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A systematic review of studies examining effectiveness of therapeutic communities

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Abstract

Purpose – The purpose of this paper is to systematically review quantitative research since 2000 on the effectiveness of residential therapeutic communities (TCs) for the treatment of substance-use disorders with reference to substance-use, crime, mental health and social engagement outcomes.

Design/methodology/approach – A systematic search with broad inclusion criteria resulted in the review of 11 studies. The studies investigated community-based TCs, as well as TCs modified for prisoners, prisoners transitioning to community living and TCs for individuals with co-occurring substance-use and mental health issues.

Findings – Results were analysed by comparing the findings of the studies under investigation, of which three studies investigated within-subjects outcomes, four compared TC treatment with a no-treatment control condition and four compared TC treatment with another treatment condition. Conclusion: consistent with previous systematic reviews of TCs, outcomes varied across studies but indicated TCs are generally effective as a treatment intervention, with reductions in substance-use and criminal activity, and increased improvement in mental health and social engagement evident in a number of studies reviewed.

Research limitations/implications – Variability in outcomes suggests further TC research and research syntheses focusing on a second key research question in the evaluation of complex interventions – how the intervention works – could play an important role in understanding TC effectiveness, and for whom it is effective and in what contexts.

Practical implications – Although there is some variability in treatment populations included in this review, evidence reported in other studies suggests individuals with severe substance-use disorders, mental health issues, forensic involvement and trauma histories, will benefit from TC treatment. This is supported by the literature which has found a general relationship between severity of substance use and treatment intensity (Darke et al., 2012; De Leon et al., 2008) with outcomes further enhanced by self-selection into treatment and appropriate client-treatment matching (see De Leon, 2010; De Leon et al., 2000, 2008). The weight of evidence gleaned from multiple sources of research, including randomised control trials and field outcome studies (De Leon, 2010) suggests TCs are an important and effective treatment for clients in improving at least some aspects of their quality of life, specifically mental health and social engagement, and in reducing harmful behaviours, including substance-use and crime. Variability in treatment setting and populations reflect the real-world setting in which TC treatment is delivered, providing a multifaceted treatment modality to a complex population in variable circumstances.

Originality/value – The strength of the current study is that it provided a broad evaluation of TC effectiveness across a range of outcomes (substance-use, criminal activity, mental health and social engagement), and is therefore valuable in updating the current literature and providing context for future research in this area. It aimed to address a key question in evaluating complex interventions: whether they are effective as they are delivered. Findings suggest that TC treatment is generally effective for the populations of concern in reducing substance use and criminal activity and contributing to some improvement in mental health and social engagement outcomes.

Keywords Therapeutic communities, Substance use treatment, Prisoners, Systematic review, Mental health issues, Treatment intervention

Paper type Research paper

Substance-use disorders are associated with high rates of morbidity and mortality (World Health Organisation (WHO), 2010), poor family relationships (Pitts, 1991) and violent and non-violent crime (Boles and Miotto, 2003; Newcomb et al., 2001). Hence, treatment is considered important for individuals and societies globally (WHO, 2010). Therapeutic communities (TCs) provide a treatment

model in which the community itself, through self-help and mutual support, is the principal means for promoting personal change. As a model of established treatment, the TC includes both clients (residents) and staff as participants in the management and operation of a caring community to challenge antisocial and problematic behaviours and evoke psychological, social and behavioural change. TCs support the development of prosocial behaviours and a positive learning environment through a combination of therapeutic involvements between residents and staff and among residents (especially senior and junior residents). They provide a “living-learning situation” (Kennard, 2004), within a 24-hour milieu, where everything that happens between members of the TC in the course of living together, and in particular when a crisis occurs, is used as a learning opportunity. Hence, the TC community provides multidimensional treatment involving therapy, education, values and skills development, with a common theme of self-help and the notion that residents/clients play an integral, active role in their own therapy and in the therapy of others. While TCs have traditionally utilised long-term residential settings, modified therapeutic communities (MTCs) are now widely established as both outpatient and, more commonly, abbreviated or shorter term (three to nine months) residential programmes.

The TC model has been adapted to different treatment settings and different populations, dating back over arguably hundreds of years, including TCs for: children and adolescents; people with long-term psychosis or acute mental problems; offenders with histories of drug abuse, violence, robbery and sex offences; and those with learning difficulties (Kennard, 2004). These have included small domestic households of just a few residents to large institutions within psychiatric and custodial settings.

Prevalent and established treatment modalities for substance-use disorders include detoxification, outpatient methadone maintenance, counselling, short- and long-term residential treatments, and harm-reduction services. TCs are part of the residential treatment landscape (Etheridge *et al.*, 1997; WHO, 2010), playing an important role in effectively treating populations with more severe substance-use and psychosocial needs when compared with other treatment modalities (De Leon, 2010; Etheridge *et al.*, 1997; Gossop *et al.*, 1999).

MTCs service different populations, including mentally ill homeless clients (Nuttbrock *et al.*, 1997), women with children (Coletti *et al.*, 1992; Stevens *et al.*, 1997; Stevens and Glider, 1994; Wexler *et al.*, 1998), youth (De Leon and Deitch, 1985; Jainchill, 1997), prisoners (McKendrick *et al.*, 2007; Sacks *et al.*, 2004; Wexler *et al.*, 1999) and clients with co-occurring substance-use and psychiatric conditions (De Leon *et al.*, 1999; Sacks *et al.*, 1998).

Although TCs have a long research history (Broekaert *et al.*, 2006; De Leon, 2010), the Cochrane hierarchy of scientific evidence suggests a limited evidence-base. Nevertheless, previous systematic reviews have found TCs to be at least as equally effective as other treatment modalities in reducing substance-use and criminal activity, and in increasing stability of employment (Prendergast *et al.*, 2002; Simpson and Sells, 1982; Vanderplasschen *et al.*, 2013). In their meta-analysis, Prendergast *et al.* (2002) found that although outcomes for TC treatment did not significantly differ to other treatment modalities (specific techniques, methadone maintenance, outpatient drug-free and detoxification), TCs had a statistically and clinically meaningful effect on reduction of drug use and crime.

