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SPECIAL ISSUE ON SUBSTANCE USE DISORDER TREATMENT

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THIS ISSUE IN BRIEF

SPECIAL ISSUE ON: Substance Use Disorder Treatment

Substance Use and Justice-Involved Individuals: Improving Practice[1]

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SUBSTANCE USE AMONG individuals involved in the justice system continues to present risks to public safety and health, and ongoing substance use among this population is one of the primary factors contributing to the high recidivism rates currently found in the U.S. (Alper, Durose, & Markman, 2018). Justice-involved adults reentering the community are among the highest at-risk group for misusing opioids and for developing an opioid use disorder (OUD), as well as for experiencing adverse health-related outcomes (overdose and death; Wakeman, 2017; Binswanger et al., 2007). Research conducted by Texas Christian University and others has found that return rates within 3 years of release from prison can be as high as 64 percent among those identified as having a substance use problem but who do not complete recommended post-release treatment services (Knight et al., 1999). Yet when these individuals receive a continuum of treatment services while under the purview of the justice system, the likelihood of recidivism decreases (Knight et al., 1999). While this research was begun over two decades ago, recent statistics suggest that over half of the prison population today enter prison with serious substance-use related problems (Bronson, Stroop, Zimmer, & Berzofsky, 2017), and most still do not receive the appropriate level of recommended services.

On a positive note, Lipsey (2019) recently conducted a meta-analysis of interventions used with this target population and found that interventions focused on rehabilitation often are effective at achieving reductions in recidivism. Perhaps as important, however, are the conclusions from the study that found that simply providing "practice as usual" without an additional focused intervention typically fails to achieve the desired recidivism reductions. The challenge for achieving continued practice improvement now focuses on identifying the factors associated with these improved outcomes (such as research pointing to the value of providing community-based programming). Studies should help inform correctional systems in search of effective practices and of alternative, innovative approaches they can implement to help address the needs of substance-involved individuals. This special issue of *Federal Probation* is devoted to this agenda by providing the field with studies of programs and approaches designed to be more innovative as well as to improve our understanding of treatment factors that can be targeted to improve outcomes.

Much has been written regarding the potential effectiveness of prison-based treatment programs and the importance of assessing risks and needs as part of the initial treatment process, but little is known about how the targets of treatment (e.g., reductions in criminal thinking and improvements in psychosocial functioning) are related to recidivism. In the Valdés Velasco et al. article in this issue titled "An Evaluation of an In-prison Therapeutic Community: Treatment Needs and Recidivism," the authors report on a particularly strong association they found between prerelease measures of "hostility" and "entitlement" and three-year return-to-custody rates for completers of an intensive prison-based drug treatment program in Illinois. These findings highlight the need to understand if desired changes have occurred in these factors and identify whether targeted interventions are needed to address deficits during community reentry programming.

Likewise, existing health problems among substance use treatment clients involved in the criminal justice system are not well understood. The article in this issue by Joe et al., "Health Problems: Relationships to Demographics, Problem Severity, and Services for Substance Users in Treatment with a Legal Status," explores this issue across 96 treatment agencies in 11 U.S. cities. Among the findings, only two-thirds of agency clients reported having had at least one health service visit. Furthermore, when compared with the general population, these justice-involved individuals were in high need for health services, particularly for treatment of respiratory, digestive, heart, and gynecological problems.

