HHS Public Access

Author manuscript

Behav Sci Law. Author manuscript; available in PMC 2019 January 01.

Published in final edited form as:

Behav Sci Law. 2018 January ; 36(1): 116–129. doi:10.1002/bsl.2330.

Effect of Continuing Care for People with Cocaine Dependence on Criminal Justice Sentences

Alexandra S. Wimberly, PhD[1], **Jordan M. Hyatt, PhD, JD**[2], and **James R. McKay, PhD**[3]

[1]School of Social Policy and Practice, University of Pennsylvania, Philadelphia, PA

[2]Department of Criminology and Justice Studies, Drexel University, Philadelphia, PA

[3]Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, and Department of Behavioral Health, Philadelphia Veterans Affairs Medical Center, Philadelphia, PA

Abstract

Background—While continuing care for substance use treatment has been associated with reduced involvement in the criminal justice system, much of this research lacks random assignment to continuing care and so is limited by self selection bias.

Objective—This study seeks to determine the impact of adding telephone-based continuing care to intensive outpatient programs on criminal justice outcomes for people with cocaine dependence.

Methods—In three continuing care studies, spanning 1998–2008, participants were randomly assigned to an intensive outpatient program or an intensive outpatient program plus a telephone-based continuing care intervention. Cocaine dependent participants from these three studies were included in the analyses, with outcomes derived from a dataset of jurisdiction-wide criminal sentences from a state sentencing agency.

Data Analysis—Multiple logistic regression was employed to examine the odds of a criminal conviction occurring in the four years after enrollment in a continuing care study.

Results—Controlling for a criminal sentence in the previous year, gender, age, and continuing care study, people with cocaine dependence randomized to an intensive outpatient program plus a telephone-based continuing care intervention had 54% lower odds (p=.05, OR=0.46, 95% CI [0.20, 1.02]) of a criminal sentence in the four years after enrollment into the continuing care study, compared to those randomized to an intensive outpatient program alone.

Conclusion—Adding telephone monitoring and counseling to intensive outpatient programs is associated with fewer criminal convictions over a four-year follow-up period than intensive outpatient programs alone.

Keywords

continuing care; cocaine; criminal justice; sentences; substance use treatment

Corresponding Author: University of Pennsylvania, 3440 Market St., Suite 370, Philadelphia, PA 19104, Phone: (508)-930-2492, Fax: (888)-975-9407, schepensalexandra@gmail.com.

Introduction

A large percentage of people in the criminal justice system have substance use problems (Belenko & Peugh, 2005; Chandler, Fletcher, & Volkow, 2009; Taxman, Perdoni, & Harrison, 2007). Approximately 85% of all prisoners have used illicit drugs (Staton-Tindall, Havens, Oser, & Burnett, 2011). The most recent Bureau of Justice Statistics data indicate that about 50% of the state and federal prison populations and over two-thirds of the jail population meet criteria for a substance use disorder (Karberg & James, 2005; Mumola & Karberg, 2006). The large percentage of people with substance use disorders in these systems is related, in part, to the harsh policing and sentencing strategies of recent decades, which have focused on incarceration rather than treatment, for people with substance use disorders (Mitchell & Caudy, 2013; Pfaff, 2015; Phelps & Pager, 2016). By 2014, 50% (95,800) of people in federal prison and just under 16% of people in state prison (208,000) were incarcerated for a drug related offense (Carson, 2015).

Despite the large number of people with substance use disorders in the criminal justice system, relatively few people receive treatment. For example, in 2004, only 15 % of state and federal prisoners with a substance use disorder received treatment by trained professionals (Mumola & Karberg, 2006). Often, the substance use treatment that is offered in correctional facilities is educational in nature, lacking in the clinical depth required to attend to the needs of people with well-established drug use (Taxman, Perdoni, & Harrison, 2007). This is surprising given that extensive research has shown that in criminal justice populations, various modalities of substance use treatment reduce both substance use and criminal justice system involvement (Chandler et al., 2009); including therapeutic communities (TC), drug courts (Bahr, Masters, & Taylor, 2012; Harvey, Shakeshaft, Hetherington, Sannibale, & Mattick, 2007; Lurigio, 2000), cognitive behavioral therapy (Bahr et al., 2012; Barnes, Hyatt, & Sherman, 2016), medication assisted treatment (Lee et al., 2016), outpatient group counseling (Welsh, Zajac, & Bucklen, 2014), and meditation (Bowen et al., 2006; Himelstein, 2011). Despite demonstrated efficacy, Lurigio (2000) cautions that substance use treatment is not a cure-all and that treatment must meet the diverse needs of people in the criminal justice system, while also recognizing the chronic and often enduring nature of substance use problems.

One factor consistently noted as key to successful substance use treatment is aftercare, also referred to as continuing care (Lurigio, 2000; Martin, Butzin, Saum, & Inciardi, 1999; Vanderplasschen, Bloor, & McKeganey, 2010). Continuing care is follow-up treatment provided after more intensive care, such as inpatient care or intensive outpatient treatment (McKay, 2009). The rationale for continuing care comes from the idea that substance use recovery is an ongoing process, as is the case for other chronic disorders, and extended support, as opposed to an episodic approach to treatment is often required to achieve sustained recoveries (McKay, 2009). As such, substance use treatment should meet the recovery needs of the person, including their particular profile of risks and needs (Andrews & Dowden, 2007; Bonta & Andrews, 2010; Taxman & Thanner, 2006).