A meta-analysis of four studies on TC effectiveness for mentally ill substance-users found significant reductions in substance use and crime, and improvements in employment, housing and mental health compared with treatment as usual (Sacks *et al.*, 2010). A further systematic review of randomised controlled trials (including both short- and long-term TCs) compared TCs to other treatments, no treatment or other TCs, and found significantly fewer TC clients had a positive urinalysis at follow-up when compared to community residential treatment (Smith *et al.*, 2008). There was no difference between outcomes for longer term and abbreviated TCs (six-month residential phase) (Nemes *et al.*, 1999; Nuttbrock *et al.*, 1998). In addition, prison-based studies have shown significant reductions in criminal activity at 12-month follow-up for TC participants compared with participants receiving prison-based mental health treatment or no treatment (Sacks *et al.*, 2004; Wexler *et al.*, 1999).

Despite results suggesting TCs are more effective than other residential and mental health treatments, Malivert *et al.* (2011) and Smith *et al.* (2008) assert their findings were inconclusive due to

methodological limitations of studies, including heterogeneity of follow-up, assessment of substance use at treatment commencement and absence of data related to substance use post-treatment. Yates *et al.* (2010) contend that basing evidence primarily on the randomised control trial does not reflect the complexity of the TC treatment modality, and the involvement of interdependent treatment components. Of consideration are both ethical and procedural difficulties in assigning participants to a modality which may not match their treatment needs (De Leon *et al.*, 2008).

Randomisation procedures and intention-to-treat analyses have also been marred by high dropout rates and participants' engagement in treatment modalities outside their assigned treatment group (Bale *et al.*, 1980; Simpson and Sells, 1982). Individualised treatment may also limit standardisation (De Leon, 2010; National Institute of Drug Abuse (NIDA), 2009). These factors have restricted systematic statistical analysis (Smith *et al.*, 2008). Therefore, research evidence supporting TCs must be interpreted with consideration of these factors.

The Medical Research Council provides guidelines for evaluating interventions with such inherent complexity, suggesting key questions in evaluating complex interventions are:

RQ1. Whether, as delivered, they are effective?

RQ2. How the intervention works? (Craig *et al.*, 2008).

These authors suggest systematic literature reviews form the foundation for answering these key questions.

Aims of the current study

The current review focuses on the first of these questions, evaluating TC effectiveness, and addresses the need for evidence to be consistently updated and amalgamated in order to answer the key question of whether TCs are effective in everyday practice. A summary of quantitative research since 2000[1] is provided through systematic review and addresses a gap in the current literature by setting broad inclusion criteria in the analysis of non-randomised studies. Systematic reviews that include non-randomised studies facilitate the dissemination and analysis of studies for which RCT methodology is problematic (Ferriter and Huband, 2005). To our knowledge only two recent reviews (Malivert *et al.*, 2011; Vanderplasschen *et al.*, 2013) included non-randomised studies. However, these review articles are "narrative" (often considered a traditional approach) in nature, lack quantitative summary of the scientific literature, and do not systematically examine the effectiveness of TC studies using the standardised protocol for systematic review methodology as described in the following section. Unlike a narrative review, a systematic review utilises a procedure to comprehensively identify all studies examining specified focused questions, assesses the methods/designs used in the studies, summarises the results, presents key findings, determines reasons for different results across studies and specifies limitations of existing knowledge base (e.g. Garg *et al.*, 2008). Furthermore, these narrative reviews examined a limited range of outcomes (e.g. Malivert *et al.*, 2011 examined TC effectiveness in terms of abstinence only, and to determine if there were predictive factors of abstinence; while Vanderplasschen *et al.*, 2013 were specifically interested in recovery, including attention to various life domains). Therefore, the present systematic review expands on previous reviews by including outcome measures related to harm reduction and rehabilitation of clients such as substance-use and crime outcomes, along with mental health and social engagement measures.

Method

The Cochrane Collaboration systematic review methodology, as outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins and Green, 2008) and the PRISMA 2009 Checklist for Systematic Reviews (Moher *et al.*, 2009) were utilised.

Search strategy

A systematic literature search was conducted using PsycINFO, Academic Search Complete and PubMed Complete databases using search terms: drug abuse/drug addiction/substance abuse

and MTCs/TCs and outcomes/treatment outcomes/effectiveness. Titles and abstracts were reviewed by the primary researcher and potentially applicable studies obtained. Studies for which the title and abstract provided insufficient information were also obtained for further review. To ensure a more comprehensive review of the available literature, the reference list of articles, review articles and chapters focusing on TCs for substance-use were also screened for relevant articles.

Study selection

To be eligible for inclusion, studies must have investigated quantitative outcomes of residential TC treatment for adult substance-users (18 years or older), with outcome measures for substance-use, criminal activity, mental health and/or social engagement. These measures were chosen as they are common in this research area (Hubbard *et al.*, 1997; Nuttbrock *et al.*, 1998; Pitts, 1991; Prendergast *et al.*, 2002; Teichman and Basha, 1996) and address the aim of TCs to reduce the harm associated with substance-use (e.g. psychological distress, criminal activity, social disengagement and risky behaviour), and to rehabilitate people to become healthy participants in society. We included studies that were randomised or quasi-randomised controlled trials of TC intervention with “no” or “related” treatment service and repeated measures designs with follow-up of at least six months. For the present systematic review, we included studies published only in English language peer-reviewed journals and over at least the past decade, as there has been a steady recorded increase in the conduct of studies in the area over this time period (e.g. Whitemore and Knaf, 2005). In addition, a comprehensive review (Prendergast *et al.*, 2002) examining a range of outcome measures – of interest to our current review – is a decade old, providing further rationale to include studies published since the 2002 review. More specifically, the present review included studies published between 2000 and 2012.

