based on these data, some researchers have argued that cannabis may precipitate the onset of schizophrenia in some individuals who would not otherwise have developed the illness (Arseneault, Cannon, Witton, & Murray, 2004). It is impossible to know whether a particular individual would have developed psychosis in the absence of cannabis use. However, if cannabis can induce psychosis in people who would not otherwise develop it, one would expect increases in the prevalence of schizophrenia in places where cannabis use has increased. A study of birth cohorts in Australia between 1940 and 1979 failed to find such an association (Degenhardt, Hall, & Lynskey, 2003).

In bipolar disorder, different relationships have been reported between substance misuse and illness onset. People who misuse alcohol before the onset of bipolar disorder have a later age of disorder onset than those whose bipolar disorder came first (Strakowski, McElroy, Keck, & West, 1996). Lower rates of bipolar disorder are seen in the families of people whose alcoholism preceded their bipolar disorder (DelBello et al., 1999), suggesting a lower genetic vulnerability. These people also tend to experience fewer affective episodes and a more rapid recovery than people whose bipolar disorder came first (Winokur et al., 1995). The findings suggest that alcohol misuse may precipitate first episodes of mania in some people who might not otherwise have developed bipolar disorder, or may have developed it at a later age (Strakowski & DelBello, 2000).

More than “Dual Diagnosis”

In describing comorbidity of substance misuse and mental disorders, the term “dual diagnosis” has typically been used as a shorthand description. However, an important issue is raised if the phrase is taken literally: frequently, there are more than two problems involved. Not only is multiple substance misuse endemic, particularly if nicotine dependence is included (Kavanagh et al., 2004a), but so is the

co-occurrence of multiple psychiatric disorders or sub-clinical presentations. For example, in addition to psychosis and substance misuse, very commonly we also see co-occurring depression, anxiety, or personality disorder (Mueser et al., 1999). Although some of these problems may often resolve after reduction or cessation of substance use – for example, depressive or anxiety symptoms often improve without specific treatment (Margolese, Carlos Negrete, Tempier, & Gill, 2006) – others may not. Even transient or secondary symptoms can be important for treatment: For example, dysphoria impairs self-efficacy and negatively skews outcome expectancies (Kavanagh, 1992), affecting engagement in behavior change (Miller & Rollnick, 2002). Furthermore, people with mental disorders have increased risks of physical disorders (Lambert, Velakoulis, & Pantelis, 2003), with cigarette smoking and other substance misuse having an important role (Brown, Inskip, & Barraclough, 2000). As mentioned above, multiple skill deficits and practical, social and functional difficulties further compound the picture, and not all of these issues spontaneously resolve after the substance misuse and mental disorders are addressed.

Regardless of the terminology adopted, it may be important to conceptualize this population as a subtype of complex presentation. An advantage of this view may be that practitioners and services are encouraged to consider the wide range of interrelated issues that face this group, rather than taking a blinkered perspective on just one or two. A second advantage is that practitioners are typically familiar with the management of complex presentations. Reconceptualizating comorbid substance misuse and mental disorder in this context may assist them to see the range of issues as legitimate targets for their involvement, and ones they feel confident in addressing, at least to some extent.

Treatment of Co-Occurring Disorders

Treatment of co-occurring substance misuse in psychotic disorders traditionally relied on either parallel or sequential approaches. In the *parallel approach*, treatments for mental illness and substance misuse were provided separately by different clinicians, usually working for different agencies. In the *sequential approach*, efforts would focus first on treating or stabilizing one disorder, which would then be followed by the second disorder.

Numerous problems were associated with both of these approaches (Polcin, 1992; Wallen & Weiner, 1989). Problems with parallel approaches included difficulties accessing both mental

health and substance misuse services, lack of assertive follow-up of clients on substance misuse treatment, poor coordination of services, problems with communication about client status and progress, and inconsistencies in goals and treatments (e.g., a focus on abstinence vs. harm reduction). The major problem with sequential treatment, particularly with psychosis and substance misuse, was the difficulty of attempting to treat one of the disorders in isolation, given the tendency for each to exacerbate the other (Hides, Dawe, Kavanagh, & Young, 2006). By the late 1980s, reviews of the treatment research literature on comorbidity had concluded that these traditional approaches were ineffective, and a consensus emerged that more effective treatment models were needed (El-Guebaly, 1990; Ridgely, Goldman, & Willenbring, 1990).

The core ingredient of new approaches to comorbidity of serious mental disorders and substance misuse was the integration of treatment for these disorders, with the same clinician (or team of clinicians) assuming responsibility for the treatment of both (Minkoff & Drake, 1991). Based on the theme of integration, a number of treatment programs have been developed for comorbidity (Carey, 1996; Drake, Bartels, Teague, Noordsy, & Clark, 1993; Kavanagh, 1995; Minkoff, 1989; Mueser, Noordsy, Drake, & Fox, 2003). While individual programs differ considerably from one-another, most share a common set of characteristics, including comprehensiveness, motivation enhancement, minimization of treatment-related stress, a harm-reduction philosophy, and assertive outreach.

Comprehensive Services

Substance misuse treatment services for clients with serious mental illness are designed to be implemented in the context of comprehensive treatment. Typically, integrated treatments attempt to address a wide range of client needs: not only medical care, pharmacological treatment, illness self-management and substance control, but also needs for housing, vocational rehabilitation, social skills training, and recreation. Attending to these basic treatment and rehabilitation needs is critical to helping clients achieve sobriety and maintain a rewarding, substance-free life (e.g., by developing social networks and activities that do not involve substance misuse) (Drake, Wallach, Alverson, & Mueser, 2002; Trumbetta et al.,1999.

Motivation Enhancement

Traditional substance misuse treatment services are usually initiated when the substance use either leads to significant problems in functioning, or legal problems force the person into treatment (e.g., driving under the influence of alcohol). In contrast, clients with comorbidity are usually in treatment

for their mental illness and often have established working relationships with treatment pro-viders, but have no clear motivation to work on their substance misuse. Therefore, motivational enhancement is a core feature of integrated comorbidity treatment programs. Examples of specific motivational enhancement strategies include motivational interviewing (Kavanagh et al., 2003; Miller & Rollnick, 2002) and contingent reinforcement (Ries et al., 2004), sometimes provided in combination with one another (Bellack, Bennet, Gearon, Brown, & Yang, 2006).

