Psychosocial Functioning and Drug Use After Treatment in a TC: A Longitudinal Study

David Warmington and Frances V. O'Callaghan

ABSTRACT: De Leon's (2000) theory of addiction views it as a disorder of the whole person, having detrimental effects on both psychological and social functioning. Little research, however, has examined the relationship between psychosocial functioning and drug use outcomes after treatment. This study analysed measures of psychological and social functioning at three time points, and drug use at Time 3, for sixty-one ex-residents of a therapeutic community. The results indicated a contemporaneous link between drug use and poorer psychological functioning (supporting the whole person theory of addiction), but no effect was found for social functioning. More research is needed to establish the direction of causality between drug use and psychological functioning; bidirectional models of causality appear promising. Integrated models of treatment, addressing substance abuse disorders and mental disorders concurrently, are recommended for this population.

Introduction

Should chronic substance abuse be regarded as a stand-alone disorder, or is it better viewed in the context of an individual’s psychological and social functioning? This is a question that has important implications for the design of drug treatment programmes. Outpatient drug treatment programmes generally focus only on those behaviours and cognitions which relate specifically to substance abuse, such as coping with cravings and dealing with high-risk situations (Marlatt & Gordon, 1985), and enhancing motivation to change (Miller & Rollnick, 2002). This focus is in contrast with residential programmes such as therapeutic communities (TCs), which stress the importance of a 'whole person' approach, viewing the substance abuse as an integral part of the psychosocial functioning of the individual (De Leon, 2000). Despite the theoretical importance of this question, there have been few studies investigating the relationship between psychosocial functioning and substance abuse after treatment (Curran, Flynn, Kirchner & Booth, 2000; De Leon, 1984; De Leon & Jainchill, 1981-2; Tomlinson, Tate, Anderson, McCarthy & Brown, 2006).

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Psychological and social indices in drug treatment outcome research

Research into drug treatment outcomes has typically used psychological and social indices in either of two ways: (a) as predictor variables, generally showing that lower psychosocial functioning at baseline is associated with higher levels of post-treatment drug use (Charney, Palacios-Boix, Negrete, Dobkin & Gill, 2005; Hunter et al., 2000; Kranzler, Del Boca & Rounsaville, 1996; McKay & Weiss, 2001; McLellan, Luborsky, Woody, O'Brien & Druley, 1983), or (b) as outcome variables which are separate to drug use outcomes, generally showing that, at a group rather than an individual level, lower psychosocial functioning at follow-up is associated with higher levels of post-treatment drug use (Gossop, Marsden, Stewart & Kidd, 2003; Guydish et al., 1999; Hubbard, Craddock & Anderson, 2003; Simpson, 1981). These studies have not shown that those who used drugs were the same individuals with lower psychosocial functioning.

Categories of comorbidity

Sciaccia (1991) has identified a useful categorisation of substance users who also have mental health issues. The term 'mentally ill chemical abusers' (MICA) is used for those with a history of a severe mental disorder involving repeated psychotic episodes, such as schizophrenia or a major affective disorder, while the term 'chemically abusing mentally ill' (CAMI) is used for those with a history of less severe mental disorder, such as anxiety, depression, or personality disorder (PD).

In recent years, MICA populations have been the focus of a burgeoning body of research. Residential programmes have been successfully adapted to accommodate the needs of MICA individuals (Carroll & McGinley, 1998; Galanter, Egelko, Edwards & Vergaray 1994). Integrated models of both inpatient and outpatient treatment, enabling concurrent treatment of substance abuse and severe mental illness, are now regarded as best practice for MICA adults (Brunette, Mueser & Drake, 2004; Tsuang, Fong & Lesser, 2006).

