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Title: The Impact of Correctional Therapeutic Communities on Recidivism: A Meta-Analysis

Abstract Approved:

Major Professor, Scott Akins

At any given time, 60% to 85% of prisoners across the United States are struggling with substance addiction and dependence. Upon release, about two-thirds of former prisoners will reoffend and return to prison. Due to the high rate of substance use and abuse in prisons, drug treatment, specifically Correctional Therapeutic Communities (CTCs) can potentially help with reintegration. The community justice framework can explain the utilization of substance abuse treatment in prison. This framework calls for correctional facilities to create community partnerships to facilitate the reintegration of inmates into society upon release. CTCs are in-prison programs that utilize segregated housing, a structured environment, mentorship, and a progression of phases to treat substance use and abuse. In many cases, CTCs are followed by aftercare treatment or services to assist with reintegration. The purpose of this study is to determine what relationship CTCs have on recidivism, with or without aftercare treatment, via meta-analysis. Findings indicate that those participating in CTCs without aftercare are 39% less likely to recidivate compared to those not in a CTC. Those participating in CTCs with aftercare treatment are 56% less likely to recidivate compared to those not in a CTC or aftercare. Differences in magnitude between CTCs with aftercare and without are not statistically significant. These findings suggest that CTCs, with or without aftercare, have a small to

moderate impact on decreasing recidivism among those in treatment. If CTCs are implemented nationwide with adequate funding, they have the potential to decrease recidivism, and build capacity in those communities that have former inmates returning to them.

The Impact of Correctional Therapeutic Communities on Recidivism: A Meta-Analysis

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Meredith Booker

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APPROVED:

Scott Akins (Chair), representing Sociology

Brett Burkhardt, representing Sociology

Paul Thompson, representing Economics

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Meredith Booker, author

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Abstract

At any given time, 60% to 85% of prisoners across the United States are struggling with substance addiction and dependence. Upon release, about two-thirds of former prisoners will reoffend and return to prison. Due to the high rate of substance use and abuse in prisons, drug treatment, specifically Correctional Therapeutic Communities (CTCs) can potentially help with reintegration. The community justice framework can explain the utilization of substance abuse treatment in prison. This framework calls for correctional facilities to create community partnerships to facilitate the reintegration of inmates into society upon release. CTCs are in-prison programs that utilize segregated housing, a structured environment, mentorship, and a progression of phases to treat substance use and abuse. In many cases, CTCs are followed by aftercare treatment or services to assist with reintegration. The purpose of this study is to determine what relationship CTCs have on recidivism, with or without aftercare treatment, via meta-analysis. Findings indicate that those participating in CTCs without aftercare are 39% less likely to recidivate compared to those not in a CTC. Those participating in CTCs with aftercare treatment are 56% less likely to recidivate compared to those not in a CTC or aftercare. Differences in magnitude between CTCs with aftercare and without are not statistically significant. These findings suggest that CTCs, with or without aftercare, have a small to moderate impact on decreasing recidivism among those in treatment. If CTCs are implemented nationwide with adequate funding, they have the potential to decrease recidivism, and build capacity in those communities that have former inmates returning to them.

Introduction

There is an inherent link between illicit drug use and crime, simply due to the use being an illegal action in itself (Nurco, Hanlon, Bateman, & Kinlock, 1995; Wexler, Falkin, Lipton, & Rosenblum, 1992). This has resulted in a high number of people incarcerated, struggling with drug addiction and dependency along with high rates of recidivism (Lipton, 1995; Nurco et al., 1995). Starting in the 1980's, research began focusing on the impacts of treating substance abuse on those serving time in prison. A growing number of studies look at the treatment outcomes of therapeutic communities that have been modified to treat substance abuse in prison settings. This study will gather the current and previous literature that evaluates the impacts of Correctional Therapeutic Communities (CTCs) on recidivism and systematically review them. Using meta-analysis, this study will test the following hypotheses, (1) CTCs for Substance Abuse with or without aftercare reduce recidivism after program completion, and (2) CTCs for substance abuse with aftercare reduce recidivism at higher rates than CTC alone. These findings can help inform policymakers about the effectiveness of drug treatment in correctional facilities as it pertains to recidivism, and how to embrace community justice practices within correctional facilities.

Theoretical Framework

Community justice refers to a strategy and philosophy that addresses public safety and social justice by focusing on whole places, not just specific cases or individuals (Clear, Hamilton, & Cadora, 2010). Under the community justice framework, crime is viewed as a social problem, not just independent incidents (Kurki, 2000). Community justice operates on two assumptions. The first, that communities are different and individualized strategies must be utilized to meet the needs of each community, even if they are working towards the same goal (Clear et al., 2010). The second assumption is that informal social control provides the

foundation for public safety, which formal social control systems are built on (Clear et al., 2010). Informal social control refers to families, social groups, and the community identity. The key is for criminal justice agencies to act proactively instead of reactively, by emphasizing crime prevention and community education, empowerment, and participation (Kurki, 2000).

The community justice framework has three central priorities. The first priority is to focus on high-impact areas where traditional criminal justice practices have proved to be ineffective or created a revolving door (Clear et al., 2010). A revolving door is created when people released from prison return to prison from their original communities, When they return to the same set of conditions that lead them to commit crime, they continue the initial behavior or action that sent them to prison and are rearrested. The second priority of community justice is to create a proactive strategy to strengthen public safety while developing systems of informal social control (Clear et al., 2010). This involves criminal justice agencies coming together to developing strategies that will strengthen community influence, and improve social conditions. The goal being that through informal social control, crime will be prevented. The third priority of community justice is to develop partnerships within the community to strengthen community capacity (Clear et al., 2010). Once crime is committed, organizations must come together to heal the community and provide tools to those involved in crime so they begin to meaningfully contribute to the community. Non-criminal justice agencies, such as drug treatment, social services, and employment related services could partner with correctional facilities under the community justice model in order to maintain the continuity of care (Clear et al., 2010).

