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Personality factors as predictors of programme completion of drug therapeutic communities

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Using the Millon Clinical Multi-axial Inventory – III (MCMI-III), this study examined what personality factors, if any, would predict retention within therapeutic community (TC) treatment for residents presenting with amphetamine-type stimulant (ATS) use disorders. The study utilised a prospective, cohort design. Participants were 213 residents (130 males) from 12 TCs in Australia, with ages ranging from 19 to 58 years. The MCMI-III was administered at the commencement of the study and follow-up discharge information was obtained from TCs at 12 months post-baseline to determine which residents had completed the treatment programme and the reason for discharge. The study revealed a high prevalence of personality and psychopathology symptomatology within an ATS-using population with scores in the clinical range (>84) on a number of personality factors. Those most likely to have left treatment prematurely or been discharged scored higher on Antisocial, Narcissistic, Negativistic, Sadistic, Schizoid, Schizotypal, Alcohol Dependence, Drug Dependence, Dysthymia, and Major Depression scales. However, no significant personality differences were observed between programme completers and non-completers. While a follow-up measure of personality was not taken, results of this study suggest personality functioning may be improved during treatment. This raises possibilities for TCs and other treatment services in relation to the inclusion of specific treatment interventions within the TC. It is recommended that future research examine the extent to which ATS users' personality pathology changes during TC-based treatment, to provide a further insight into suitable evidence-based treatment approaches specific to an ATS-using population.

Keywords: mental health; outcome predictors; substance dependence; residential treatment; treatment outcome; comorbidity

Introduction

An estimated 14.3–52.5 million people use amphetamine-type stimulants (ATS) worldwide, increasing to between 38 million and 100.1 million when cocaine and Ecstasy are included. In Australia, the recent use of meth/amphetamine and Ecstasy fell between 2007 and 2010 (2.3–2.1% and 3.5–3.0%, respectively); however, cocaine use increased (1.6–2.1%) among people aged 14 years and over (Australian Institute of Health and Welfare [AIHW], 2011a).

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Although the majority of ATS users who present for treatment will attend an outpatient setting, 13.9% entered residential treatment, including therapeutic communities (TCs) in Australia during 2009–2010. Since 2009, there have been increasing numbers of ATS presentations to TCs and other treatment services.

The Australian National Drug Strategy Household Survey (AIHW, 2011a) found recent ATS users were twice as likely to report high or very high levels of psychological distress, as those who had not used in the last 12 months before the survey (20.8% compared with 9.6%). This group was also twice as likely as non-recent users to report being diagnosed or treated for a mental illness in the past 12 months (25.6% compared with 11.7%), often resulting in a range of accompanying mental health and behavioural issues for treatment providers.

A further concern for treatment providers is the impact of psychopathology and personality disorders on effective treatment for ATS use, and therefore the effect these factors may have on retention in treatment. This study examined characteristics of an ATS-using population, using the Millon Clinical Multiaxial Inventory-III (MCMI-III; Millon, Millon, Davis, & Grossman, 2009), in addition to a review of treatment completion rates across the sample to determine what personality disorders, if any, would predict treatment completion and retention within the TC.

Coupled with these concerns is the development and implementation of a treatment intervention that has relevance with this substance-using group, especially as deficits in cognitive and executive function may make some cognitively based interventions less accessible.

Psychopathology and personality disorders

There are limited client characteristics that are significantly or consistently associated with treatment retention (Condelli & Hubbard, 1994; De Leon, 1985; Simpson & Sells, 1982), other than client status at treatment entry. Research investigating the effectiveness of modified TCs has shown clients with Axis I co-occurring disorders, show better 12 months retention compared with community-based TCs serving standard populations (see Mierlack et al., 1998; Sacks, Sacks, De Leon, Bernhardt, & Staines, 1997). Additionally, more integrated and supportive, but less structured approaches prove successful for dually-diagnosed populations (Brunette, Mueser & Drake, 2004; De Leon, Sacks, Staines, & McKendrick, 2000; Mueser & Drake, 2000). Hence, psychopathology and severity of substance use have been found to be associated with retention and treatment outcomes.