Numerous studies within the criminal justice setting have demonstrated that intensive treatment followed by continuing care is effective in reducing substance use and criminal

justice involvement (Lurigio, 2000; Welsh et al., 2014); and is cost-effective (McCollister et al., 2003). For example, one study found that people who were randomly assigned to a TC and completed aftercare experienced reduced re-incarcerations one year after prison release as compared with both those who were randomly assigned to TC and did not compete aftercare and those who were randomly assigned to mental health treatment in prison (Sacks, Sacks, McKendrick, Banks, & Stommel, 2004). Studies that examine five-year outcomes of TCs find that people who complete TC and continuing care have significant reductions in substance use and rates of re-incarceration and re-arrest (Inciardi, Martin, & Butzin, 2004; Prendergast, Hall, Wexler, Melnick, & Cao, 2004). A recent study looked at a follow-up period of an average of 6.9 years post-release, and found that participation in TC and aftercare was significantly associated with a 44 % reduction in re-incarceration when compared with people released from prison without a substance use treatment facility (Olson & Lurigio, 2014). Continuing care was a key component of the program, as overall TC participation only demonstrated reductions in re-incarceration of 15% as compared with people released from prison without a substance use treatment facility (Olson & Lurigio, 2014).

While the latter research demonstrates that those people who complete continuing care experience less substance use and criminal justice involvement than those who do not, self-selection bias is a concern (Prendergast, Hall, Wexler, Melnick & Cao, 2004; Sacks, Sacks, McKendrick, Banks & Stommel, 2004). Selection bias likely poses an issue for all non-experimental studies of continuing care. Since continuing care participation is usually voluntary, people who participate more in continuing care are likely to be more motivated, have less stressors, and/or cope with stress in ways other than using drugs, with these factors accounting for success, rather than continuing care alone.

One approach to isolating the causal effects of continuing care is to control for these potential biases by employing a randomized controlled trial to evaluate the continuing care component (Altman & Bland, 1999). This approach is underrepresented within the current literature. We identified only one older study, (completed in New England and Hong Kong), in which opioid users were randomly assigned to a 6–12 month group continuing care intervention or to standard care (McAuliffe, 1990). Individuals in the continuing care condition reported less criminal activity at 6 and 12 months when compared to those who did not receive the continuing care intervention. While this study demonstrated promising results, it was limited to self-report data and a relatively short follow-up period. A reliance on unverified offender self-reported data alone (instead of administrative criminal justice records) can create challenges in drawing inferentially valid conclusions (Hindelang, Hirschi, & Weis, 1979; Thornberry & Krohn, 2000).

In sum, while there is research that shows that continuing care is associated with reduced criminal justice involvement, there are several limitations and gaps in this literature that can be addressed through the current study. Firstly, to deal with self-selection (and other unknown) bias this study employs a randomized design to assign participants to intensive outpatient treatment plus a telephone-based continuing care intervention vs. intensive outpatient treatment only. In addition, this study uses administrative data from a state sentencing agency to address limits in the validity of self-report data on criminal justice

involvement. Finally, this study looks at four years of follow-up data to examine the longer term effects of continuing care on criminal justice involvement.

The objective of this study is to compare the criminal convictions of people with cocaine dependence randomized to receive an intensive outpatient program (IOP) which included some continuing care counseling groups as part of standard care, versus those randomized to receive both IOP and individual telephone monitoring and counseling calls (TMC).

Methods

Participants

Participants included individuals who were enrolled in one of three independent randomized controlled trials evaluating the effect of continuing care. While participants included in this data set may have used a variety of substances, they all met DSM criteria for cocaine dependence. We focused this study on patients with cocaine dependence because it was the most common illicit drug used by patients in Philadelphia IOPs when the trials were conducted and users often had criminal justice involvement. All three studies took place during a ten-year period, between 1998–2008. Participants from these three studies were largely in their early 40s, African American, and male. All three studies had follow-up periods of two years. Details of each of the three studies, including sample sizes, time frames and condition characteristics, are presented in Table 1.

Study treatment conditions

In each of the included research trials, the evaluation focused on the identification of the effects of IOP as compared to IOP in conjunction with the provision of additional services. Accordingly, participants were randomly assigned to IOP or to IOP and one of two other continuing care treatment conditions. These treatment conditions are listed in Table 1. In all three studies, TMC was one of the other treatment conditions. Although the experiments included additional conditions, individuals assigned to these groups are not included in the present analysis, because these additional conditions were each included in only one study. For example, one study included a CBT condition, and another study included a telephone monitoring only condition, without counseling. The current, pooled analysis includes only individuals assigned to the two treatment conditions that were constant across all of the experiments, as described below:

Intensive outpatient program (IOP only)—Group treatment was provided for about nine hours per week to individuals assigned to this condition. Sessions had themes such as denial, relapse prevention, and encouraging involvement in self-help groups (McKay et al., 2010; McKay, Alterman, McLellan, & Snider, 1994). The duration of IOP varied across the three studies with IOP lasting four weeks in the first study, and three-to-four months in the second and third studies (Table 1). Most participants in IOP were eligible to participate in weekly group counseling aftercare sessions after completing the more intensive initial phase of treatment.

Telephone monitoring and counseling (IOP+TMC)—Participants in this condition were also in IOP and were provided TMC, starting either at the end of or in the middle of IOP. TMC included individual counseling sessions, usually via phone (unless the participant was more comfortable meeting in person, or had difficulties accessing a phone). Additionally each participant received an individual in-person orientation to introduce them to the clinical protocol. The IOP+TMC sessions lasted three months for the first study, 18 months for the second study and 24 months for the third study (Table 1). In the first study, IOP+TMC participants could receive 12 weekly individual continuing care counseling sessions. In the second study, IOP+TMC participants could receive eight weekly, followed by 22 bi-weekly, and lastly six monthly individual continuing care counseling sessions. In the third study, IOP+TMC participants could receive eight weekly, followed by 22 bi-weekly, followed by 6 monthly, and lastly 3 bi-monthly individual continuing care counseling sessions.

