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Modified Therapeutic Community for Co-Occurring Disorders: A Summary of Four Studies

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Abstract

This paper summarizes results from four research studies (N=902) that examined the effectiveness of the modified therapeutic community (MTC) for clients with co-occurring disorders (most with severe mental disorders). Significantly better outcomes for MTC were found across four E vs. C comparisons on 23.1% (12 of 52) of primary outcome measures of substance use, mental health, crime, HIV risk, employment and housing. Study limitations included the potential for selection bias, limited measurement of program fidelity and insufficient examination of the relationship between treatment dose and outcome. Future research should emphasize clinical trial replications, multiple outcome domains and further development of continuing care models. Given the need for research-based approaches, the MTC warrants consideration when program and policy planners are designing programs for co-occurring disorders.

Keywords

Co-occurring disorders; substance abuse; severe mental disorder; modified therapeutic community

1.0 Background

The modified therapeutic community (often abbreviated as “modified TC”; for consistency and the reader’s convenience, “MTC” has been used throughout this paper) was developed in the early and mid- 1990s as a treatment model and approach for those whose substance use

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disorders co-occurred with mental disorders. The MTC approach described in this paper was based on the theoretical framework of the standard TC model, as documented in previous publications (e.g., De Leon, 2000), and adapted to treat individuals with co-occurring disorders (De Leon, 1993; Sacks, De Leon, Bernhard, & Sacks, 1997; 1998; Sacks, Sacks, & De Leon, 1999). The core principles and methods of the TC that are especially relevant to the treatment of co-occurring disorders include: providing a highly structured daily regimen; fostering personal responsibility and self-help in managing life difficulties; using peers as role models and guides with the peer community acting as the healing agent within a strategy of “community-as-method” (the community provides both the context for and mechanism of change); regarding change as a gradual, developmental process and moving clients through progressive treatment stages; stressing work and self-reliance through the development of vocational and independent living skills; and promoting prosocial values within healthy social networks to sustain recovery.

Although most of the key elements, structure, and processes of the standard TC are maintained in the MTC model, they have been reshaped to accommodate the individual needs, impairments and deficits of clients with co-occurring disorders. The modifications have been developed to respond to the clients’ psychiatric symptoms, cognitive impairments, and level of functioning. As compared to the standard TC approach, the MTC incorporates increased flexibility, reduction in the duration of various activities, less confrontation, increased emphasis on orientation and instruction, fewer sanctions, more explicit affirmation for achievements, greater sensitivity to individual differences, and greater responsiveness to the special developmental needs of the clients, all of which serve to maximize social learning opportunities. In brief, the MTC is a comprehensive treatment model that makes three key alterations for individuals with co-occurring disorders: it is *more flexible, less intense, and more individualized*. The central TC feature remains: the MTC, like all TC programs, seeks to develop a culture where clients learn through a self-help process to foster change in themselves and others, and where the community becomes the healing agent. A complete description of the MTC for clients with co-occurring disorders, including treatment manuals and guides to implementation, can be found in other writings (e.g., De Leon, 1993; Sacks et al., 1997; 1998; 1999).

The main purpose of this paper is to present a summary of four research studies undertaken over the last decade by a single investigative team examining the effectiveness of MTC treatment for clients with co-occurring substance use and mental disorders, a condition that is now commonly termed “co-occurring disorders.” Subjects in initial studies were mainly those with severe mental illness (i.e., schizophrenia and other psychotic disorders, bipolar disorders and major depression) who were, at the time, typically distinguished as having “mental illness and chemical abuse,” or MICA, disorders; for consistency in this paper, “co-occurring disorders” has been used throughout. Since the MTC was designed to address the problem of co-occurring disorders — a condition widely acknowledged to represent multiple problem areas — the paper summarizes research findings across six outcome domains (substance use, mental health, crime, HIV-risk, employment, and housing).

The paper begins with a descriptive summary of the four studies, conducted in a variety of settings and with different populations of clients with co-occurring disorders (e.g., homeless, offenders, outpatients in substance abuse treatment, and those with HIV/AIDS). Client and program characteristics of each study are noted, and the progression of the research activities is narrated, along with the alterations made to the treatment and research protocols to suit each new context. Next, the paper summarizes the findings from the four outcome studies across multiple outcome domains. The paper concludes with a discussion of the findings and proposes an agenda for future research into MTC treatment for clients who have co-occurring disorders.

2.0 Methods

2.1 Descriptive Summary of Four Studies

Summaries of program and subject characteristics are given in Table 1 and Table 2, respectively, which follow the narrative descriptions (below) of each of the four studies. From the information displayed in Table 1, the narrative gives a brief synopsis of the program under study and the methods employed in the research. The narrative also highlights the diagnostic information and the main differences between the sample in one study and the samples in the other studies as shown in Table 2.