Community justice can be applied to all levels of the criminal justice system, including policing, courts, and corrections. While police can work directly with citizens develop a sense of community and culture of crime prevention, the courts can utilize community justice in situations

where people have already committed crimes. Drug courts were developed in response to the inability of breaking the drug-crime cycle through incarceration, as well as the proven effectiveness of clinical treatment strategies to reduce drug dependence and re-offending (Sanford & Arrigo, 2005). Drug courts emphasize treatment, and support, along with graduated sanctions; rather than focusing solely on adjudication and sanctioning (Clear et al., 2010). The judge, prosecutor, and defense work as a team to treat defendants and maintain public safety (Clear et al., 2010). This approach works to break the criminal justice revolving door and reduce the recidivism that many drug users experience.

Correctional facilities are the last area of the criminal justice system to embrace community justice practices. Utilizing drug treatment programs can control and reduce the risk of drug use and reoffending (Clear et al., 2010; Lipton, 1995). Traditionally, "the success of correctional treatment programming is notoriously poor" (Clear et al., 2010, p. 96). Programs generally only work for a small group of clients and no singular program in successful for everyone (Clear et al., 2010). However, applying community justice principles of building community capacity and developing partnerships may improve programs and reduce recidivism. Utilizing problem-solving techniques and creating working partnerships with substance abuse treatment agencies may allow offenders the opportunity to reintegrate into society successfully (Clear et al., 2010). While the foundation of community justice dates back to the 1970's, many strategies utilizing community justice principles have not yet been applied practically (Kurki, 2000). This provides an opportunity to apply community justice to all areas of the criminal justice system.

Literature Review

Substance abuse costs approximately $712 billion annually and spans across budgets related to health care, crime and lost work productivity ("Trends & Statistics," 2015). This intersectionality occurs because many individuals who suffer from addiction and substance abuse find themselves involved with the criminal justice system. It is estimated that anywhere from 60 to 85% of those in local, state or federal correctional facilities abuse substances (Hiller, Knight, & Simpson, 1999; Lipton, 1995). With a shifting public opinion toward rehabilitation rather than incapacitation, treating inmates during incarceration is becoming a favored option (McCollister et al., 2003). Treating inmates while they are incarcerated involves changing the attitudes, beliefs, and behavior of drug offenders towards drugs which may decrease their chance of recidivism and relapse (Welsh, 2007; Wexler, 1986). One approach to drug treatment within the prison setting is called Correctional Treatment Communities (CTC) for Substance Abuse. Research on the effectiveness of CTC has been unstable due to inconsistency in measurement, control migration and differences in the application of aftercare programs (Welsh & Zajac, 2007). Regardless of these limitations, CTC may be able to decrease cost related to drug abuse and incarceration, while decreasing the rate of those returning to prison.

Treating Substance Abuse in Correctional Facilities

In the United States, "drug offenders account for the largest proportion of prisoners being released back into the community, as well as those who remain incarcerated" (Golder et al., 2005, p. 101). Treating substance abuse while a person is incarcerated offers the unique opportunity of providing treatment to a population that may be unable to receive treatment otherwise (Lipton, 1995). In a 1997 survey of correctional facilities in the U.S., 37.7% of local, state and federal correctional facilities reported providing substance abuse treatment to inmates

(Office of Applied Studies, 2000). The agencies with the highest percentage of available substance abuse treatment are federal and state prisons with 93.8% and 56.35% having programs, respectively (Office of Applied Studies, 2000). Those with the lowest percentage of substance abuse treatment available are jails and juvenile facilities, with 32.6% and 33.8% reporting program availability, respectively (Office of Applied Studies, 2000). However, of those facilities that report providing substance abuse treatment to inmates, only 26.3% have specialized treatment units (Office of Applied Studies, 2000). Specialized treatment units are a key component to treating substance abusers in a CTC, which require participants to be in a segregated housing unit. Often, these units are not available in correctional facilities. This limits the kinds of treatment options that may be provided for substance abuse.

Correctional Therapeutic Communities

The Correctional Therapeutic Community (CTC) is the application of a therapeutic community approach to the prison or correctional setting (De Leon, 1995; Wexler, 1986). The therapeutic community approach is one of the most common treatment approaches that has been adapted for a correctional setting (Hiller et al., 1999). The therapeutic community framework for addictions is based in the social learning model found in psychology (De Leon, 1995). The therapeutic community approach relies on communal healing and support, with an emphasis on the community as an agent of change for individual behavior (De Leon, 1995). A formal therapeutic community framework was generated after the 1980's as a result of a wide diversity of programs that utilized therapeutic community principles and the complexity of the treatment process (De Leon, 1995). The therapeutic community framework operates on the assumptions that the person with addiction is the problem and the addiction itself is a symptom of that problem (De Leon, 1995). Addiction is triggered by social, psychological and occasionally

physiological disorders or stress in an individual's life (De Leon, 1995). Additionally, the framework assumes that with the adoption of certain values, a person can either develop or reclaim a socially productive and conventional lifestyle (De Leon, 1995).

A long-term therapeutic community generally lasts up to 24 months; during that time, participants navigate through three phases: orientation, primary treatment and reentry (De Leon, 1995; Welsh & Zajac, 2007). In a CTC, this timeline is condensed to 6-9 months with the same three phases included for a shorter period of time. In most cases, once an inmate completes treatment they are released from the correctional facility and transitioned back into society. It is at this point that aftercare treatment would be implemented in the treatment process. A previous meta-analysis done by Chanhatasilpa, Mackenzie, & Hickman (2000), indicates that CTCs along with follow-up care can have a positive impact on reducing recidivism. However, the strength and duration of positive impacts from aftercare are largely debated (Welsh & Zajac, 2007).

Aftercare Treatment

Aftercare treatment can provide assistance to newly released prisoners and act as a transitional step for reintegrating into society (Hiller et al., 1999). Previous research suggests that treating drug abuse must be done within a continuum of care (Friedmann, Taxman, & Henderson, 2007; Houser, Salvatore, & Welsh, 2012; McCollister et al., 2003). This means that once treatment is completed, patients are not released into the world without assistance or further care. Aftercare as a follow-up or transition out of CTC has "the greatest potential to reduce reincarceration among substance-abusing offenders" (McCollister et al., 2003, p. 76). Residential and community aftercare, specifically, have been associated with improved post-release outcomes, including decreased rates of recidivism (Chanhatasilpa et al., 2000; Hiller et al., 1999). However, empirical studies on aftercare and its impacts have not been conclusive in their

claims that aftercare cannot reduce reincarceration any more significantly than traditional CTCs (Chanhatasilpa et al., 2000).