The therapeutic approach was cognitive behavioral in nature. Sessions included identification of relapse risk, developing and rehearsing more effective coping responses, and discussions on how to connect with community supports. In the most recent study included in this paper, in addition to the IOP+TMC condition, there was a second IOP+TMC condition that included financial incentives for attendance (*i.e.*, $10 per session). For the purposes of this study, the IOP+TMC plus financial incentives condition was included in the IOP+TMC group, because the TMC components were the same in both conditions, and the provision of incentives did not improve substance use outcomes (McKay et al., 2013).

Results of the three studies indicate that adding TMC to IOP generally produced improved substance use outcomes over IOP only. The first study found that alcohol and drug use outcomes were better in IOP+TMC than in standard group counseling continuing care (McKay, Lynch, Shepard, & Pettinati, 2005). In the second study (McKay et al., 2010, 2011), IOP+TMC produced better alcohol use outcomes than IOP only. Finally, in the third study (McKay et al., 2013), people who were using cocaine at IOP initiation experienced less substance use if randomized to IOP+TMC or IOP+TMC plus financial incentives rather than IOP only. (McKay et al., 2013). While the IOP+TMC condition demonstrated favorable substance use outcomes, these previous studies did not look at its effect on criminal justice outcomes, which is the objective of the current study.

Study Procedures

Participants were recruited and consented within their first month in IOP. Follow-up assessments occurred at 3, 6, 9, 12, 18, and 24 months post-baseline in the first study; at 3, 6, 9, 12, 15, 18, 21, and 24 months post-baseline in the second study; and at 3, 6, 9, 12, 18, and 24 months post-baseline in the third study. Participants received $35–50 for each baseline and follow-up assessment. Follow-up rates at the final study assessment ranged between 75% and 86% across the three studies and did not differ meaningfully across treatment conditions (Table 1).

Measures

Demographic and baseline substance use data were obtained using the Addiction Severity Index (ASI; McLellan, Luborsky, Woody, & O'Brien, 1980) administered at the baseline interview, which was completed between week two and week four of IOP. The ASI results also provided information regarding prior substance use treatments, as well as patterns of cocaine and alcohol use within the past 30 days. In addition, the Structured Clinical Interview for DSM-IV was used to obtain information regarding cocaine dependence diagnoses and mental health problems (First, Spitzer, Gibbon, & Williams, 2012).

Criminal justice outcome and matching process

The primary criminal justice outcome for this analysis was conviction for a new criminal offense, as measured by the issuance of a new criminal justice sentence of any type within the four-year post-study enrollment period.[4] Criminal justice data were obtained from the Pennsylvania Commission on Sentencing (PCS) for the years 1997–2012. For each study, we looked at number of distinct sentences in the year prior to a person's enrollment in the continuing care study (baseline measure) and the number of sentencing events in the four years after enrollment in the continuing care study (outcome measure). The duration of baseline and outcome periods chosen for this analysis was based on the maximum number of years of criminal justice data available from the PCS, while allowing for the assessment of baseline and follow-up periods of similar duration across the three studies. PCS data were matched with continuing care data by first name, last name and date of birth.[5]

After matching the databases, 20% (n=129) of participants from the continuing care data set were determined to have a sentence listed in the PCS data. The 129 matches were verified by matching first name, last name and date of birth from both the criminal justice and continuing care data sets. One-hundred-five of the matches were exact matches. Twenty-four were possible matches with typographical errors; these were manually confirmed to represent the same individual. Of these 129 matches, 28 of the criminal justice sentences occurred within four years of enrolling in the respective continuing care study. Twenty-nine of the criminal justice sentences occurred in the year prior to enrollment in continuing care.[6]

Data Analysis

Differences between IOP only and IOP+TMC at baseline were evaluated with one-way ANOVAs (for continuous measures) and chi-square tests (for categorical measures).

Multiple logistic regression (SAS PROC LOGISTIC) was used to generate the odds of a new sentence (our dependent variable) occurring in the four years after enrollment into the

[4]A sentencing event can encompass the punishment for a number of distinct criminal charges, each generally associated with a single criminal act. In some cases, the sentence may not carry any additional punishment, but, in these data, there is a 1:1 relationship between convictions and sentences. Additionally, while a variable temporal lag between arrest and sentencing for a crime is possible, the relatively long follow-up period employed uniformly here permits the use of these data. Alternate measure of recidivism (e.g., re-arrest, re-incarceration, technical violations) may provide different times to failure and prevalence, though all are commonly used in criminological research (Andersen & Skardhamar, 2017; Ostermann, Salerno, & Hyatt, 2015).

[5]Link King, a public domain SAS application that integrates a deterministic and probabilistic strategy to match data sets was used (Campbell, n.d.).

[6]Seventy-two additional criminal justice sentences were discarded from study analysis because they were outside of the window of one-year pre-continuing care study enrollment and four years post-continuing care study enrollment.

continuing care studies, taking into consideration four independent variables. These variables were: 1.) criminal justice sentence in the year prior to enrollment in the continuing care study (yes/no), 2.) treatment condition (IOP alone/IOP+TMC), 3.) gender (male/female), which was included because the male gender has been associated with increased criminal justice involvement (Archer, 2004; Schwartz, Steffensmeier, Zhong, & Ackerman, 2009), and 4.) study (study one/study two/study three), which was included because treatment intensity varied by study. Analyses were completed under the intent to treat principle, meaning all participants were included in the analysis under their randomized treatment condition assignment, regardless of intervention participation rates.

Results

The majority of participants were single, had about four years of previous substance use treatment and had used alcohol and cocaine each on about one day in the 30 days prior to their enrollment in the continuing care study. Rates of substance use were low because much or all of the 30-day baseline period coincided with the time in which the participants were in IOP. There were no significant baseline differences between those in IOP alone and those in IOP+TMC. Complete comparison statistics can be found in Table 2.