Research in CAMI populations

There has been ample epidemiological research confirming that substance-using individuals (SUD) have a much higher rate of depression and anxiety disorders than the general population (Farrell et al., 2003; Merikangas et al., 1998; Teeson, Hall, Lunskey & Degenhardt, 2000). Research in the United States has found that, among those with a 12-month substance use disorder (and excluding substance-induced disorders), the incidence of affective disorders was 19.7% (compared with 8.1% for those without a substance use disorder); and the incidence of anxiety disorders was 17.7% (compared to 10.4% for those without a substance use disorder) (Grant et al., 2004).
Despite widespread acknowledgement of the extent of CAMI comorbidity, however, treatment outcome studies focusing specifically on CAMI populations are surprisingly rare. Burns, Teesson and O'Neill (2005) found poorer alcohol treatment outcomes at three-month follow-up in a group of outpatients with comorbid anxiety and/or depression compared with a non-comorbid group. In another recent study with both drug users and alcohol users, this effect was found to be more marked for those with concurrent depression and anxiety (Charney et al., 2005). An important study by Curran et al. (2000) highlighted the need for more investigation into the relationship between post-treatment mental health and substance use outcomes. After a 21-day alcohol inpatient treatment programme, more severe post-treatment depression symptoms at 12-month follow-up were associated with increased incidence of relapse. Surprisingly, however, those who reported depression symptoms only at follow-up had equivalent relapse rates to those who reported persistent depression symptoms across time (i.e. at both baseline and follow-up). In another study, negative affective states were found to precede post-treatment drug use more frequently in CAMI individuals than in SUD-only individuals (Tate, Brown, Unrod & Ramo, 2004).

Residential drug rehabilitation programmes, such as TCs, provide a useful opportunity to study CAMI populations. Generally, most individuals with substance abuse problems severe enough to warrant residential treatment also have some history of a mental disorder such as anxiety or depression. MICA individuals are not admitted into most TC programmes and were excluded from this study.

**Psychological functioning**

Despite the common exclusion of clients with serious mental health problems from most TCs, over 70% of TC clients have been found to have a lifetime non-drug psychiatric disorder such as depression, antisocial PD or borderline PD (Jainchill, 1994). There is ample evidence of improvement in psychological functioning during TC treatment (Carroll & McGinley, 1998; De Leon, 1989; Kennard & Wilson, 1979). However, there is a dearth of studies showing that this improvement is correlated with decreased drug use (De Leon, 1984; De Leon & Jainchill, 1981-2). Two studies in particular have highlighted the need for further investigation to clarify this issue: comparing the effectiveness of day treatment and TCs, no difference was found between the two modalities in drug use outcomes at six and eighteen months, but greater social and psychological improvement for the TC clients was evident (Guydish, Werdegar, Sorensen, Clark & Acampora, 1998; Guydish et al., 1999). This would appear to contradict the whole person model, which would predict better drug use outcomes for those with greater social and psychological improvement. However, the study may have been weakened by differences in the two groups at baseline, despite random allocation to treatment.
Social functioning

Social learning theory also predicts that success in drug treatment is associated with improved social functioning, and there is some empirical support for this. It has been shown that in residential treatment programmes, drug use outcomes are related to the participant’s post-treatment level of social support (Broome, Simpson & Joe, 2002; Hser et al., 1999) and relationship functioning (Ravndal & Vaglum, 1994a). However, in contrast to these studies, Ravndal’s (2001) outcome study in a Norwegian TC found that programme completion did not predict drug use outcomes, but did predict better post-treatment social functioning. More investigation is needed in this area.

Direction of causality

Various models have been proposed to explain possible directions of causality between substance use and mental disorders. These models have been reviewed in terms of their relevance to MICA individuals (Mueser, Drake & Wallach, 1998), but they can also be applied to CAMI individuals. They are grouped into four categories: (a) secondary substance use disorder models propose that a mental disorder increases vulnerability to a substance use disorder; (b) secondary psychiatric disorder models propose that substance use precipitates a mental disorder; (c) bidirectional models suggest that either disorder can increase vulnerability to the other disorder; (d) common factor models hold that comorbidity is a result of shared risk factors such as genetic loading (for which the evidence is mixed), or antisocial PD (for which moderately strong evidence exists for MICA individuals).

One of the secondary substance use disorder models, the multiple risk factor model, is relevant to CAMI individuals and bears a similarity to the whole person model of addiction. The multiple risk factor model, supported by indirect evidence (Mueser et al., 1998), holds that substance abuse is the result of a range of psychosocial risk factors such as the drive to alleviate dysphoria, association with drug-abusing peers, and lack of structured daily activities. The drive to alleviate dysphoria, or ‘self-medication’ (Khantzian, 1985), has been shown as an important motivation for substance use in recent studies of CAMI groups (Bizarri et al., 2007; Tate et al., 2004).

