British Journal of Occupational Therapy

Research Paper

British Journal of Occupational Therapy
2016, Vol. 79(5) 290–298

DOI: 10.1177/0308022616631547
bjo.sagepub.com
SAGE

The impact of psychotic disorders and co-morbid substance abuse on vocational rehabilitation: Results from an Australian national survey of psychosis

Geoff Waghorn[1], Emily Hielscher[2], James Atyeo[3] and Sukanta Saha[4]

Abstract

Introduction: It is unclear from prior research whether or not substance abuse co-morbid with psychosis is an added barrier to success in vocational rehabilitation. The aim of this study was to examine the relationships among three types of co-morbid substance abuse or dependence, by type of employment assistance received (disability employment services, mainstream unemployment services, other government programmes, and own resources), and by type of employment attained (competitive and non-competitive).

Method: Data were drawn from the Australian National Survey of High Impact Psychosis ($N = 1825$). The survey was conducted in seven Australian catchment areas from March to December 2010. Descriptive statistics and logistic regression methods were used.

Results: There were no added effects of lifetime substance abuse or dependence on any employment. However, there were some minor substance-specific effects. Past year cannabis use was negatively associated, while alcohol use was positively associated with being employed. All categories of lifetime substance abuse or dependence were associated with reduced utilisation of intensive forms of employment assistance.

Conclusion: At a population level, lifetime substance abuse or dependence had no added impact on current employment status. Those with psychosis co-morbid with lifetime substance abuse or dependence could benefit from greater utilisation of evidence-based supported employment.

Keywords

Substance abuse or dependence, severe mental illness, psychotic disorders, employment, competitive employment

Received: 23 September 2015; accepted: 6 January 2016

Introduction

Epidemiological evidence consistently shows high co-morbidity, at around 40–50%, between the psychotic and substance abuse disorders (Kavanagh et al., 2004; Moore et al., 2012). The second Australian national survey of psychosis found the prevalence of co-morbid substance abuse or dependence had increased since the first national survey in 1997–1998 (Kavanagh et al., 2004): with respect to alcohol (28% to 51%), cannabis (23% to 51%) and other illicit drugs (12% to 32%) (Moore et al., 2012). Co-morbid substance abuse disorders are considered an obstacle to effective treatment of the psychotic disorders due to a worse course of illness, including increased psychotic symptoms, increased relapses and rehospitalisations and poorer psychosocial functioning (McGurk et al., 2009; Moore et al., 2012; Rebgetz et al., 2015; Wade et al., 2006).

The impact of co-morbid substance abuse or dependence on participation in vocational rehabilitation, employment status, and on outcomes from vocational rehabilitation remains unclear. Some reports show a negative effect on employment status (Swartz et al., 2000; Todd et al., 2004). Todd et al. (2004) studied UK mental health and addiction service users and found that any form of co-morbid substance abuse significantly predicted unemployment. Other studies found no relationship (Dickerson et al., 2008; Kozaric-Kovacic et al., 1995) or a positive effect on employment (Cantwell, 2003). Kozaric-Kovacic et al. (1995) followed 312 adults with schizophrenia and found that those with a co-morbid alcohol abuse disorder had poorer social

[1]Head, Social Inclusion and Recovery Research, The Queensland Centre for Mental Health Research, Brisbane, Australia; Discipline of Psychiatry, University of Queensland, Brisbane, Australia; School of Applied Psychology, Griffith University, Brisbane, Australia
[2]Research Officer, The Queensland Centre for Mental Health Research, Brisbane, Australia
[3]Previously employed as Research Officer, The Queensland Centre for Mental Health Research, Brisbane, Australia
[4]Senior Scientist, The Queensland Centre for Mental Health Research; Discipline of Psychiatry, the University of Queensland, Brisbane, Australia; Queensland Brain Institute, University of Queensland, Brisbane, Australia

Corresponding author:
Geoffrey Waghorn, QCMHR, The Park, Centre for Mental Health, Locked Bag 500, Archerfield, via Brisbane, QLD 4108, Australia.
Email: geoff_waghorn@qcmhr.uq.edu.au

functioning although there were no differences in employment status.

This relationship has also been examined in intervention designs of vocational rehabilitation. Several reports failed to find an added impact of substance abuse or dependence on vocational functioning (Cook et al., 2007; Goldberg et al., 2001; Sengupta et al., 1998). Other studies reported added impairments to vocational functioning (McGurk et al., 2009; Razzano et al., 2005; Wilk et al., 2006), while one study reported superior vocational functioning (Drebing et al., 2002). The reasons for these mixed results remain unclear although some authors attribute this to methodological differences, particularly in how substance abuse is classified and reported. Others attribute this to the fact that substance abuse is more common in persons with better premorbid social functioning, which is a predictor of better vocational functioning (McGurk et al., 2009).

The mixed nature of these results supports continuing research to monitor the prevalence and vocational impact of co-morbid substance abuse or dependence. One key issue is whether a diagnosis of co-morbid substance abuse or dependence is or is not an added barrier to vocational rehabilitation for people with psychotic disorders. This is important because an added negative impact implies a need for systematic screening to identify and counter substance use and abuse that may hinder vocational rehabilitation. Negative impacts imply that more intensive and more costly forms of vocational rehabilitation may be needed. On the other hand, neutral or positive impacts reduce the need to focus on past co-morbid substance abuse while providing access to suitable vocational rehabilitation programmes.

Method

Aims

The aim of this study was to investigate whether co-morbid substance abuse or dependence represented an added barrier to vocational rehabilitation among those diagnosed with the psychotic disorders, in a large national survey of psychosis. A second question concerned the extent to which the most intensive forms of vocational assistance were utilised by those of working age who were diagnosed with both a psychotic disorder and substance abuse or dependence.