2.1.1 Study 1— Homeless—This series of studies began in 1991 with an initial focus on male and female homeless individuals with co-occurring disorders who had been referred to community residential settings from shelters and psychiatric hospitals. The major goals of this project were to develop, implement, document and evaluate MTC treatment for homeless persons with severe mental illness occurring in conjunction with substance use disorders.

The MTC program developed for Study 1, delivered over a planned stay of 12 months, was a highly structured, comprehensive residential program that consisted of multiple interventions organized in four areas: (1) *Community Enhancement* — to facilitate the individual's assimilation into the community and reaffirm the individual's commitment to recovery (e.g. Morning meeting, Orientation Seminars, General Meetings); (2) *Therapeutic/Educative* — to promote self-expression, divert acting-out behavior, and resolve personal and social issues (e.g., Individual Counseling, Dual Recovery Classes, Conflict Resolution Groups); (3) *Community and Clinical Management* — to maintain the physical and psychological safety of the environment and ensure that residential life is orderly and productive (e.g., Program Policies, Social Learning Consequences); and (4) *Work/Vocational* — to promote positive work attitudes and develop work skills (e.g., Peer Work Hierarchy, Vocational Counseling).

The MTC interventions from this study constituted the core set of MTC interventions that were employed either generically across treatment settings or adapted to meet the special needs of the population being served (for a full description of the program see Sacks et al., 1997; 1998; 1999, and section 1.0 *Background* of this paper). On average, almost three-quarters (72%) of the MTC group attended the nine key MTC program activities, and a fidelity analysis of the MTC components found an average total agreement of 87% among clients asked 'Did this occur?' for service areas delivered/covered within each intervention (Sacks, 1997). No fidelity data were available for the control group.

In Study 1, Study 2, and Study 3, E condition staff was different from and independent of C condition staff. The staff for the Study 1 program consisted of substance abuse and mental health professionals employed by the participating site in a staff to client ratio of 1 to 6. A Clinical Supervisor with training and experience delivering TC programs for special populations provided site leadership. Training and technical assistance protocols provided three days of immersion training in the MTC approach, regular training sessions (monthly) using a manual and curriculum developed for the project team, and weekly consultation/supervision for the program director, clinical supervisor and program staff (which included demonstration sessions, an initial period when groups were co-led, direct observation of program staff performance, and regular feedback and discussion sessions). The training and technical assistance protocols established in this study became the prototype for the other studies (cf. Sacks et al., 1997; 1998; 1999).

The *Diagnostic Interview Schedule* (DIS; Hasin, 1991; Robins, Cottler, Bucholz, & Compton, 1995; Ross, Swinson, Doumani, & Larkin, 1995) was used to determine the diagnoses summarized in Table 2. The table shows that virtually all (95%) Study 1 clients received a

lifetime diagnosis of substance abuse or dependence, while 6 in 10 (60%) received a lifetime diagnosis of severe mental disorder (schizophrenia and other psychotic disorders, mania or major depression); 81% obtained a lifetime diagnosis of any Axis I or Axis II mental disorder. Clients participating in Study 1 differed from other study participants mainly in their lower education level and lifetime employment rates. According to agency diagnostic procedures, virtually all subjects in all four studies had co-occurring disorders (i.e., at least one substance use disorder as well as at least one mental disorder, independent of each other).

Study 1, conducted in a community residential setting, sequentially assigned (Staines, McKendrick, Perlis, Sacks, & De Leon, 1999) homeless men and women (n=342) with co-occurring disorders to one of two experimental (E) MTC groups (MTC-Moderate or MTC-Low) or to a control (C) group that provided typical services or treatment-as-usual (TAU). The two MTC programs were similar in planned duration of stay (one year), structure, stages, and array of interventions, but differed in three other important features. Specifically, as opposed to MTC-Moderate, clients in MTC-Low: (1) attended a day treatment program offered in the community, rather than having all treatment activities within the residential facility; (2) had reduced peer responsibilities (they were assigned fewer of the duties that clients and staff shared in facility operations); and (3) received a program that was structured to have fewer activities. Upon completing the residential program, MTC clients entered an MTC Supported Housing program; all TAU clients also received some form of continuing care treatment services.

Whereas 56% of the residents assigned to MTC-Low were retained for 12 months, only 34% of the MTC-Moderate subjects stayed as long in treatment (Table 1). The retention for both groups compared favorably to 12-month rates reported in the literature for the standard TC of between 9% and 15% in a review of seven programs (De Leon & Schwartz, 1984) and of between 33% and 36% in a more recent study (De Leon, Hawke, Jainchill, & Melnick, 2000). Retrieval rates (Table 1) at 12-month follow-up were 65% for the MTC-Moderate group, 70% for the MTC-Low group, and 73% for the C group. Retrieval rates for a subsequent follow-up point (not shown) approximately two years post-baseline (749 days on average) increased to at least 80% for all groups (i.e., MTC-Moderate, 81%; MTC-Low, 85%; and C, 80%).