In a cost-benefit assessment on CTCs and aftercare, McCollister et al. (2003) found that the therapeutic community alone is more cost effective than coupling it with aftercare. This may be attributed to the optional nature of aftercare, differences in aftercare programs and individual differences in those who choose to participate versus those who do not (Houser et al., 2012; McCollister et al., 2003). It has been suggested that the impacts of aftercare magnify those of CTCs in the long term (Houser et al., 2012). However, further research is needed to determine how treatment success is impacted in the long term.

Findings from the Literature

With the cost of incarceration on the rise along with the number of people being incarcerated for longer periods of time, public opinion toward rehabilitation is becoming more favorable (Lipton, 1995). Moreover, chronic drug users are responsible for a high volume of crime; meaning that an overwhelming amount of crime is committed by those who struggle with substance abuse addiction (Lipton, 1995). A growing number of studies identify effective substance abuse programming in correctional facilities as a continuum of care or, "program phases that allow the offender to move through the criminal justice system while obtaining treatment services to reinforce recovery" (Friedmann et al., 2007, p. 268). CTC is an evidence-based practice that allows substance abusing offenders to work through phases of treatment such as, orientation, primary treatment, and reentry, with the goal of decreasing the likelihood of rearrest and relapse while increasing the likelihood of abstinence from illicit drugs and gainful employment (*Intervention Summary - Correctional Therapeutic Community for Substance Abusers*, 2013). With the rise of correctional expenditures per person, when CTC is offered on a

continuum of care including aftercare treatment, it is likely that short- and long-term rehabilitation efforts can become more effective and efficient.

Data & Methods

This study utilizes meta-analysis to find what impact Correctional Therapeutic Communities (CTC) with and without aftercare has on recidivism. Meta-analysis is defined as a study of studies that uses a standardized measure to compare studies individually and generalize results across multiple studies in a comprehensive manner via an overall effect size (Lipsey & Wilson, 2001). An effect size is calculated for each study representing the impact of a treatment on a desired outcome. Effect sizes are a standardized measure that quantifies the difference between two groups (Lipsey & Wilson, 2001). Effect sizes can be generated in the form of standard mean differences, correlation coefficients or odds ratios. In this case, odds ratio effect sizes were computed for each study. To compute an odds ratio effect size, frequencies from control and treatment groups in each study are needed. The treatment group is either CTC alone or CTC with aftercare treatment. The control group or comparison group varied from a group of inmates awaiting treatment to a group of inmates identified as substance abusers.

Selecting Studies

I used the Oregon State University library and article databases to collect studies for the meta-analysis; I searched for the terms “Correctional Therapeutic Community”, “Substance Abuse Treatment in Prison”, “CTC” and “Prison Drug Treatment”. These words were searched together or separately on electronic article databases (Google Scholar, 1Search, Web of Science, JSTOR, and Academic Search Premier). I additionally examined the citation maps of each article; this included citations of each study found as well as any studies that cited the identified

study. A total of 54 studies were identified as potentially eligible. These studies were then reviewed based on the following criteria:

1. The study contained quantitative research methods.
2. The study utilized either an experimental or quasi-experimental design with control or comparison and treatment groups.
3. The primary intervention measured in the study was a therapeutic community with or without aftercare.
4. One of the outcomes measured in the study was rearrest, reincarceration or recidivism.

Thirteen studies fit the criteria for inclusion into the analysis. One study utilized two separate samples, one for males and one for females, and was counted as two separate studies due to their statistical dependence (Harry K. Wexler et al., 1992). Therefore, the total count of studies is fourteen. Thirteen effect sizes were calculated for CTC treatment alone, and 7 effect sizes were calculated for CTC treatment coupled with aftercare services. Separate average overall effect sizes were computed for these two groups. Two studies utilized an experimental design with an intent-to-treat model, and the remaining 12 studies utilized a quasi-experimental study design with a comparison group created. Each study is statistically independent from one another.

Calculating Effect Sizes

I compiled all articles in a database that contains the last name of the primary author, year of publication, N (number of subjects) in the study, the treatment variable and the outcome variables. The textbook “Practical Meta-Analysis,” by Mark W. Lipsey and David B. Wilson was used as a guide for calculating the effect sizes (measured in odds ratios) and conducting the analysis. The effect size statistic that is used is odds ratios due to the dichotomous nature of the

dependent variable to measure the group comparisons. An odds ratio effect size is calculated using the proportions in each group, treatment or control, with the desired outcome using the following equation (Lipsey & Wilson, 2001):

$$ES_{OR} = \frac{p_1\,(1-p_2)}{p_2(1-p_1)}$$

Where p_1 and $p_2$are the proportions of each group, treatment and control, which have recidivated. The odds ratio effect sizes via binary proportions for each study were calculated using an online calculator developed by David B Wilson, PhD[1]. The primary dependent variable, recidivism, measures whether those that completed treatment (CTC-alone or CTC with aftercare) returned to jail, prison, were rearrested or not. Data for rearrest and reincarceration were obtained from the thirteen studies that qualified. Both outcomes were coded as recidivism rate for the purpose of this analysis. If a study contained rearrest or reincarceration data, the rearrest data was used to calculate the effect size. This is done in order to prevent the inclusion of the same study twice, or over-representing the sample population for that one study (Lipsey & Wilson, 2001). Each study must correspond with one effect size per analysis. Once all individual study effect sizes were computed, an overall effect size for each outcome was computed using a fixed effects model and random effects model. Calculating an overall effect size involved taking the natural log of the odds ratio effect size and calculating the inverse variance weight[2] (Lipsey & Wilson, 2001). After the inverse variance weight is calculated for each study, the weighted mean effect size, or overall mean with fixed effects can be computed using the following equation:

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[1] Practical Meta-Analysis Effect Size Calculator, http://cebcp.org/practical-meta-analysis-effect-size-calculator/odds-ratio-or-and-risk-ratio-rr/binary-proportions/

[2] Equation for the inverse variance weight (w): $w_{LOR} = \frac{1}{SE_{LOR}^2}$ where SE_{LOR} is the standard error of the natural log of the odds ratio effect size.

$$\overline{ES} = \frac{\sum(w_i ES_i)}{\sum w_i}$$

The preferred overall effect size is the random effects model because it accounts for random differences between studies outside of sampling error (Huedo-Medina, Sanchez-Meca, Marin-Martinez, & Botella, 2006; Lipsey & Wilson, 2001). To test whether there is heterogeneity between studies, we must use a Q test (Huedo-Medina et al., 2006)[3]. Rejecting the homogeneity assumption involves the inclusion of a random term (v_θ) that produces inflated standard errors and decreases the likelihood of committing type 1 error (Lipsey & Wilson, 2001). Therefore, conclusions are drawn in this study using the random effects model for overall effect sizes.