Participants

Participants were drawn from the second national Survey of High Impact Psychosis (SHIP). The full details of the methods are described elsewhere (Morgan et al., 2012, 2013). In summary, the SHIP generated a national probability sample from seven catchment areas including inner city, urban and rural settings, representing 1.5 million people aged 18–64 years. Screening for psychosis took place during the census month of March 2010 in public mental health services and non-government organisations. Of the 7955 people who screened positive, 1825 were randomly selected for and completed face-to-face interviews. The study was approved by institutional human research ethics committees at each of the seven study sites and all participants provided written informed consent.

Measures

Face-to-face interviews covered psychiatric symptoms, substance use, functioning and demographic characteristics (e.g. age, sex, education, employment, migrant status). Trained interviewers, who were predominantly allied health professionals, administered the survey.

Substance abuse and dependence. A diagnosis of alcohol and illicit drug abuse or dependence was made using the Diagnostic Interview for Psychosis–Diagnostic Module (DIP-DM) (Castle et al., 2006), which was developed for use by trained mental health professionals in the first Australian survey of psychosis (Jablensky et al., 2000). It uses SCAN prompts (World Health Organization, 1999) to elicit signs and symptoms, and then applies the OPCRIT criteria (McGuffin et al., 1991) using a computer algorithm to generate diagnoses according to several classification systems. Diagnoses were derived using the International Classification of Disease, version 10 classification system (World Health Organization, 1992).

The DIP-DM covers a series of questions about current and lifetime use, including frequency of use, quantity and impact. For example, respondents were asked about lifetime (e.g. 'Have you ever…') and past year (e.g. 'In the past 12 months have you…') use of alcohol and other illicit substances. This information was used by interviewers to determine a lifetime diagnosis of (a) alcohol abuse or dependence, (b) cannabis abuse or dependence, and (c) other illicit drug abuse or dependence (heroin, tranquilliser, inhalant, ecstasy, hallucinogens and stimulants), according to OPCRIT criteria (McGuffin et al., 1991). The specific criteria to determine lifetime diagnoses were: continued use despite knowledge of having a persistent or recurrent social, occupational, psychological or physical problem that is caused or exacerbated by that substance; or recurrent use in situations in which it is physically hazardous; or symptoms definitely indicative of dependence (such as tolerance, increasing use, signs of withdrawal when stopping or cutting down). One of the above must have occurred persistently for at least one month or repeatedly over a longer period.

Current employment. International definitions of labour force activity were applied to determine two mutually exclusive categories of labour force activity: employed versus not employed in the past 4 weeks, consistent with definitions of labour force activity used by the Australian Bureau of Statistics (ABS) (Australian Bureau of Statistics, 2010). The ABS typically uses three mutually exclusive categories: not participating in the labour force; available for, and actively looking for work; and employed. However, a binary labour force variable was needed so we compared those employed (competitively and non-competitively) to

those not employed by collapsing non-participants in the labour force with those not employed yet actively looking for work.

Competitive employment was defined as one or more hours per week of part-time or full-time work in the open labour market at or above minimum award wages, in jobs not reserved for people with disabilities, where supervision is provided by personnel regularly employed by the business. The complement, non-competitive employment, was defined as jobs paying below award wages, jobs reserved for people with disabilities, jobs where the employer continues to receive a wage subsidy, or wages paid under the supported wage scheme award. Voluntary work and unpaid work experience were not included in the definition of non-competitive employment.

Global functioning. The personal and social performance scale (PSP) was used as a clinician-rated global measure of personal and social dysfunction (Morosini et al., 2000; Nafees et al., 2012; Patrick et al., 2009). The impact of illness is assessed from a structured clinical interview covering four main areas: socially useful activities; personal and social relationships; self-care; and disturbing and aggressive behaviours. Difficulty in each area is rated using a six-point severity scale with the following categories: absent; mild; manifest but not marked; marked; severe; or very severe. Total scores range from 1 to 100 where lower scores indicate poorer functioning. The PSP has good inter-rater reliability (intra-class correlation coefficient (ICC) = 0.87) and moderate (Nafees et al., 2012) to good test–retest reliability (ICC > 0.90) (Patrick et al., 2009) in this population.

Statistical analyses

For the main analyses, the effects of drug and alcohol abuse or dependence on current employment status were examined using logistic regression, with the second category (no substance abuse or dependence) as the reference group. Unadjusted odds ratios were estimated using univariate logistic regression (model 1). For model 2, multiple logistic regression controlled the influential covariates (age, sex, migrant status, education attainment and severity of illness) derived from previous studies with the same population sample (Moore et al., 2012). A similar modelling approach examined the effects of substance abuse or dependence on the type of employment assistance received in the previous 12 months. Analyses were performed in SAS (version 9.3; SAS Institute, Cary, NC, USA; SAS Institute, 2012) using SURVEYFREQ and SURVEYLOGISTIC procedures (An AB, 2004) which are designed to analyse complex survey samples.

Results

Of the 1825 persons with psychotic disorders, 408 (22.4%) were employed in the previous four weeks. Most (18.1%, $n = 330$) were employed in competitive employment, with 4.3% ($n = 78$) in non-competitive employment. Co-morbid substance abuse or dependence was prevalent. Half (51%) were found to have a lifetime diagnosis of alcohol abuse or dependence; 51% had lifetime cannabis abuse or dependence; and 32% had a lifetime diagnosis of other illicit drug abuse or dependence. The majority of participants had used alcohol in the past year (73.5%). In terms of cannabis, the majority reported use at some point in their life (66.4%), while nearly a third had used cannabis in the past year (32.8%).