2.1.2 Study 2—Offender—Upon completion of Study 1, the investigators began to study the effectiveness of the MTC approach for male offenders with severe mental illness and substance abuse disorders, an under-served subgroup seen to be in need of research to develop and test innovative treatment models. These inmates became a population of interest, in part, because their numbers appeared to be increasing, and because their special needs placed exceptional demands not only on individuals and families, but also on criminal justice and treatment systems.

Study 2, conducted within the Colorado Department of Corrections, used a program design (Sacks, Sacks, & Stommel, 2003) that incorporated many of the core features and elements described in sections 1.0 *Background* and 2.1 *Study 1—Homeless*. From this foundation, further adaptations for offenders with co-occurring disorders were incorporated, including: an emphasis on criminal thinking and behavior; recognition and understanding of the interrelationship of substance use, mental illness, and criminality (triple recovery); operational adjustments to comply with facility security demands; and expansion of the treatment team to include security personnel and other Department of Corrections staff.

The staff for this program, at a ratio of 1 staff to 8 clients, consisted of substance abuse counselors employed by a provider agency under contract to the Colorado Department of Corrections, and mental health and criminal justice professionals employed by the Colorado Department of Corrections. Site leadership was provided by a clinically trained Program Director with experience delivering TC programs. The implementation and quality control

procedures for the MTC intervention were quite similar to those described for Study 1, but added weekly training via phone conference, and monthly oversight of the MTC program from a system-wide TC coordinator.

Diagnostic results from the DIS, shown in Table 2, revealed that nearly 9 in 10 (87%) of the offenders received a lifetime diagnosis of substance abuse or dependence, while about two-thirds (62%) received a lifetime diagnosis of severe mental disorder; 83% obtained a lifetime diagnosis of any mental disorder. This sample of male offenders from Colorado differed from the samples in the other studies mainly in ethnicity (higher percentage of whites and lower percentage of blacks) and in that all had a lifetime history of incarceration.

Study 2 (Sacks, Sacks, McKendrick, Banks, & Stommel, 2004), randomly assigned 185 male inmates with co-occurring disorders either to the MTC program (the E condition) or to a C (Control) condition (a mental health treatment program). The planned duration of stay was 12 months for the MTC program; the duration of the C group program was considered to be variable (for a full description of the program, see Sacks et al., 2003).

Over the first 6 months of prison treatment, 95% of the subjects in the MTC program stayed in treatment, compared with 69% of those in the C group; at 12 months, 71% of those in the MTC program and 30% of those in the C group were retained. When released from prison, a majority (57%) of the offenders who had completed the prison MTC program entered MTC aftercare treatment (a residential program); all offenders received some form of aftercare once released from prison. One year after being released from prison, retrieval rates for follow-up interviews were 82% for the MTC group and 69% for the C group.

2.1.3 Study 3— Outpatient—Treatment for substance use disorders occurs most frequently in outpatient settings and typically includes counseling (individual and group) with referral to appropriate community services. In that context, it was seen as desirable to incorporate MTC services into outpatient programming for addicted clients who show evidence of co-occurring disorders. Study 3 (Sacks, McKendrick, Sacks, Banks, & Harle, in press) sought to evaluate the effectiveness of an enhanced treatment track, which added MTC features and three targeted MTC interventions, compared with standard outpatient treatment. A total of 240 male and female admissions who had screened positive for psychological/emotional problems were randomly assigned to either MTC or standard treatment. Significantly better outcomes were anticipated on variables related to the treatment goals (i.e., mental health, trauma, and housing).

The enhanced track incorporated MTC features (i.e., community meetings) designed to strengthen identification with the community, and added three other elements considered to be critical components of effective treatment appropriate for co-occurring disorders programming. These three elements were: (1) *Psycho-Educational Seminar*, to improve clients' understanding of mental illness (e.g., Jerrell & Ridgely, 1999; Sciacca, 1987-88; 1992), (2) *Trauma-Informed Addictions Treatment*, to help clients discuss issues of addiction and recovery, and cope with past and present trauma (Harris & Fallot, 2001; Harris et al., 2001; Sacks & Sacks, 2005); and (3) *Case Management*, to teach clients case management skills (Brown et al., 2001; Brown, Farrell, & Voskuhl, 1999; Brown, O'Grady, Battjes, & Farrell, 2004). DART programming was delivered to the E group as part of the outpatient program, with DART elements replacing some standard individual and group activities, and remained within the structure of 9 hours per week of program activities (3 hours on each of 3 days) for the 12-week program duration.

The staff for this program consisted of substance abuse and mental health professionals employed by the participating site (Gaudenzia, Inc.) at a staff to client ratio of 1 to 10, and was led by a clinically trained supervisor with experience delivering TC programs for special

populations. The implementation and quality control of the MTC intervention followed the same protocols as described for Study 1, with the addition of training and supervision in the delivery of the manual-based *Trauma-Informed Addiction Treatment* (Sacks & Sacks, 2005). Analysis of treatment dose for the MTC group indicated partial delivery of the treatment components (84% attended a *Psycho-Educational Class*, 62% attended a *Trauma-Informed Addictions Treatment*, and 62% received individual *Case Management*).