An associated concern relates to personality disorders. Ravndal and Vaglum (2010) in a seven-year follow-up study of substance users from 21 treatment services in Norway, administered the MCMI-III at treatment commencement ($n = 481$) and again at follow-up ($n = 342$) to determine whether measurement at entrance reflected the person's emotional state, rather than personality traits, which are considered to be stable over time. All participants were drug-free (defined as no drug use over the 30 days prior to interview) at the study's commencement.

Results of the Norwegian study showed a reduction in the level of scores over the seven-year follow-up on all subscales and equally across two sub-groups – those who were not using at the time of follow-up ($n = 97$) and those who admitted to continuing drug use ($n = 245$). Base rate scores of 85 and above strongly support the presence of pathological symptoms, while scores of 75–84 are indicative of a clinical syndrome, and scores of 60–74 indicate symptom pathology (Millon et al., 2009). Ravndal and Vaglum (2010) suggest that categorical personality disorder diagnoses (>84 MCMI-III base score rates) at the time of

treatment entrance for drug-using populations may have poor predictive validity. Hence, it is likely that the chaotic lifestyles which are often the hallmark of substance-using populations still play a role in the person's life in early treatment, and may therefore contribute to more 'state' influences, resulting in higher scores. Consistent with other studies of personality (Roberts, Walton, & Viechtbauer, 2006; Skodol et al., 2005), the authors found a general decrease in the level of self-reported personality traits over time among substance users in this study.

ATS treatment

International data suggest there are more users of synthetic drugs than plant-based drugs, such as heroin and cocaine, combined (United Nations Office on Drugs and Crime [UNODC], 2012). In Australia, ATS are reportedly the second most commonly used illicit drugs, following cannabis (AIHW, 2011a). The co-existence of ATS use and mental health problems creates challenges for treatment services (National Drug Research Institute [NDRI] & Australian Institute of Criminology [AIC], 2008), exacerbating the 'tenuous link' with clients. Nevertheless, meth/amphetamines were reportedly the fourth most common principal drug of concern (DOC) for which treatment was sought in 2009 (AIHW, 2011b).

Retention rates are poor (NDRI & AIC, 2008); however, there is growing evidence of the efficacy of psychosocial therapies, including cognitive and behavioural therapies and motivational interviewing (MI), with ATS users (Topp, 2006). A systematic review (Lee & Rawson, 2008) found cognitive behavioural therapy (CBT) was associated with reductions in meth/amphetamine use. Brief CBT and MI interventions have also shown success. An Australian brief CBT intervention, developed by Baker et al. (2005), resulted in a significant drop in meth/amphetamine use between pre- and post-treatment and six-month follow-up, with 49.4% of the treatment group abstinent at six-month follow-up compared to 27.1% of the control group.

Further trials examining the efficacy of treatment strategies specific to Australian ATS use and dependence (State Government of Victoria, 2010) are needed, and several studies are currently underway. Initial findings from the Methamphetamine Treatment Evaluation Study reveal promising treatment outcomes, with marked reductions in methamphetamine use at both 3 and 12-month follow-up, in comparison with pre-treatment levels (McKetin et al., 2010). Several treatment protocols and guidelines are also in the development, testing and release phases, such as the Group Intervention for ATS, which utilises a combination of CBT, Mindfulness and Acceptance and Commitment Therapy (ACT). Specifically developed for group implementation, it is showing promising results in TC settings (Magor-Blatch & Pitts, 2009). Others offering promise are the Clinical Treatment Guidelines for Alcohol and Drug Clinicians (Lee et al., 2007); and the Treatment Approaches for Users of Methamphetamine (Jenner & Lee, 2008).

Personality factors, mental health and ATS use

ATS users are typically more challenging in presentation during treatment, as mental health issues are often exacerbated by ATS use, sometimes resulting in aggressive behaviour and early withdrawal from treatment (AIHW, 2011a). This may be further aggravated by cognitive deficits resulting in poor executive functioning, making treatment engagement difficult. Gunn and Rickwood (2009) compared psychopathology between ATS users and a control condition, surveying adults undertaking residential treatment at four Australian

TCs. Results showed high prevalence of psychopathology among all participants (ATS users and non-ATS users), with ATS users reporting significantly higher levels of depression and anxiety.