Table 1 shows the frequency of lifetime alcohol, cannabis and other illicit drug abuse or dependence by participant characteristics. Table 2 shows the associations between these variables. Having a lifetime co-morbid alcohol abuse or dependence disorder was associated with younger age, being male, not being partnered (single), native born, not completing high school, and a greater severity of global functioning as measured by the PSP. However, partner status, migrant status and educational attainment did not survive adjustment in the multivariate logistic regression model (see Table 2). The same individual characteristics were also associated with a lifetime cannabis abuse or dependence disorder, although the effects of age and sex were stronger and all correlates survived adjustment except partner and migrant status. A lifetime diagnosis of other illicit drug abuse or dependence was associated with the same correlates apart from educational attainment. Of these, only partner status did not survive adjustment in the multivariate model.

Overall, there were no statistically significant effects of lifetime substance abuse or dependence disorders on any employment (both competitive and non-competitive). However, those who used cannabis in the past year were more likely not to be employed compared with those who did not (odds ratio (OR) = 1.29, 95% confidence interval (CI) = 1.00–1.67). This association remained statistically significant after adjusting for age, sex, migrant status, partner status, educational attainment, and global functioning (OR = 1.41, 95% CI = 1.06–1.89). In contrast, alcohol use in the past year was positively associated with employment and this effect remained after adjusting for the influential correlates listed (OR = 0.71, 95% CI = 0.52–0.97). Of the three lifetime substance abuse or dependence types, only one influenced the type of employment reported. Lifetime other illicit drug abuse or dependence was positively associated with non-competitive employment (OR = 1.72, 95% CI = 1.01–2.94), but became non-significant after adjustment.

Table 3 shows the frequency of lifetime substance abuse or dependence by type of employment assistance received in the previous year. Table 4 shows the associations between these variables. Four levels of intensity of government employment assistance were examined: disability employment services, mainstream unemployment services, other government programmes and own resources. Own resources included using private recruitment companies, obtaining help from family and friends, getting help from other sources, or finding employment without assistance. After adjusting for age, sex, migrant status, educational attainment and global functioning, those with

Table 1. Frequency of lifetime substance abuse or dependence by participant characteristics ($n = 1825$).

	Alcohol lifetime abuse or dependence[a] ($n = 931$)		Cannabis lifetime abuse or dependence[a] ($n = 931$)		Other drug lifetime abuse or dependence[a,b] ($n = 584$)	
Variable	**Yes, *n* (%)**	**No, *n* (%)**	**Yes, *n* (%)**	**No, *n* (%)**	**Yes, *n* (%)**	**No, *n* (%)**
Age (years)						
18–27	118 (58)	86 (42)	136 (67)	68 (33)	82 (40)	122 (60)
28–37	305 (54)	264 (46)	361 (63)	208 (37)	243 (43)	326 (57)
38–47	263 (53)	232 (47)	272 (55)	223 (45)	158 (32)	337 (68)
48–57	176 (45)	212 (55)	133 (34)	255 (66)	73 (19)	315 (81)
58–65	59 (35)	110 (65)	25 (15)	144 (85)	21 (12)	148 (88)
Sex						
Male	634 (58)	453 (42)	660 (61)	427 (39)	399 (37)	688 (63)
Female	287 (39)	451 (61)	267 (36)	471 (64)	178 (24)	560 (76)
Partner status						
Partnered (married or de facto)	137 (44)	175 (56)	141 (45)	171 (55)	84 (27)	228 (73)
Not partnered	784 (52)	729 (48)	786 (52)	727 (48)	493 (33)	1020 (67)
Migrant status						
Yes	147 (45)	178 (55)	136 (42)	189 (58)	71 (22)	254 (78)
No	774 (52)	726 (48)	791 (53)	709 (47)	506 (34)	994 (66)
Educational attainment						
Did not complete high school	334 (56)	271 (44)	345 (56)	270 (44)	215 (35)	400 (65)
Completed high school	143 (47)	161 (53)	159 (52)	145 (48)	85 (28)	219 (72)
Completed higher qualifications	431 (48)	460 (52)	417 (47)	474 (53)	271 (30)	620 (70)
Diagnosis						
Affective psychosis	324 (47)	369 (53)	329 (48)	364 (53)	216 (31)	477 (69)
Non-affective psychosis	498 (53)	451 (48)	526 (55)	423 (45)	319 (34)	630 (66)
Global functioning[c]						
Very severe	252 (54)	212 (46)	258 (56)	206 (44)	166 (36)	298 (64)
Severe	248 (55)	203 (45)	232 (51)	219 (49)	145 (32)	306 (68)
Good	228 (49)	235 (51)	241 (52)	222 (48)	149 (32)	314 (68)
Very good	193 (43)	254 (57)	196 (44)	251 (56)	117 (26)	330 (74)

[a]Lifetime substance abuse or dependence was assessed by interviewers according to OPCRIT criteria (McGuffin et al., 1991).
[b]Other drug: heroin, tranquilliser, inhalant, ecstasy, hallucinogens, and stimulants (amphetamine and cocaine).
[c]Based on quartiles of global functioning scale, PSP (personal and social performance scale): higher score indicates less disability.

cannabis abuse or dependence (with recent use) were significantly less likely to receive assistance from the most intensive form of government assistance available (disability employment services or disability employment network), compared to those with no substance abuse or dependence. Those with alcohol or other drug abuse or dependence had significantly greater odds of utilising their own resources than those with no substance abuse or dependence. This relationship was not moderated by adjustment for the correlates listed. A general pattern emerged that those with any type of lifetime substance abuse or dependence (alcohol, cannabis or other) were more likely to utilise their own resources in job seeking than receive either low intensity or high intensity government employment assistance.