Further eligibility criteria included adherence to traditional TC principles or concepts, referred to De Leon (2000) as a basis for the programme, or included a description of traditional TC treatment elements (self-help, mutual self-help, community-as-method). All potentially relevant articles for inclusion were independently reviewed by the second and third authors and any disagreements resolved through discussion. Variables of interest were based on those extracted in Prendergast *et al.* (2002). Additional variables included descriptors of TC and control treatment components (including community-as-method, self-help, progression through stages, relapse prevention, psychoeducation, criminal thinking, parenting skills, anger management), definitions and specific details of outcome measures (self-report, official records, urinalysis), eligibility criteria for study and TC entry, and details of participants unable to be followed up.

Assessment of risk of bias

Studies were assessed for risk of bias with reference to the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins and Green, 2008) including selection bias, systematic differences in exposure factors other than the intervention of interest (performance bias), blinding procedures, attrition bias and selective reporting of outcomes.

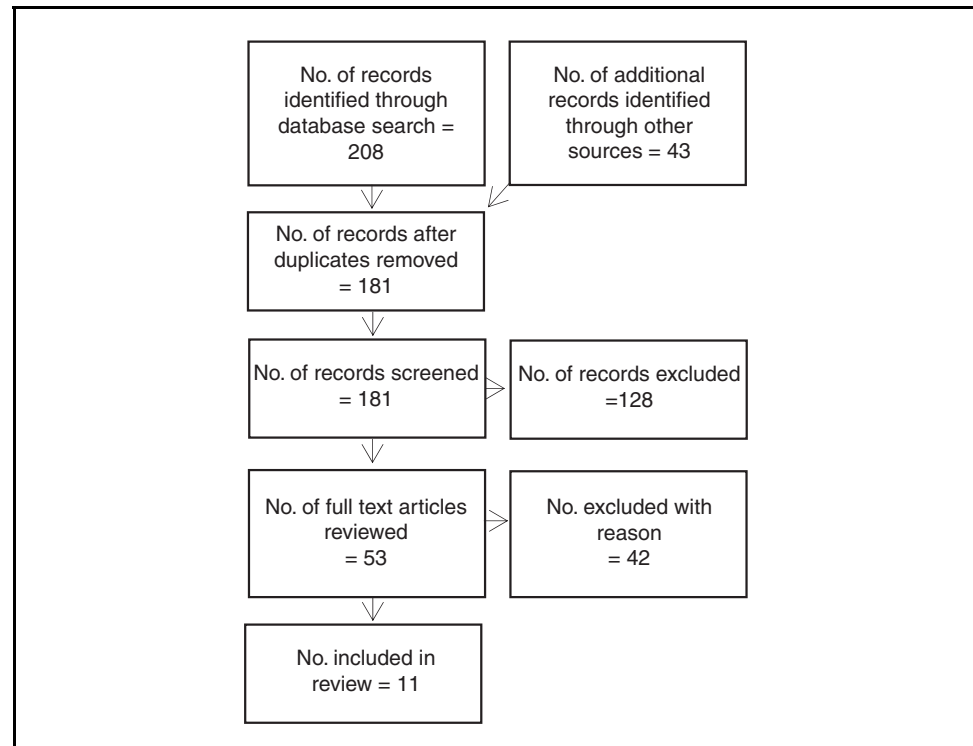
Results

Search results are shown in Figure 1. Of the 42 articles excluded, 21 did not report baseline and/or follow-up data; six were not TCs or provided insufficient information on treatment modality; five reported outcomes related to components of treatment-only; and one was a review article. Nine studies used the same cohort as a selected study. The final review included 11 studies (see Table I).

Demographic characteristics of participants in included studies

Five studies included male participants only; four, both male and female; and two, female participants only. Of the mixed-gender studies, females comprised 15-31 per cent in the sample. Mean age of participants in each study was between 26 and 38 years. Eight of the studies reported ethnicity of participants with some variability in racial profile: Caucasian (27-56 per cent), African American (17-74 per cent), Hispanic (2-39 per cent), or other

Figure 1 Systematic search results



(1-17 per cent). Five studies reported marital status (33-73 per cent of participants never being married). Variability was also found in educational attainment. Five studies reported 16-64 per cent of the sample had completed high school equivalent or higher education; and 11 years' education was reported as the mean by an additional three studies. Five of the six studies reported on employment, noting about 50 per cent of participants had been employed for a period of 6-12 months prior to TC or prison entry.

Half of the studies reported a primary drug of concern for participants, with notable variations between samples: opiates (4-72 per cent), alcohol (11-56 per cent), crack/cocaine (6-70 per cent) and amphetamine-type stimulants (21-58 per cent). Additionally, half of the studies reported on the mental health history of participants, with 59-96 per cent having a history of mental health treatment or diagnoses. When reported (three studies), a high proportion of participants had a history of physical (71-98 per cent), sexual (32-75 per cent) and childhood sexual abuse (39-87 per cent).

Of the community-based TC participants, one study reported 40 per cent were on probation and another reported 51 per cent had arrest or conviction histories. The remaining studies reported criminal history as mean number of arrests (lifetime arrests: 9-17) or number of years incarcerated (4.1-6 years).