Cohen's D Interpretation

Another type of effect size is called Cohen's D or the Standard Mean Difference (SMD). This effect size is generally calculated when the outcome variable of interest is continuous and measures the difference, in standard deviations, between two means (Lipsey & Wilson, 2001). While this is not the case in this analysis, the interpretation of Cohen's D effect sizes will prove to be helpful. These interpretations are made on a series of thresholds, while arbitrary but widely accepted, that speak to the magnitude of a treatment on a given outcome (Lipsey & Wilson, 2001). In this case, the Cohen's D interpretation can tell us the expected magnitude that CTCs have on recidivism with or without aftercare. In order to determine these thresholds, the logged odds ratio, or log odds, must be converted into a Cohen's D effect size by using the following formula (Borenstein, Hedges, Higgins, & Rothstein, 2009).

$$Cohen's\ D = Log\ Odds \times \frac{\sqrt{3}}{\pi}$$

[3] The Q test is computed by summing the squared deviations of each studies effect size from the overall effect size, and weighting the contribution of each study by it's inverse (Huedo-Medina et al., 2006, p. 4).

Once the conversion from log odds to Cohen's D is made, the resulting effect size as an absolute value can be interpreted using the estimated magnitude of effect in Table 1. It is important to note that these conversions represent estimations, since the initial effect sizes represented the odds of a binary outcome, not a continuous measure.

Table 1: Cohen's D Effect Size Interpretation

Estimated Magnitude	Cohen's D
Very Small	< 0.2
Small to Moderate	0.2 – 0.5
Moderate to Large	0.5 – 0.8
Large	> 0.8

The Cohen's D interpretation allows for the comparison of magnitudes across multiple treatments. In other words, we can compare how much of an impact CTC alone has on recidivism with the impact that CTC with aftercare has on recidivism in terms of very small to large impacts.

Results

Of the 14 studies that met the criteria for analysis, 13 studies measured recidivism outcomes for Correctional Therapeutic Community (CTC) completers without any additional treatment and 7 studies measured recidivism outcomes for CTC with aftercare. In order to maintain statistical independence, an overall effect size could not be computed due to the overlap in the treatment samples in the 'CTC-Only' and 'CTC+Aftercare' groups. Table 1 shows the summary effect size information for the two treatment groups in odds ratios. Both analyses indicated there is a negative relationship between treatment and recidivism. These results are statistically significant for both treatments because the confidence intervals do not contain one. Additionally, these confidence intervals overlap; therefore, I cannot conclude that CTC alone and CTC with aftercare are statistically different than one another.

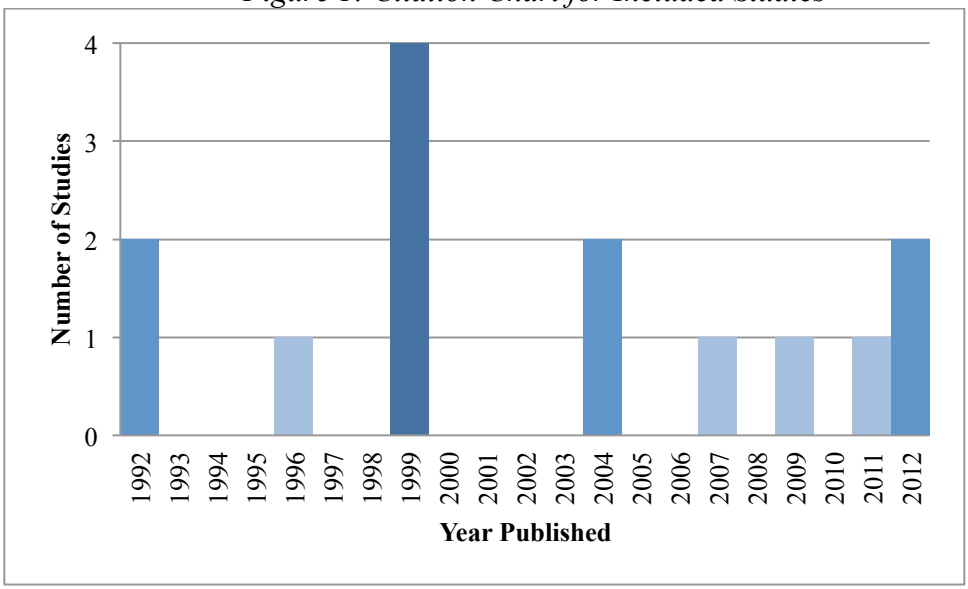
Table 2: Summary of Effect Sizes for Recidivism

Parameter	No. of Studies	Effect Size (OR)	95% Confidence Interval (OR)	Cohen's D Interpretation
All Studies	14	--	--	--
Treatment				
CTC-Only	13	0.61**	0.50 – 0.74	Small to Moderate
For Rearrest	8	0.52**	0.42 – 0.65	Small to Moderate
For Reincarceration	5	0.92	0.64 – 1.31	None
CTC + Aftercare	7	0.44**	0.30 – 0.66	Small to Moderate
For Rearrest	3	0.47**	0.39 – 0.56	Small to Moderate
For Reincarceration	4	0.41**	0.21 – 0.83	Small to Moderate

** = Statistical Significance at the 95% Confidence Interval

Each of the 14 peer-reviewed studies came from published journals and were published between 1992 to 2012. A majority of studies were published in 1999. The years 1992, 2004, 2012 all had two studies. One study came from the years 1996, 2007, 2009, and 2011. Figure 1 shows the number of studies published by year.