Discussion and implications

Lifetime substance abuse or dependence is highly prevalent (32–51%) among adults with psychotic disorders but had no added impact on current employment status. A lifetime diagnosis of abuse or dependence on substances other than alcohol and cannabis was associated with non-competitive types of employment. Interestingly, alcohol use in the past year (which includes non-problematic use) but not lifetime abuse or dependence, was positively associated with current employment. However, cannabis use in the past year, but not lifetime cannabis abuse or dependence, was negatively associated with current employment. Together these results show that individual patterns of use in the past year appear more important in vocational rehabilitation than a past history of substance abuse or dependence.

These results also suggest a substance-specific explanation for the controversy about whether substance abuse co-morbidity does (McGurk et al., 2009; Razzano et al., 2005; Swartz et al., 2000; Todd et al., 2004; Wilk et al., 2006) or does not (Cook et al., 2007; Dickerson et al., 2008; Goldberg et al., 2001; Kozaric-Kovacic et al., 1995; Sengupta et al., 1998) add barriers to employment. These results support the research showing that co-morbid substance abuse or dependence does not add barriers to employment among adults with

Table 2. Multivariable associations between lifetime substance abuse or dependence and participant characteristics ($n = 1825$).

Variable	Alcohol lifetime abuse or dependence ($n = 931$)		Cannabis lifetime abuse or dependence ($n = 931$)		Other drug lifetime abuse or dependence ($n = 584$)	
	Model 1[a] OR (CI)[c]	Model 2[b] OR (CI)[c]	Model 1[a] OR (CI)[c]	Model 2[b] OR (CI)[c]	Model 1[a] OR (CI)[c]	Model 2[b] OR (CI)[c]
Age (years)						
18–27	**2.6 (1.7–4.1)**	**2.7 (1.7–4.3)**	**11.7 (6.9–20.1)**	**12.7 (7.3–22.3)**	**4.8 (2.7–8.3)**	**5.2 (2.9–9.4)**
28–37	**2.2 (1.5–3.2)**	**2.2 (1.5–3.2)**	**11.1 (6.9–17.9)**	**11.8 (7.2–19.2)**	**5.8 (3.5–9.6)**	**5.9 (3.5–10.0)**
38–47	**2.1 (1.5–3.1)**	**2.1 (1.4–3.2)**	**7.4 (4.6–11.9)**	**8.1 (5.0–13.3)**	**3.4 (2.0–5.7)**	**3.5 (2.0–5.9)**
48–57	**1.6 (1.1–2.4)**	**1.6 (1.1–2.4)**	**3.0 (1.8–4.9)**	**3.1 (1.9–5.1)**	**1.8 (1.02–3.1)**	**1.8 (1.02––3.2)**
58–65 (reference)						
Sex						
Male	**2.2 (1.8–2.7)**	**2.0 (1.7–2.5)**	**2.7 (2.2–3.3)**	**2.5 (2.0–3.1)**	**1.9 (1.5–2.3)**	**1.7 (1.3–2.1)**
Female (reference)						
Partner status						
Partnered (married or de facto)	**0.7 (0.5–0.9)**	0.9 (0.7–1.2)	**0.7 (0.6–0.9)**	1.0 (0.8–1.3)	**0.7 (0.5–0.9)**	0.9 (0.7–1.3)
Not partnered (reference)						
Migrant status						
Yes	**0.8 (0.6–0.9)**	0.8 (0.6–1.1)	**0.7 (0.5–0.8)**	0.8 (0.6–1.1)	**0.6 (0.4–0.8)**	**0.6 (0.4–0.9)**
No (reference)						
Educational attainment						
Did not complete high school	**1.3 (1.1–1.7)**	1.2 (0.9–1.6)	**1.4 (1.1–1.7)**	**1.5 (1.2–1.9)**	1.2 (0.9–1.5)	1.2 (0.9–1.5)
Completed high school	0.9 (0.7–1.2)	0.8 (0.6–1.0)	1.2 (0.9–1.6)	1.0 (0.7–1.3)	0.9 (0.6–1.2)	0.7 (0.5–1.0)
Completed higher qualifications (reference)						
Diagnosis						
Affective psychosis	1.1 (0.9–1.3)	0.9 (0.7–1.1)	1.3 (1.0–1.6)	0.9 (0.7–1.2)	1.1 (0.9–1.4)	0.9 (0.7–1.1)
Non-affective psychosis (reference)						
Global functioning						
Very severe	**1.5 (1.2–2.0)**	**1.4 (1.03–1.9)**	**1.6 (1.2–2.1)**	**1.5 (1.1–2.1)**	**1.6 (1.2–2.2)**	**1.7 (1.3–2.4)**
Severe	**1.6 (1.2–2.1)**	**1.5 (1.1–2.0)**	**1.3 (1.0–1.7)**	1.3 (0.9–1.8)	**1.4 (1.03–1.9)**	**1.4 (1.03–2.0)**
Good	1.3 (0.9–1.7)	1.3 (0.9–1.7)	**1.4 (1.04–1.8)**	**1.4 (1.1–2.0)**	**1.5 (1.1–2.0)**	**1.5 (1.1–2.1)**
Very good (reference)						

[a]Model 1: unadjusted bivariate logistic regression.
[b]Model 2: simultaneous logistic regression which adjusted for age, sex, migrant status, educational attainment, and global functioning (PSP total score).
[c]OR: odds ratio, where >1 signifies that the event is associated with higher odds of outcome, and <1 signifies that the event is associated with lower odds; CI: 95% confidence interval given in parentheses next to the OR. An OR is statistically significant if its CI does not overlap the null value (OR = 1). These are weighted estimates.
Statistically significant results are shown in **bold** typeface ($P < 0.05$).

psychosis. To resolve this controversy, future reviews of this literature could try to differentiate studies that involve population sampling compared to small intervention samples, and differentiate studies that aggregate types of substance abuse from those that examine specific substances. In addition, further investigations could help by examining patterns of recent and current use as well as the effects of lifetime abuse or dependence on vocational status.