Characteristics of TCs programmes utilised in included studies

Studies described adherence to TC principles in a variety of ways. All identified traditional TC philosophies, principles or concepts, or outlined several specific traditional TC elements, such as community meetings, facilitation of self-help and mutual self-help, encounter groups, progression through stages and/or hierarchical structure. However, only seven studies provided a more comprehensive programme description as defined by a clear reference to TC philosophy. These included a statement of community-as-method and self-help principles or reference to De Leon (2000) as the basis of the programme, describing at least four additional treatment components. Additional treatment components were outlined by all but two of the studies and included psychoeducation, individual and group counselling, challenging criminal-thinking and behaviour, employment or education support, living/coping/relationship/parenting and/or anger

Table 1 Summary of studies included in systematic review

Study and country	N	% follow up	Gender and mean age (years)	TC type (duration in months)	Comparison	Outcome measure		Statistical outcome		Outcome summary
						Pre	Post	Pre	Post	
Fernandez-Montalvo et al. (2008) Spain	414	37	M/F	Community (9)	Pre with Post	Drug Use	1.0	0.47	Post 72 months	Proportion of individuals using drugs reduced from 100% to 46.5%. Significantly fewer program completers relapsed (32.7% compared with the program dropouts (83.3%). Employment increased from 44.5% at baseline to 57.8% at follow up
Hiller et al. (2002, 2006) USA	526	96	M/F	Probation	TC with randomly selected probationers (control)	Employed Arrest	0.45	0.58	OR 24 months	
Inciardi et al. (2004) USA	1,077	50	M/F	Prison Work- Release (6)	TC with standard work release (control)	Graduates Non-completers	1.50	1.60	OR 60 months	
Messina et al. (2010) USA	115	100	F	Prison (6)	Pre with post	Illicit Drug Use Arrest	4.49**	3.54**	3.54** 1.61*	At 12 months, both the graduates and non-completers were more likely to have been arrested for a serious felony offence compared with the control group. At 2 years, the graduates were less likely, but the non-completers remained more likely, to have been arrested for a felony offence compared with the control group
Prendergast et al. (2004) USA	715	81	M	Prison (9-12)	TC with no treatment group (control)	ASI scores	Pre M(SD)	Post TC M(SD)	12 months 0.07 (0.14)*	At 42-month follow-up the treatment group were 4.49 and 1.71 times more likely to be drug and arrest free, respectively, than the control group. At 60 month follow up the treatment group were 3.54 and 1.61 times more likely to be drug and arrest free, respectively, than the control group
Sacks et al. (2004), Sullivan et al. (2007) USA	185	75	M	Prison (12-18)	TC with Intensive Mental Health Services (Control)	Drug use Alcohol use Mental health Social	0.20 (0.24) 0.20 (0.24) 0.39 (0.29) 0.25 (0.28)	0.04 (0.08)* 0.18 (0.30) 0.34 (0.27) 0.23 (0.24)*	12 months 0.21 (0.17) 0.18 (0.30) 0.34 (0.27) 0.10 (0.19)*	Significant improvement was found between pre-treatment and 1 year post-treatment follow up on all ASI Composite scores for the MTC group. Improvements were found for the TC group on all composite scores with the exception of the social scale
Sacks et al. (2008) USA	314	100	F	Prison (6-24)	TC with Intensive Outpatients Program (Control)	Re-incarceration Heavy drug use Employed	60 months 0.83 0.23 0.52	0.76* 0.25 0.55	TC	The treatment group were significantly less likely to be re-incarcerated at 5-year follow-up. There was no significant difference between the control and treatment group for heavy drug use and employment
						Re-incarceration Criminal activity Substance use	0.26** 0.55 0.34**		B 6 months	Those in the TC group were less likely to be re-incarcerated or self-report criminal activity at follow-up compared with the control group. The TC group was significantly less likely to have engaged in substance use at follow up than the control group
						Frequency drugs Frequency Alcohol Criminal activity Any arrest Non-parole arrest BDI BSI PSS	-0.39 0.28 -0.40 -0.44 -0.95* -2.38* -1.64 -2.78*			There were significant within-group improvements on all measures of psychological symptoms, substance use and criminal behaviour for both the TC and control group. Between-groups there was significantly more improvement for the TC group on BDI and PSS scores as well as non-parole violation arrests

(continued)

Table 1

Study and country	N	% follow up	Gender and mean age (years)	TC type (duration in months)	Comparison	Outcome measure	Statistical outcome	Outcome summary
Sacks et al. (2012) USA	512	22	M	Re-entry TC	TC with parole supervision and case management (control)	Re-incarceration Criminal activity	OR 12 months	Those in the TC group were significantly less likely to self-report criminal activity or be re-incarcerated at follow up when compared with the control group
Soyez et al. (2006) Belgium	203	48	M/F	Community (12-14)	Pre with post	ASI scores	Pre Post 12-18 months	A MANOVA of all EuropASI problem areas found an overall significant group effect at follow up. Each problem area had significantly improved from baseline with the exception of employment
van Stelle and Moberg (2004)	212	52	M	Prison (9)	TC with no treatment group (control)	Drug use Alcohol Legal Psychological Family/social Employment	6.76 (1.37) 3.51 (2.61) 3.82 (2.41) 4.57 (2.26) 5.01 (1.66) 3.65 (2.32)* 3.27 (2.16) TC (F) 12 months	
	36					Abstinent Med. comp Arrested	0.31 0.17 0.75	A logistic regression analysis revealed that TC participants were significantly more likely than control group to be abstinent from substances since release at 3-month follow-up, but there was no difference between the groups at 12-month follow-up. No differences were found for medication compliance at 12-month follow-up. The TC group were significantly less likely to be arrested at 12-month follow-up
Welsh (2007) USA	708	100	M	Prison (11)	TC with standard treatment (control)	Re-incarceration Re-arrest Drug relapse	Exp(B) 17 months 1.61* 1.48* not significant	A logistic regression, controlling for differences at baseline, found that the TC group were significantly less likely than the control group to be re-incarcerated or rearrested at follow up. It was reported that the treatment group were not significantly different from the control group with regards to drug relapse. However a β -coefficient was not reported

Notes: % follow up, percentage of N with post-treatment outcome measures, where two follow-up periods are noted, the percentage represents the longest follow-up period; M, male; F, female; Pre, baseline data; Post, post-treatment data; P, proportion; Med. Comp, medication compliance; BDI, Beck depression inventory; PSS, posttraumatic stress disorder; OR, odds ratio; B, unstandardised β -coefficient. * **Significant at $p < 0.05$ and 0.01 levels, respectively

management skills-training. Only one study (Welsh, 2007) referred to research evidencing consistent and appropriate implementation of TC principles. No study had examined fidelity of treatment measurements during the study period.