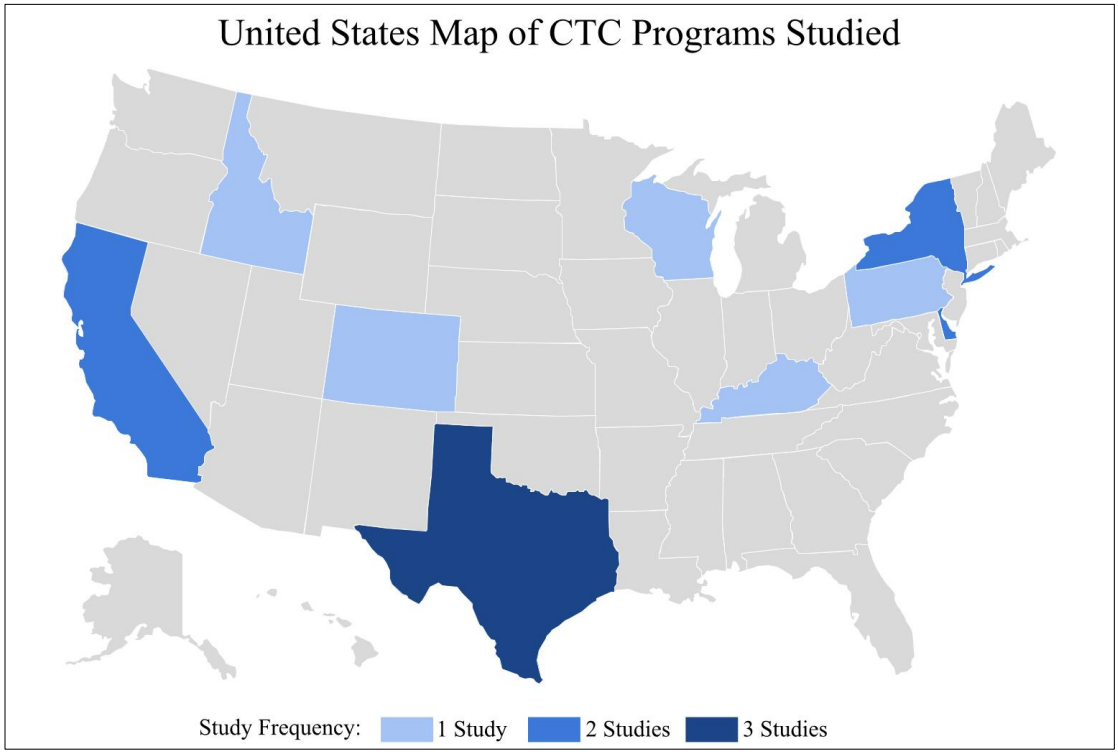
Figure 1: Citation Chart for Included Studies



Additionally, the studies in this analysis looked at CTC programs with and without aftercare treatment from correctional facilities across the nation. Figure 2 displays the frequency of studies across the United States. There is an overrepresentation of programs reviewed from

Texas correctional facilities with three studies. California, Delaware, and New York are also slightly overrepresented with two studies each included in the analysis. The remaining states had one study reviewed with correctional facilities from that state. The CTC programs had some variation in application at the different facilities studied. In this analysis, the programs reviewed all take on traditional therapeutic community principles, including segregated housing for treatment, phases in treatment, mentorship, and structured living

Figure 2: Frequency of Studies by State



The variation is seen in the number of phases in treatment (programs reviewed range from 3-5 phases), length of the program, and whether the program participants are required to enroll in additional treatment at the conclusion of the CTC. In terms of gender representation, Wexler et al. (1992) and Sacks, McKendrick, & Hamilton (2012) had samples exclusively comprised of women. All other studies were exclusively in men's correctional facilities. The first phase of analysis was to see what impact, if any, CTC treatment had on recidivism.