This is important because substance abuse can be a complex social phenomenon in which reasons for use can vary markedly among individuals. At an individual level the potential impacts on vocational rehabilitation can be diverse, even though once identified the effects can often be accommodated. For instance, regular cannabis use may gradually increase social anxiety and reduce career goal orientation in a young person with schizophrenia, while alcohol use may in the short term build social confidence and reduce anxiety. Therefore individual patterns of recent use and how those patterns help or hinder vocational rehabilitation need to be explored.

In terms of employment assistance received in the past year, a consistent pattern emerged showing that lifetime substance abuse or dependence was associated with less utilisation of the most intensive government funded employment assistance. The relationships in Table 4 imply either: (a) the most intensive government programmes discourage or exclude people with co-morbid substance abuse; or (b) that those with substance abuse problems are less inclined to seek out support services. This pattern suggests that either increasing exclusion or increasing self-reliance, or both, are needed to explain decreasing utilisation of more intensive services when those with psychotic disorders also experience lifetime substance abuse or dependence.

Table 3. Frequency of lifetime substance abuse or dependence by type of assistance received to find work in the past year among adults with psychotic disorders ($n = 489$).

Variable / Substance type	Category	Type of employment assistance[a]							
		DEN or CRS[b]		JNA[c]		Other gov[d]		Own resources[e]	
		Yes, *n* (%)	No, *n* (%)	Yes, *n* (%)	No, *n* (%)	Yes, *n* (%)	No, *n* (%)	Yes, *n* (%)	No, *n* (%)
Alcohol lifetime abuse or dependence									
	Yes	78 (30)	182 (70)	143 (34)	282 (66)	19 (7)	240 (93)	107 (41)	153 (59)
	No	78 (34)	150 (66)	18 (28)	46 (72)	11 (5)	218 (95)	71 (31)	158 (69)
Alcohol lifetime abuse or dependence with recent use[f]									
	Yes	132 (31)	292 (68)	81 (35)	122 (65)	27 (6)	397 (94)	164 (39)	261 (61)
	No	24 (38)	40 (62)	80 (30)	206 (70)	3 (5)	61 (95)	14 (22)	50 (78)
Cannabis lifetime abuse or dependence									
	Yes	79 (30)	186 (70)	94 (36)	172 (64)	19 (7)	247 (93)	112 (42)	154 (58)
	No	77 (35)	146 (65)	67 (28)	156 (72)	11 (5)	211 (95)	66 (30)	157 (70)
Cannabis lifetime abuse or dependence with recent use[f]									
	Yes	83 (29)	206 (71)	105 (37)	185 (63)	20 (7)	270 (93)	115 (40)	175 (60)
	No	73 (37)	126 (63)	56 (31)	143 (69)	10 (5)	188 (95)	63 (32)	136 (68)
Other drug[g] lifetime abuse or dependence									
	Yes	45 (28)	118 (72)	61 (37)	102 (63)	14 (9)	149 (91)	72 (44)	91 (56)
	No	111 (34)	214 (66)	100 (31)	226 (69)	16 (5)	309 (95)	106 (33)	220 (67)
Other drug[g] lifetime abuse or dependence with recent use[f]									
	Yes	54 (28)	140 (72)	75 (39)	119 (61)	16 (8)	178 (92)	82 (42)	112 (58)
	No	102 (35)	192 (65)	86 (29)	209 (71)	14 (5)	280 (95)	96 (33)	199 (67)

[a]Type of employment assistance utilised in the past year was ranked left to right by service intensity.
[b]DEN: Disability Employment Network, the most intensive services in Australia; CRS: Commonwealth Rehabilitation Service Australia or other vocational services.
[c]JNA: Job Network Agency, the mainstream unemployment services in Australia.
[d]Other gov: personal support programme, Clubhouse Transitional Employment, Australian disability enterprises (businesses providing sheltered employment) and the personal helpers and mentors programme.
[e]Own resources: private recruitment companies, family or friends, or any other help.
[f]Lifetime substance abuse or dependence with recent use is reported use in the past 12 months.
[g]Other drug: heroin, tranquilliser, inhalant, ecstasy, hallucinogens, and stimulants (amphetamine and cocaine).

This relationship is concerning because while lifetime substance abuse or dependence shows no added barrier to employment attainment, it is associated with underutilisation of the most suitable and most intensive forms of employment assistance. This is not desirable given the many studies that demonstrate the benefits of more intensive and evidence-based employment services for this population (Drebing et al., 2002; McGurk et al., 2009; Mueser et al., 2011). This finding has international relevance because other studies have reported a negative bias in referral to employment services for dually diagnosed clients (Biegel et al., 2009; Frounfelker et al., 2011). Although these data cannot clarify the extent that underutilisation involves service exclusion via a referral or acceptance bias, they support zero exclusion principles and support increasing the availability of evidence-based supported employment programmes for those with psychotic disorders and co-morbid substance abuse or dependence (Drake et al., 2012; Mueser et al., 2011).

Limitations

The main limitation of this study is that the data were derived from a cross-sectional survey that limited the range and nature of relationships that could be examined. For instance, we could not determine whether people were previously excluded from more intensive forms of employment assistance. Nor could we determine the extent that co-morbid substance abuse added to work-related impairments over those produced by psychotic disorders alone. Furthermore, we could not establish the extent to which substance abuse or dependence impaired employment motivation and impaired the dependable behaviour relevant to attending work regularly and to retaining employment. Substance abuse may also reduce a person's work performance and productivity when at work, another important aspect of employment, which we could not examine.

Although the second national survey of psychosis is one of the best to date for this purpose, it has limitations.