Characteristics of research methodologies utilised in included studies

Design characteristics. All studies aimed to evaluate TC treatment effectiveness in reducing illicit drug use and/or criminal activity. Four studies provided mental health outcomes and five provided social engagement outcomes (family relationship measures, employment and housing). Table I provides a summary of characteristics and results from selected studies. Most TC treatments were modified for a specific population; two for individuals transitioning from incarceration to community living, two for incarcerated females, three for incarcerated individuals with co-occurring substance-use and mental health issues, and two for individuals currently incarcerated. The remaining two studies investigated community-based TC outcomes.

Assessment of risks of bias. No studies indicated concealed allocation or outcome assessment from study participants. Blinding of participants and personnel is not practicable for TC research (Smith *et al.*, 2008). Studies using a random allocation design did not indicate their method of random sequence generation.

Characteristics of outcomes utilised in included studies

Outcome measures are reported according to the methodological design of the studies: first, within-subjects (a research design in which a pre- and post-test analysis is utilised. In other words, same participants are examined at baseline and post-intervention); second, TC compared with no-treatment group; and third, TC compared with another treatment group.

Within-subjects TC comparison. Fernandez-Montalvo *et al.* (2008), Messina *et al.* (2010) and Soyez *et al.* (2006) used a within-subjects design to measure outcomes, focusing particularly on families within the TC setting. Sacks *et al.* (2008) reported both within- and between-group outcomes. Risks of bias within studies existed due to low follow-up rates (37-100 per cent), use of subjective outcome measures, and small sample size. Fernandez-Montalvo *et al.* and Soyez *et al.* did not specify eligibility criteria; Messina *et al.* indicated that participants were mandated based on prisoner files and criminal history.

Substance-use outcomes. Fernandez-Montalvo *et al.* (2008) reported the outcome measure as relapse in the six years post-treatment, defined as "use of an illegal drug on three occasions during any period of two months since treatment". At baseline, 100 per cent of the sample reported drug use and follow-up indicated 46.5 per cent had relapsed since leaving treatment.

Messina *et al.* (2010) found that addiction severity index (ASI) composite scores for the TC group at baseline were 0.20 and 0.17 for alcohol and drug composite scores. At one-year follow-up, the scores had significantly reduced to 0.07 and 0.02, respectively. MTC group composite scores also significantly reduced, with mean alcohol and drug use at baseline: 0.18 and 0.21, and at one-year follow-up: 0.03 and 0.04. Soyez *et al.* (2006) found significant improvements between baseline and 12-18 month follow-up on both the drug use ($M = 6.76$ to $M = 3.37$) and alcohol ($M = 3.51$ to $M = 2.03$) ASI composite score. Sacks *et al.* (2008) found significant within-group improvements for both TC and control groups on self-reported Centre for Therapeutic Community protocol (CTCR) scores of frequency of alcohol and drug use.

Crime outcomes. Soyez *et al.* (2006) found the mean legal composite ASI score significantly reduced from baseline ($M = 3.82$) to follow-up ($M = 2.59$), indicating a significant reduction in criminal activity.

Mental health outcomes. Messina *et al.* (2010) found ASI psychological composite scores significantly improved for both TC and MTC group. However, only the TC groups showed improvement on the Self-Efficacy Scale. ASI psychological composite scores for MTC group were: 0.34 baseline, 0.23 follow-up; and for TC group: 0.39 baseline, 0.24 follow-up. Self-Efficacy Scale scores for MTC group: 2.30 baseline, 2.60 follow-up; and for TC group: 2.20 baseline, 2.60 follow-up. Soyez *et al.* (2006) found a significant reduction in mental health problems, with the mean ASI psychological composite score reducing from 4.57 at baseline to 3.28 at follow-up.

Sacks *et al.* (2008) reported significant within-group improvements in Beck Depression Inventory (BDI), Posttraumatic Symptom Scale (PSS) and Brief Symptom Inventory (BSI) scores.

Social engagement outcomes. Fernandez-Montalvo *et al.* (2008) found that self-reported employment status at baseline for the overall sample was: employed 44.5 per cent and unemployed 42.5 per cent. At follow-up, 58.7 per cent of the sample was in stable employment, with significantly more participants who completed the programme achieving this (70.8 per cent compared with the dropout group 26.2 per cent). Messina *et al.* (2010) used the ASI family composite score as a measure of social engagement. The MTC group showed significant improvement ($M = 0.20$ at baseline and 0.10 at follow-up) compared with the TC group ($M = 0.25$ at baseline and 0.14 at follow-up). Soyez *et al.* (2006) found significant improvement in the social/family ASI composite score from baseline ($M = 5.01$) to follow-up ($M = 3.65$). However, employment did not significantly differ from baseline ($M = 2.44$) to follow-up ($M = 2.17$).

TC compared with no-treatment group. Four studies (Hiller *et al.*, 2002; Inciardi *et al.*, 2004; Prendergast *et al.*, 2004; van Stelle and Moberg, 2004) compared TC treatment with a no-treatment group. Risks of bias existed within and between studies. Two studies used a cohort design and two used randomly assigned participants. Follow-up rates ranged from 63.8 to 96.0 per cent of the original sample. All studies included objective measures for criminal outcomes and two included objective measures of substance-use outcomes. All four studies indicated participants were selected based on possibly subjective measures, including counsellor interviews, court mandates, TC admission criteria and diagnoses.

Substance-use outcomes. Inciardi *et al.* (2004) classified participants as “drug free” if they self-reported no illegal drug use and returned exclusively negative urinalysis results. At 42- and 60-months follow-up, the treatment group was significantly more likely to be drug-free (odds ratios = 4.49 and 3.54, respectively) compared with the no-treatment group. Probability of avoiding relapse was significantly higher for TC non-completers, completers and completers with aftercare.