ATS use has therefore been found to exacerbate existing vulnerabilities, increasing the likelihood of mental health problems, and raising concerns that co-morbid psychopathology and personality disorders may compromise the ability of ATS users to engage and ultimately benefit from psychosocially based treatment (Loxley et al., 2004; Meredith, Jaffe, Ang-Lee, & Saxon, 2005; NDRI & AIC, 2008). Reports show 48% of the Australian national sample of illicit drug users perceive themselves to have experienced a mental health problem (Stafford & Burns, 2012), with depression (66%) and anxiety (45%) most commonly reported. ATS use is also associated with paranoia, confusion and psychosis (NDRI & AIC, 2008). In 2010, 20% of meth/amphetamine users reported high or very high levels of psychological distress, including mental illness (25.6%) (AIHW, 2011a).

The current study

While previous ATS research has sometimes included self-report of psychopathology, thus far personality and psychopathology symptomatology have not been adequately investigated among ATS users. This study aimed to address this gap in research by examining psychopathology and personality of an ATS-using population, using the MCMI-III (Millon et al., 2009), in addition to a review of treatment completion rates.

MCMI-III scale scores were compared to determine if there were any differences between the psychopathology and personality of ATS users who reported ATS as either their primary or secondary DOC. Those reporting ATS as the secondary DOC reported heroin (47.7%), alcohol (37.9%), cannabis (10.6%), benzodiazepines (1.5%) and non-prescription medications (1.5%) as primary concerns. In this paper, primary DOC refers to the main substance that the client stated led them to seek treatment from the treatment agency. This is self-defined and may relate to a number of personal and interpersonal issues, including mental health and legal concerns. Frequencies of programme completion and non-completion by primary or secondary DOC were also examined.

To determine if personality factors and psychopathology symptoms were related to treatment retention, MCMI-III scale scores were also compared among ATS users who completed and did not complete treatment. As co-morbid psychopathology is reported to compromise the ability of ATS users to engage and ultimately benefit from psychosocially based treatment (Meredith et al., 2005), we were interested in determining if the presence of personality and psychopathology symptomatology would have a negative impact on treatment retention.

Methods

Participants

Participants of this study were clients of 12 TCs across Australia, located in Queensland, New South Wales, Western Australia, Australian Capital Territory and Victoria. Only participants who indicated that ATS was either their primary or secondary DOC were recruited. This study utilised secondary data from a wider population-based Australian study of 253 eligible participants, of which 213 cases provided usable data (Figure 1).¹ The sample comprised: 130 males (61.03%) and 83 females (38.97%) with age ranging from 19 to 58 years ($M = 33.94$, $SD = 7.90$).

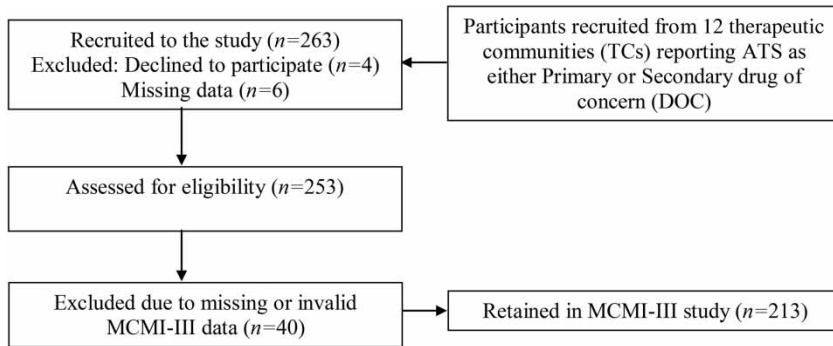


Figure 1. CONSORT diagram showing recruitment of participants to the study.

Most participants were Australian-born (84.2%), and similar numbers in each group reported parents born overseas and in Australia. Only 28.3% stated they had been unemployed for a short period of time (three months or less) and 71.7% of participants across both conditions gave periods of long-term unemployment. There were no significant differences between groups in relation to schooling, with 25.5% having completed to year 9 or 10 and a further 36.8% completing a tertiary technical or trade qualification or tertiary degree.