CTC-Only Treatment

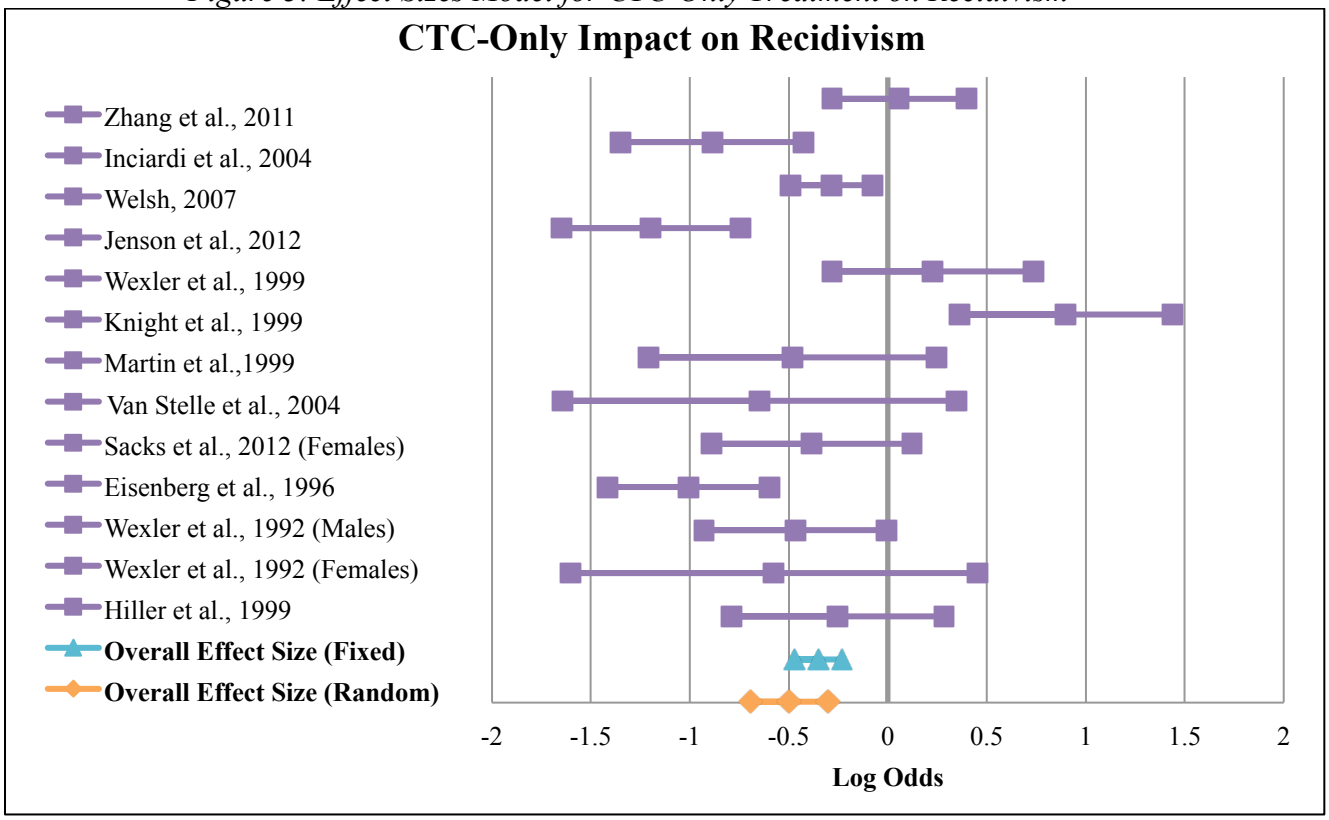
Out of the 14 studies, 13 contained data that compared a control or comparison group with a CTC treatment group as a standalone treatment. Participants that completed CTC were included in the treatment groups of each study. Odds ratio effect sizes were computed for each study and an overall effect size using a fixed effects model and random effects model were computed. Table 2 shows the study characteristics for the 'CTC-Only' analysis. The total study sample size (N) ranges from 86 to 1553, for a total of 7,710 study participants represented. As stated previously, Wexler et al. (1992) contained two independent sample sizes that differed by gender. Therefore, they were treated as two independent studies. For each study, the time lapsed for followed-up with each of the study participants varied from 13 months to 5 years. At the time of follow-up, 5 studies measured whether a study participant was reincarcerated and the remaining 8 studies measured if the participant had been rearrested. The comparison groups in each of these studies are generally those participants that were unable to be treated with CTC. Eight of these studies had untreated comparison groups. This means the participants were eligible for CTC but due to a limited number of beds or other facility-specific barriers, they were not able to enter the CTC program. Two studies had comparison groups with inmates that were placed on work release instead of CTC treatment. One study utilized a comparison group of other inmates in the same facilities, and one study had an experimental control group of participants randomly assigned to CTC treatment or a cognitive behavioral intervention.

Table 3: Study Characteristics for CTC-Only Treatment Articles

Study Citation	Total Study N	Time of Follow-up	Outcome Variable	Comparison Group
Zhang, Roberts, & McCollister, 2011	797	5 years	Reincarceration	Untreated
Inciardi, Martin, & Butzin, 2004	1077	5 years	Rearrest	Work-release
Welsh, 2007	1553	4 years	Rearrest	Untreated
Jensen & Kane, 2012	725	4 years	Rearrest	Untreated
Wexler, Melnick, Lowe, & Peters, 1999	478	3 years	Reincarceration	Untreated
Knight, Simpson, & Hiller, 1999	394	3 years	Reincarceration	Untreated
Martin, Butzin, Saum, & Inciardi, 1999	489	3 years	Rearrest	Work-release
Van Stelle & Moberg, 2004	91	1 year	Reincarceration	Untreated
Sacks, McKendrick, & Hamilton, 2012	468	1 year	Reincarceration	Cognitive Behavioral Intervention (Control)
Eisenberg & Fabelo, 1996	672	1 year	Rearrest	Comparison
Wexler, Falkin, Lipton, & Rosenblum, 1992 (Males)	484	1-3 years	Rearrest	Untreated
Wexler, Falkin, Lipton, & Rosenblum, 1992 (Females)	86	1-3 years	Rearrest	Untreated
Hiller, Knight, & Simpson, 1999	396	13-23 months	Rearrest	Untreated

Once the effect sizes were computed, they were graphed in a forest plot. The forest plot for the 'CTC-Only' studies is depicted in Figure 3 in log odds; this represents a systematic review of each outcome found in the included studies along with an overall average effect size. The middle point for each study is the calculated effect size in log odds and the line with two endpoints represents the confidence interval for the effect size. Effect sizes are in the log odds form in Figure 3 to clearly depict the impact each studies impact has on recidivism in positive and negative terms. If a study overlaps or contains zero, the results of that study cannot significantly determine the impact of CTC on recidivism. Seven of the studies are not statistically different from zero. One study shows a positive relationship between CTC and recidivism. Five studies show a statistically significant negative relationship between CTC and recidivism.

Figure 3: Effect Sizes Model for CTC-Only Treatment on Recidivism



Overall, the fixed effects model and random effects model are statistically significant and depict a negative relationship. This indicates that those who participate in CTC are less likely to recidivate. The overall odds ratio effect size for the random effects model is 0.61 with a 95% confidence interval of 0.50 – 0.74 (See Table 2). In other words, the odds of recidivating after CTC are 0.61 times (or 39% less than) that of a person who did not receive treatment. There are similar findings for the impact of CTC with aftercare.

When the studies are further separated between those accounting for rearrest vs. reincarceration, there is a difference among treatment outcomes. As noted in Table 2, when CTC-only is analyzed by those rearrested or reincarcerated, the impact of CTC-only on reincarceration is rendered not statistically significant. However, the impact on CTC-only on rearrest maintains its statistical significance. In a Cohen's D interpretation, CTC as a standalone

treatment has a small to moderate impact on decreasing the likelihood of recidivism, more specifically rearrest.