Table 4. Multivariable associations between lifetime substance abuse or dependence and type of employment assistance received among adults with psychotic disorders ($n = 489$).

Substance type	Type of employment assistance							
	DEN or CRS[a]		JNA[b]		Other gov[c]		Own resources[d]	
	Model 1[e] OR (CI)[g]	Model 2[f] OR (CI)[g]	Model 1[e] OR (CI)[g]	Model 2[f] OR (CI)[g]	Model 1[e] OR (CI)[g]	Model 2[f] OR (CI)[g]	Model 1[e] OR (CI)[g]	Model 2[f] OR (CI)[g]
Alcohol lifetime abuse or dependence	0.8 (0.6–1.2)	0.8 (0.5–1.2)	1.0 (0.7–1.5)	0.9 (0.5–1.3)	1.6 (0.7–3.6)	1.6 (0.7–3.9)	**1.6 (1.04–2.3)**	**1.6 (1.02–2.4)**
Alcohol lifetime abuse or dependence with recent use	0.9 (0.5–1.6)	0.8 (0.4–1.5)	1.3 (0.7–2.3)	1.1 (0.6–2.1)	1.1 (0.3–4.2)	1.0 (0.3–3.7)	**2.1 (1.1–4.2)**	1.8 (0.9–3.7)
Cannabis lifetime abuse or dependence	0.8 (0.6–1.2)	0.7 (0.4–1.1)	1.4 (0.9–2.1)	1.1 (0.7–1.8)	1.7 (0.7–3.7)	1.7 (0.7–4.1)	**1.9 (1.3–2.8)**	1.5 (0.9–2.4)
Cannabis lifetime abuse or dependence with recent use	0.7 (0.5–1.1)	**0.6 (0.3–0.9)**	**1.5 (1.01– 2.3)**	1.2 (0.8–2.0)	1.49 (0.7–3.4)	1.7 (0.6–3.6)	**1.6 (1.1–2.4)**	1.3 (0.9–2.0)
Other drug lifetime abuse or dependence	0.7 (0.5–1.1)	0.7 (0.4–1.0)	1.4 (0.9–2.2)	1.3 (0.9–2.1)	**2.4 (1.1–5.2)**	**2.4 (1.03–5.8)**	**1.8 (1.2–2.7)**	**1.8 (1.1–2.8)**
Other drug lifetime abuse or dependence with recent use	0.7 (0.5–1.1)	0.7 (0.4–1.0)	**1.6 (1.1–2.5)**	1.5 (0.9–2.3)	**2.4 (1.1–5.2)**	**2.4 (1.0–5.7)**	**1.7 (1.2–2.6)**	**1.6 (1.1–2.5)**

[a]DEN: Disability Employment Network, the most intensive services in Australia; CRS: Commonwealth Rehabilitation Service Australia or other vocational services.
[b]JNA: Job Network Agency, the mainstream unemployment services in Australia.
[c]Other gov: personal support programme, Clubhouse Transitional Employment, Australian disability enterprises (businesses providing sheltered employment) and the personal helpers and mentors programme.
[d]Own resources: private recruitment companies, family or friends, or any other help.
[e]Model 1: unadjusted bivariate logistic regression. The reference group was survey participants with no substance abuse or dependence.
[f]Model 2: simultaneous logistic regression which adjusted for age, sex, migrant status, educational attainment, and global functioning (PSP total score). The reference group was survey participants with no substance abuse or dependence.
[g]OR: odds ratio, where >1 signifies that the event is associated with higher odds of outcome, and <1 signifies that the event is associated with lower odds; CI: 95% confidence interval given in parentheses next to the OR. An OR is statistically significant if its CI does not overlap the null value (OR = 1). These are weighted estimates.
Statistically significant results are shown in **bold** typeface ($P < 0.05$).

The survey design did not include those solely in the care of private mental health providers (e.g. general medical practitioners or private psychiatrists), nor those who had dropped out of all contact with mental health and non-government agencies. This could matter because some of these individuals may have better employment outcomes. Only those aged 18 years of age and older were eligible for inclusion, hence the survey does not estimate the impact of psychotic disorders on educational and vocational outcomes in younger people aged 15–18 years. Also, there was no information on the distribution and accessibility of employment services within the survey catchment areas. Since 2010 there have been no restrictions on new referrals (Australian Government, 2009). Hence there is no reason to expect that the range of employment services described differed in the catchment area compared with the nation as a whole.

The focus of this report has been on the lifetime co-morbid diagnoses of substance abuse or dependence, or any use in the past year. This may be a limitation of this analysis because it is possible that recent problematic use, which does not meet the criteria for abuse or dependence, may have a stronger impact on vocational functioning than any prior use. Although not a focus of this report, recent problematic use of alcohol and other drugs may indicate a greater need for more intensive employment assistance, and hence warrants further investigation. In addition, all forms of prior and current use and abuse may have vocational implications. For instance, alcohol users at risk of problematic use may need to avoid social situations at work where alcohol use is encouraged. On the other hand, regular cannabis users may have to confine their use to days other than work days to maintain energy levels and ensure safety in the workplace.

Another limitation of this study is that patterns of substance abuse or dependence did not necessarily align with periods of employment. Hence we could not distinguish past dependence or abuse from current problematic use, abuse or dependence. Future studies are needed to examine how concurrent substance use patterns actually interact with vocational activities, and how the demands of managing substance abuse in addition to managing overall mental health, help or hinder vocational progress.

Implications for occupational therapists

These results show that at a population level, a diagnosis of co-morbid lifetime substance abuse or dependence need not be considered an additional employment-related disability for someone with psychosis seeking employment. However, given that the implications of co-morbid substance abuse are consistently negative for continuing mental health treatment and care (e.g. Rebgetz et al., 2015) some indirect negative effects on vocational rehabilitation at an individual

level ought to be anticipated. For instance, a negative effect of substance abuse on wellness could delay participation in services or disrupt employment. It is also possible for employment to help the person to manage their substance abuse, by restricting time and opportunities for substance use and by providing alternative activities.