All participants met DSM-IV criteria for ATS dependence, with age of first use ranging from 11 years (amphetamines) to 46 years (cocaine and Ecstasy). All ATS drugs had been injected, with this the primary mode reported particularly for amphetamines (97.5%).

Measures

The MCMI-III (Millon et al., 2009) is a personality measure designed to assist in psychiatric screening and clinical diagnosis and was administered at the commencement of the study. The MCMI-III assesses the interaction of Axis I (major psychiatric disorders) and Axis II personality disorders in individuals over 18 years, based on DSM-IV classification.

The MCMI-III contains 175 test items, encompassing 27 scales and is of assistance to mental health professionals in making clinical diagnostic and treatment decisions. It identifies the deeper and pervasive personality characteristics underlying a person's overt symptoms; and assists the practitioner to gain an integrated understanding of the relationship between personality characteristics and clinical syndromes in order to facilitate treatment decisions.

Scales include: Fourteen Clinical Personality scales, including Schizoid, Avoidant, Depressive (Melancholic), Dependent, Histrionic, Narcissistic, Antisocial, Sadistic, Compulsive, Negativistic, Masochistic (Self-Defeating), Schizotypal, Borderline, and Paranoid; Seven Clinical Syndrome scales, including Anxiety, Somatoform, Bipolar (Manic), Dysthymia, Alcohol Dependence, Drug Dependence, and Posttraumatic Stress Disorder (PTSD); Three Severe Clinical Syndrome scales, including Thought Disorder, Major Depression, and Delusional Disorder and Three Modifying Indices and a Validity scale.

Demographic information was also collected at baseline and showed no significant differences between participants reporting ATS as primary or secondary DOC.

Procedure

The MCMI-III was administered at baseline only, as its prime purpose was the clinical diagnoses of psychopathology and the influence of personality disorder and psychopathology

on treatment retention. Follow-up information was obtained from the TCs at 12 months post-baseline to determine which participants had completed the TC, and reason for premature discharge for those who had not completed. Although programme length varied between TCs, there was a general expectation of approximately six months (26 weeks) treatment time within the residential component of the TC and a further three to six months post-treatment support, initially commencing within a halfway house or supported accommodation.

For each participant the following was requested at follow-up: (a) date of admission; (b) date of discharge; (c) reason for discharge from the programme, including programme completion or whether the person left against advice; (d) referral information (i.e. was the person referred to another service of the TC or to another external service [with name of services to which the person was referred]) and (e) date of readmission if the person had returned to the TC. For the purposes of the study, 'completion' was defined as completion of the residential component of the TC prior to discharge (generally 26 weeks). Those who left the programme against advice or were discharged for disciplinary reasons were considered 'non-completers'.

Statistical analysis

All statistical analyses were conducted using a critical alpha level of .05, using SPSS 19.0. All relevant testing of assumptions were performed prior to running the main analyses and raw data screened for missing and out-of-range values. List-wise case deletion was employed to deal with missing cases.

Results

Personality factors: computations and intercorrelations

Raw unstandardised scores from MCMI-III scales generally demonstrated acceptable to good internal reliability ($\alpha = .68-.85$) other than for the Compulsive (Cronbach $\alpha = .57$) and Narcissistic scales (Cronbach $\alpha = .59$). Raw unstandardised scores from the MCMI-III scales were converted to base rate scores using procedures outlined by Millon et al. (2009). Base rate scores of 85 or above strongly support the presence of pathological symptoms; scores of 75–84 are indicative of clinical syndromes and scores of 60–74 suggest symptom pathology.

Inspections of the means for each of the MCMI-III scales across the total sample suggested a strong presence of pathological symptoms with means of 85 or above on Anti-social, Depressive, Masochistic, Alcohol Dependence and Drug Dependence scales. The highest observed mean in this range was on the Drug Dependence scale, $M = 97.01$ ($SD = 16.40$).