CTC + Aftercare Treatment

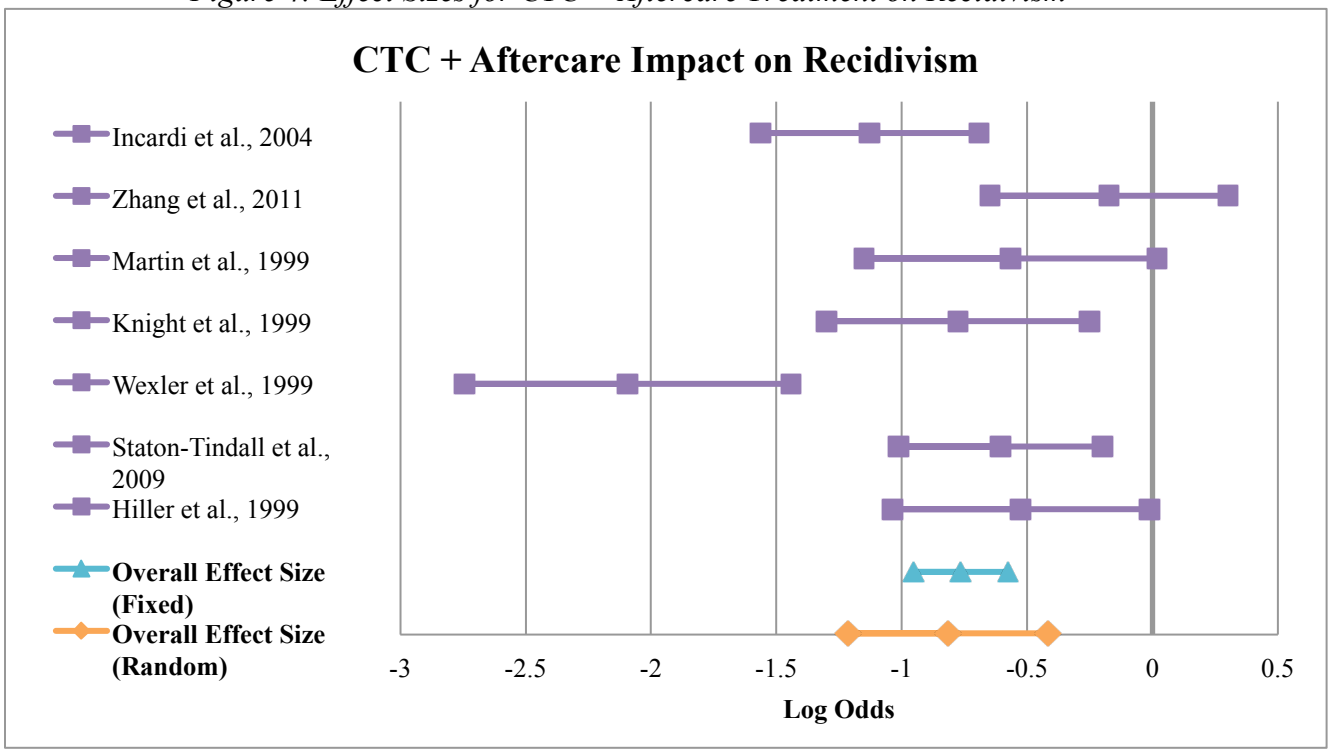
Seven studies measured the impact of CTC with aftercare treatment compared to a control or comparison group. Six of these studies were represented in the CTC-only analysis, Staton-Tindall et al. (2009) looked specifically at the role of aftercare services coupled with CTC treatment and was not included in the CTC-only analysis. The control or comparison group did not consist of treatment participants that only received CTC. Odds ratio effect sizes were calculated for each study as well as an overall effect size in a fixed effects model and random effects model. As stated previously, the results from the random effects model is the statistic being utilized as the preferred overall effect size. Table 3 provides a synthesized summary of the study characteristics in this analysis. The total N for each study ranges from 394 to 1077, for a grand total of 4,331 participants represented. The time of follow-up assessment was the same as the 'CTC-Only' analysis with a range from 13 months to 5 years. Four studies measured the outcome variable in terms of reincarceration and 3 studies measured whether a participant was rearrested. Three studies utilized a comparison group of untreated participants who qualified for CTC treatment, but were unable to begin or enter treatment. Two studies utilized a comparison group of potential treatment participants who were placed on work release instead of CTC treatment. One study compared CTC graduates with those who entered aftercare treatment at the end of their CTC treatment, and one study had an experimental design with a randomized control group of those who were not placed in treatment.

Table 4: Study Characteristics for CTC + Aftercare Treatment Articles

Study Citation	Total Study N	Time of Follow-up	Outcome Variable	Comparison Group
Inciardi, Martin, & Butzin, 2004	1077	5 years	Rearrest	Work-release
Zhang, Roberts, & McCollister, 2011	797	5 years	Reincarceration	Untreated
Martin, Butzin, Saum, & Inciardi, 1999	489	3 years	Rearrest	Work-release
Knight, Simpson, & Hiller, 1999	394	3 years	Reincarceration	Untreated
Wexler, Melnick, Lowe, & Peters, 1999	478	3 years	Reincarceration	Control Group (no treatment)
Staton-Tindall et al., 2009	700	1 year	Reincarceration	CTC graduates
Hiller, Knight, & Simpson, 1999	396	13-23 months	Rearrest	Untreated

The forest plot for the 'CTC+Aftercare' analysis is depicted in Figure 4 with log odds effect sizes. In this analysis, two studies were not statistically different from zero. The remaining five studies were all statistically significant and show a negative relationship between CTC + Aftercare and recidivism. In contrast with the CTC-Only analysis, no studies have a positive relationship between the treatment and recidivism.

Figure 4: Effect Sizes for CTC + Aftercare Treatment on Recidivism



The overall effect size indicates that there is a negative relationship between CTC coupled with aftercare on recidivism. More specifically, the odds ration effect size associated with the relationship is 0.44 with a 95% confidence interval of 0.30 – 0.66 (See Table 2). This means that the odds of a person recidivating with CTC and aftercare treatment are 0.44 times (or 56% less than) that of a person who does not receive treatment.

If the effect sizes are split up into two groups, those measuring rearrest and those measuring reincarceration, there is no statistical difference in treatment outcomes (see Table 2). Those that complete CTC and continue on to aftercare are little/moderately less likely to be rearrested and/or reincarcerated compared to those that are not in CTCs or aftercare.

Both analyses show that CTC with or without aftercare has a negative relationship with the likelihood of a person recidivating. More specifically, these findings show that CTCs have a small to moderate impact on decreasing recidivism among those in treatment.