Promising innovative programs and approaches to addressing substance use

[1] AUTHORS' NOTE: Funding for this manuscript was provided by the National Institute on Drug Abuse, National Institutes of Health (NIDA/NIH) through a grant to Texas Christian University (UG1 DA050074; Danica Knight, Kevin Knight, David Olson, Tim Condon, Multiple Principal Investigators; U01DA036224; Danica Knight, Principal Investigator). Interpretations and conclusions are entirely those of the authors and do not necessarily reflect the position of NIDA/NIH or the Department of Health and Human Services.
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problems among justice-involved populations also are explored in this issue. Yang's article titled "Measuring Hope in Jail Inmates with Substance Use Problems" highlights the importance of promoting positive feelings, cognitions, and behaviors associated with "hope." Based on the study's sample of male and female jail inmates, the author points to the need for strengths-based interventions that integrate gender-specific risk to facilitate hope. Potential gender differences are further emphasized in Lehman et al.'s article, "Gender Differences in a Disease Risk Reduction Intervention for People in Prison-based Substance Abuse Treatment." This study examined an innovative, multi-session curriculum called *WaySafe* that was provided to incarcerated individuals prior to release and found that, although women in the program had significantly greater risk factors than did men, men and women benefited equally from the program.

Next, in "Facilitating Self-exploration and Behavioral Change Associated with HIV Risk Reduction: A Qualitative Study of Individuals on Probation and Their Experiences Using a Decision-making App," Pankow et al. examined participants in *StaySafe,* an app-based innovative intervention delivered during the high-risk period of community reentry. Feedback from participants who completed the intervention indicated that approaches like this one can be effective in improving knowledge and awareness of substance-related risk factors like HIV, and can be an invaluable tool in promoting decision-making and self-regulation skills.

Hero Help is another innovative approach, particularly focused on addressing the opioid problem. As described by Streisel and colleagues in "Using Law Enforcement to Improve Treatment Initiation and Recovery," the New Castle County program in Delaware was able to place a *Hero Help* coordinator within their police department and improve access to care as well as outcomes for their participants.

The biggest challenge, however, might be in the successful and faithful implementation of evidence-based practices for justice-involved populations. As Walker et al. point out in their article "Fidelity in Evidence-based Practices in Jail Settings," assertive supervision and vigilant quality monitoring to actually implement evidence-based practices in criminal justice settings like jails is imperative. Needs such as extensive training and monitoring are easily overlooked or ignored and, if not addressed, can undermine the goal of delivering evidence-based practices.

Dennis et al. provide further guidance in "Operationalizing a Behavioral Health Services Cascade of Care Model: Lessons Learned from a 33-Site Implementation in Juvenile Justice Community Supervision." The authors examined records from 31,308 youth cases collected from 33 counties in 7 states. Based on study findings, this article provides a framework to help guide practice as well as describing clearly defined ways to improve service delivery.

One of the most important practices that requires careful attention involves screening and assessment. In "The Validity of TCU Drug Screen 5 for Identifying Substance Use Disorders among Justice-involved Youth," Wiese et al. discuss how the TCU screening instrument is a valid screener for substance use disorder for juvenile populations and provide clear guidelines for how best to implement it.

Collectively, these papers help set the stage for providing a better understanding of innovative and new practices that have the potential to translate into more effective prevention, intervention, and treatment practices for justice-involved populations.

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Overview of Substance Use Disorder Occurrence and Treatment in the Federal Judiciary

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ONE OF THE MOST well-established evidence-based principles is that supervision interventions should be targeted based on the specific risk levels in each case. Often referred to as the "risk principle," this theory recognizes that it is imprudent to take a one-size-fits-all approach to supervision and treatment. This guiding principle for correctional programming strongly applies to services provided to persons on supervision with substance use disorder identified as a dynamic risk factor.

In the 94 federal judicial districts nationwide, U.S. probation and pretrial services officers play an integral role in the criminal justice system. Officers supervise individuals released to the community to make sure they comply with court-ordered conditions. Often, for the many persons under supervision with a substance use disorder, these conditions will include substance use testing and treatment.

Substance use disorder treatment is a tool that helps U.S. probation and pretrial services officers supervise persons under supervision in the community. Treatment—which includes urine testing and services such as detoxification; residential treatment; individual, family, or group counseling; and medication—is provided to persons who use illegal drugs, abuse prescription drugs or alcohol, and suffer from a substance use disorder. Either these individuals are on probation, parole, or supervised release or they are on pretrial supervision while waiting to appear in court.