Additionally, means between 75 and 84, indicative of a clinical syndrome, were observed on Anxiety, Bipolar, Borderline, Dependent, Narcissistic, Negativistic and Sadistic scales. Means between 64 and 74, suggesting symptom pathology, were observed on Avoidant, Paranoid, Schizoid, Schizotypal, PTSD, Dysthymia and Thought Disorder scales.

Many of the Clinical Personality scales were positively correlated (Table 1), with strongest positive correlations observed between Masochistic and Depressive scales, $r(148) = .78, p < .001$; Borderline and Negativistic scales, $r(148) = .77, p < .001$ and Avoidant and Dependent scales, $r(148) = .76, p < .001$.

Table 1. Interrelationships among the MCMI-III clinical personality scales.

Scale	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Antisocial	–													
2. Avoidant	.21**	–												
3. Borderline	.59**	.59**	–											
4. Compulsive	–.42**	0.01	–.26**	–										
5. Dependent	.28**	.76**	.63**	–.09	–									
6. Depressive	.28**	.75**	.69**	–.04	.74**	–								
7. Histrionic	.17*	–.59**	–.23**	–.04	–.35**	–.53**	–							
8. Masochistic	.35**	.71**	.74**	–.05	.75**	.78**	–.38**	–						
9. Narcissistic	.21**	–.52**	–.12	.02	–.40**	–.42**	.63**	–.23**	–					
10. Negativistic	.61**	.58**	.77**	–.26**	.56**	.61**	–.23**	.63**	–.04	–				
11. Paranoid	.36*	.63**	.59**	.06	.52**	.55**	–.21**	.63**	–.01	.68**	–			
12. Sadistic	.71*	.31**	.58**	–.25**	.33**	.31**	.08	.40**	.25**	.65**	.60**	–		
13. Schizoid	.26**	.65**	.45*	.02	.44**	.59**	–.63**	.53**	–.27**	.51**	.52**	.33**	–	
14. Schizotypal	.32**	.67**	.59**	–.06	.56*	.61**	–.32**	.60**	–.18*	.56**	.71**	.47**	.58**	–

Note: $N = 150$.* $p < .05$.** $p < .01$.

Table 2. Interrelationships among the MCMI-III clinical syndrome scales and severe clinical scales.

Scale	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Alcohol Dependence	–									
2. Anxiety	.43**	–								
3. Bipolar: Manic	.36**	.49**	–							
4. Drug Dependence	.43**	.35**	.48**	–						
5. Dysthymia	.41**	.54**	.29**	.22*	–					
6. PTSD	.39**	.75**	.40**	.35**	.56**	–				
7. Somatoform Disorder	.25**	.48**	.25**	.12	.65**	.43**	–			
8. Delusional Disorder	.28**	.34**	.57**	.34**	.28**	.37**	.27**	–		
9. Major Depression	.33**	.59**	.32**	.25**	.74**	.63**	.80**	.32**	–	
10. Thought Disorder	.45**	.59**	.59**	.36**	.61**	.60**	.50**	.57**	.61**	–

Note: $N = 150$.

* $p < .05$.

** $p < .01$.

Interrelationships among MCMI-III Clinical Syndrome scales and Severe Clinical scales (Table 2) showed strongest positive correlations between Somatoform and Major Depression scales $r(148) = .80, p < .001$; PTSD and Anxiety scales $r(148) = .75, p < .001$ and Major Depression and Dysthymia scales $r(148) = .74, p < .001$. The strongest positive correlation observed across all scales was between AntiSocial and Drug Dependence scales, $r(148) = .83, p < .001$.

Treatment retention: by DOC (primary and secondary ATS)

Frequencies of programme completion and non-completion by DOC (primary and secondary ATS) indicate that more participants reporting ATS as primary rather than secondary DOC successfully completed the TC programme prior to discharge (Table 3). Across both groups, more participants (55.90%) left prematurely. Of those who did not complete, 46 (48.40%) of participants with ATS as their primary DOC and 73 (61.90%) of participants reporting ATS as their secondary DOC, left prior to completing the treatment. Of participants reporting ATS as the primary DOC, 28 (29.47%) left against advice of programme staff, and 48 (40.68%) of participants reporting ATS as the secondary DOC, similarly left against programme advice.