Prendergast *et al.* (2004) used the outcome measure “heavy drug use” (based on self-report measures and defined as the use of drugs (excluding alcohol and marijuana) several times per week in the previous 12 months). No significant differences between treatment and control groups for heavy drug use (control group: 23 per cent; treatment group: 25 per cent) were found. Treatment dropouts, treatment completers, completers with no aftercare and completers with aftercare did not differ significantly on heavy drug use outcomes.

van Stelle and Moberg (2004) found TC participants were significantly more likely to report abstinence post-release compared with the control group at three-months follow-up (63 and 49 per cent, respectively). At 12-months, differences were no longer significant (TC = 27 per cent, control = 31 per cent), with no difference between-groups for positive urinalysis.

Crime outcomes. Hiller *et al.* (2002) obtained official arrest records for treatment group (12-months and 24-months post-discharge) and comparison group (post-incarceration). Benefits of TC treatment completion emerged at two-year follow-up. One-year arrest rates between treatment completers (17 per cent), non-completers (20 per cent) and the comparison group (13 per cent) were not significant. At two years, the non-completers were significantly more likely to have been arrested (30 per cent) compared with the treatment completers (21 per cent) and the comparison group (23 per cent). Treatment completers and non-completers were more likely (odds ratios of 1.9 and 1.5, respectively) to have been arrested at one year compared with the comparison group. At two years, treatment completers were 10 per cent less likely (odds ratio = 0.9) and treatment non-completers significantly more likely (odds ratio = 1.6) to have been arrested compared with the comparison group.

Inciardi *et al.* (2004) found that at 42- and 60-months follow-up the treatment group were significantly more likely to be arrest-free, based on self-report and official records (odds ratios = 1.71 and 1.61, respectively) compared with the control group. Probability of avoiding re-arrest was significantly higher for TC completers and completers with aftercare.

Prendergast *et al.* (2004) found that the treatment group was significantly less likely to be re-incarcerated, according to official records, with 76 and 83 per cent of the treatment and

control groups re-incarcerated, respectively, at five-year follow-up. The treatment group had significantly longer days to first re-incarceration compared with the control. Greater treatment completion significantly predicted a delay in re-incarceration. However, group differences reduced after two years follow-up.

van Stelle and Moberg (2004) found differences between arrest rates at three-months were not statistically significant between groups (TC and control). However, at 12 months significantly more control group participants compared with TC participants had been arrested.

Mental health outcomes. Using the mental health indicator of medication compliance, van Stelle and Moberg (2004) found TC participants were significantly more likely to have been medication-compliant at three months but not at 12 months compared with the control group.

Social engagement outcomes. Prendergast *et al.* (2004) found no significant differences between treatment and control groups on employment (treatment: 55 per cent; control: 52 per cent) for the previous 12 months at five-year follow-up. However, those who completed treatment and treatment with aftercare had significantly higher employment rates compared with treatment and aftercare dropouts.

TC compared with another treatment group. Four studies investigated TC treatment compared with another treatment (Sacks *et al.*, 2004, 2008, 2012; Welsh, 2007). Sacks *et al.* (2012) investigated the effect on recidivism for mentally ill chemical-abusers as compared with parole supervision case management, where TC treatment was more intense and comprehensive. Sacks *et al.* (2004) and Sullivan *et al.* (2007) reported on the comparative effectiveness of prison TC and mental health services. Treatment and comparison groups received treatment for mental health and substance-use disorders, medication compliance and CBT to challenge criminal thinking. The treatment group received their treatment in the TC environment and also spent significantly more time in treatment than the comparison group.

Welsh (2007) evaluated the effectiveness of five prison-based TC programmes for inmates participating in substance-use treatment. The comparison sample comprised inmates assessed as having a high need for substance-use treatment but who received short-term drug education and outpatient treatment due to TC space limitations. Sacks *et al.* (2008) randomly allocated female inmates to either TC treatment or intensive-outpatient control group. The TC group received treatment components within the TC environment, while control participants received treatment in the form of discrete, educational units.

Risks of bias existed within studies. Welsh (2007) used a cohort design and the remaining three studies randomly assigned participants. Follow-up rates ranged from 75 to 100 per cent of the original sample. Three of the studies included objective measures for criminal outcomes and one included objective measures of substance-use outcomes. Minimal eligibility criteria were reported by studies. Sacks *et al.* (2012) excluded 53 per cent as they were denied placement by a treatment agency. Respective control groups received less intensive treatment compared with the TC groups.

Substance-use outcomes. Sacks *et al.* (2004) found that the treatment group was significantly less likely to have engaged in self-reported substance-use at follow-up compared with the control group (31 and 56 per cent, respectively). Sacks *et al.* (2008) found significant within-group but not between-group differences on self-reported frequency of alcohol and drug use as per the Center for Therapeutic Community Research Protocol. Welsh (2007) reported the treatment group did not significantly differ from the control group for drug relapse. However, the β -coefficient for the group difference was not reported.

Crime outcomes. Sacks *et al.* (2004) found that the TC group was less likely to be re-incarcerated than the control group (9 per cent compared with 33 per cent) or self-report criminal activity (47 per cent compared with 67 per cent) at follow-up. Only the difference in re-incarceration reached statistical significance. Sacks *et al.* (2008) found significant within-group improvement in self-reported criminal activity, arrests (all types) and non-parole violation arrests for both the TC and control group. Between-group differences were found for non-parole violation arrests with significantly more improvement for the TC group compared with the control group. There were no significant differences between-groups for arrests (all types) or criminal activity.

Sacks *et al.* (2012) found the TC group significantly less likely to self-report criminal activity (odds ratio = 0.39) or be re-incarcerated (odds ratio = 0.39) at 12-month follow-up when compared with the control group. Welsh (2007) conducted a logistic regression controlling for baseline differences and found the treatment group were significantly less likely than the control group to be rearrested or re-incarcerated at follow-up.

Mental health outcomes. Sacks *et al.* (2008) assessed psychological symptoms using the BDI, BSI and PSS and found significant within-group improvements on all measures of psychological symptoms for both the TC and control group, and significantly greater improvement for the TC group on BDI and PSS scores, but not the BSI.