For officers who supervise those with a substance use disorder, treatment provides the means to directly address these individuals' alcohol or drug use and to help change their behavior. Treatment is key to enforcing the conditions set for their release, increasing the likelihood that they will choose to obey the law, and controlling the danger they may pose to the community. For persons under pretrial supervision, treatment also helps officers to reasonably ensure that these persons return to court as required.

The Director of the Administrative Office of the U.S. Courts, under 18 U.S.C. § 3672, has the authority to "contract with any appropriate public or private agency or person for the detection of and care in the community of an offender who is an alcohol dependent person, an addict, or a drug-dependent person. . . ." Similar authority is contained within 18 U.S.C. § 3154, which allows pretrial services to contract for treatment services. When the probation or pretrial services office uses this authority and Judiciary funds pay for treatment, it is referred to as "contract" treatment. Probation and pretrial services offices will also frequently use treatment services that are available to the person under supervision in the community without cost to the federal judiciary or through the individual's own healthcare coverage. This is referred to as "noncontract" treatment.

All delegations and authorities related to judiciary procurement are given by the Director conditional on adherence to the limitations and guidelines set forth in the *Guide to Judiciary Policy*. Contracts for treatment services may be awarded only according to procedures and provisions of the procurement manual, Simplified Procurement Procedures for Treatment Services. Treatment services may be procured within one's own district or anywhere in the country where they are needed.

For pretrial supervision, officers supervised 46,336 cases during fiscal year 2018. Of that number, 21,918 had substance abuse treatment conditions. During that same period, 5,988 persons were in substance use contract treatment, which was paid for by the federal judiciary. A total of $14,068,858 was spent on substance use testing and treatment of pretrial services persons under supervision in fiscal year 2018 (50 percent increase since fiscal year 2014).

For post-conviction supervision, federal probation offices supervised 186,509 cases during fiscal year 2018. Of that number, 120,217 had substance abuse treatment conditions. During the same period, federal probation offices had 27,122 persons in substance use contract treatment, which was paid for by the federal judiciary. A total of $45,681,745 was spent on substance use testing and treatment of post-conviction persons under supervision in fiscal year 2018 (56 percent increase since fiscal year 2014).

PPSO regularly tracks drug use trends of persons under probation and pretrial services supervision. This issue has garnered even more attention over the past few years due to the opioid epidemic in the United States. With that in mind, our national positive drug test rates for the following drug types are listed in Table 1 on the next page.

In contrast, our national positive rates for the drug types in Table 2 are also on the next page.

TABLE 1

U.S. Probation and Pretrial Services National Positive Rates – Opioid Related

Drug Type	Calendar Year 2016	Calendar Year 2017	Calendar Year 2018
Opiates	6.3%	5.6%	4.9%
Oxycodone	3.9%	3.2%	2.9%
Fentanyl	1.9%	2.0%	2.6%
Buprenorphine	5.5%	5.7%	5.5%

TABLE 2

U.S. Probation and Pretrial Services National Positive Rates – Non-Opioid Related

Drug Type	Calendar Year 2016	Calendar Year 2017	Calendar Year 2018
Marijuana	12.6%	13.6%	13.9%
Amphetamines	7.8%	8.4%	9.2%
Cocaine	6.6%	7.1%	7.2%

Under 18 U.S.C. § 3154(4) and 3672, the Director of the Administrative Office of the U.S. Courts has the authority to contract for treatment services for those who are released to the community for federal pretrial services and post-conviction supervision. Agreements for treatment services may be awarded according to the Simplified Procurement Procedures for Treatment Services.

The treatment services procurement program includes almost 80 different services to address substance use disorder treatment, mental health treatment, and sex offender treatment. Specific to substance use testing and treatment, there are 25 different services available, along with an additional 6 services that address co-occurring substance use and mental health disorders. (A list of these services appears in the Appendix to this article.) The remainder of this document will provide an overview of some of the available services, along with national expenditures, for fiscal year 2018.