There is also evidence for the secondary psychiatric disorder models, also known as the ‘rebound effect’, which propose that drug use produces or increases psychiatric symptoms (Tomlinson, Tate, Anderson, McCarthy & Brown, 2006). A comprehensive review by Schuckit (2006) has indicated that substance-induced mental disorders contribute significantly to the incidence of comorbidity.

The present study

The primary aim of this study was to examine the relationship between drug use, and psychological and social functioning, after residential rehabilitation treatment (regardless of the length of time since treatment). The study aimed to
examine one aspect of the theory of addiction as a disorder of the whole person, which underpins TC treatment. It was predicted that (1) generally, residents would show an improvement in psychological functioning during the time they were in the programme from Time 1 (T1) to Time 2 (T2); (2) improvement in psychological functioning would be maintained in those who did not experience problem drug use after treatment (T2 to Time 3 (T3)) - those who returned to problem drug use would either show a lack of improvement, or a decline after an initial improvement (T1 to T2 to T3); and (3) those who did not experience problem drug use after treatment would show better social functioning (T1 to T3) than those who returned to problem drug use.

Method

Participants and procedure

One hundred and ten ex-residents of a TC located in NSW, Australia were recruited from various sources. After residents leave the TC, they are followed up by means of a phone interview one to two years later. The first author, who was employed by the drug treatment agency at the time, conducted these follow-up phone calls and asked each ex-resident if they would be willing to complete an additional questionnaire as part of the research. Fifty-seven agreed to participate, thereby allowing their TC data to be included in the current study. Further participants were recruited at an ex-residents' reunion function attended by the first author. They were approached individually and asked if they would participate in the current study (18 agreed). Finally, information leaflets advertising the study were left in drug treatment venues and other services such as coffee shops within the local region inviting former residents of the TC to contact the researchers if they were willing to be involved in the study, with 35 people responding to these appeals.

Ex-residents were sought who had been at the TC for a period of at least eight weeks, within the past five years, and had left the programme at least six months previously. An incentive for returning a completed questionnaire was offered (i.e. being included in a draw for a $200 shopping voucher). The questionnaire package (including a consent form for participation in the current research as well as consent for access to their TC data) with a pre-paid return envelope was mailed to participants.

Sixty-three participants returned completed questionnaires, a response rate of 57%. This compares favourably with response rates for similar mail surveys in Australia (see Latuken, 1987; O'Callaghan & Alcorn, 2002). Data from two participants were discarded - one who had left the TC programme only four months previously, and another who had left the programme six-and-a-half years previously. This left a total of 61 participants.

On receipt of the questionnaires and consent forms, each participant's TC file was accessed and relevant data collected. Prior to mailing, each questionnaire package was given a research code number to identify clients, so
that there was no need for the participant to identify themselves. The study was approved by the Human Research Ethics Committee of the authors’ university.

**Measures**

*The Symptom Checklist-90-Revised (SCL-90-R)* (Derogatis, 1994). This is a widely-used measure designed to assess psychological problems as well as psychopathology. It comprises ninety items rated by respondents on a 0-4 scale, according to their subjective level of symptomatic distress over the previous two weeks. An overall score (the Global Severity Index or GSI) is obtained, a higher score representing poorer psychological functioning. The measure has sound reliability and validity (Dawe & Mattick, 1997).

All participants completed the SCL-90-R within two weeks of arriving at the TC (T1), and fifty-seven participants (93%) completed the SCL-90-R again at the time of leaving the programme (T2). The SCL-90-R was also included in the questionnaire package mailed to participants (T3).

*The Opiate Treatment Index – Social Functioning Section (OTI-SFS)* (Darke, Ward, Hall, Heather & Wodak, 1991). Twelve questions, which address issues such as employment, interpersonal conflict and social support, yield a possible score of 0-48, with a higher score indicating more problematic social functioning. This measure also has sound psychometric properties (Darke et al., 1991). Fifty participants (82%) completed the OTI-SFS at T1. The OTI-SFS was also included in the questionnaire package mailed to participants (T3).