Discussion

Overview

The aim of this study was to systematically review quantitative research since 2000 on the effectiveness of residential TCs for the treatment of substance-use disorders with reference to substance-use, crime, mental health and social engagement outcomes. The systematic review included 11 studies published since 2000 and contributes towards our understanding of the effectiveness of TC treatment for substance-users. In the studies reviewed, TC treatment was found predominantly, but inconsistently, to be effective in reducing substance-use and criminal activity and contributing to improvement in mental health and social engagement outcomes.

Consistent with other findings, participants undertaking TC treatment were shown to improve significantly at one- to six-year follow-up compared with baseline (Vanderplasschen *et al.*, 2013). Within-subject outcome studies found consistent improvement for substance-use, mental health and social engagement outcomes. Statistically significant reductions in substance use were found using ASI and CTRC scores (Messina *et al.*, 2010; Sacks *et al.*, 2008; Soyez *et al.*, 2006). Soyez *et al.* (2006) also reported on criminal activity and found significant reductions. Significant mental health improvement was found on ASI scores (Messina *et al.*, 2010; Soyez *et al.*, 2006) but not self-efficacy (Messina *et al.*, 2010). Significant social engagement improvement was found for family relationships (Messina *et al.*, 2010; Soyez *et al.*, 2006) but not employment (Soyez *et al.*, 2006).

In contrast to studies investigating within-subjects outcomes, when TC treatment is compared with no treatment or other treatment conditions, findings are inconsistent. TC treatment compared with no treatment controls found variability in substance-use and crime outcomes as well as minimal treatment effects for mental health and social engagement outcomes. van Stelle and Moberg (2004) found a significant treatment effect for reduction in substance use at three months but not 12-month follow-up. Inciardi *et al.* (2004) and Prendergast *et al.* (2004) reported on five-year substance-use outcomes. Inciardi *et al.* (2004) found a significant TC treatment effect on relapse to any drug use, but Prendergast *et al.* (2004) found no effect on relapse to "heavy" drug use. It is possible that differences in follow-up rates and outcome measures influenced differences in outcomes as Inciardi *et al.* had a significantly poorer follow-up rate (64 per cent) compared with Prendergast *et al.* (81 per cent). Additionally, the use of self-report measures may have decreased the disparity between treatment and control groups (Prendergast *et al.*, 2004). Treatment participants have been found to be more willing to self-report drug use compared with no-treatment groups (Bale *et al.*, 1984).

Crime outcomes varied between studies and time of follow-up. Hiller *et al.* (2002) found the treatment group were more likely to be arrested for a felony offence at one-year follow-up, but treatment completers were less likely to be arrested at two-year follow-up. van Stelle and Moberg (2004) found that the treatment group was significantly less likely to be arrested compared with a control group at one year, but not at three months. Differences between these two studies may be related to the different population under study (mandated felony probationers compared with dually diagnosed clients) and outcomes measures (felony arrest compared with any arrest). Inciardi *et al.* (2004) and Prendergast *et al.* (2004) both found that the treatment group were less likely to be re-incarcerated compared with a control group at five

years. Mental health and social engagement outcomes were only reported in two studies, and found minimal treatment effects.

Studies investigating TC treatment compared with another treatment condition found improvements in most crime and some mental health outcomes, but contrasting substance-use outcomes. Sacks *et al.* (2008) and Welsh (2007) found no treatment effect for substance-use outcomes; however, Sacks *et al.* (2004) found significant improvement in the treatment group. Significant treatment effects were found for crime outcomes (Sacks *et al.*, 2004; Welsh, 2007). In contrast, Sacks *et al.* (2008) found improvements in non-parole violation arrests but not for all arrests or self-reported criminal activity. Sacks *et al.* (2008) found significant improvements in BDI and PSS mental health outcome scores, but not BSI scores. These differences may have arisen due to the different populations under investigation and outcome measures utilised.

The variability in outcomes is consistent with previous systematic reviews and may have been influenced by differences in study populations, TC treatment and methodological quality of studies. Smith *et al.* (2008) and Malivert *et al.* (2011) found varying results depending on outcome measures and comparison groups. Methodological issues identified have also been identified in previous reviews (Malivert *et al.*, 2011) and included limited use of random assignment, poor follow-up rates and unclear delineation of populations under study. Demographic information indicated variability in gender, racial profile, educational attainment and employment history.

Clinical and research implications

Although there is some variability in treatment populations included in this review, evidence reported in other studies suggests individuals with severe substance-use disorders, mental health issues, forensic involvement and trauma histories, will benefit from TC treatment. This is supported by the literature which has found a general relationship between severity of substance use and treatment intensity (Darke *et al.*, 2012; De Leon *et al.*, 2008) with outcomes further enhanced by self-selection into treatment and appropriate client-treatment matching (see De Leon, 2010; De Leon *et al.*, 2000, 2008). The weight of evidence gleaned from multiple sources of research, including randomised control trials and field outcome studies (De Leon, 2010) suggests TCs are an important and effective treatment for clients in improving at least some aspects of their quality of life, specifically mental health and social engagement, and in reducing harmful behaviours, including substance-use and crime. Variability in treatment setting and populations reflect the real-world setting in which TC treatment is delivered, providing a multifaceted treatment modality to a complex population in variable circumstances.

Future systematic reviews could address this complexity by utilising a realist synthesis approach to better understand the complexities of social interventions, which is effectively used in evaluating other substance-use intervention programmes (Hunter *et al.*, 2012). The realist synthesis methodology helps to examine “what works, for whom and in what circumstances, in what respects and how” (Pawson *et al.*, 2005) and is built on the notion that it is not the treatment modalities which are effective; rather the “how” and “why” such treatment programmes bring change are important aspects of its efficacy. The steps involved in this type of synthesis include: scoping out the review questions and nature of the treatment programmes; searching for evidence in the published literature and identifying a defined set of theoretical underpinnings; synthesising the obtained data, thus refining the theory of what works, for whom, how and under what circumstances; and testing the theoretical paradigm in practical contexts and subsequently providing recommendations for best practice based on the review outcomes. Therefore, this refined approach would strengthen our understanding of TC effectiveness, the causal mechanisms behind the TC, as well as how effectively these mechanisms work for different groups in differing circumstances (Rycroft-Malone *et al.*, 2012). Such an approach would draw together the existing key areas of inquiry in TC research, their effectiveness and contextual predictors of outcomes.