Case Management Services

Case management services are a method of coordinating the care and services of those with a substance use disorder. These services can be used as a way of linking a reentry program to the clinicians and service providers who are involved with the care of those under supervision. In fiscal year 2018, a total of $184,270 was spent on these services, with an average of $401 per person under supervision who received them.

Intake Assessment and Report

A comprehensive biopsychosocial intake assessment and report is conducted by a state-certified substance use disorder counselor or a clinician who meets the standards of practice established by his or her state's regulatory board. The assessor identifies the substance abuse severity of the person under supervision based upon the most current edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM), strengths, weaknesses, and readiness for treatment. In fiscal year 2018, a total of $1,511,885 was spent on this service, with an average of $130 per person under supervision who received the service.

Manualized Cognitive Behavioral Group Counseling

Cognitive behavioral counseling groups offer a structured approach to address the criminal thinking component of substance use. Examples of this type of group are Moral Reconation Therapy,® Thinking for a Change,® Choices & Changes,® and The Change Companies.® The specific curriculum used is designed to address substance use issues. Research has found cognitive behavioral therapy to be very effective.[1] In fiscal year 2018, $3,351,167 was spent on this service, with an average of $682 per person under supervision who received the service.

Substance Use Counseling

Counseling is a clinical interaction between the person under supervision and a trained and certified counselor. The interactions are deliberate and based on various clinical modalities that have demonstrated evidence to change behavior. This can include individual counseling, group counseling, family counseling, group family counseling, intensive outpatient counseling, and treatment readiness group. Individual and group counseling are the two most commonly used forms of counseling. In fiscal year 2018, a total of $10,231,159 was spent on individual counseling, with an average of $545 per person under supervision who received the service. And $5,664,297 was spent on group counseling, with an average of $795 per person under supervision who received the service.[2]

Integrated Treatment for Co-Occurring Disorders

Individuals with co-occurring disorders receive substance use and mental health services in an integrated fashion. When receiving integrated treatment services, persons under supervision will be treated by the same clinician and/or team in the same location. Individual and group counseling are the two most common forms of this service. In fiscal year 2018, a total of $4,737,553 was spent on individual counseling, with an average of $934 per person under supervision who received the service. And $370,570 was spent on group counseling, with an average of $572 per person under supervision who received the service.

Residential Treatment

Residential substance use treatment programs are in-house facilities where the person remains for the duration of the program. They provide a highly structured environment that incorporates counseling, drug testing, and other approaches that involve cooperative living for people receiving treatment. Although the length of treatment can vary based on the person's clinical needs, it typically ranges from 28 days to 9 months. The purpose of this type of treatment is for the person to achieve complete sobriety and not be tempted by his or her disorder. This gives the person enough time to address any underlying issues caused by past substance use.

The two most common forms of this

[1] Research shows that cognitive behavioral group treatment is among the most successful interventions with substance-dependent offenders. (Note: D.B. Wilson, L.A. Bouffard, and D.L. McKenzie, "A Quantitative Review of Structured Group-Oriented Cognitive-Behavioral Programs for Offenders," *Criminal Justice and Behavior*, Vol. 32, No. 2, pp. 172-204, 2005. When and where available, this should be the default choice of treatment for substance-dependent offenders.

[2] While the average money spent per client on group counseling is more than the average spent on individual counseling, it should be noted that group counseling sessions generally occur with greater frequency and over a longer period.

service are short-term[3] and long-term[4] residential treatment. Residential treatment is an option for individuals struggling with severe forms of substance use disorder. It is intended for individuals who are in need of a more intensive approach that removes outside influences and distractions. Residential treatment placements often occur as a result of clinical assessment or are the result of a court order. Often it is a last-ditch effort before supervision is revoked. In fiscal year 2018, a total of $12,737,406 was spent on short-term residential treatment, with an average of $4,582 per person under supervision who received the service, and $1,753,269 was spent on long-term residential treatment, with an average of $6,130 per person under supervision who received the service.