*The Composite International Diagnostic Interview – Computerised Version (CIDI-Auto)* (Wittchen, 1994). This is a self-administered, computerised diagnostic interview, providing diagnosis of DSM-III-R Axis I disorders. Forty-nine participants (80%) completed the CIDI-Auto at T1. The interview version of the CIDI is regarded as having excellent technical equivalence to ratings by clinicians ($K=0.5-0.7$); and good overall diagnostic concordance with a clinical checklist ($K=0.7-0.8$) (Wittchen, 1994).

**Personal Factors in Drug Treatment questionnaire.** This is an eight-item questionnaire prepared by the researchers, asking about the participant’s drug use and drug treatment at T3. It was piloted with current residents to ensure face validity. For consistency of data, the drug history questions were based on those in the TC admission interview (T1).

**Results**

*Demographic data.* Of the 61 participants, 31 (50.8%) were female and 30 (49.2%) were male. The mean age of participants on commencement of the programme (T1) was 34.7, $SD=8.8$; the mean age at completion of the follow-up questionnaire (T3) was 37.5, $SD=8.6$. 

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*Image of a histogram*
**Time in residential programme (T1 to T2).** The amount of time between participants entering and leaving the residential programme (T1 and T2 respectively) ranged from 59 days to 301 days, with a mean of 188.7 days, *SD*=61.3.

**Time since leaving programme (T2 to T3).** The time elapsed between leaving the programme (T2) and completing the follow-up questionnaire (T3) ranged from six months to sixty-seven months, with a mean of 28.2 months, *SD*=14.7 months.

**Table 1: Primary Drug of Concern at T1 and T3**

<table>
<thead>
<tr>
<th>Drug</th>
<th>T1 (n = 61)</th>
<th>T3 (n = 24)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>N</em></td>
<td>%</td>
</tr>
<tr>
<td>Heroin</td>
<td>32</td>
<td>52</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Alcohol</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Cannabis</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Cocaine</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Opiates</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Drugs of concern.** The primary drug of concern for participants at T1 and T3 is summarised in Table 1. At T3, twenty-four participants indicated that they had experienced problem drug use during the previous six months. At T1, 84% of participants nominated at least one other drug as a secondary concern and, at T3, 55% of those with problem drug use nominated at least one other drug as a secondary concern.

**Mental health.** Forty-six participants (94% of those who completed the CIDI-Auto) met the full criteria for at least one DSM-IV Axis I diagnosis (other than substance use disorders) within the twelve months prior to T1. The mean number of Axis I diagnoses (other than substance use disorders) for all participants who completed the CIDI-Auto was 3.0. Thirty-eight participants (78%) met the full criteria for an anxiety disorder, thirty-five participants (71%) met the full criteria for a mood disorder, and thirty participants (61%) met the full criteria for both an anxiety disorder and a mood disorder, within the previous twelve months. No information was available for Axis II diagnoses (PDs).

**Results**

**Note.** Cell sizes differ across analyses due to missing data for the OTI-SFS at T1 (eleven cases), the SCL-90-R at T2 (four cases), and treatment history (one case). All analyses using data from the SCL-90-R focused on the Global Severity Index (GSI) score only.
Change in psychological functioning during treatment

To test the hypothesis that participants' psychological functioning would improve over the course of treatment (i.e., from T1 to T2), a repeated measures t-test was performed on the GSI score. There was a significant decrease in GSI from T1 ($M=1.38$, $SD=0.66$), to T2 ($M=0.64$, $SD=0.45$, $t(56)=9.02$, $p<0.01$). This indicates an overall improvement in psychological functioning for all participants over the course of the programme, from a mean T-score of 80 to a mean T-score of 64 (using non-patient norms) (Derogatis, 1994). The result supports the prediction that participants would show an improvement in psychological functioning across the time of the programme.

Change in psychological functioning across time between recent and non-recent users

To test whether differences in psychological functioning at T1, T2 and T3 existed between those participants who reported having experienced problem drug use in the six months prior to T3 ($n=20$), and those who did not ($n=37$), a repeated measures ANOVA was performed, using a 2 (drug use: recently using, recently non-using) X 3 (time: T1, T2, T3) mixed-model design, with GSI score as the dependent variable. The results are shown in Figure 1 (lower scores indicate better psychological functioning).