One over-arching conceptual framework for enhancing motivation, and tailoring treatment to clients' motivational level, is the *stages of treatment* (Mueser et al., 2003; Osher & Kofoed, 1989) which was adapted from the *stages of change* theory (Prochaska & DiClemente, 1984). The stages of treatment assumes that changes in substance misuse behavior occur in the context of a therapeutic relationship, and that motivation to change behavior precedes efforts to reduce substance use. At the *engagement stage*, the client does not yet have a therapeutic relationship, and therefore the goal is to establish such a relationship before making efforts to persuade the client to work on substance use problems (e.g., outreach to connect with clients in the community, helping resolve a crisis or pressing problem). In the *persuasion stage*, clients are seeing a clinician on a regular basis and have a working relationship, but are not motivated to develop a sober lifestyle. Therefore, the goal of this stage is to help the client develop such motivation before trying to reduce substance use and achieve sobriety (e.g., motivational interviewing to increase the perceived advantages of sobriety, psychiatric rehabilitation to help the person develop new skills for getting substance use-related needs met, such as socialization and coping with symptoms). When motivation for sobriety has been established, as indicated by initial attempts to reduce substance use, the *active treatment stage* focuses on providing additional strategies to help the client to further improve their control (e.g., practicing skills for dealing with high risk situations). When sobriety has been achieved the *relapse prevention stage* focuses on maintaining awareness that a relapse into substance misuse could occur (e.g., developing a relapse prevention plan), and extending recovery to other areas of functioning such work and social relationships.

Minimization of Treatment-related Stress

People with serious mental illnesses are highly sensitive to the effects of interpersonal stress (Myin-Germeys, van Os, Schwartz, Stone, & Delespaul, 2001; Zubin & Spring, 1977), which can worsen the course of both psychiatric illness (Butzlaff & Hooley, 1998) and substance misuse (Fichter, Glynn, Weyer, Liberman, & Frick, 1997). In order to avoid such stress, and to optimize the therapeutic

relationship, integrated treatment programs eschew stressful, confrontational approaches, and utilize instead supportive techniques that focus on helping clients recognize the benefits of changing their substance use (e.g., use of Socratic questioning to explore effects of substance use) (Graham et al., 2004).

Harm-reduction Philosophy

In the past, services have often focused on abstinence from substances as the only legitimate treatment goal, and some (e.g., many alcohol and other drug programs in the US) continue to have this focus. Integrated comorbidity programs, on the other hand, usually adopt a more pragmatic approach by encouraging abstinence while also supporting efforts to gradually cut down substance use and to reduce the harmful effects of using substances (e.g., providing information on minimizing risk of contracting an infectious disease through use of clean needles and safe sex). While continued use of substances puts clients with comorbidity at high risk for relapse (Drake & Wallach, 1993), initially many clients are unwilling (or feel unable) to adopt abstinence as their goal. Focusing on harm-reduction can solidify the therapeutic relationship, build self-efficacy, address some of the damaging and life-threatening effects of substance use, and strengthen motivation to make further gains in substance control.

Assertive Outreach

Many clients with co-occurring disorders are only tenuously engaged in treatment, or have difficulty remembering and keeping appointments, especially during symptom exacerbations (Miner et al., 1997; Pristach & Smith, 1990). In contrast to many substance misuse treatment services that depend solely on clinic appointments, integrated treatment programs typically provide assertive outreach in the community in order to engage and retain clients in treatment (Drake et al., 1998a). Assertive contact can make the difference between a temporary setback and a longer term loss of engagement, or between a minor symptom exacerbation and a full relapse. Such outreach can also be fruitful for engaging significant others in treatment, such as family members (Mueser & Fox, 2002).

Research on Integrated Treatment

Research on the effects of treatments for co-occurring disorders has grown rapidly over recent years. We conducted a review of all published randomized controlled trials focusing on clients with psychosis and substance misuse, identifying studies by standard database searches, checks of reference lists and personal communication with known researchers. For the current purposes,

quasi-experimental and within-subject designs were excluded, as were studies that focused solely on program engagement or forensic outcomes. Seventeen studies were identified (Table 1).

Table 1. Sample characteristics for randomized controlled trials

Study	Sample description	Other exclusions (except consent issues)	Source	N1	% Male	M Age	NonAnglo Ethnicity %	Single/ never married %	Completed high school %	Unemployed %	Independent living %	Substances misused %	Diagnoses	# Prior psychiatric admissions (Range)
Lehman et al. (1993)	US OP SCZ/ SA/ BP/ MD + *lifetime* SUD (54 % current SUD)	• < 18, > 40	Clinician referral	54	74 %	31	69 % Af	NR	NR	NR	NR	Lifetime: 71 % al 62 % mj 17 % cocaine 13 % amphet 13 % opiates 8 % sed 27 % hall 10 % poly 12 % other	DSM-III-R SCZ/ SA BP MD	68 % 23 % 9 %
Burnam et al. (1995)	US homeless people or Major Aff + SUD	• Not homeless or # 2 dependent housing situations in previous 6 mths	Agencies serving homeless people	276	84 %	37	28 % Af 14 % other	49 %	72 %	NR	All homeless (for M = 5 yrs)	Last mth use: 47 % mj 53 % cocaine 8 % amphet 9 % opiates 45 % sed 9 % other	24 % SCZ Aff	93 % NR
Hellerstein et al. (1995, 2001) ; Miner et al. (1997)	US OP SZ spectrum + SUD	• < 18 or > 50 yrs • Not desire for SUD treatment • Life-	• Screening of IPs in dual diagnosis unit	47	77 %	32	43 % Af 32 % Hisp	NR	(M = 11 yrs ed)	NR	(8 % of N = 63 sample in own apart.)	87 % cocaine (40 % crack) 77 % mj IV use	RDC SCZ SA	32 % 30 % 70 % 7.5