Eleven (2%) of people in IOP+TMC (including five misdemeanors and six felonies) were sentenced within the four years after study enrollment versus 17 (6%) of people who were in IOP alone (including ten misdemeanors and seven felonies). The top four charges among people in IOP alone and IOP+TMC included theft or robbery (n=9, 32%), followed by possession (n=5, 18%), DUI (n=4, 14%), and criminal trespass (n=4, 14%). Full results can be found in Table 3.

People in IOP+TMC had 54 % lower odds, (p=.05, OR=0.46, 95% CI [0.20, 1.02], Table 4) of having a criminal justice sentence within the four years after enrollment in the continuing care study compared to those in IOP alone. Men were at increased odds (in comparison to women) of having a criminal justice sentence within the four years after enrollment in the continuing care study (p<.05, OR= 5.53, 95% CI [1.27, 24.05]). People with a criminal sentence in the year prior to their enrollment in the continuing care study had increased odds of having a criminal justice sentence within the four years after enrollment into the continuing care study (p=.07, OR= 2.97, 95% CI [0.91, 9.68].

Participants in the second study had a greater likelihood of having a criminal justice sentence within the four years after study enrollment in the continuing care study in comparison to those in the first and third studies. To further understand this finding we completed an additional regression analysis that included a study by treatment condition interaction term. The regression analysis found that this interaction term did not approach significance (p=0.99), demonstrating that the effect of treatment condition on the conviction outcomes did not differ across studies. While IOP and IOP+TMC participants in study two had more criminal justice sentences than participants in studies one and three, the ratio of sentences for those in IOP+TMC versus IOP was similar across the three studies with those in IOP having about twice the percentage of criminal justice sentences than those in IOP +TMC (Table 5).

We also completed a secondary analysis to examine all baseline criminal justice sentences (*i.e.,* not restricting to one year prior to continuing care study enrollment) and looking at all post-study enrollment criminal justice sentences (*i.e.,* not restricting to four years post-continuing care enrollment). The results were in the same direction, but with stronger associations between treatment and outcomes. Participants in IOP+TMC had 64 % lower odds ($p<.05$, OR=0.36, 95% CI [0.15, 0.85]. (*i.e.,* in comparison to participants in IOP alone) of having a criminal justice sentence after enrollment in the continuing care study. Participants with a criminal justice sentence prior to their enrollment in the continuing care study were at increased odds of having a criminal justice sentence after enrollment into the continuing care study ($p<.0001$, OR= 27.69, 95% CI [9.72, 78.81]).

Discussion

This study found that people with cocaine dependence who were randomized to telephone monitoring and counseling in addition to intensive outpatient treatment were at decreased odds of having a criminal conviction in the four years after enrolling in a continuing care study, as opposed to people randomized to intensive outpatient treatment only. In addition, men were more likely to have a criminal justice sentence than women. This finding is unsurprising given that men make up a larger percentage of the prison population than women (Carson, 2015). People who had had a criminal justice sentence in the year prior to study enrollment were more likely to have a sentence after enrolling in a continuing care study (a finding that trended towards statistical significance at $p=.07$), consistent with literature that shows that a recent criminal justice offense is associated with additional criminal justice involvement (Kurlychek, Brame, & Bushway, 2006).

This study combined three different continuing care experiments, spanning the years 1998–2008. We found that participants in the second experiment were more likely than participants in the first and third experiments to have a sentence in the four years after study enrollment, regardless of treatment condition. We have several hypotheses to explain this finding. First, participants in the first study (who had the least number of criminal sentences in comparison to the other two studies) enrolled people who had completed their IOP program and displayed abstinence in their final week of IOP. In the other two studies participants could be enrolled prior to IOP completion with no abstinence requirement. Therefore, it may be that people in the first study were more advanced in their recovery at study initiation, which supported less criminal justice involvement. A second hypothesis is that there were regional changes in criminal justice enforcement that led to increased criminal justice involvement in the population, a hypothesis that is supported by an increase in the Philadelphia Prison System population from the years of 1999–2008 (The PEW Charitable Trusts, 2011).

In the study sample (combining data from three separate experiments), there were 28 people who had a sentence within four years post-study enrollment, or just over 4% of the sample. In comparison, just under 3% of the general population in the United States is under correctional supervision, including prisons, jails, probation or parole (Kaeble, Glaze, Tsoutis, & Minton, 2015). We anticipated our study sample would have a higher percentage of sentences because people with substance use problems typically have higher rates of

criminal justice involvement than the general population. For example, one study found that among a sample of people with narcotics problems, 18% were incarcerated at age 37 and 12% were incarcerated at age 48 (Hser, 2001). The relatively low number of sentences post-study enrollment in the present study is likely due to several factors. First, study eligibility included completion of 3–4 weeks of IOP, meaning that participants with a poorer prognosis may have dropped out of IOP prior to enrolling in a continuing care study. This may have led to the study sample having better overall outcomes and less criminal justice system involvement. Second, we looked at a limited time period of four years post-study enrollment. There were an additional 72 sentences that occurred either before the year prior to a person enrolling in continuing care or more than four years after enrolling. These additional sentences were not included in our primary analysis so that each study had the same baseline and follow-up period in which a criminal justice sentence could occur. Third, study participants were mostly in their early forties, an age when less criminal justice involvement occurs; as most criminal justice offenses occur at a younger age (Hirschi & Gottfredson, 1983; Massoglia & Uggen, 2010). Finally, we looked only at criminal justice sentences, as opposed to measures such as arrests or parole violations. We chose this measure because it has more impactful consequences to the individual and society. A criminal sentence is detrimental to the individual as it results in a criminal record and potentially incarceration, probation, parole and/or fines. In addition, criminal sentences are associated with substantial judicial and corrections costs to society.