![Figure 1: Mean GSI scores of recently using and recently non-using groups](image)

Significant main effects were found for both drug use, $F(1, 55)=5.94$, $p<0.05$, and time, $F(2, 110)=36.36$, $p<0.001$. A significant drug use X time interaction
was also found, $F(2, 110)=5.55$, $p<0.01$. No significant difference was found between the recently using and recently non-using groups at T1, $t(59)=0.63$, or T2, $t(55)=0.14$, $p>0.05$. However, at T3, the recently non-using group showed significantly higher psychological functioning (i.e. lower GSI scores, $t(59)=3.85$, $p<0.01$) than the recently using group.

**Change in social functioning across time between recent and non-recent users**

A repeated measures ANOVA was performed to test whether differences in social functioning at T1 and T3 existed between the recently using group ($n=15$), and the recently non-using group ($n=35$). This involved a 2 (drug use: recently using, recently non-using) X 2 (time: T1, T3) mixed-model design, with the OTI-SFS score as the dependent variable. The results are shown in Figure 2 (lower scores indicate better social functioning).

**Figure 2: Mean OTI-SFS scores of recently using and recently non-using groups**

A significant result was found for the main effect of time, $F(1, 48)=16.74$, $p<0.001$. However, no significant result was found for the main effect of drug use,

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1 To determine whether outcomes were affected by the amount of time elapsed since participants left the programme, these variables were further tested with the covariate of time since leaving the programme. No significant result was found for this covariate, $F(1)=0.21$, $p>0.05$. Results of the main effect interaction remained significant, $F(1)=8.44$, $p<0.01$. 

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no significant drug use X time interaction was found, 
$F(1, 48)=0.43, p>0.10$.

**Discussion**

The overall aim of the present study was to gain information about the relationship between psychosocial functioning and drug use, after treatment in a TC.

**Psychological functioning.** A significant improvement in psychological functioning was found for all participants from T1 (entry to the TC programme) to T2 (leaving the TC programme). This supports the prediction of Hypothesis 1, that participants would show an improvement in psychological functioning across the time of the programme, and is consistent with previous research (Carroll & McGinley, 1998; De Leon, 1989; Kennard & Wilson, 1979).

The most important finding was that those who reported no drug use at T3 showed significantly higher psychological functioning at T3 (but not T1 or T2), than those who did report recent drug use. This supports the prediction of Hypothesis 2, and is consistent with the limited number of studies which have explored this relationship (Curran et al., 2000; De Leon, 1984; De Leon & Jainchill, 1981–2). This indicates a contemporaneous link between drug use and poorer psychological functioning, and supports the whole person theory of addiction. In particular, it shows agreement with the finding by Curran et al. (2000) that post-treatment relapse rates are related to psychological functioning **at the time of relapse**. The implications of this finding are discussed later in terms of (a) direction of causality, and (b) treatment models.

**Social functioning.** No significant difference in social functioning at T1 and T3 was found between the recently using group and the recently non-using group. Hypothesis 3 was not confirmed, and the whole person theory of addiction was not supported. The result contrasts with previous findings that drug use outcomes are related to the participant’s post-treatment level of social support (Broome, Simpson & Joe, 2002; Hser et al., 1999). Unfortunately, the power of the analysis for this hypothesis was weakened by missing data at T1 (11 cases). As shown in Figure 2, a trend was in fact found for lower social functioning in the recently using group at T3 but, because there were only 15 cases in this group, power was limited and a significant result was not obtained.

**Implications**

**Direction of causality.** The bidirectional models remain largely untested, but could explain findings supporting both secondary substance use disorder models and secondary psychiatric disorder models. For instance, it is possible that substance use occurs after negative affective states (secondary substance use disorder model), and subsequently has adverse effects on psychological functioning (secondary psychiatric disorder model). This could be a reasonable
explanation of the finding of the present study; however, more research is needed to establish whether bidirectional causality exists.