Table 1. Sample characteristics for randomized controlled trials

		threatening illness • ASPD • GAF < 30 • MMSE < 24 • Needing long-term hospitaliz'n									cocaine +al +mj	66 %			
Herman et al. (1997, 2000)	US IP +SUD	• Unmanageable behavior needing extensive seclusion (est 10 %)	SMD IP screening	485	74 %2	332	77 % Af2	63 %2	(M = 11 yr ed)2	NR	7 %2	46 % al mj cocaine	DSM-III-R SCZ 10 % Organic disorders 10 % Af 37 % other 1 % 2	28 % 21 % 33 % at 29 % 1st IP 26 % admission)2	
Drake et al. (1998a)	US OP SA/ BP + SUD	• Age < 18 or > 60 Other medical condition, mental retardation	SZ/ Clinician referral	223	74 %	34	4 % Non-Anglo	61 %	63 % (20 % Post-High school)	82 %	81 %	74 % al 42 % other	DSM-III-R SZ SA BP	53 % 22 % 24 %	NR
Barrowclough et al. (2001); Haddock et al. (2003)	UK OP SZ/ SA + SUD and their carer	• Not in current contact with MH services • < 18 or > 65 yrs • < 10 hr/ wk face-to face contact with carer	Screening of IP admission records	32	92 %	31	0 %	NR	NR	NR	(50 % lived with carer)	Use: al 83 % mj 61 % cocaine 11 % amphet 28 % heroin 100 %	SCZ 72 % SA 11 %	4.9	

Table 1. Sample characteristics for randomized controlled trials

		• Organic brain disease, clinically sig illness, learning disability									6-mth SUD: 54 % al (61 % incl. risky use)				
											mj (66 % incl. wkly use)	51 %			
											cocaine	2 %			
											amphet (23 % incl. wkly use)	22 %			
	Australian Psychiatric IP + SUD (90 % sample) or weekly illicit use or risky alcohol use[3]	• Not capable of interview • Not local residence innext 12 mths	Patients agreeing to interview	160	75 %	31	NR	60 %	9 %	(76 % pension/ benefit)	NR	opiate sed	DSM-IV SZ	37 %	
													19 % Aff	29 %	
Baker et al. (2002a,b)												other	11 % Other	13 %	
													13 % None	19 %	
		• < 18 or > 65 yrs												4.3	
		• High alcohol dependence													
		• Memory problems, oganic brain disease													
Hulse & Tait (2002, 2003)	Australian IP SMD + Alcohol Dependence	• Lived outside area	Screening	120	54 %	32	NR	NR	NR	NR	NR	100 % al	DSM-IV (from files)	NR	

Table 1. Sample characteristics for randomized controlled trials

		• Insufficient English • Too disturbed or aggressive for interview												
Graeber et al. (2003)	US Vets Affairs IP & OP SCZ + current AUD (last 3 mth)	• Active intravenous drug abuse	Screening of medical records	30	97 %	44	20 % Af 40 % Hisp	NR	NR	NR	60 %	100 % Al 40 % mj 27 % cocaine	DSM-IV 100 % SCZ	23.0
James et al. (2004)	Australian OP/ IP Non-organic psychosis + current SUD	• Insufficient English • Developmental disability • Other current SUD treatment • Previous Gp treatment for SUD or psychosis	Referrals from CMHCs	63	71 %	28	NR	NR	NR	NR	NR	NR	57 % SCZ	NR
Kavanagh et al. (2004b)	Australian IP Psychosis + SUD	• < 16 or > 35 yrs 3 yrs since MH diagnosis, > 2 previous psychotic episodes • Insufficient English Developmental	• Screening of Re	25	60 %	23	16 % anglo	Non-92 %	44 %	88 %	(31 % living away from parents/ partner)	Greatest problem: 40 % mj (52 % daily use) 28 % al 16 % amphet 8 % inhalant 48 % nicotine	8 % SCZ	(68 % at 1st episode)

Table 1. Sample characteristics for randomized controlled trials

Study	Sample description	Other exclusions (except consent issues)	Source	N1	% Male	M Age	Non-Anglo Ethnicity %	Single/ never married %	Completed high school %	Unem-ployed %	Independent living %	Substances misused %	Diagnoses	# Prior psychiatric admissions (Range)
		disability or amnestic disorder • Other current SUD treatment • Current opiates												
Calsyn et al. (2005); Morse et al. (2006)	US homeless people SMD + SUD	Other exclusions (except consent issues) • Currently in ICM program	Screening relevant agencies, psych units, street locations	196 (144–149 with data to 24 mths)	80 %4	404	73 % Af 2 % other4	57 %4	58 % 4	NR	0 % (all homeless)4	40 % al ab/ dep only drug ab/ dep only both cocaine mj	48 % SCZ SA atypical psychosis BP MD delusional4	12 % 19 % 11 % 42 % 11 % 34 % 19 % 2 % NR
Baker et al. (2006)	Australian OP Psychosis + risky alcohol use3, or weekly use of mj or amphet	• < 15 yrs Inadequate spoken English Organic brain impairment Not local residence in next 12 mths	Referrals from CMHCs (34 %), IP units (33 %), early psychosis service (28 %); media ads (3 %); research register (2 %)	130 (data on 119 with post & 6-mth assess.)	78 %	29	(9 % born outside Australia)	78 %	(M age at leaving school: 16yr; 66 % post-school qual.)	(88 % on welfare support)	NR	DSM Ab/ Dep: al (86 % lifetime) mj (89 % lifetime) amphet (54 % lifetime)	67 % ICD-10 SCZ 73 % SA BP mania other psychosis	62 % 13 % 9 % 42 % 16 % 1.0 (0–6)
Bellack et al. (2006)	US OP SMD+ cocaine/SMD	• Not stabilized	NR. CMHCs (59 %), Vet	175	63 %	43	75 % Af (others NR)	42 %	(M=11 yr education)	NR	NR	69 % cocaine opiates	38 % SCZ SA	27 % 5.3

Table 1. Sample characteristics for randomized controlled trials

	heroin/ mj dependence		Med Center.								mj	7 % Aff			
Edwards et al. (2006)	Australian OP 1st episode DSM-IV psychosis + Mj use in last 4 weeks	• Not adequate English • High service use in last 2 yrs (2 of: Psych IPs, crisis/ respite care, ER visits, incarcerations) • Homeless/ unstably housed • Poor indep living skills • No pending legal charges, illnesses, dev disability precluding participation	Screening at admissionto early psychosis program or at 10 wks, 3 or 6 mths	47	72 %	215	NR	83 %5	(15 % Post-sec) 5	NR	NR	SUD: al mj5	72%SCZ Aff psychoses other psychosis	3 % 49 %	11 % 17 % 35
Essock et al. (2006)	US OP Psychosis (SCZ, SA, BP, MD) + SUD (last 6 mths)	Scheduled for discharge if IP	Dr by CMs ind OP & IP services	198	72 %	37	55 % Af 14 % Hisp 4 % other	73 %	49 %	90 %	NR	74 % al 81 % other	76 % SCZ/ SA Aff other		17 % 6 % NR