Two 2×2 Pearson's chi-square tests of independence were performed to examine whether DOC (primary and secondary ATS) was related to programme completion (*No* vs. *Yes*), and leaving against advice (*No* vs. *Yes*). Assumptions were met with a sufficiently large sample ($N = 213$, including three participants who reported continuing in the

Table 3. Frequencies of completers, non-completers and continuers by ATS as primary and secondary DOC.

Programme completion	Primary ATS	Secondary ATS	Total
Completion	48 (50.50%)	43 (36.40%)	91 (42.70%)
Non-completion	46 (48.40%)	73 (61.90%)	119 (55.90%)
(Continuing)	1 (1.1%)	2 (1.70%)	3 (1.40%)
Total	95	118	213

programme), and all cells having an expected count of more than five. Results indicated a significant association between DOC (primary or secondary ATS) and programme completion, $\chi^2(1, N = 210) = 4.14, p = .042$ (Table 3). However, there was no significant relationship between DOC (primary and secondary ATS) and leaving against advice, $\chi^2(1) = 3.74, p = .053$.

Personality factors and treatment retention

To determine what personality factors, if any, would predict treatment retention, a series of independent samples *t*-tests were conducted. Table 4 contains the means, standard deviations and *t*-values for the MCMI-III scale base rate scores for completing and non-completing residents.

No significant differences were observed between completers and non-completers across MCMI-III scales, although several differences between mean scale values were in the expected direction. Compared to those who completed a treatment programme; those who did not complete scored higher on Antisocial, Narcissistic, Negativistic, Sadistic, Schizoid, Schizotypal, Alcohol Dependence, Drug Dependence, Dysthymia and Major Depression scales.

Table 4. Means, standard deviations and *t*-values for the MCMI-III scales for completers and non-completers.

MCMI-III Scale	Programme completion		<i>t</i> (144)	<i>p</i>
	Completion (<i>M</i> (SD), <i>n</i> = 63)	Non-completion (<i>M</i> (SD), <i>n</i> = 83)		
<i>Clinical Personality scales</i>				
Antisocial	88.35 (12.80)	90.19 (15.32)	.077	.441
Avoidant	72.84 (30.34)	72.16 (29.54)	-0.14	.892
Borderline	79.78 (20.84)	78.20 (21.92)	-0.44	.662
Compulsive	41.65 (15.32)	37.66 (13.30)	-1.68	.095
Dependent	75.08 (28.95)	73.43 (28.64)	-0.34	.733
Depressive	82.06 (29.01)	82.78 (32.83)	0.138	.891
Histrionic	47.56 (20.18)	46.81 (18.60)	-0.23	.817
Masochistic	84.54 (23.34)	82.98 (27.79)	-0.36	.719
Narcissistic	59.19 (20.92)	62.53 (19.96)	0.98	.328
Negativistic	73.43 (27.25)	74.65 (25.49)	0.28	.781
Paranoid	69.62 (23.25)	67.29 (27.60)	-0.54	.590
Sadistic	74.98 (15.96)	78.75 (20.43)	1.25	.214
Schizoid	71.44 (26.40)	74.36 (20.54)	0.75	.454
Schizotypal	66.97 (24.73)	67.13 (22.89)	0.04	.967
<i>Clinical Syndrome scales</i>				
Alcohol Dependence	84.32 (16.34)	87.99 (18.72)	1.24	.217
Anxiety	84.70 (19.09)	80.72 (27.34)	-0.99	.326
Bipolar	72.89 (21.89)	70.52 (23.07)	-0.63	.531
Drug Dependence	96.21 (14.87)	97.36 (19.02)	.40	.691
Dysthymia	70.48 (23.23)	73.20 (25.48)	.67	.507
PTSD	68.43 (21.89)	66.83 (24.97)	-0.40	.687
Somatoform	58.32 (24.27)	56.86 (26.37)	-0.34	.732
<i>Severe Clinical Syndrome scales</i>				
Delusional Disorder	59.87 (25.16)	59.88 (30.07)	.00	.999
Major Depression	58.05 (28.74)	63.28 (27.19)	1.12	.263
Thought Disorder	66.68 (20.88)	64.25 (21.08)	-0.69	.490

Discussion

This study explored personality and psychopathology symptomatology of substance users who reported ATS as either their primary or secondary DOC. Treatment completion was then compared across groups (ATS as primary vs. secondary DOC) and MCMI-III scale scores compared among those who completed, and did not complete treatment to determine if personality was related to treatment retention.