Table 2 shows that all clients (100%) met agency criteria for substance abuse or dependence. Although diagnostic instruments were not employed in this cooperative initiative, data from the *Global Assessment of Individual Need* (GAIN; Dennis, 2000; Sacks et al., in press) indicated that virtually all clients had psychological/emotional symptoms, and many (46%) self-reported a diagnosis of a severe mental disorder. Overall, the sample in this study likely had a lower proportion of individuals with severe mental disorders than has been reported in the other studies, but did not differ on the other demographic variables listed in Table 2.

Fifty-one percent of E group subjects were retained in treatment for 12 weeks, compared to 69% of C group clients (i.e., were in attendance for at least once in a month). An intent-to-treat analysis of all study entrants at one-year post treatment follow-up retrieved 85% of E group clients and 80% of C clients.

2.1.4 Study 4— HIV/AIDS—In the late 1990s, a highly specialized population, individuals with HIV/AIDS and co-occurring disorders, became the focus of a special government initiative (Center for Mental Health Services, 1998; Sacks, 1998). Emphasis was placed on determining the effectiveness of well-designed treatment models for individuals with HIV/AIDS and co-occurring disorders, and on calculating the costs of services.

The participating site used in Study 4 (Gaudenzia, Inc.) provided six months of core residential MTC treatment for clients with HIV/AIDS and co-occurring disorders. To accommodate the combined medical, addiction, and mental disorders, the core residential program altered the structure of the TC model to deliver a unique combination of fully integrated medical/psychiatric/nursing care. The adaptations ensured that clients with co-occurring disorders, who were AIDS symptomatic (program eligibility criteria) and physically ill when they entered the program, were medically stabilized as rapidly as possible, and that their physical and mental health care was integrated within the residential substance abuse treatment program. On completion of the residential phase of treatment, clients were referred for aftercare services.

The staff for the program consisted of substance abuse, mental health and medical/nursing professionals who were employed by the participating site at a staff to client ratio of 1 to 8. Site leadership was provided by a clinically trained Program Director who had experience delivering TC programs for special populations. The implementation and quality control of the MTC intervention adhered to the same protocols as described for Study 1.

The *Structured Clinical Interview* (SCID-I and -II; First, Gibbon, Spitzer, & Williams, 1996; First, Gibbon, Spitzer, Williams, & Benjamin, 1997; Magruder, Sonne, Brady, Quello & Martin, 2005) was used to determine mental and substance use disorder diagnoses. Table 2 shows that all clients (100%) met SCID criteria for substance abuse or dependence and that nearly three-quarters (74%) received a SCID lifetime diagnosis of severe mental disorder; fully 100% obtained a lifetime diagnosis of any mental disorder. These clients differed from those in the other studies in their HIV positive status and their history of injection drug use.

Study 4 (unpublished), randomly assigned men and women who had completed the core residential MTC program (n=77) to either MTC or standard aftercare. The clients assigned to MTC aftercare received an integrated MTC aftercare program of outpatient activities delivered

in the residential facility over a planned duration of six months. The MTC aftercare program incorporated case assistance and skills development, peer community meetings and activities, family/significant other support groups, a Peer Advocacy Group and activities, a Re-Entry Group using tools for self-management, and a Health and HIV/AIDS Self-Management Group. The standard aftercare group was referred to community-based agencies for post-residential treatment, as had been established prior to the study, but Gaudenzia staff continued to monitor these clients for a full 90 days to encourage adherence to their medical and service plan.

One hundred thirty-five Study 4 participants entered the core MTC residential treatment; 57% (n=77) completed the six-month program. The retrieval rate at one-year was 67%; follow up interviews occurred at 12-months post-baseline for dropouts and 12-months post-residential treatment for subjects who completed the residential phase of treatment.

2.2 Selecting Measures

This article reports analyses that assessed data at follow-up for four comparisons, drawn from three of the four studies (Studies 1, 2 and 3), which contrasted a group that received MTC treatment with a group that received another treatment approach (cf. section 3.1.4 for a description of the results of Study 4). The six outcome domains of interest, which were measured across all studies, included substance use, mental health, criminality, HIV risk behavior, employment and housing. A crosswalk of studies was conducted to assess data collected for each domain. Understanding outcomes for multiple outcome domains is of interest to the field of co-occurring disorders because: (1) clients with co-occurring disorders have multiple problems in multiple domains; (2) multiple measurements provide a more comprehensive picture of treatment effectiveness than can be obtained when relying on one or two domains. Moreover, measurements over multiple domains, as presented in this summary, have particular relevance since the MTC is a treatment model meant to affect multiple problem areas.