Table 1. Sample characteristics for randomized controlled trials

														63 % al +drug		
		• Age < 18													27 % al only	
		• Current psychosis													10 % drug only	
		• Danger to self/ others													Ns: 10 cocaine 16 mj 9 sed 8 opiates 1 amphet > 1 drug	13 % BP I 1 BP II 1 BP NOS
	US OP +SUD in last 30 days; mood stabilizer 2wks)	• Concurrent substance use treatment	• Residential treatment restricting use	• Ad. within hospital/ referral												
Weiss et al. (2007)					62	48 %	42	6 % non-white	63 %	(58 % college grad)	47 %	NR				16 % 3 % NR

NR: Not reported in paper NA: Not applicable

1. Number entering trial (after eligibility confirmed and baseline assessments obtained)

2. These data were on the 427 participants completing the discharge interview, as reported in Herman et al. (1997).

3. Risky alcohol use was defined as exceeding maximum levels set by the Australian National Health and Medical Research Council for healthy adults in the general population.

4. These data are on the 149 participants who had 24-mth SU and symptom data, reported in Morse et al. (in press).

5. These data are as at 10 wks, on the full sample of 47 participants.

Sample Description: US: United StatesAus: AustralianIP: Inpatients OP: OutpatientsCMFC: Community Mental Health Centre

SMD: Unspecified serious mental disorder/s SCZ: Schizophrenia/schizophreniformS-A: Schizo-affective BP: Bipolar

MD: Major DepressionAff: Affective disorder PNOS: Psychotic disorder not otherwise specified

SUD: Substance Use Disorder (abuse or dependence) AUD: Alcohol Use Disorder (abuse or dependence) ASPD: Antisocial Personality Disorder

Anx: Anxiety disorder

GAF: Global Assessment of Functioning MMSE: Mini-Mental State Examination

Ethnicity: Af: African American Hisp: Hispanic

Substances: al: alcohol mj: marijuana/cannabis amphet: amphetamine/ methamphetamine/ other stimulants sed: sedatives or tranquillizers hall: hallucinogens

Inspection of Table 1 indicates that most studies include a significant proportion of clients with schizophrenia, and a mixture of other diagnoses as well. Study groups varied from young, first-episode participants to people with chronic and disabling disorders. Sample sizes ranged from 25 to 485, with most having a relatively substantial number (Median = 120). While most studies had a majority of men (Range = 48–97 %, Median = 74 %), mean ages (Range = 21–44, Median = 32), diagnoses and indices of chronicity or severity varied widely, and trial durations varied from just

three months, to as much as five years post-baseline (Median = 12 months). Types of interventions also varied significantly, including residential (Burnam et al., 1995), individual (Graeber, Moyers, Griffith, Guajardo, & Tonigan, 2003; Herman et al., 1997) or group treatment (Hellerstein, Rosenthal, & Miner, 1995; James et al., 2004; Weiss et al., 2007), case management for delivering integrated treatment (Drake et al., 1998a), and studies of brief, motivational intervention (Baker et al., 2002a,b; Kavanagh et al., 2004b). Intervention contact time also ranged widely, from a single 30–45 minute session (Baker et al., 2002a,b; Hulse & Tait, 2002; Hulse & Tait, 2003) to intensive case management over three years (Drake et al., 1998a; Essock et al., 2006).

As described in previous reviews of this literature, early research on integrated treatment programs was limited by a number of different factors, including the use of insensitive measures of substance misuse in the population of clients with serious mental illness (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998b). However, over time and with growing recognition of the methodological requirements of research on the treatment of comorbidity (McHugo et al., 2006), the scientific rigor of studies has steadily improved, as can be seen for the controlled studies in Table 3.

Table 2. Results of randomized controlled trials

Study	Design	Contact time	Post-baseline assessment timing2	Results: Post-treatment (vs. or controlling for baseline)1	Results: Follow-up (vs. or controlling for baseline)1
Lehman et al. (1993)	TAU (SCM, day rehab, housing if needed) vs. TAU + ICM + Gp	Staffing—TAU 1:25; ICM 1:15. Gp: 5 hr/wk (Ed, Discussion, S-H, Social activity)	12 mths	At 12 months, NS between conditions on psychiatric inpatient days, or self-reported alcohol, drug, psychiatric severity, life satisfaction	NA—assessed responses to treatment extending over 12 mths
Burnam et al. (1995)	Control vs. Nonresidential vs. Residential Nonres & Res had Ed + S-H + Gp + CM + Activities.	NR Res & Nonres. more intensive over 1st 3 mths—later involvement self-selected. Res: 24 hr program x 3 mths, then supported housing.	3, 6, 9 mths	At 3 mths (end of intensive treatment phase): • Res & Nonres— > fall in days used alcohol than Controls NS between Res & Nonres, except Nonres had more time in	At 6 mths: • Res & Nonres— < fall in drug use severity than Controls NS between Nonres & Res at 6, 9 mths

Table 2. Results of randomized controlled trials

		Nonres: 8hr/day, 5 days/wk; more intensive CM than Res.		independent housing	
Hellerstein et al. (1995, 2001) Miner et al. (1997)	TAU (Parallel treatment by MH, SUD services) vs. Int (Supportive Gp + Ed re MH, SUD + S-H) 3	2 x 1¼ hr Gp sessions/wk for self-selected period	4, 8 mths postdischarge	At 4 mths, Int had • > retention in treatment (70 % vs 38 %) NS across conditions for addiction or psychiatric severity (overall sample improved).	Int. had: • > retention to 8 mths. NS across conditions for hospitalization days. Overall sample improved across conditions on addiction (0–8 mths) & psychiatric severity (0–8 mths & 4–8 mths).
Herman et al. (1997, 2000)	TAU vs. Int (Ed + R-Ed + S-H + Gp)	Int: 1hr/wk ind., 5hr/wk Gp over M=51 days; 1:6 staffing. TAU: ½hr/wk ind, 1hr/wk Gp over M =31 days; 1:8 staffing.	Discharge/4wks; 2, 6, 10, 14, 18 mths post-discharge	At discharge, Int had > engagement, > knowledge of SU & 12-step programs (not > MH knowledge) • > motivation to control SU, become emotionally/ psychologically healthy, remain sober, attend S-H (not > # MH goals) • > ratings of treatment effectiveness	Admission to 2 mths post-discharge—Int had • > drop in alcohol use 2–18 mths—little change in alcohol use; NS interaction with condition
Drake et al. (1998a)	SCM vs. ACT	Greater intensity in ACT. Staffing—ACT 1:12; SCM 1:25	6, 12, 18, 24, 30, 36 mths	At 3 years, ACT allocated patients had • < attrition (4 % vs. 14 % SCM) • < clinician-rated alcohol problems • > clinician-rated substance abuse recovery	NA—assessed responses to treatment extending over 3 years