Medication-Assisted Treatment

When traditional therapies are not effective in isolation, medication-assisted treatment (MAT) can provide the necessary physical stabilization to improve the success of treatment. Medications are frequently used in combination with counseling to treat specific forms of a substance use disorder. MAT is approved for the treatment of alcohol use disorder and opioid use disorder.

An effective treatment for opioid use disorder includes MAT, which combines behavioral therapy and medications. The Food and Drug Administration (FDA) has approved methadone, buprenorphine (buprenorphine with naloxone), and naltrexone for the treatment of opioid use disorder. Naltrexone is an opioid antagonist, methadone is an opioid agonist, and buprenorphine is a partial opioid agonist.[5] MAT can be challenging due to the high cost and need for properly licensed physicians.

An opioid agonist is a drug that activates the opioid (mu) receptors on nerve cells in the brain. A full agonist (methadone) continues to produce effects on the receptors until all receptors are fully activated or until the maximum effect is reached—resulting in a relief of cravings, blocking of the euphoric effects associated with heroin and other opioids, and prevention of withdrawal.

A partial agonist (such as buprenorphine) activates the mu receptors, but not to the same extent as a full agonist; the effects increase until a plateau is reached. Once a plateau is reached and maintained, those with opioid addiction will not experience withdrawal symptoms.

An opioid antagonist (such as naltrexone) binds to the opioid receptors with greater affinity than agonists, but does not activate the receptors. It blocks the receptor; therefore, preventing the neurons from responding to opioids—effectively blocking the effects of opioids. The result is a reversal of the effects of opioids and is used in the management of opioid use disorder to aid in the prevention of relapse. MAT has been found to reduce morbidity and mortality, decrease overdose deaths, reduce transmission of infectious disease, increase treatment retention, improve social functioning, and reduce criminal activity.[6]

Methadone, in use since 1964 for the treatment of opioid use disorder, may be dispensed only in federally approved opioid treatment programs (OTPs). Treatment protocols require that a client take the medication at the clinic where it is dispensed daily. Take-home dosages generally are allowed only for clients who have been on an established maintenance program for an extended period.

In October 2002, the FDA approved buprenorphine for the treatment of opioid use disorder. Physicians who obtain specialized training may prescribe buprenorphine. Some of these physicians are private, office-based practices; others are affiliated with substance abuse treatment facilities or programs and may prescribe buprenorphine to clients at those facilities. OTPs may also prescribe and/or dispense buprenorphine. In October 2010, the FDA approved extended-release, injectable naltrexone to treat and prevent relapse in clients with opioid use disorder following medical withdrawal management from opioids. Extended-release injectable naltrexone may be prescribed by any person who is licensed to prescribe medication (e.g., physician, physician assistant, nurse practitioner), or qualified staff may order its administration.

The U.S. probation and pretrial services system has traditionally not used medication in the treatment of substance use disorders. However, due to the emphasis on the opioid epidemic, the federal judiciary has increasingly used MAT through contract services. Many jurisdictions also can use noncontract services in the community to connect those under supervision with MAT at no cost to the judiciary. The use of contract MAT by probation and pretrial services offices is still extremely limited due to a combination of factors, such as resistance at all levels,[7] cost, and its use being limited to alcohol and opioid use disorder.

A recent survey of all 94 judicial districts on their use of MAT showed that of 90 districts that responded, there were 828 cases with federal supervisees receiving MAT. Only nine districts reported the use of MAT in more than 25 cases. Of those, only four districts reported the use of it in more than 50 cases. The district reporting the highest number of cases (94) receiving MAT is Massachusetts. Thirty-seven districts reported having 10 or fewer cases receiving MAT, and 10 districts are not using MAT because there is not a current need for it.