It is concerning that people with lifetime co-morbid abuse or dependence were less likely to utilise the most intensive employment assistance. Future studies could explore whether the reduced utilisation is due to service provider exclusion, or due to individual challenges and preferences. It is possible that service providers have difficulty engaging with this group, or may perceive the barriers and challenges as too high to admit service users with both psychosis and co-morbid substance abuse. In the meantime occupational therapists working in vocational rehabilitation or mental health services could help by identifying clients with co-morbid substance abuse and finding ways to help them utilise available services at the most appropriate time. If service exclusion is a factor, occupational therapists can promote non-exclusionary principles, and help service providers to plan, at an individual level, how substance use can be best managed during vocational rehabilitation. The evidence supporting a focus on recent use patterns opens new opportunities for occupational therapists to explore the nature of current use and how, at an individual level, it could impact on vocational progress.

Conclusion

There was no evidence of a general negative impact of lifetime co-morbid substance abuse or dependence on current employment status. However, substance use patterns in the past year may be more relevant to vocational rehabilitation than lifetime abuse or dependence. This is because cannabis use in the past year, but not lifetime abuse or dependence, was negatively associated with employment. In addition, alcohol use in the past year, but not lifetime abuse or dependence, was positively associated with employment. Taken together, this evidence supports a focus on recent use patterns of specific substances, rather than on any past substance abuse or dependence.

Any lifetime co-morbid substance abuse or dependence was associated with less utilisation of the most intensive forms of employment assistance in the previous year. Therefore, community residents with psychosis and co-morbid lifetime substance abuse or dependence may benefit from increased utilisation of more intensive forms of evidence-based supported employment. Further research is urgently needed to determine whether decreased utilisation is due to service providers restricting access, or due to individual factors such as: personal preferences, help-seeking avoidance, poor knowledge of available services, self-stigma, or personal difficulties managing substance use. In the meantime, occupational therapists working in vocational rehabilitation can help by exploring individual substance use patterns in order to minimise any negative impacts on participation in vocational rehabilitation.

Key findings

- There was no evidence of an added impact of lifetime co-morbid substance abuse or dependence on current employment status.
- Lifetime co-morbid substance abuse or dependence was associated with less utilisation of intensive employment assistance.

What this study adds

- Substance use patterns in the past year may be more relevant to vocational rehabilitation than lifetime abuse or dependence. Cannabis use in the past year, but not lifetime abuse or dependence, was negatively associated with employment.
- Alcohol use in the past year, but not lifetime abuse or dependence, was positively associated with employment.
- Overall, co-morbid lifetime substance abuse or dependence was associated with decreased utilisation of vocational rehabilitation.

Acknowledgements

This report is an analysis of data collected in the framework of the 2010 Australian National Survey of High Impact Psychosis. The members of the Survey of High Impact Psychosis Study Group are: V Morgan (project director); A Jablensky (chief scientific advisor); A Waterreus (project coordinator); A Mackinnon (statistician); R Bush, D Castle, M Cohen, C Galletly, C Harvey, P McGorry, J McGrath, H Stain (site directors); V Carr (Australian Schizophrenia Research Bank); A Neil (health economics); B Hocking (SANE Australia); S Saw (Australian Government Department of Health and Ageing). This report acknowledges, with thanks, the hundreds of mental health professionals who participated in the preparation and conduct of the survey and the many Australians with psychotic disorders who gave their time and whose responses form the basis of this publication.

Research ethics

This study was approved by institutional human research ethics committees at seven Australian study sites: Greater Western Area Health Service (NSW) (HRECI091HNEI360); Melbourne Health (VIC) (2010.011); West Moreton Hospital and Health Service (QLD) (52-09); Central Northern Adelaide Health Service (SA) (2009179); St Vincent's Hospital Melbourne (VIC) (119/09); University of Western Australia (WA) (RA/4/1/2478); The University of Newcastle (NSW) (H-2010-0019). All participants provided written, informed consent prior to participation. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Declaration of conflicting interests

The authors confirm there are no conflicts of interest.

Funding

The study was funded internally by the Queensland Centre for Mental Health Research and by the Australian Government Department of Health and Ageing.

References

An AB (2004) Performing logistic regression on survey data with the new survey logistic procedure. *Proceedings of the Twenty-Seventh Annual SAS Users Group International Conference*. Available at: http://www2.sas.com/proceedings/sugi27/p258-27.pdf (accessed June 2012).

Australian Bureau of Statistics (2010) Standards for social, labour and demographic variables. Report, Australian Bureau of Statistcs, Canberra, Australia. Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1288.0Main+Features11996?OpenDocument (accessed 11 December 2012).

Australian Government (2009) National Mental Health and Disability Employment Strategy. Report, Department of Employment, Education and Workplace Relation, Canberra, Australia. Available at: https://www.dss.gov.au/our-responsibilities/mental-health/programs-services/national-mental-health-and-disability-employment-strategy (accessed 11 December 2012).

Biegel DE, Beimers D, Stevenson LD, et al. (2009) Predictors of referral to supported employment among consumers with co-occurring mental and substance use disorders. *Community Mental Health Journal* 45(6): 427–438.

Cantwell R (2003) Substance use and schizophrenia: Effects on symptoms, social functioning and service use. *The British Journal of Psychiatry* 182(4): 324–329.

Castle D, Jablensky A, McGrath J, et al. (2006) The diagnostic interview for psychoses (DIP): Development, reliability and applications. *Psychological Medicine* 36: 69–80.