**Integrated treatment models.** Regardless of the direction of causality, the results of the present study suggest that CAMI individuals would benefit from treatment approaches which integrate both mental health and substance abuse interventions (Horton, 1997), just as integrated treatment for MICA populations is now recommended (Brunette et al., 2004; Tsuang et al., 2006). Currently, CAMI individuals are serviced chiefly by the alcohol and other drug treatment services, which do not generally focus on mental health interventions (Kay-Lambkin, Baker & Lewin, 2004). There is evidence that, for SUD individuals with poor psychological functioning, an intervention which includes clinician involvement may achieve better outcomes (Ray, Weisner & Mertens, 2005; Woody, McLellan, Luborsky & O'Brien, 1991).

Although Australian outpatient studies have found that those who complete brief cognitive-behavioural therapy (CBT) substance abuse interventions show improved mental health outcomes, these effects may not be robust (Kay-Lambkin et al., 2004; Feeney, Connor, Young, Tucker & McPherson, 2006). Generally, it is reasonable to suggest that interventions aimed at reducing substance use in CAMI individuals are more effective if they also address depression and anxiety (e.g. Clarkin & Kendall, 1992; Myrick & Brady, 2001; Scott, Gilvary & Farrell, 1998). An integrated CAMI outpatient programme may involve weekly psychoeducational group sessions, occasional supportive individual psychotherapy sessions, and psychiatric treatment where appropriate (Charney et al., 2005).

There is also potential for more integration of treatment for CAMI individuals at the inpatient level (Grella & Stein, 2006). Although, as this present study demonstrates, traditional TC programmes (without specifically targeted mental health interventions) can improve the mental health of CAMI individuals, it may yet be possible to improve on this success. The modification of TCs to include the addition of specialised mental health staff may be worth considering. TC programmes can be augmented with psychological interventions such as CBT (Burling, Seidner, Salvio & Marshall, 1994; Vassilev & Groshkova, 2007), motivational interviewing (Santa Ana, Wulfert & Nietert, 2007), and mindfulness-based stress reduction (Marcus et al., 2003). This would be a logical next step in the improvement of residential service delivery, and a suitable acknowledgement that residential substance abuse treatment, in targeting CAMI individuals, is already performing a de facto mental health service role.

A primary limitation of the present study was the small sample size which limited the power of the statistical analyses that could be undertaken. Added to this was the effect of missing data for the social functioning analysis: the trend towards lower social functioning for the recently using group could possibly prove to be a significant one with the greater power afforded by a larger sample. There is also the possibility of bias due to self-selection of participants. Ethical considerations prevented us from obtaining information from those who

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chose not to participate in the research and this may have biased the sample towards the inclusion of more successful ex-residents since we were not able to follow up all ex-residents of the TC. There were also considerable variations in the amount of time that elapsed between T2 and T3 and there is no information available about events that may have influenced the participants during this time.

A limitation of questionnaire research in general is the reliance on self-reporting of drug use by respondents, although there is evidence for the accuracy of drug users' self-reports (Broome, Simpson & Joe, 2002; Weatherby et al., 1994). However, there are sound reasons to believe that, for the purpose of this research, self-reporting of drug use was acceptable. First, one consistent finding has been that, although drug users may not report all of their use, few fail to report any of it (Magura, Goldsmith, Casriel, Goldstein & Lipton, 1987).

Thus, a comparison between those who reported some use and those who did not is likely to be based on reasonably accurate data. Second, the questionnaire was confidential, self-administered, and there were no consequences for reporting drug use - all conditions recommended for an accurate self-report (Harrison, 1997; Maiisto et al., 1990; Weatherby et al., 1994). Finally, the questions were phrased in line with recommendations for improved cognitive processing: using simple language, some aided recall (listing substances), and referring to a specific, recent time period (Babor, Brown & Del Boca, 1990). A written questionnaire was suited to the population under investigation: low-literacy clients are generally not admitted to the TC programme, as it entails a proportion of written work.

A further limitation of the present study was the lack of information about participants' PD diagnoses. This information would have provided a useful area of examination in relation to both psychological and drug use outcomes. As PDs are an important component of CAMI populations, more evaluation is needed regarding the effectiveness of traditional TC programmes in treating PDs, particularly since traditional TC programmes could be modified to provide an ideal platform for proven interventions which specifically target PDs.

References


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