In fiscal year 2018, a total of $659,069 was spent on agonist/antagonist treatment, with an average of $3,787 per person under supervision who received the service. This was for 174 persons under supervision in 5 districts. In the same period, $80,186 was spent on inpatient detoxification medication, with an average of $1,215 per person under supervision who received the service. This was for 66 persons under supervision in 2 districts. Last, $48,568 was spent on methadone maintenance medication, with an average of $1,734 per person under supervision who received the service. This was for 28 persons under supervision in 3 districts. Note that the methadone detoxification service was not used at all during this period.

Since 2014, the federal judiciary has emphasized the importance of an individualized and integrated approach to the treatment of substance use disorder in individuals under supervision. Training in the procurement of substance use disorder treatment services is provided annually to probation and pretrial services staff and there is continual programmatic support for the supervision of individuals under supervision with treatment

[3] For those needing residential treatment for up to 90 days.

[4] For those needing residential treatment for up to 270 days.

[5] Center for Substance Abuse Treatment. (2005). "Medication-Assisted Treatment for Opioid Addiction in Opioid Treatment Programs." *Treatment Improvement Protocols* (TIP) Series 43 (Rev. ed.; HHS Publication No. SMA 12-4214). Rockville, MD: Substance Abuse and Mental Health Services Administration.

[6] Volkow, N. D., Frieden, T. R., Hyde, P. S., & Cha, S. S. (2014). "Medication-Assisted Therapies—Tackling the Opioid-Overdose Epidemic." *New England Journal of Medicine*, 370(22), 2063–2066.

[7] Court, probation, and pretrial services staff, clinical staff, and patient resistance to the use of medication-assisted treatment (MAT), a lack of perceived effectiveness of MAT, and lack of knowledge about how to implement MAT within their treatment setting.

needs. We have also partnered with the Federal Judicial Center on educational programs for probation and pretrial services for drug and alcohol treatment specialists; in these programs there was an emphasis on substance use disorder treatment being a collaborative process. The federal judiciary continually analyzes data from the national and local levels to assess for programmatic and training needs, and to watch for trends in the federal probation and pretrial services system that require a response to address substance use disorder treatment services needs.

Appendix

Services for Substance Use Testing and Treatment

- Urine Collection/Testing & Reporting
- Urine Collection/NIDT Device Testing
- Sweat Patch/Application & Removal
- Breathalyzer
- Case Management Services
- Intake Assessment and Report
- Clinical Group Cognitive Behavioral Therapy
- Manualized Group Cognitive Behavioral Therapy
- Individual Counseling
- Group Counseling
- Family Counseling
- Group Family Counseling
- Intensive Outpatient Counseling
- Treatment Readiness Group
- Agonist/Antagonist Medication
- Administrative Fee Agonist/Antagonist Medication
- Medical Detoxification
- Non-Medical Detoxification
- Inpatient Detoxification Medication
- Administration of Agonist/Antagonist Medication
- Agonist/Antagonist Medication Monitoring
- Therapeutic Community Residential Treatment
- Short-Term Residential Treatment
- Long-Term Residential Treatment
- Confined Treatment Alternative

Services for Co-Occurring Substance Use and Mental Health Disorders

- Individual Counseling for Co-occurring Disorders
- Group Counseling for Co-occurring Disorders
- Treatment Readiness Group for Co-occurring Disorders
- Family Counseling for Co-occurring Disorders
- Short-Term Residential for Co-Occurring Disorders
- Long-Term Residential for Co-Occurring Disorders

An Evaluation of an In-prison Therapeutic Community: Treatment Needs and Recidivism