Our findings have important implications in terms of cost savings associated with substance use treatment. While six percent of people in IOP alone had a sentence within four years post-study enrollment, only two percent of people in IOP+TMC had similar outcomes. If those in IOP+TMC had had sentences at a rate similar to those in IOP, fifteen more people from IOP+TMC would have had a sentence, a meaningful difference if we consider the great expense of police, courts and corrections expended for and as a result of each criminal incident. For example, if a person's sentence leads to a year of incarceration in Pennsylvania, the incarceration alone costs $42,339 per year (Vera, 2012). This study therefore supports research that demonstrates the cost effectiveness of IOP+TMC to society (McCollister, Yang, & McKay, 2016), and the cost effectiveness of substance use treatment in relation to criminal justice costs (Harwood, Hubbard, Collins, & Rachal, 1988).

In the current climate of mass incarceration, the results of this study support the need to treat substance use problems from a public health standpoint. This study demonstrates that substance use treatment that includes individualized continuing care is associated with fewer criminal sentences. In this dataset, about one-third of the sentences were drug-related (*e.g.,* drug possession or DUI). In addition, it is possible that the sentences were related to activity done while under the influence of, or for the procurement of, drugs. Current criminal justice reform efforts highlight the need to refer people with drug problems who have a criminal sentence related to their drug use to treatment rather than to the criminal justice system. Along this line of thinking, people with substance use dependence can best be served through treatment, including continuing care.

Strengths

This study looked at three continuing care experiments over a decade and found similar treatment effects on criminal justice outcomes across the three experiments. Such replication of findings provides strong support for IOP+TMC's effect on criminal justice sentences. With a lengthy follow-up period of four years (roughly two years while in continuing care and two years after continuing care completion), this study demonstrates that the effects of substance use treatment endure past treatment completion. The criminal justice data obtained for this study were robust and reliable. In addition, using the criminal justice measure of a sentence is a conservative measure of criminal justice involvement. Therefore, the study shows that substance use treatment can affect the more consequential criminal justice contacts. Finally, using the Link King matching system, we matched the substance use and criminal justice datasets, yielding matches that may not have been possible with only a deterministic matching strategy.

Limitations

This study, like others that rely on administrative data, is subject to several qualifications. Because the criminal justice data only included those who were sentenced, the data may not indicate the extent to which people had criminal justice involvement. In addition, we only controlled for criminal sentences in the year prior to that person's enrollment in the continuing care study. Therefore, we do not have a full picture of the criminal justice history of the study population. However, secondary analyses that made use of all available data on criminal sentencing, which extended beyond the one year pre-baseline and four year post-baseline study periods came to essentially the same conclusions as the more tightly controlled analyses.

This study does not shed light on the specific therapeutic mechanisms of action in IOP+TMC that led to lower sentencing rates than IOP alone. It is possible that the reductions in substance use associated with receiving IOP+TMC led to reductions in criminal justice involvement related to either the effects of alcohol and drugs or efforts to obtain them. In addition, it may be that participants in IOP+TMC engaged in less criminal risk activity on the whole, such as less sex-risk behavior that is often associated with substance use and is criminalized (like sex work). Further, drug use disorders and criminal justice involvement are both highly stigmatized, and society's response may involve exclusion from community resources (Best, Irving, & Albertson, 2017). Therefore, when a person is engaged in recovery, they may have greater access to social networks and community resources that also may reduce criminal justice involvement, such as access to a wider range of housing and employment options. More research will be needed to determine the specific nature of the effects of IOP+TMC on criminal justice involvement. It may be that the extended, individualized attention provided by TMC was an important factor in its effectiveness.

An additional limitation is that the three continuing care studies varied in the number of TMC sessions a participant could receive. However, all interventions did include weekly individualized sessions for the initial two-three months, which may have been one of the crucial components to the TMC intervention. A final limitation is that this study sample

included only people with cocaine dependence. Therefore, these study findings have limited generalizeability to people with dependency to other drugs, such as opioids, that have specific treatment needs.

Conclusion

Substance use recovery is a complex process that involves multiple relapses and for some people may never result in abstinence. Continuing care, in the form of telephone monitoring and counseling, offers continued support after people have completed more intensive treatment. The prior results of the three studies that were combined for this analysis (McKay et al, 2005; 2010; 2011; 2013) indicated that IOP+TMC reduces substance use relative to standard care, and these new results indicate that it also reduces convictions. Future studies in this area should build upon this work by examining extended follow-up periods, different criminal justice outcome measures and by collecting qualitative feedback from continuing care participants regarding how treatment affects criminal-risk behavior and access to community resources.

Acknowledgments

National Institute on Drug Abuse Grants F31 DA038429, R01 DA020623, K02 DA000361, and K24 DA029062 supported this research. Additional support was provided by the Center of Excellence in Substance Abuse Treatment and Education of the Department of Veterans Affairs. We thank the Pennsylvania Commission on Sentencing and the management, clinical staff and patients at NorthEast Treatment Centers and Presbyterian Hospital for collaborating on this research project.

References

Altman DG, Bland JM. Statistics notes: Treatment allocation in controlled trials: Why randomise? British Medical Journal. 1999; 318(7192):1209. [PubMed: 10221955]

Andersen SN, Skardhamar T. Pick a number: Mapping recidivism measures and their consequences. Crime & Delinquency. 2017; 63(5):613–635.