Discussion

The above analysis indicates that Correctional Therapeutic Communities (CTCs), provided with or without aftercare, reduces the likelihood of returning to prison after completing the treatment compared to those that do not participate in CTCs. Those participating in CTC's without aftercare are 0.61 times as likely to recidivate compared to those not in a CTC. Those participating in CTC's with aftercare treatment are 0.44 times as likely to recidivate compared to those not in a CTC to begin with. This provides evidence for the first hypothesis, that CTCs for Substance Abuse reduce recidivism after program completion. Since the confidence intervals for both of these effect sizes overlap, we cannot determine if either treatment is statistically different from one another. Therefore we are unable to provide evidence for the second hypothesis that

CTCs for Substance Abuse with aftercare reduce recidivism at higher rates than CTC alone. A series of studies focused on this hypothesis would need to be conducted to determine if there is a different in treatment outcomes between CTC-only and CTC with aftercare.

In 2005, the Bureau of Justice Statistics reporting that 76.6% of those released from prison in 30 states were arrested within 5 years of their initial release (Durose, Cooper, & Snyder, 2014). In a hypothetical situation, we can determine the predicted probability of recidivism for those who participate in CTC's and CTC's with aftercare. For a CTC-only participant, their likelihood of recidivism would go from 76.7% to 67%. For a participant in CTC with aftercare, their likelihood of recidivism would decrease from 76.6% to 59%. In a practical sense, tells us that CTC's with or without aftercare services provided can reduce the likelihood of a participant recidivating by a small to moderate amount.

Limitations

This meta-analysis potentially suffers from sampling bias due to the gathering of only published articles and studies. This refers to publication bias, which may lead to an upward bias of the mean effect size due to the tendency of published material to report statistically significant findings (Lipsey & Wilson, 2001). While this bias was not intentionally committed, I was unable to locate white papers, dissertations or other publications that were not peer-reviewed journal articles that were eligible for meta-analysis.

In addition to a potential bias of the meta-analysis itself, the individual studies may also be a source of bias. Many of the studies included in this meta-analysis do not provide information about the number of treatment participants that dropped out of the program prior to its completion. This exclusion of dropouts may upwardly bias the results of each study. This means that the studies may report positive treatment outcomes for those that successfully

completed treatment and fail to include the number of participants that failed to complete the treatment. Therefore, treatments are more likely to have positive treatment outcomes or show a larger impact of a treatment on a given outcome. Unfortunately, there is no way to control for this bias when conducting a meta-analysis because the findings in the literature collected cannot be altered.

Policy Implications

Practically, this analysis can add to the growing evidence that treating substance abuse in correctional facilities can reduce the rate that people get caught in the criminal justice 'revolving door'. In order to begin and continue treating substance abusers, this requires a shift in policy that goes from viewing substance abuse from a crime to a disease (Lipton, 1995). Treating and responding to substance use as a public health problem, rather than a criminal problem, has the potential to decrease violence and crime (Gilligan & Lee, 2004). This shift from incapacitation to treatment falls in line with the community justice framework. Creating correctional facilities that promote community justice principles require facilities to partner with substance abuse treatment services, in the hope that inmates will be able to return to the community as functioning members of society. This requires individual correctional facilities, and county and state governments to create policies that are focused on building community capacity and different stakeholders working together. The above analysis indicates that Correctional Therapeutic Communities (CTCs) can be utilized in prisons as a treatment option to reduce recidivism.

From a financial standpoint, treating substance abuse in prison is economical. In a cost-benefit analysis of a CTC with and without aftercare, the study found that for those participating in a CTC, the cost of reducing recidivism was $80 per inmate per day (McCollister et al., 2003). The cost of reducing recidivism per day came at a cost of $51 per inmate for those participating

in the CTC and then aftercare (McCollister et al., 2003). These findings show that reducing recidivism comes at a cost; however, reducing recidivism and promoting community participation can provide personal and social benefits to the treatment participant as well as the community as a whole.

Research on therapeutic communities, in correction facilities or otherwise, "has consistently demonstrated success with substance abusers" (Harry K. Wexler, 1995, p. 64). However, issues with substance abuse do not operate in a vacuum. Often those struggling with substance abuse also have mental health issues. In 2006, the Bureau of Justice Statistics reported that mental illness was prevalent in "56% of State prisoners, 45% of Federal prisoners, and 64% of jail inmates" (James & Glaze, 2005, p. 1). Just as substance abuse is widespread within the prison setting, mental health is also poor, indicating that people may be coping with both conditions simultaneously. A previous systematic review of therapeutic communities outside of prison for comorbidity of substance abuse and mental illness found that therapeutic communities are effective for treating co-occurring disorders (S. Sacks, Banks, Mckendrick, & Sacks, 2008). More research on treatment options for those suffering from comorbidity of substance abuse and mental health within the prison setting is needed. In this analysis, the program reviewed by Van Stelle & Moberg (2004) was available for those with dual-diagnoses; however, no other programs in this study were equipped for treating problems outside of substance abuse.

Finally, additional research on the impact of aftercare services coupled with CTC treatment should be done. Previous research suggests that aftercare services are "undeniably important for the offender's transition from prison to the community" (McCollister et al., 2003, p. 78). However, findings from this analysis do not indicate that significant difference exists between CTC as a standalone treatment and CTC with aftercare services. Therefore, additional

research on the treatment impacts of aftercare services with or without a prefacing treatment should be examined.

Conclusion

This meta-analysis adds to the growing body of literature reviewing the impact of drug treatment in prison. Findings indicate that those participating in Correction Therapeutic Communities with or without aftercare treatment are less likely to recidivate, by 39% and 56% respectively, compared to those inmates who have not participated in CTCs. Future research should look at individual program differences in CTCs, and how those differences impact the treatment effects of aftercare treatment. Therapeutic communities can help participants by providing health care, develop a sense of community and socialization, and provide specialized programs (e.g. education and job programs) (Gilligan & Lee, 2004). These treatment characteristics are congruent with the community justice principles of growing community capacity and successfully reintegrating former prisoners' into society.

These findings provide evidence that CTCs have the potential to reduce the rate of return for those prisoners that suffer from substance abuse. With the inclusion of aftercare services, former prisoners can transition to life outside of prison and begin to cope with their addiction in the community. By investing in CTCs in prisons for those prisoners that struggle with substance, money can be saved annually for every prisoner that successfully transitions back into the community.

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