As a consequence of spanning a number of years and funding arrangements, the individual study instruments and domain concentrations, while similar, are not constant across all studies. Changes in instrumentation occurred (a) to correspond with the emphasis or focus of a particular study, (b) to comply with requirements of participation in a federally-sponsored cooperative agreement that employed specific instruments, or (c) to take advantage of new, improved measures that emerged over time.

Outcome measures were drawn primarily from published reports of each study; where published data were not available for a particular domain, the full data-set from each study was examined to find the most similar measure on which unpublished data were available. A general strategy was developed to decide which variables to include in this report:

1. *Multiple measures of a domain (if possible), and an equal number of measures in all studies, were included.* Multiple measures were included to maximize the data being assessed for each domain. As yet, in the outcome domains of interest, specific single measures have not emerged to represent the standard for the field.
2. *Measures were chosen without regard to the direction of statistical significance in the original study.* This protected against bias that would have resulted from selecting only those measures that favored the MTC. For example, in Study 2, significant differences from the C group found for those who received MTC treatment across a variety of crime measures (i.e., any criminal activity, and alcohol or drug related criminal activity) were excluded from the summary analyses.
3. *Similar data across studies were included whenever possible; however, if one or more studies had alternative measures of greater relevance to the domain, these data were*

used. For example, although the “number of sex partners” was reported for every study, some of the studies collected data considered by experts working in this area to be more indicative of high risk for HIV infection (e.g., “sex while high”).

In each domain, the number of outcomes included in analyses for this summary paper ranged from one to four measures, and was equal to that of the fewest outcomes reported for any of the individual studies. For example, although Study 2 reported four outcomes for substance use, Study 1 reported only three, which limited the measures used in this analysis to three.

3.0 Results

3.1 Summary of Results from Four Studies

Table 3 summarizes the findings at 12-month follow-up for all four studies and includes four E vs. C comparisons, drawn from the three studies (Studies 1, 2 and 3) that contrasted a group receiving MTC treatment with a group receiving another treatment approach. The pre-post comparison from Study 4 (HIV/AIDS) is also included.

3.1.1 Study 1 — Homeless—In general, greater treatment effects emerged for MTC-Low, which was modified to have lower demands and more staff guidance, in comparison to the more rigorous MTC-Moderate. As seen in Table 3, an intent-to-treat analysis of all study entrants revealed that, as compared to the control (TAU) group, outcomes for MTC-Low showed significant improvements on all three measures of substance use, HIV sexual risk behaviors, and on employment, while MTC-Moderate differed significantly only on employment. No significant differences were observed between the groups on measures of crime, mental health or housing.

3.1.2 Study 2 — Offenders—The results obtained from an intent-to-treat analysis of all study entrants showed that, one-year post prison release, those in the MTC group had significantly lower rates of reincarceration for new crimes than did those in the C group. These differences persisted after an examination of various threats to validity (e.g., initial motivation, duration of treatment, exposure-to-risk) (Sacks et al., 2004). Significant outcome differences favoring the MTC group were likewise observed for two substance use measures and one measure of employment. No differences were apparent between the groups on measures of mental health, HIV-risk or housing.

3.1.3 Study 3 — Outpatient—Compared to C, the E (MTC) group had significantly better outcomes in an intent-to-treat analysis, as predicted, on two measures of psychological symptoms. Although the group difference did not reach significance on the measure of housing stability selected for this summary (“lived where paid rent”; $p < 0.07$), a similar variable (“the number of days lived where paid rent”), which was used in the published report of the study’s main outcomes, did show a significant advantage ($p < 0.05$) for the E group (Sacks et al., in press). No significant differences between the groups were evident for measures of substance use, crime, HIV-risk behavior or employment.

3.1.4 Study 4 — HIV/AIDS—In Study 4 (HIV/AIDS), both the experimental and comparison groups received residential MTC treatment. This study was included in Table 3; significant pre-post treatment effects were noted on all six domains and for 11 of 13 measures (p values between $p < 0.05$ and $p < 0.001$).

4.0 Discussion

4.1 Summary of Findings

A series of four studies of MTC programs was undertaken to evaluate the effectiveness of the approach for clients with co-occurring disorders in comparison with alternative treatments. In the course of each of these studies, the MTC program was altered to accommodate both the specific population being served and the circumstances of the treatment setting, although key features of the MTC were retained throughout. In all MTC programs, a self-help process to foster change was fundamental, and community as the healing agent was emphasized. All programs provided psycho-educational seminars to improve clients' understanding of mental illness and its relationship to substance abuse (i.e., dual recovery), addiction treatment groups to explore issues of addiction and recovery as well as to help clients cope with past and present trauma, and skills training to assist clients with self-management of daily activities and seeking services post-treatment.