Cook JA, Razzano LA, Burke-Miller JK, et al. (2007) Effects of co-occurring disorders on employment outcomes in a multisite randomized study of supported employment for people with severe mental illness. *Journal of Rehabilitation Research and Development* 44(6): 837–849.

Dickerson FB, Stallings C, Origoni A, et al. (2008) Predictors of occupational status six months after hospitalization in persons with a recent onset of psychosis. *Psychiatry Research* 160(3): 278–284.

Drake RE, Becker DR and Bond GR (2012) *Individual Placement and Support: An Evidence-based Approach to Supported Employment*. New York: Oxford University Press.

Drebing CE, Fleitas R, Moore A, et al. (2002) Patterns in work functioning and vocational rehabilitation associated with coexisting psychiatric and substance use disorders. *Rehabilitation Counseling Bulletin* 46(1): 5–13.

Frounfelker RL, Wilkniss SM, Bond GR, et al. (2011) Enrollment in supported employment services for clients with a co-occurring disorder. *Psychiatric Services* 62(5): 545–547.

Goldberg RW, Lucksted A, McNary S, et al. (2001) Correlates of long-term unemployment among inner-city adults with serious and persistent mental illness. *Psychiatric Services* 52(1): 101–103.

Jablensky A, McGrath J, Herrman H, et al. (2000) Psychotic disorders in urban areas: An overview of the study on low prevalence disorders. *Australian and New Zealand Journal of Psychiatry* 34(2): 221–236.

Kavanagh DJ, Waghorn G, Jenner L, et al. (2004) Demographic and clinical correlates of comorbid substance use disorders in psychosis: Multivariate analyses from an epidemiological sample. *Schizophrenia Research* 66(2–3): 115–124.

Kozaric-Kovacic D, Folnegovic-Smalc V, Folnegovic Z, et al. (1995) Influence of alcoholism on the prognosis of schizophrenic patients. *Journal of Studies on Alcohol and Drugs* 56(6): 622–627.

McGuffin PC, Farmer A and Harvey I (1991) A polydiagnostic application of operational criteria in studies of psychotic illness: Development and reliability of the OPCRIT system. *Archives of General Psychiatry* 48(8): 764–770.

McGurk SR, Mueser KT, DeRosa TJ, et al. (2009) Work, recovery, and comorbidity in schizophrenia: A randomized controlled trial of cognitive remediation. *Schizophrenia Bulletin* 35(2): 319–335.

Moore E, Mancuso SG, Slade T, et al. (2012) The impact of alcohol and illicit drugs on people with psychosis: The second Australian national survey of psychosis. *Australian & New Zealand Journal of Psychiatry* 46(9): 864–878.

Morgan VA, McGrath JJ, Jablensky A, et al. (2013) Psychosis prevalence and physical, metabolic and cognitive co-morbidity: Data from the second Australian national survey of psychosis. *Psychological Medicine* 44(10): 2163–2176.

Morgan VA, Waterreus A, Jablensky A, et al. (2012) People living with psychotic illness in 2010: The second Australian national survey of psychosis. *Australian and New Zealand Journal of Psychiatry* 46(8): 735–752.

Morosini PL, Magliano L, Brambilla L, et al. (2000) Development, reliability and acceptability of a new version of the DSM-IV Social and Occupational Functioning Assessment Scale (SOFAS) to assess routine social functioning. *Acta Psychiatrica Scandinavica* 101(4): 323–329.

Mueser KT, Campbell K and Drake RE (2011) The effectiveness of supported employment in people with dual disorders. *Journal of Dual Diagnosis* 7(1–2): 90–102.

Nafees B, van Hanswijck de Jong P, Stull D, et al. (2012) Reliability and validity of the personal and social performance scale in patients with schizophrenia. *Schizophrenia Research* 140(1–3): 71–76.

Patrick DL, Burns T, Morosini P, et al. (2009) Reliability, validity and ability to detect change of the clinician-rated personal and social performance scale in patients with acute symptoms of schizophrenia. *Current Medical Research and Opinion* 25(2): 325–338.

Razzano LA, Cook JA, Burke-Miller JK, et al. (2005) Clinical factors associated with employment among people with severe mental illness: Findings from the employment intervention demonstration program. *The Journal of Nervous and Mental Disease* 193(11): 705–713.

Rebgetz S, Kavanagh DJ and Hides L (2015) Can exploring natural recovery from substance misuse in psychosis assist with treatment? A review of current research. *Addictive Behaviors* 46: 106–112.

SAS Institute (2012) *SAS version 9.3*. Cary, NC: SAS Institute.

Sengupta A, Drake RE and McHugo GJ (1998) The relationship between substance use disorder and vocational functioning among people with severe mental illness. *Psychiatric Rehabilitation Journal* 22(1): 41–45.

Swartz JA, Lurigio AJ and Goldstein P (2000) Severe mental illness and substance use disorders among former supplemental security income beneficiaries for drug addiction and alcoholism. *Archives of General Psychiatry* 57(7): 701–707.

Todd J, Green G, Harrison M, et al. (2004) Social exclusion in clients with comorbid mental health and substance misuse problems. *Social Psychiatry and Psychiatric Epidemiology* 39(7): 581–587.

Wade D, Harrigan S, Edwards J, et al. (2006) Substance misuse in first episode psychosis: 15-month prospective follow-up study. *British Journal of Psychiatry* 189(3): 229–234.

Wilk J, West JC, Rae DS, et al. (2006) Relationship of comorbid substance and alcohol use disorders to disability among patients in routine psychiatric practice. *The American Journal on Addictions* 15(2): 180–185.

World Health Organization (1992) *The ICD-10: Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization.

World Health Organization (1999) *Schedules for Clinical Assessment in Neuropsychiatry*. Geneva: World Health Organization.