Andrews DA, Dowden C. The risk-need-responsivity model of assessment and human service in prevention and corrections: Crime-prevention jurisprudence. Canadian Journal of Criminology and Criminal Justice. 2007; 49:439–464. DOI: 10.3138/cjccj.49

Archer J. Sex differences in aggression in real-world settings: A meta-analytic review. Review of General Psychology. 2004; 8(4):291–322. DOI: 10.1037/1089-2680.8.4.291

Bahr SJ, , Masters AL, , Taylor BM. What works in substance abuse treatment programs for offenders?; The Prison Journal 2012 120

Barnes GC, Hyatt JM, Sherman LW. Even a little bit helps: An implementation and experimental evaluations of cognitive-behavioral therapy for high-risk probationers. Criminal Justice and Behavior. 2016; 44(4):611–630. DOI: 10.1177/0093854816673862

Belenko S, Peugh J. Estimating drug treatment needs among state prison inmates. Drug and Alcohol Dependence. 2005; 77:269–281. DOI: 10.1016/j.drugalcdep.2004.08.023 [PubMed: 15734227]

Best D, Irving J, Albertson K. Recovery and desistance: What the emerging recovery movement in the alcohol and drug area can learn from models of desistance from offending. Addiction Research & Theory. 2017; 25(1):1–10. DOI: 10.1080/16066359.2016.1185661

Bonta J, , Andrews D. Viewing offender assessment and rehabilitation through the lens of the risk-need-responsivity model. In: McNeil F, Raynor P, , Trotter C, editorsOffender supervision: New directions in theory, research and practice Routledge: 2010 1940

Bowen S, Witkiewitz K, Dillworth TM, Chawla N, Simpson TL, Ostafin BD, … Marlatt GA. Mindfulness meditation and substance use in an incarcerated population. Psychology of Addictive Behaviors. 2006; 20(3):343–7. DOI: 10.1037/0893-164X.20.3.343 [PubMed: 16938074]

Campbell KM. Rule Your Data with The Link King © (a SAS/AF® application for record linkage and unduplication). Sugi 30n.d

Carson EA. Bureau of Justice Statistics Bulletin 2015 Prisoners in 2014. NCJ 248955

Chandler RK, Fletcher BW, Volkow ND. Treating drug abuse and addiction in the criminal justice system: Improving public health and safety. JAMA: The Journal of the American Medical Association. 2009; 301(2):183–190. DOI: 10.1001/jama.2008.976.Treating [PubMed: 19141766]

First MB, , Spitzer RL, , Gibbon M, , Williams JBW. Structured clinical interview for DSM-IV® Axis I disorders (SCID-I), clinical version, administration booklet Arlington, VA: American Psychiatric Publishing, Inc; 2012

Harvey E, Shakeshaft A, Hetherington K, Sannibale C, Mattick RP. The efficacy of diversion and aftercare strategies for adult drug-involved offenders: A summary and methodological review of the outcome literature. Drug and Alcohol Review. 2007 Jul.26:379–387. DOI: 10.1080/09595230701373917 [PubMed: 17564873]

Harwood HJ, Hubbard RL, Collins JJ, Rachal JV. The costs of crime and the benefits of drug abuse treatment: A cost-benefit analysis using TOPS data. NIDA Research Monograph. 1988; (86):209–235.

Himelstein S. Meditation research: The state of the art in correctional settings. International Journal of Offender Therapy and Comparative Criminology. 2011; 55(4):646–61. [PubMed: 20332328]

Hindelang MJ, Hirschi T, Weis JG. Correlates of delinquency: The illusion of discrepancy between self-report and official measures. American Sociological Review. 1979; 44(6):995–1014. Retrieved from http://www.jstor.org/stable/2094722.

Hirschi T, Gottfredson M. Age and the explanation of crime. American Journal of Sociology. 1983; 89(3):552–584. Retrieved from http://links.jstor.org/sici?sici=0002-9602%28198311%2989%3A3%3C552%3AAATEOC%3E2.0.CO%3B2.

Hser YI. A 33-year follow-up of narcotics addicts. Archives of General Psychiatry. 2001; 58(5):503–508. [PubMed: 11343531]

Inciardi JA, Martin SS, Butzin CA. Five-year outcomes of therapeutic community treatment of drug-involved offenders after release from prison. Crime & Delinquency. 2004; 50(1):88–107. DOI: 10.1177/0011128703258874

Kaeble D, Glaze L, Tsoutis A, Minton T. Correctional population in the United States, 2014. Bureau of Justice Statistics Bulletin. 2015 (NCJ 249513).

Karberg JC, James DJ. Substance dependence, abuse and treatment of jail inmates, 2002. Bureau of Justice Statistics Special Report. 2005 (NCJ 209588).

Kurlychek MC, Brame R, Bushway SD. Scarlet letters and recidivism: Does an old criminal record predict future offending? Criminology & Public Policy. 2006; 5(3):483–504.

Lee JD, Friedmann PD, Kinlock TW, Nunes EV, Boney TY, Hoskinson RA, … O'Brien CP. Extended-release naltrexone to prevent opioid relapse in criminal justice offenders. New England Journal of Medicine. 2016; 374(13):1232–1242. DOI: 10.1056/NEJMoa1505409 [PubMed: 27028913]

Lurigio AJ. Drug treatment availability and effectiveness: Studies of the general and criminal justice populations. Criminal Justice and Behavior. 2000; 27(4):495–528.

Martin SS, Butzin CA, Saum CA, Inciardi JA. Three-year outcomes of therapeutic community treatment for drug-involved offenders in Delaware: From prison to work release to aftercare. The Prison Journal. 1999; 79(3):294–320.

Massoglia M, Uggen C. Settling down and aging out: Toward an interactionist theory of desistance and the transition to adulthood. American Journal of Sociology. 2010; 116(2):543–582. DOI: 10.1086/653835

McAuliffe WE. A randomized controlled trial of recovery training and self-help for opioid addicts in New England and Hong Kong. The Journal of Psychoactive Drugs. 1990; 22(2):197–209. [PubMed: 2197394]

McCollister KE, French MT, Prendergast M, Wexler H, Sacks S, Hall E. Is in-prison treatment enough? A cost-effectiveness analysis of prison-based treatment and aftercare services for substance-abusing offenders. Law & Policy. 2003; 25(1):63–82.