A synthesis approach still requires high-quality research. The methodological quality found in this review was variable. Hence, it is clear TC research needs to continue to refine its methodology. This review suggests the need to include increased utilisation of random or sequential assignment of participants, objective measures to complement validated self-report

measures and increased follow-up rates. TC providers can contribute to the improved quality of research in this area by utilising fidelity measures of TC treatments and enhancing transparency and systematic processes of eligibility procedures for TC treatment.

Limitations

This review should be interpreted with reference to its limitations as it only explores research published in peer-reviewed journals. This makes it highly susceptible to publication bias and future reviewers could contact prominent authors for unpublished studies, as well as considering conference papers and government reports.

As noted above, included studies had significant methodological issues which may have biased the results and generalisability of findings. A more focused review may be required as the heterogeneity of studies in this area increases the complexity of meta-analysis (Malivert *et al.*, 2011; Smith *et al.*, 2008). Such a review could also choose one treatment setting, population and outcome measure, perhaps facilitating more robust conclusions. Such meta-analytic methods have been used previously and may provide clearer information on the statistical and clinical significance of findings (Prendergast *et al.*, 2002; Sacks *et al.*, 2010). Variability in treatment settings and populations in this review is also likely to have contributed to the variability in findings. Treatment setting, characteristics of the population under review and outcome of interest have all been found to influence research on the effectiveness of TCs.

Conclusions

The strength of the current study is that it provided a broad evaluation of TC effectiveness across a range of outcomes (substance-use, criminal activity, mental health and social engagement), and is therefore valuable in updating the current literature and providing context for future research in this area. It aimed to address a key question in evaluating complex interventions: whether they are effective as they are delivered. Findings suggest that TC treatment is generally effective for the populations of concern in reducing substance use and criminal activity and contributing to some improvement in mental health and social engagement outcomes.

This must also be viewed in the context of the populations for which TCs have been found to be most effective – that is, those with complex presentations, which may include (as evidenced in studies included in the current review) substantial periods of substance use, poor mental health and psychosocial profile, substantial unemployment and criminal history. Variability in outcomes suggests further TC research and research syntheses focusing on a second key research question in the evaluation of complex interventions – how the intervention works – could play an important role in understanding TC effectiveness, and for whom it is effective and in what contexts.

Note

1. Rationale for including studies published since 2000 is provided in the Method section.

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Appendix. Systematic Literature Search Strategies

PsycINFO and Academic Search Complete Search Strategy

(TX (Drug abuse OR drug addiction OR substance abuse OR substance use)) AND (TX (modified therapeutic communit* OR therapeutic communit*)) AND (TX (outcomes OR treatment outcomes OR effectiveness)).

Medline Search Strategy

((Drug abuse) OR (drug addiction) OR (substance abuse)) AND ((modified therapeutic communit*) OR (therapeutic communit*)) AND ((outcomes) OR (treatment outcomes) OR (effectiveness)).

About the authors

Dr Lynne Magor-Blatch, PhD, MPsyCh (Forensic), BA (Hum. and Soc.Sci.), Grad.Dip.App.Psych., Dip.Teach. (Sec), Cert IV TAA, is a Forensic Psychologist and an Associate Professor with the University of Canberra and the University of Wollongong (Australia), within the Masters in Clinical Psychology programmes at both universities. Lynne commenced work with therapeutic communities 1974 at the Ley Community (Oxford) and Alpha House (Portsmouth) and has been involved since that time with TCs in Australia, where she also holds a position as Executive Officer with the Australasian Therapeutic Communities Association. Lynne has developed TC programmes for parents and children, and for offenders in correctional settings. Her PhD thesis, undertaken with the National Drug and Alcohol Research Centre (NDARC), UNSW, assessed the effectiveness of a specialist intervention which she developed for use with clients with Amphetamine-Type Stimulant (ATS) use disorders seeking treatment within the TC setting. In June 2010, Lynne was inducted into the National Alcohol and Drug Honour Roll for significant contribution to the AOD sector over a considerable period of time. Dr Lynne Magor-Blatch is the corresponding author and can be contacted at: lynne.magor-blatch@canberra.edu.au

Dr Navjot Bhullar, PhD, MA (Psychology), MPhil (Psychology), BA (Hons.), is a researcher with expertise in the area of mental health/well-being and its antecedents and correlates, including examining effectiveness of interventions related to alcohol/drug problems. In addition, Navjot has extensive experience in conducting quantitative research and advanced statistical techniques. Dr Bhullar has over 40 peer-reviewed publications, many of which appear in top-ranked journals, and has also been successful in obtaining external funding for her work on mental health and well-being.

Bronwyn Thomson, MPsyCh, BSci (Hons.), completed her degree in Master of Clinical Psychology at the University of Canberra, with her study which focused on the effectiveness of TC treatment. During her study, Bronwyn undertook clinical placements in mental health and has since accepted a position as a Psychologist with the Australian Capital Territory's Forensic Mental Health team. Her prime work role is within the Alexander Maconochie Centre, the recently established adult prison for male and female offenders in Canberra. This prison setting also includes a TC for male offenders and therapeutic programming for female prisoners.

Dr Einar Thorsteinsson, PhD, BA, GCHE, is a researcher with specialisation in the area of health psychology focussing on coping, social support, depression, cardiovascular reactivity and stress. Einar also has extensive expertise in research methods and advanced statistics. Dr Thorsteinsson has a very strong research record and a diverse and robust research base that has resulted in more than 40 peer-reviewed journal article publications.

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