In line with expectations, the presence of pathological symptoms, clinical syndromes and symptom pathology was observed for 19 of the 24 MCMI-III Clinical Personality, Clinical Syndrome and Severe Clinical Syndrome scales. A strong presence of pathological symptoms was observed on the Antisocial, Depressive, Masochistic, Alcohol Dependence, and Drug Dependence scales, with the Drug Dependence scale recording the highest mean score. Scores indicative of the presence of a clinical syndrome were observed on the Anxiety, Bipolar, Borderline, Dependent, Narcissistic, Negativistic and Sadistic scales.

Scores suggestive of symptom pathology were observed on the Avoidant, Paranoid, Schizoid, Schizotypal, PTSD, Dysthymia and Thought Disorder scales. These results are consistent with previous studies (Grilo, Martino, et al., 1997; Grilo, Walker, Becker, Edell, & McGlashen, 1997). Prior research particularly highlights the prevalence of anti-social personality disorder, major depression, bipolar disorder and PTSD (Jacobsen, Southwick, & Kosten, 2001; Kidorf et al., 2004; Ross, Dermatis, Levounis, & Galanter, 2003; Sbrana et al., 2005; Skinstad & Swain, 2001). Our results corroborate previous findings, confirming that co-morbidity is a prominent issue in general substance-using populations, and also specific to the current ATS-using population.

Treatment retention

Overall, approximately 43% of participants completed the TC prior to discharge. Although treatment rates for ATS users have been found to be similar to other substances (Hawke, Jainchill, & De Leon, 2000), this treatment completion rate exceeds those reported in previous studies, with rates recorded as ranging from 7% to 15% (McCusker et al., 1995) and 23.3% (Maglione, Chao, & Anglin, 2000). Nevertheless, the majority of participants did not complete the TC (approximately 56%). A comparison of substance users presenting with ATS as either primary or secondary DOC revealed more participants reporting ATS as their primary DOC (50.5%) than those with ATS as the secondary DOC (36.4%) completed the TC. However, the difference between the two groups was not significant. Of those participants who did not complete a programme, many left against advice (ATS as primary DOC: 48.4% and ATS as secondary DOC: 61.9%). Nevertheless, as results indicate that primary DOC among ATS users is not associated with treatment retention within the TC, this highlights the importance of relapse prevention training for all residents.

Personality factors and treatment retention

While certain personality disorders are more likely to indicate poor treatment retention and relapse (Ross et al., 2003), results revealed no significant differences in personality and psychopathology symptomatology between participants in this study who completed a programme, and participants who did not. Other researchers report similar findings, with some personality disorders being unrelated to TC treatment outcomes (Messina, Wish, Hoffman, & Nemes, 2002).

An additional explanation of the current findings is the potential for the TC to have impacted on personality and psychopathology symptomatology. Although personality

disorders are said to be resistant to change, stable over time and pervasive across a range of situations (American Psychiatric Association, 2000), there is evidence suggesting changes in personality disorders occur during treatment.

A longitudinal six-year study examining change in personality disorders during and post-treatment reported no change in some personality disorders, whereas significant changes were observed in Schizoid, Avoidance, Schizotypal and Borderline personality disorders (De Groot, Franken, van der Meer, & Hendriks, 2003). In accordance with these findings, it may be speculated that the current participants' personality scores may have changed over time, and therefore initial scores may be unrelated to treatment retention. Hence, examining participants' personality at both admission and throughout treatment may provide a better indication of the relationship between personality and treatment retention, and the role duration of treatment and specific interventions plays in successful outcome.