McCollister K, Yang X, McKay JR. Cost-effectiveness analysis of a continuing care intervention for cocaine-dependent adults. Drug and Alcohol Dependence. 2016; 158:38–44. [PubMed: 26621551]

McKay JR. Continuing care research: What we've learned and where we're going. Journal of Substance Abuse Treatment. 2009; 36(2):131–145. DOI: 10.1016/j.jsat.2008.10.004.Continuing [PubMed: 19161894]

McKay JR, Alterman AI, McLellan AT, Snider EC. Treatment goals, continuity of care, and outcome in a day hospital program. 1994; (151):254–259.

McKay JR, Van Horn DHA, Oslin DW, Lynch KG, Ivey M, Ward K, … Coviello DM. A randomized trial of extended telephone-based continuing care for alcohol dependence: Within-treatment substance use outcomes. Journal of Consulting and Clinical Psychology. 2010; 78(6):912–923. DOI: 10.1037/a0020700 [PubMed: 20873894]

McKay JR, Lynch KG, Shepard DS, Pettinati HM. The effectiveness of telephone-based continuing care for alcohol and cocaine dependence: 24-month outcomes. Archives of General Psychiatry. 2005; 62(2):199–207. DOI: 10.1001/archpsyc.62.2.199 [PubMed: 15699297]

McKay JR, Van Horn DHA, Lynch KG, Ivey M, Cary MS, Drapkin ML, … Plebani JG. An adaptive approach for identifying cocaine dependent patients who benefit from extended continuing care. Journal of Consulting and Clinical Psychology. 2013; 81(6):1063–73. DOI: 10.1037/a0034265 [PubMed: 24041231]

McKay JR, Van Horn D, Oslin DW, Ivey M, Drapkin ML, Coviello DM, … Lynch KG. Extended telephone-based continuing care for alcohol dependence: 24-month outcomes and subgroup analyses. Addiction. 2011; 106(10):1760–9. DOI: 10.1111/j.1360-0443.2011.03483.x [PubMed: 21545667]

McLellan AT, Luborsky L, Woody GE, O'Brien CP. An improved diagnostic evaluation instrument for substance abuse patients. The Journal of Nervous and Mental Disease. 1980; 168(1):26–33. [PubMed: 7351540]

Mitchell O, Caudy MS. Examining racial disparities in drug arrests. Justice Quarterly. 2013; 32(2): 288–313. DOI: 10.1080/07418825.2012.761721

Mumola CJ, Karberg JC. Drug use and dependence, state and federal prisoners, 2004. Bureau of Justice Statistics Special Report. 2006 (NCJ 213530).

Olson DE, Lurigio AJ. The long-term effects of prison-based drug treatment and aftercare services on recidivism. Journal of Offender Rehabilitation. 2014; 53(8):600–619. DOI: 10.1080/10509674.2014.956965

Ostermann M, Salerno LM, Hyatt JM. How different operationalizations of recidivism impact conclusions of effectiveness of parole supervision. Journal of Research in Crime and Delinquency. 2015; 52(6):771–796. DOI: 10.1177/0022427815580626

Pfaff J. The war on drugs and prison growth: Limited importance, and limited legislative options. Harvard Journal on Legislation. 2015; 52(1):173–220. Retrieved from http://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1650&context=faculty_scholarship%0Ahttp://ir.lawnet.fordham.edu/faculty_scholarship/651/.

Phelps MS, Pager D. Inequality and punishment: A turning point for mass incarceration? The ANNALS of the American Academy of Political and Social Science. 2016; 663(1):185–203. DOI: 10.1177/0002716215596972

Prendergast ML, Hall EA, Wexler HK, Melnick G, Cao Y. Amity prison-based therapeutic community: 5-year outcomes. The Prison Journal. 2004; 84(1):36–60. DOI: 10.1177/0032885503262454

Sacks S, Sacks JY, McKendrick K, Banks S, Stommel J. Modified TC for MICA offenders: Crime outcomes. Behavioral Sciences and the Law. 2004; 22:477–501. DOI: 10.1002/bsl.599 [PubMed: 15282836]

Schwartz J, Steffensmeier D, Zhong H, Ackerman J. Trends in the gender gap in violence: Reevaluating ncvs and other evidence. Criminology. 2009; 47(2):401–425. DOI: 10.1111/j.1745-9125.2009.00152.x

Staton-Tindall M, , Havens JR, , Oser CB, , Burnett MC. Handbook of evidence-based substance abuse treatment in criminal justice settings New York: Springer; 2011 Substance use prevalence in criminal justice settings; 81101

Taxman FS, Perdoni ML, Harrison LD. Drug treatment services for adult offenders: The state of the state. Journal of Substance Abuse Treatment. 2007; 32(3):239–254. [PubMed: 17383549]

Taxman FS, Thanner M. Risk, need, and responsivity (RNR): It all depends. Crime & Delinquency. 2006; 52(1):28–52. DOI: 10.1177/0011128705281754 [PubMed: 18542715]

Thornberry TP, Krohn MD. The self-report method for measuring delinquency and crime. Criminal Justice. 2000; 4(1):33–83. DOI: 10.2307/1141583

The Pew Charitable TrustsPhiladelphia' s crowded, costly jails: The search for safe solutions The Pew Charitable Trusts; Philadelphia: 2011 Retrieved from http://www.pewtrusts.org/~/media/legacy/uploadedfiles/wwwpewtrustsorg/reports/philadelphia_research_initiative/philadelphiascrowdedcostlyjailsrevpdf.pdf

Vanderplasschen W, Bloor M, McKeganey N. Long-term outcomes of aftercare participation following various forms of drug abuse treatment in Scotland. The Journal of Drug Issues. 2010; 40(3):703–728.