Overall, significantly better outcomes were observed for the MTC group across four E vs. C comparisons on 23.1% (12 of 52) of primary outcome measures of substance use, mental health, crime, HIV risk, employment and housing. Because Study 4 lacked an E vs. C comparison, it has been excluded from the overall tallies of the percentage of variables which show significant E vs. C differences. In all, significantly better outcomes emerged for the MTC group in every study, but findings were not apparent for all domains in all studies, and the measures for which differences were detected varied from study to study.

The results of Study 1 for substance use, HIV risk behavior, and employment provide some evidence of the comparative effectiveness of the MTC approach for homeless clients with co-occurring disorders and, more particularly, of a less demanding version of the MTC model (De Leon, Sacks, Staines, & McKendrick, 2000). Overall, Study 2 outcome findings were significant for substance use, crime, and employment, and were consonant with the findings from other studies of integrated prison and aftercare TC programs for offenders with substance use disorders alone (e.g., Inciardi, Surratt, Martin, & Hooper, 2002; Wexler & Lipton, 1993; Wexler, Melnick, Lowe, & Peters, 1999; Wexler, Prendergast, Hall, Melnick, & Cao, 2004). It should be noted, however, that Study 2 findings for aftercare are qualified, in part, by a potential for selection bias (cf. section 4.3 for a discussion of this issue). The results of Study 3 provide some support for the effectiveness, on specific mental health and housing outcomes, of outpatient substance abuse treatment programs that add MTC features and selected MTC interventions to strengthen their capacity to treat co-occurring disorders (Sacks et al., in press). These results, too, are qualified, in part because the findings were obtained for only 3 of 34 outcome measures (not shown). Although Study 4 lacked an E versus C comparison, pre-post analysis found significant positive change in all six domains during residential treatment. Further work is needed to identify those domains in which the MTC is maximally effective for a given population and to strengthen the model in those areas in which the effects are not sufficiently robust.

4.2 Core Elements

The portability of the MTC model to different settings is an important concern as evidence of cooccurring disorders is seen in an increasing variety of populations and service agencies. Core elements of the model were present in each of the MTC programs studied, and the delivery of core elements was demonstrated in one study. In examining program fidelity to the MTC model (Study 1, Homeless), the investigators reported that clients endorsed items 87% of the time (Sacks et al., 1997), indicating that the delivery of core program elements was consistent with the program manual description (Sacks et al., 1998). However, the programs included in these four studies differed in the extent to which the core elements were present and in the specific

enhancements provided for each particular population. For example, in Study 2 (Offender), the MTC program had a far greater emphasis on the reduction of criminal thinking and behavior than did the other programs and, in Study 3 (Outpatient), many fewer MTC elements were offered (and those elements were only partially delivered) than were included in the other study programs. The data offered some evidence that programs providing specific enhancements (e.g., the criminal thinking curriculum in the prison MTC) produced better outcomes in the targeted area (e.g., criminal behavior), and some evidence that focused interventions (e.g., Study 3, Outpatient) can improve specific outcomes in the areas targeted by the enhancements. Further work is needed to identify the essential core MTC elements and the nature of enhancements with the potential to improve MTC treatment for any given population and in any given setting.

4.3 Limitations

Several important considerations should be kept in mind when interpreting these results.

Sustaining Design Integrity and Selection Bias—Although both Study 1 and Study 2 employed rigorous assignment designs for the residential phase of treatment, these studies took on quasi-experimental features because the aftercare component included MTC treatment completers only. This raises the potential that sample differences, especially motivation for treatment and behavior change, contributed to treatment effects. Although an analysis of this threat to validity in Study 2 indicated that motivation was not related to either entry into aftercare or crime outcomes (Sacks et al., 2004), the potential exists that other unexamined sample differences favoring the MTC group were contributing to the differential effectiveness of MTC treatment. Thus, it is imperative to conduct further and appropriately rigorous MTC studies that overcome this limitation.

Fidelity of Treatment—The studies, as reported here, contain limited information on treatment fidelity; however, the narrative summaries and original articles describe the training, technical assistance and quality control protocols that were employed to guide treatment implementation and monitoring. Nevertheless, the measurement of treatment fidelity is essential to assure that the intervention was delivered as designed, and to permit clarification of the treatment components that are, and are not, essential to treatment outcome.

Treatment Dose—This summary article does not report treatment dose across studies, although some data have been included in other published reports. For example, an analysis of treatment duration in Study 2 indicated that effect sizes remain large and significant between the MTC and control group on measures of incarceration after equating the groups for the amount of treatment. The authors concluded, “the significant differences between the groups cannot be attributed to sheer differences between the groups in the amount of treatment, but likely also reflect differences in the type of treatment (that is, to the integration of prison and aftercare MTC treatment)” (Sacks et al., 2004, p. 493). Nevertheless, since the MTC is a comprehensive treatment program of considerable duration, it is important to determine the minimum and optimum amounts of elements and of treatment duration that are needed to achieve beneficial outcomes.

The studies also involved variations in populations and settings (as were intended), and in alterations to MTC treatment (as had been planned), and outcome measures varied from study to study. For the above reasons, caution is urged in the interpretation of these findings, and the need for increased rigor in future studies is underscored.