Table 2. Results of randomized controlled trials

					• > financial support adequacy Across conditions: Equal improvement on alcohol & drug use, clinician-rated drug problems, community days, total BPRS, life satisfaction. Those actually receiving ACT also improved more than SCM on alcohol use.	
Barrowclough et al. (2001)	TAU vs. TAU +Int (MI + CBT for symptoms + FI)	MI: 5 weekly sessions CBT: 18 weekly + 6 biweekly FI: 10–16 sessions (some RI only) Over 9 mths	Post (9mths), 12 mths, 18 mths SU every 3 mths	At 9 mths (Post), Int had: • > GAF, < neg symptoms, reduction in days relapsed NS between conditions on: • Proportion with MH relapse (p<.10), total symptoms, social functioning	At 12 mths, Int had: • > improvement GAF, pos symptoms; < proportion with MH relapse (33 % vs 67 %), reduction in days relapsed • > increase in total days abstinent from all substances over the 12 mths NS between conditions on: • Total symptoms, neg symptoms, days in relapse, social functioning • total days abstinent from preferred substance over the 12 mths • carer needs (p < .10) At 18 mths, Int had: • > improvement GAF, neg symptoms	

Table 2. Results of randomized controlled trials

					NS between conditions on: • Total symptoms, pos symptoms, proportion relapsed; days in relapse (p< .10), days abstinent , social functioning (p< .10) • Treatment costs Over 3 mths, MI had: • > reduction in polydrug use4 NS between conditions: • To 3 mths, on % attending substance misuse services (MI 17%; Control 17 %), # sessions attended (MI 4.5, Control 5.8) • To 3 mths, on alcohol, mj use, symptoms (both conditions improved). No change in amphet use. • To 12 mths, on number of substances misused, social functioning, global symptom severity (both improved). No change in criminal activity.
Baker et al. (2002a, b)	Ad + substance service referral vs. MI	MI: 1 x 30–45 m individual session	3, 6, 12 mths	NA.	
Hulse & Tait (2002, 2003)	Inf vs MI	MI: 1 x ¾ hr session	6 mths, 5 yrs	NA	At 6 mths, MI had: • < al intake, > proportion improved To 5 yrs:

Table 2. Results of randomized controlled trials

Study	Design	Contact time	Post-baseline assessment timing2	Results: Post-treatment (vs. or controlling for baseline)1	Results: Follow-up (vs. or controlling for baseline)1
					• NS between conditions on time to first alcohol-related hospital event • Both conditions had > time to 1st hospital event & 1st MH hospitalization, and < # MH episodes than matched patients who left hospital before recruitment to the study
Kavanagh et al. (2004b)	TAU vs. TAU + MI	MI: max 3 hrs total over 6–9 sessions + 4 wkly	6 wks, 3, 6, 9, 12 mths	NA	MI had • < SU problems at
Graeber et al. (2003)	Ed vs. MI	3 x 1hr weekly sessions	4, 8, 24 wks after treatment completion	NA	MI had • < drinking days over follow-up assessments • > abstinence rates at 8 & 24 wk assessments. NS between conditions: • Peak BAC, weekly drinks
James et al. (2004)	TAU + Ed (SUD) vs. TAU + Gp (Ed, MI, CBT)	Ed: 1 hr Int: 6 x 1½ hr weekly Gp	3 mths	At 3 mths, TAU + Gp had • > improvement in symptoms, drug abuse (functional impact, severity of dependence; mj, al, poly substance use) • > reduction in medication dose • < rate of hospitalization	NA

Table 2. Results of randomized controlled trials

			phone calls (max ½ hr total)			6 and 12 mths (NS if those who left before MI segment included).
Calsyn et al. (2005) ; Morse et al. (2006)	TAU vs. ACT vs. Int ACT		As needed	Continuous to 6, 12, 18, 24 mths	To 24 mths: • Int ACT = ACT > TAU on days stable housing, satisfaction • ACT> Int ACTTAU on treatment cost NS between conditions: • Criminal justice measures • SU, symptoms (all improved) • IP & emergency shelter costs • Patient maintenance costs (all increased)	NA—continuous measures over 24 mths
Baker et al. (2006)	TAU vs. TAU +MI+Int CBT		MI+CBT: 10 x 1hr weekly sessions	15 wks, 6 mths, 12 mths	• Nsd for condition on any measure. • Across conditions: Improvements to 15 wks on alcohol, poly-drug use, BPRS neg symptoms, BDI-II depression. No significant improvements on cannabis, amphetamines.	Exp group had • < BDI-II depression at 6 months • Better GAF result over 12 mths • NS for condition on substance effects. Across conditions to 12 mths: • Improved alcohol, poly-drug use, BPRS mania, neg symptoms. • NS improvement on mj, amphet.
Bellack et al. (2006) 5	Support + Ed vs. MI +CBT for SUD5		Both: Gps 2 x 1,5 hr weekly for 6 mths	Weekly over 6 mths	Over 6 mths, MI +BT had • < dropout from treatment, >	NA—assessed responses to treatment extending over 6 mths