VeraThe Price of Prisons | Pennsylvania New York, NY: 2012

Welsh WN, Zajac G, Bucklen KB. For whom does prison-based drug treatment work? Results from a randomized experiment. Journal of Experimental Criminology. 2014; 10(2):151–177. DOI: 10.1007/s11292-013-9194-z

Table 1

Continuing Care Studies at Publicly Funded Intensive Outpatient Programs (IOP)

	Study 1	Study 2	Study 3
Continuing care recruitment period	1998–2000	2004–2007	2007–2008
Year of baseline criminal sentences	1997–1998	2003–2004	2006–2007
Four Years of criminal sentences post-continuing care enrollment	2000–2004	2007–2011	2008–2012
Sample size	163	168	321
Cocaine use eligibility criteria	Cocaine dependence at time of entry to IOP	Cocaine dependence at time of entry to IOP	Lifetime criteria for cocaine dependence and using cocaine in 6 months prior to starting IOP
IOP involvement at enrollment	Completed 4-week IOP	Completed week 3 of IOP. IOP had flexible length of stay of 3–4 months.	Completed week 2 of IOP. IOP had flexible length of stay of 3–4 months.
Treatment conditions	1.) IOP 2.) IOP + cognitive behavioral therapy/relapse prevention (not included in this paper's analysis) 3.) IOP + telephone monitoring and counseling (TMC)	1.) IOP 2.) IOP + extended telephone monitoring (not included in this paper's analysis) 3.) IOP + TMC	1.) IOP 2.) IOP + TMC 3.) IOP + TMC plus incentives
IOP Duration & intensity	1 month 9 hours per week	3–4 months 9 hours per week	3–4 months 9 hours per week
TMC intervention duration	3 months	18 months	24 months
Number of TMC Sessions Offered	12	36	39
Average Number of TMC Sessions Completed	6	9	TMC=16 TMC plus incentives=26
Follow-up rates at Final Study Assessment	86%	77%	75%

Table 2

Characteristics of Study Participants by Treatment Condition

	Intensive Outpatient Program (N = 282)		Telephone Monitoring and Counseling (N = 370)			
	n	***(%)***	***n***	***(%)***	**Significance Test**	***p***
Gender						
Male	208	(74)	281	(76)	$\chi^2 = 0.41$	0.52
Female	74	(26)	89	(24)		
Race						
Black	243	(86)	326	(88)	$\chi^2 = 0.54$	0.46
White	39	(14)	44	(12)		
Marital Status						
Married	7	(6.48)	21	(9.86)	$\chi^2 = 1.03$	0.31
	M	*(SD)*	*M*	*(SD)*	Significance Test	*p*
Age						
Years	42.06	(7.84)	42.92	(7.36)	F = 1.18	0.28
Education						
Years	10.37	(8.11)	12.42	(8.36)	F = 2.05	0.15
Cocaine Use						
Past 30 days	1.47	(3.28)	1.38	(3.14)	F = 0.12	0.73
Alcohol Use						
Past 30 days	1.53	(3.97)	1.21	(2.78)	F = 1.34	0.25
Drug Treatment						
Years	4.17	(4.91)	4.31	(5.32)	F = 0.08	0.78

Table 3

Offense Type After Enrollment in Continuing Care Study by Treatment Condition

	Treatment Condition		
Offense Type ***n*** **Row %** **Column %**	**IOP**	**IOP+TMC**	**TOTAL**
Theft/Robbery	6 66.67% 35%	3 33.33% 27%	9 100%
Possession of Drugs	1 20% 6%	4 80% 36%	5 100%
DUI	3 75% 18%	1 25% 9%	4 100%
Criminal Trespass	1 25% 6%	3 75% 27%	4 100%
Assault	2 100% 12%	0 0% 0%	2 100%
Carrying Firearm	1 100% 6%	0 0% 0%	1 100%
Disorderly Conduct	1 100% 6%	0 0% 0%	1 100%
Sexual Assault	1 100% 6%	0 0% 0%	1 100%
Prostitution	1 100% 6%	0 0% 0%	1 100%
TOTAL	17 100%	11 100%	28 100% 100%

Note: The total sample size of IOP is 282. The total sample size of IOP+TMC is 370.

Table 4

Summary of Logistic Regression Analysis for Variables Predicting Criminal Justice Sentence Four Years after Enrollment in a Continuing Care Study

							95% Confidence Interval for Exp(B)	
Variables	**B**	**Standard Error**	**Wald**	**df**	**Sig.**	**Exp(B)**	**Lower Bound**	**Upper Bound**
Baseline criminal justice sentence (Y v. N)	1.09	0.60	3.28	1	0.07	2.97	0.91	9.68
Treatment Condition (TMC v. IOP)	−0.79	0.41	3.70	1	0.05	0.46	0.20	1.02
Study (2 v.1)	1.42	0.59	5.76	1	0.02	4.13	1.30	13.15
Study (2 v.3)	1.07	0.43	6.00	1	0.01	2.92	1.24	6.89
Gender (Men v. Women)	1.71	0.75	5.19	1	0.02	5.53	1.27	24.05

Table 5

Total Number of Offenses in the Four Years after Enrollment into Continuing Care Study by Study and Treatment Condition

Continuing Care Study	IOP	IOP+TMC
Study 1 (*n*, % study population)	3 (3.41)	1 (1.33)
Study 2 (*n*, % study population)	9 (10.47)	5 (6.10)
Study 3 (*n*, % study population)	5 (4.63)	5 (2.35)