4.4 Future Directions

Several developments are necessary to strengthen the research base for the MTC program. First, although clinical trials research is especially difficult to conduct when a comprehensive intervention, such as the MTC, is being examined, random assignment studies would further solidify the empirical base of support for this model and fortify its research support. When new program initiatives are opened in situations where the target population far exceeds the number of funded beds or slots, the ethical concerns arising from random assignment relating to preferred vs non-preferred treatments are minimized, since the study would employ all available beds without bias; the residential phases of Study 1 and Study 2 were conducted under these conditions. Second, more replication studies are needed as the research base for the MTC model is not extensive. New research could take into consideration some of the issues described in the previous section on limitations. Finally, development and evaluation must continue into aftercare models that can make use of MTC principles while recognizing the long-term risk for relapse of individuals as they re-enter the community and attempt to establish drug-free status. Since continuity of care is essential for the treatment of co-occurring disorders, it becomes advisable to identify the relative contribution of residential and aftercare components.

4.5 Conclusion

In conclusion, the four studies summarized in this paper suggest the effectiveness of the MTC program with different co-occurring disorders populations and in different settings. The limitations of these studies notwithstanding, given the need for research-based approaches, program and policy planners should consider the MTC when designing programs for co-occurring disorders, particularly if the intent is to develop a comprehensive treatment model. At the same time, study should be encouraged that will continue to build the research base and to clarify the factors that contribute to and increase treatment effectiveness for this population.

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TABLE 1

Program Characteristics for each Study

	Study 1 Homeless	Study 2 Offender	Study 3 Outpatient	Study 4 HIV/AIDS
Research dates	10/91 - 5/97	10/95 - 10/02	10/00 - 10/04	09/98 - 09/04
Region	New York, NY	Pueblo, CO	Philadelphia, PA	Philadelphia, PA
Research design	Sequential assignment into two E (MTC) or C (TAU)	Random assignment into E (MTC) or C	Random assignment into E (MTC) or C	All subjects MTC residential
Assessment schedule	Baseline at time of randomization Follow-up 6, 12, 18, & 24 months post baseline	Baseline at time of randomization Follow-up 6 & 12 months post prison release	Baseline at time of randomization Follow-up at 6 & 12 months post baseline	Baseline at entry into residential MTC Follow-up at 6 & 12 months post discharge
Treatment setting	Residential	Prison and Community Corrections	Outpatient	Residential
Staffing	Substance abuse and mental health professionals; 1:6 staff to client ratio	Substance abuse, mental health and criminal justice professionals; 1:8 staff to client ratio	Substance abuse, and mental health professionals; 1:10 staff to client ratio	Substance abuse, mental health and medical/nursing professionals; 1:8 staff to client ratio
Intervention & Control Groups	E MTC-Moderate E MTC-Low C TAU	E MTC C mental health group	E MTC C standard substance abuse treatment	All subjects MTC
Baseline Sample	183 E MTC-Moderate 93 E MTC-Low 66 C TAU	92 E MTC 93 C	126 E MTC 114 C	135 MTC
Retrieval(12-month follow-up)[†]	119 (65%) E MTC-Moderate 65 (70%) E MTC-Low 48 (73%) C TAU	75 (82%) E MTC 64 (69%) C	107 (85%) E MTC 91 (80%) C	91 (67%) 12 months post residential / 12 months post baseline
Length of stay(planned)	12 months	12 months	12 weeks	6 months
Retention(% of planned length of stay)	34% E MTC-Moderate 56% E MTC-Low n/a C TAU	71% E MTC 30% C	51% E MTC 69% C	57% MTC

MTC=modified therapeutic community; TAU=treatment as usual; E=Experimental condition; C=Control (comparison condition)

[†]The Study 2 (Offender) 12-month follow-up was measured from their release from prison (i.e., to a non-controlled environment) so that the residential status of all subjects would be comparable in terms of risk for relapse.

TABLE 2

Subject Characteristics for each Study

	Study 1 Homeless	Study 2 Offender	Study 3 Outpatient	Study 4 HIV/AIDS
Gender— Male	75%	100%	43%	49%
Age— Mean (SD)	35.35 (6.89)	34.29 (8.82)	37.60 (8.86)	37.99 (6.81)
Never married	74%	61%	63%	75%
Any children	47%	63%	68% child under 21 yr	N/A
Ethnicity—	White Black Hispanic	49% 30% 16.5%	13% 79% 8%	7% 88% 6%
High school diploma	36% 12 years	67% or GED	62% or GED	56% or GED
Axis I substance abuse/dependence	95% LT	87% LT	100% LT	100% LT
Axis I severe mental disorder	60% LT	62% LT	n/a	74% LT
Any (Axis I or Axis II) mental disorder	81% LT	83% LT	n/a	100% LT
BDI — Mean (SD)	14.40 (10.09)	15.82 (11.83)	16.44 (11.35)	18.20 (10.65)
Incarcerated	59% LT	100% LT	NA [†]	60% LT
HIV positive status	10%	3%	N/A	100%
Injected drugs	24% LT	43% LT	27% LT	61% LT
Employment	16% L12	63% L12	39% L12 full time	NA ^{††}
Housing	At program entry: 7% house/apt 12% shelter/street	Prior to incarceration: 72% house/apt 10% shelter/street	48% L1 house/apt 9% L1 shelter/street	Prior to treatment: 20% house/apt ^{†††} 3% shelter/street