Table 2. Results of randomized controlled trials

				# sessions attended • Clean urines—> proportion of tests, >% with 4 & 8-wk periods, & multiple 4-wk periods. On separate group analyses, MI +CBT had significant • decline in 90-day Psych/SU admission rates, • decline in arrest rates, • improved financial QoL, general life satisfaction and overall QoL • improved daily activity performance. Support did not (but only daily activities had sig. interaction with condition).	
Edwards et al. (2006)	TAU6+Ed vs. TAU6+MI + Ed + Int. CBT	10 x 20–60 weekly sessions over 3 mths + booster phone call after 3 mths	3, 9 mths (Post, 6 mths follow-up)	Both conditions fell equally on% days used mj NS on proportion using mj in past 4 wks, severity mj use, symptoms, readiness to change, OP attendance	NS between conditions on any variable. Sample was stable across follow-up on% days used mj
Essock et al. (2006)	Int SCM vs. Int ACT	NR	Each 6 mths to 3 yrs	Linear effects to 3 yrs: • SCM had > IP, institutional days (only at site with higher rates of instit.) • Similar	NA—assessed responses to treatment extending over 3 years

Table 2. Results of randomized controlled trials

					improvement across conditions on SU, symptoms, general life satisfaction.	
					During treatment, Int Gp had: • < days using al, al intoxication, ASI • < depression, mania symptoms	During follow-up, Int Gp had: • < days using al, al intoxication, ASI • < depression, mania symptoms
Weiss et al. (2007)	Int Gp vs. SUD Gp	20 hr (weekly 1hr sessions). Int Gp attended more. (Results unchanged if control for attendance)	Monthly to 5 mths (Post), 8 mths (3-mth follow-up)	Improvement across conditions on days using al, ASI, mania. NS time or group effects on other drugs, weeks in BP episode.		Improvement across conditions on depression. NS time or group effects on other drugs, weeks in BP episode.

N/R: Not reported in paper NA: Not applicable NS: Not significant

1. Unless otherwise stated, all listed results were statistically significant ($p < .05$ or better).
2. Assessment timing is Post-Baseline unless otherwise stated.
3. Gp is manualized, but issues and skill foci are modified according to individual needs. Housing, medical, prevocational, family interventions are also offered as needed.
4. Not significant after Bonferroni adjustment for number of measures.
5. The authors refer to the control condition as Supportive Treatment for Addiction Recovery (STAR), and the experimental condition as Behavioral Treatment for Substance Abuse in Severe and Persistent Mental Illness (BTSAS).
6. TAU in Elkins et al. (2006) involved case management, mobile assessment and treatment, family intervention, group programs and a recovery clinic for early psychosis.

Treatments

TAU: Treatment as usual or routine careInt: Integrated treatment for comorbidityACT: Assertive Community Treatment

CM: Case management (ICM: Intensive; SCM: standard) MI: Motivational interviewing CBT: Cognitive-behavior therapy

RI: Relatives/carers intervention FI: Family intervention (patient and relative/s) Voc: Vocational/supported work program

Inc: Incentives Gp: Group interventionS-H: AA or other self-help groups

Ed: Patient education (R-Ed: Relatives/carer education) Inf: Written Information Ad: Advice

Goals/Outcomes

SU: substance use MH: Mental health QoL: Quality of Life

GAF: Global Assessment of Functioning ASI: Alcohol Severity Index

Table 3. Methodology indices on reports of randomized controlled trials

Study	Started study (% eligible sample) [n=50=1]	Diagnosis confirmed by structured [n=50=1]	Randomization	Baseline equivalence (or statistical control)	Contact time equivalence reported	Attrition from assessments (% baseline sample) [<33%=1]	Independent protocol adherence checks2	Corroboration of self-reports by toxicology	Blind ratings	Intention to treat analyses	Quality Score /10

Table 3. Methodology indices on reports of randomized controlled trials

Lehman et al. (1993)	NR	Yes [1]	Individual [1]	[NR]	No [0]	[NR]	NR	NR	NR	NR	[2]
Burnam et al. (1995)	57%(276/484)	84% (Yes [1]	Individual within gender and SCZ/ Aff [1]	[NR]	No [0]	3 mths: 21 %, 6 mths: 24 %, 9 mths: 30 %. (58 % all f/u) [NR]	No housing status) [0]	(except No [0]	No [0]		[4]
Hellerstein et al. (1995, 2001)				Yes (Drug Composite Score *p* < .10; statistically controlled for) [1]	Yes (Drug loads not controlled) [1]	< 2 sessions: 38 % 4 mths: 47 % 8 mths: 64 % [1]					
Herman et al. (1997)	Not 100%?	(Yes [1]	Individual [1]				[NR]	NR	NR	Yes	[5]
Drake et al. (1998a)	94 %	(223/236) [1]	Individual [1]	Differed only on BPRS Disorganization [1]	No [1]	At discharge: 15 % 3 yrs: 9 % [0]	18 Clinician records + independent [1]	No Urine toxicology [1]	NR Yes [1]	No. On 429 (88 %) with 1 f/u No-on 203 (91 %) with f/u data [1]	[4] [3]
Barrowclough et al. (2001); Haddock et al. (2003)	55 %	No [1]	Individual, independent within sex, al/ drugs/ drugs +al [0]	Yes [1]	No [1]	12 mths: 11 % pts, 25 % carers mths: 22 % pts [0]	Weekly 18 supervision on audiotaped sessions [1]	(Checked clinician ratings vs self-report) [0]	Yes (and high inter-rater reliability) [0]	Yes [1]	[6]
Baker et al. (2002a,b)	100 %	Psych: No (Yes [1]	SUD: Individual [0.5]	Yes [1]	No [1]	3 mths: 30 % mths: 27 % [0]	6 NR	(Attendance measured) [NA		Engagement yes. SU no: 112 (70 %) to 3 mths	[4.5]

Table 3. Methodology indices on reports of randomized controlled trials

						12 mths: 28 % lost: 44 %)	(1				[0]
Hulse & Tait (2002, 2003)	83 %	(120/144) [1]	Individual [0]	Exp had greater proportion risky/ harmful drinking, fewer days between initial & index admission [1]	No [0]	6 mths: 31 % (record linkage) [0]	(36 % for al. intake) 5 yrs: 27 % checklist; supervision [1]	Therapist No [0]	Yes [0]	Yes [1]	[1.5]
Graeber et al. (2003)	NR	Yes [1]	Yoked [1]	Exp had >Hisp, <anglo # drinks / wk, but NS) [1]	Yes [0]	7 % [1]	(½ (2/30) [1]	NR No [0]	No [0]	No—on 28 (91 %) with f/u data [0]	[1]
James et al. (2004)	86 %	Symptoms of (63/73) [1]	No—Alternation SCRIT5 allocation [0.5]	Yes [0]	No [1]	3 mths: 8 % [0]	No [1]	No [0]	Yes [0]	No [1]	[1.5]
Kavanagh et al. (2004b)	61 % (25/41)	Yes [1]	Individual, within site [1]	Exp had < IP duration > confidence controlling SU > proportion living with relatives [1]	No [0]	6 mths: 4 % mths: 32 % [0]	12 therapist checklist; supervision [1]	No [0]	Yes 12 mths) [0]	(at Yes [1]	[1]
Calsyn et al. (2005);	100 %	(196/196) [1]	Individual [1]	NR (No. for potential confounds) [1]	Controlled ACT> ACT>TAU.	Crime data: SU.	ACT checked on 27 % Dartmouth ACT	Criminal justice records No [0]	No [0]		[0]