Limitations of the current study

Although the MCMI-III is reportedly a reliable and valid measure of personality pathology, reliance on this measure alone may be a limitation of this study. Self-report measures of personality have been suggested to over-report the presence and severity of personality disorders (De Groot et al., 2003). Therefore, given the complexity of personality pathology, a more comprehensive assessment may be appropriate, with the possible addition of a clinical interview, such as the Structured Clinical Interview for DSM-IV for Axis II personality disorders. A dichotomous approach may be more clinically beneficial in future studies.

Future directions

Future directions for research into the impact of personality and psychopathology on treatment retention within an ATS-using population include examining the changes in personality throughout treatment. Although several studies have researched changes in personality of drug-using populations in TC-based treatment (Calsyn, Wells, Fleming, & Saxon, 2000; De Groot et al., 2003; Haller & Miles, 2004; Ravndal & Vaglum, 1995), no reported studies have examined this occurrence specific to an ATS-using population. Conducting this research longitudinally would enable the measurement of ATS users' personality pathology at regular intervals, allowing further comparison and investigation into observed differences in personality disorders.

Alcohol is reportedly the primary DOC for most residents entering TC treatment (Magor-Blatch & Pitts, 2009). However, this study found heroin was the most commonly cited DOC after meth/amphetamines. Further examination of the relationship of DOC to personality and psychopathology is particularly relevant.

It is suggested that some personality disorders are resistant to standard interventions, such as CBT (Seivewright, Tyrer, & Johnson, 2004), although Matusiewicz, Hopwood, Banducci, and Lejuez (2010) found in a review of CBT treatments for personality disorders that CBT was an effective treatment modality, resulting in reduction of symptoms and enhancing functional diagnoses for some personality disorders. Axis I disorders (e.g. depression, anxiety) are generally considered as acute disruptions in normal functioning, whereas Axis II disorders have been understood as patterns of dysfunction and viewed as intractable. Nevertheless, there is growing evidence of improvement over time (McGlashan et al., 2005), and particularly as CBT appears to emphasise the connection between automatic thoughts and underlying schemas, which are thought to be both maladaptive and poorly regulated in those with personality disorders (Matusiewicz et al., 2010).

However, the additional concerns of poor cognitive functioning evident within this group (Gunn & Rickwood, 2009) raise concerns regarding the appropriateness of cognitively based approaches. Hence, the inclusion of third-wave CBT interventions, including ACT and mindfulness-based interventions (Magor-Blatch & Pitts, 2009) and DBT (Linehan et al., 1999), warrants investigation. In the TC, ACT is also well suited to the environment as it shares common ground with 12-step approaches (Wilson, Hayes, & Byrd, 2000), MI (Budney, Higgins, Radonovich, & Novy, 2000; Miller, 1996) and relapse prevention/harm reduction models (Carroll, 1996; Marlatt & Gordon, 1985). It is proposed that ACT also shares much in common with the principles of the TC, and provides an opportunity for personal assessment and growth in conjunction with the TC model.

Conclusion

Understanding personality and psychopathology of ATS users is an important addition to drug-abuse research, and subsequently informs the foundation of evidence-based treatment. This study revealed a high prevalence of personality and psychopathology symptomatology within an ATS-using sample and highlights the prevalence of co-morbidity within ATS-using populations. Co-morbidity has been associated with high levels of dropout, also observed within this study. Of interest, however, was the finding that those who nominated ATS as the primary DOC were more likely to have remained in treatment and that psychopathology was not related to programme completion, dropout or retention. Similar results have been found in other studies of TC populations (Darke, Campbell, & Popple, 2012) with this study likewise finding that poorer baseline results did not affect the person's chances of remaining in TC treatment.

While this study has been focused on the TC, which provides the unique opportunity for a contained treatment modality and 24-hour focus, it is recommended that future research also be extended to outclient services. In this context, an examination of the extent to which ATS users' personality pathology changes during treatment, thereby providing a further insight into suitable evidence-based treatment approaches specific to this population, will greatly add to the literature on treatment for this population group.

Note

1. Forty cases were deleted due to either missing or invalid data.

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