LT= lifetime, L12 last 12 months, L6 last six months, L1 last month/current

[†] 77% LT involvement with the criminal justice system^{††} 29% usually employed in the last 3 years^{†††} Includes permanent housing for HIV+ clients

TABLE 3

Summary of Outcomes at 12 Months by Study

	Study 1— Homeless		Study 2— Offender		Study 3— Outpatient		Study 4— HIV/AIDS	
	MTC-Moderate Effect Size Odds Ratio [†]	MTC-Low Effect Size Odds Ratio [†]	Effect Size Odds Ratio [†]	Effect Size Odds Ratio [†]	Effect Size Odds Ratio [†]	Effect Size Odds Ratio [†]	Pre-Post Effect Size Odds Ratio ^{†,‡}	
Substance use								
Alcohol	Frequency of alcohol to intoxication (L6)	Frequency of alcohol to intoxication (L6)	Any alcohol to intoxication (L12)	Any alcohol to intoxication (L3)	Any alcohol to intoxication (L6)	Any alcohol to intoxication (L6)	0.157***	
Drug 1	Number different drugs used (L6)	Number different drugs used (L6)	Any drug use (L12)	Any drug use (L3)	Any drug use (L6),	Any drug use (L6),	0.111***	
Drug 2	Highest frequency of drug use (L6)	Highest frequency of drug use (L6)	Severity of drug use (L12 users only)	GAIN Substance Problem Index	Severity of drug use (L6: users only)	Severity of drug use (L6: users only)	0.061***	
Mental health								
BDI	Beck Depression Index Total	Beck Depression Index Total	Beck Depression Index Total	Beck Depression Index Total	Beck Depression Index Total	Beck Depression Index Total	0.442*	
GSI/BSI	Global Severity Index	Global Severity Index	Brief Symptom Index	Brief Symptom Index	Brief Symptom Index	Brief Symptom Index	0.389**	
Psych 1	Manifest Anxiety Scale Total	Manifest Anxiety Scale Total	Any psychiatric treatment (L12)	GAIN Emotional Problem Index	SF36 mental health	SF36 mental health	0.218**	
Psych 2	Tennessee Self-Concept Scale Total	Tennessee Self-Concept Scale Total	Any psychiatric medication (L12)	GAIN any psychological/emotional problem (L3)	SF36 role emotional	SF36 role emotional	0.294*	
Crime								
Criminal Activity	Number of crimes committed (L6)	Number of crimes committed (L6)	Any criminal activity not parole/technical violation (L12)	Any trouble with the law/breaking the law (L3)	Any illegal activity for profit (L3)	Any illegal activity for profit (L3)	0.586	
Incarceration	Any jail/prison (L6)	Any jail/prison (L6)	Reincarcerated for new crime not parole or technical violation (L12)	Any jail/prison (L3)	Any jail (L6)	Any jail (L6)	0.218***	
HIV risk behavior								
Injection	Number times used needles (L6)	Number times used needles (L6)	Any needle use (L6)	Any needle use (L3)	An Any needle use (L3)	An Any needle use (L3)	0.300*	
Sexual behavior	Any sex with an acquaintance, stranger, IV drug user, or having more than two sex partners (L6)	Any sex with an acquaintance, stranger, IV drug user, or having more than two sex partners (L6)	Any sex while high (L12)	Number of sex partners (L3)	Any unprotected sex with someone HIV negative or status unknown (L3)	Any unprotected sex with someone HIV negative or status unknown (L3)	0.553	
Employment								
	Level of employment (L6)	Level of employment (L6)	Any employment (L6)	Any work for pay (L3)	Any work for pay (L1)	Any work for pay (L1)	0.031***	
Housing								
	Live in a house/apartment (L6)	Live in a house/apartment (L6)	Had no stable place to live (L12)	Live somewhere you pay rent (L3)	Currently live in stable housing (house, apartment, SRO, HIV permanent housing)	Currently live in stable housing (house, apartment, SRO, HIV permanent housing)	0.312***	

L1=last month; L3=last three months; L6=last 6 months; L12=12 months post prison release

* p<0.05

**
p<0.01
***
p<0.001

† An odds ratio of less than 1 indicates greater improvement for clients in the MTC group than in the control group.

†† An odds ratio of less than 1 indicates improvement from baseline to 12-month follow-up.