Table 3. Methodology indices on reports of randomized controlled trials

					service: ACT=ACT>TAU [1]	SUD Int Symptoms 24 % [0]	Scale. (Indications of diffusion across conditions) [1]	[1]			
Baker et al. (2006)	100 % 6	(/130) Yes [1]	Individual [1]	Yes [1]	No [1]	15 wks: 7 % 6 mths: 5 % 12 mths: 20 % [0]	Therapist checklist & supervision [1]	No [0]	Yes [0]	Yes [1]	[7]
Bellack et al. (2006)	68 %	(175/257) [1]	Individual within center, controlling sex, psych. diagnosis, drug of choice, # SUDs. [1]	Yes [1]	Yes for frequency. Duration NR [1]	53 % (92/175) [0.5]	Videotapes independently rated—fidelity high [0]	Urinalyses [1]	[1]	No—on 110 (63 %) engaged in treatment. [0]	[5.5]
Edwards et al. (2006)	62 %	(47/76) [1]	Independent, individual [1]	Yes [1]	Yes [1]	4 % to 3 Post, 30 % to 6-mth f/u [1]	Supervision [1]	No [0]	Yes (high inter-rater reliability) [0]	Yes [1]	[3]
Essock et al. (2006)	81 %	(198/244) [1]	Individual within site [1]	Clinician rating of progress to SU recovery ACT<SCM Some site differences [1]	No Same higher caseload) [1]	3 yrs: 10 % (SCM missed 1 assess.) [0]	Independent ratings, supervision. High fidelity (less than ideal) [1]	Urine, saliva. Independent used all available data). (ACT in community management info system. [1]	(Results Service use: Yes (High reliability) [1]	No [1]	[8]
Weiss et al. (2007)	67 % 7	(62/93) Yes [1]	Individual [1]	Yes [1]	Yes [1]	0 for all 8 mths for 95 %) [1]	Indep (Data ratings. Weekly supervision using videos. [1]	Urine screens. [1]	No [1]	No [0]	[9]

Table 3. Methodology indices on reports of randomized controlled trials

NR: Not reported in paper NA: Not applicable NS: not significant Exp: Experimental condition/s MD: Mental disorder SUD: Substance Use Disorder

1. Starting the study involved completion of baseline assessments and randomization. Non-attendance at treatment is considered attrition. Percent of eligible participants who started the study excludes participants subsequently found ineligible.

2. Requires formal independent ratings to score 1. Reviews of taped sessions in supervision sessions is insufficient to score.

3. Unless otherwise stated, the potential sample included people who did not subsequently consent to participation.

4. This difference was not significant after Bonferroni correction.

5. For psychosis, used structured interview of symptoms, and Operational Criteria (OPCRIT) checklist, based on all available data. No standard interview for SUD.

6. Refusal to participate in the study (20/173 referrals) is coded here as a refusal of screening.

7. Percent of people who fulfilled initial screening criteria. It is unknown whether those who did not complete baseline assessments would have fulfilled all entry criteria.

Based on data from the published papers, we awarded studies one point for each of ten methodological criteria (> 50 % of the eligible sample entering the study, confirmation of diagnosis by standard interview, appropriate randomization procedure, baseline equivalence or statistical control, equivalence of contact time, # 33 % loss from attrition, independent checks on protocol adherence, corroboration of substance use reports, blind ratings, and intention to treat analyses). Total scores rose from 2.0 in 1993, to an average of 7.1 in 2006. Four studies had a score of 8 or more (Drake et al., 1998a; Edwards et al., 2006; Essock et al., 2006; Weiss et al., 2007), three of which were published in 2006 or 2007.

The data now permit the drawing of some tentative conclusions.

1 *Limited impact of brief interventions.* In comparison with control conditions, brief interventions tend to have limited effects, especially in the longer term (Baker et al., 2002a,b; Hulse & Tait, 2002; Hulse & Tait, 2003; Kavanagh et al., 2004b), with one exception that included a relatively small (N = 30) sample size (Graeber et al., 2003). The findings suggest that the primary role of brief interventions for co-occurring disorders, such as motivational interviewing, is engagement in treatment, with further treatment being required before relative improvements in substance use or symptoms are reliably seen across samples.

2 *Little added impact from greater intensity of case management.* Studies comparing integrated treatment delivered on assertive community treatment teams (ACT) (Stein & Santos, 1998), with integrated treatment provided by standard case management teams reported little or no

additional benefit from the more intensive ACT teams (Calsyn, Yonker, Lemming, Morse, & Klinkenberg, 2005; Drake et al., 1998a; Essock et al., 2006; Morse et al., 2006).

3 *Better outcomes from extended cognitive behavioral therapy.* Interventions that extend for substantial periods (e.g. 6–9 months) that address SUD and SMI using cognitive-behavioral procedures tend to have better outcomes, although only two studies fell into this category (Barrowclough et al., 2001; Bellack et al., 2006; Haddock et al., 2003). However, the only long-term follow-up published to date (Haddock et al., 2003) – focusing on maintenance of outcomes from the intervention of Barrowclough et al. (2001) – suggests that gains decay over time, and differences between conditions in substance use may not be maintained.

4 *Integrated treatment appears superior.* Integrated programs tend to have superior outcomes to non-integrated controls, although findings are mixed.

The results of these controlled trials support positive effects from integrated treatment for comorbidity, although impacts on substance misuse outcomes tend to be modest and inconsistent. Larger reviews of integrated treatment programs for comorbidity that include a wider range of study methodologies, such as quasi-experimental designs, suggest stronger support for integrated treatment (Drake, Mueser, Brunette, & McHugo, 2004; Drake & O'Neal, in press). Within our own review, there is an association between lower methodological score and stronger treatment effects (Tables 2 and 3), although further high-quality studies may change this picture. Other potential sources of variability in findings across controlled studies are their different populations (e.g., first episode vs. chronic psychosis, range and severity of comorbid conditions, degree of housing instability), interventions (e.g., brief motivational enhancement, cognitive behavioral therapy, family intervention, ACT, residential), and treatment durations (one session to three years of intensive case management). In fact, the variability in studies is so great that no standardized intervention has yet been ex-amined, much less replicated, in more than one published study.

Future Directions: Improving Treatments

It is possible that some existing treatments are approaching the ceiling on what can be done with psychological interventions for people with substance misuse and serious mental disorders, and that the limited relative power of existing treatments has more to do with the challenging nature

of the clients' problems than with deficiencies in the treatments themselves. However, we offer some speculations on aspects that may be important in maximizing treatment effects. These features are already displayed by many existing approaches: however, our suggestion is that their explicit consideration may offer ideas on further refinement of current practice.

1 *An emphasis on maximizing quality of life.* A significant challenge continues to be maintaining engagement in addressing substance use. If clients stop using substances, they potentially stand to lose a great deal, including immediate and powerful reward or relief effects from the substance, a highly valued recreational activity, and in many cases, a large proportion of their social contacts. Treatments need to ensure that they add more than they take away from the person's quality of life, and have strategies to address periods when net costs may seem to outweigh the benefits.

2 *Development of natural reinforcers for maintaining control.* A related issue is that benefits that accrue from changes in substance use need to be experienced reliably in the natural environment. The community reinforcement approach to alcoholism, developed by Azrin and colleagues (Azrin, 1976; Hunt & Azrin, 1973), represents an early attempt to help clients reconstruct their social networks and roles and work with family members to ensure that positive changes are reliably cued and rewarded. Current integrated treatments attempt to adapt similar strategies to comorbidity. Focusing on aspects that are identified from assessment as being of particular importance to an individual may maximize the benefits of the approach.

3 *Restriction of cognitive and behavioral demands on clients.* More treatment components are not necessarily better, especially if they place excessive concurrent performance demands on clients (Kavanagh et al., 2006). Problems with attention and prospective memory that are commonly seen in people with serious mental disorder make this issue especially important in the current context. A corollary is that additional strategies to cue skill utilization in the natural environment or otherwise compensate for symptomatic problems may further increase treatment impact.
A second corollary is that treatments may have maximal impact if at each point they focus on incremental changes that are likely to impact on multiple issues faced by that individual (e.g., for a dysphoric client with restricted recreational pursuits, prominent negative symptoms and poor functional skills, a focus on pleasurable, non-drug activity with low performance difficulty may have benefits across the problem domains).

4 *An emphasis on existing strengths and on recovery.* The wide-ranging and often severe deficits that are exhibited by this group may sometimes blind both practitioners and clients to individuals' capabilities and achievements. A focus on strengths assists in maintaining the motivation and self-efficacy of both the client and the practitioner (Rapp, 1998). Given the likelihood of behavioral lapses or sym-ptomatic exacerbations (and the risk that one will trigger the other), it may be particularly important to dwell on transitional achievements. Similarly an orientation to recovery is needed, which encompasses the possibility of chronic or recurring difficulties, but maximizes self–direction and quality of life (Anthony, 1993; Oades et al., 2005). Further consideration of implications of this idea for treatments may be beneficial.

Future Directions: Improving the Evidence Base

Significant continuing challenges for research in this field are to identify components (apart from motivational aspects) that maximize treatment impact, and identify factors that reliably predict positive outcomes. Prior work on understanding the long-term course of comorbidity (Drake, McHugo, Xie, Packard, & Helmstetter, 2006), and evaluating the effects of integrated treatment, suggests several potentially fruitful avenues for future research. Virtually all studies of integrated treatment for comorbidity indicate significant improvements in substance misuse for both integrated and comparison interventions, especially over the first 6 to 12 months of treatment. As many studies have limited statistical power, it becomes difficult to demonstrate that integrated treatment is more effective than alternative approaches when clients in both groups improve over time. One approach to this problem is to provide a relatively brief, standardized treatment program to all study participants, and to then randomize only clients who have persistent substance use problems following the intervention (e.g., six months later) to integrated or comparison treatments. This strategy would presumably reduce the rate of clients who show a rapid remission of their substance misuse early in either integrated or customary treatment, which could serve to highlight the benefits of integrated care for clients with more persistent substance misuse.

Another approach to improving treatment research on comorbidity is to evaluate the impact of different interventions provided at different stages of treatment, based on the model developed by Osher and Kofoed (1989). According to this framework, specific interventions need to be tailored to the individual client's stage of treatment (i.e., engagement, persuasion, active treatment,

relapse prevention). For example, the primary goal of the persuasion stage is to motivate clients to understand the impact of substance misuse on their lives, and to instill a desire to change. In the relapse prevention stage, on the other hand, the primary goal is to support clients in achieving and maintaining a sober lifestyle. Although relapse rates in clients with comorbidity are high (Xie, Drake, & McHugo, 2006), intervention research has not focused on evaluating the effectiveness of treatments specifically designed to prevent relapse in clients who achieve a remission of their substance misuse (Drake, Wallach, & McGovern, 2005). Research specifically targeting particular stages of treatment may be useful in reducing the heterogeneity of both intervention methods and outcomes in clients with comorbidity.

An argument can be made that much of the existing research may be underestimating the true impact of treatment, by focusing primarily on abstinence, days to relapse and similar indices of ultimate success. Given that this population tends to have a variable course, often characterized by patchy improvements across substances, symptoms and functional domains or by setbacks occurring during symptomatic crises, an emphasis on sustained change in any one area may not fully reflect whether a positive trajectory is in place. Investigation of more sensitive indices of incomplete or transient improvements may be required in order to detect transitional positive effects from treatments.

Conclusion

Rapid advances in the sophistication of both research and treatment approaches have occurred over recent years, but the evidence that specific treatments provide greater sustained effects than control interventions remains limited. Challenges include both a need to further increase the impact of treatments, and a need to take the research to the next level: the replication of effects from specific treatments, identification of effective components and reliable predictors of response, and methods to increase the sensitivity of research methodology in this area.

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