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DRUG USE, PARTICULARLY among individuals released from incarceration, is a major problem that needs to be addressed. According to the Bureau of Justice Statistics, 68 percent of those recently released from prison were arrested within 3 years of release, with longer term desistance from crime continuing to decline over time (Alper, Durose, & Markman, 2018). Involvement in drug use is a key factor driving this poor outcome, with more than half (58 percent) of those in state prison currently meeting criteria for a diagnosis of substance abuse or dependence (Bronson, Stroop, Zimmer, & Berzofsky, 2017). And these individuals are among the more than 130 lives a day being lost as a result of the current nationwide opioid epidemic (National Institute on Drug Abuse, 2019). Furthermore, the Centers for Disease Control and Prevention reports that overdose death rates continue increasing across different age and race groups, and these overdoses include a wide range of drugs. Between 2015 and 2016, "age-adjusted cocaine-involved and psychostimulant-involved death rates increased by 52.4 percent and 33.3 percent, respectively" (Kariisa, Scholl, Wilson, Seth, & Hoots, 2019). Methamphetamine's widespread abuse has been significantly increasing in recent years, especially in the central and western regions of the country (Artigiani, Hsu, McCandlish, & Wish, 2018).

With such a rise in drug use problems, coupled with the significant number of incarcerated individuals meeting substance use disorder (SUD) diagnostic criteria, specialized in-prison treatment communities have been one way to provide appropriate treatment and support for those who need it most. Specific, targeted curricula to treat incarcerated individuals are being provided within secure facilities across the U.S. and have shown promising results. For example, the program offered to individuals with methamphetamine problems at the Southwestern Illinois Correctional Center (SWICC) in Illinois has shown that their focus on tailoring of services has had a significant impact on participant "treatment readiness" and program retention (Roberts, Redfield, Olson, Rawson, & Knight, 2010).

Catering to the unique treatment needs of offenders with an extensive history of substance abuse, the modified therapeutic community (TC) model at SWICC is founded on the notion that drug abuse is a primary symptom of a "disordered personality" (De Leon, 2000). The SWICC TC is designed to treat the person as a whole in a peer-community setting, supporting participants through treatment phases, which promote increased levels of responsibility (De Leon, 2000). While in-prison TCs have varying components, there are common elements within the model that are essential components of the SWICC program. One such component is that treatment participants are housed separate from the general prison population in a designated dorm unit. In order to deliver an effective, high-intensity drug treatment program that promotes a complete lifestyle change, participants are housed away from the influence of antisocial behavior in order to cultivate an atmosphere focused on rehabilitation and positive change (Mitchell, Wilson, & MacKenzie, 2007; NIDA, 2015; Wexler, & Prendergast, 2010). Another component of the model is the community design of the therapeutic dorm unit. Participants of the program are directly involved in running the therapeutic unit by leading group sessions, actively monitoring each other in adhering to the community rules, and resolving conflict while working on eliminating their own antisocial behavior

and developing prosocial attitudes and values (Wexler et al., 2010). The community design of this model relies on staff and participants challenging any antisocial behavior, while supporting prosocial transformations (Mitchell et al., 2007). Perrin, Frost, and Ware (2018) provide a concise summary of the positive effects of peer support in prison, pointing out not only the mutual benefit for prisoners when they seek support from one another, but also the higher level of understanding for one another's struggles brought by peers rather than the treatment staff who may not have experienced incarceration and SUDs. Given the prison environment, the SWICC in-prison TC program has been modified to reflect the fact that peers in the program cannot supervise each other or directly mete out rewards and punishments, which falls under the correctional staff's purview.

Given that pairing in-prison TC programming with an aftercare component has been shown to be especially beneficial in reducing recidivism, SWICC participants continue to receive support once they are released to the community. Olson and Lurigio (2014) studied a sample of individuals who completed an in-prison TC program and were assigned to an aftercare program in Illinois. The researchers developed a large sample of program completers (n=1,501) and compared them with a comparison group (n=2,858) along a number of dimensions. After developing four models to test their hypotheses, the researchers found that participation in an in-prison TC (such as the SWICC program) lowered the risks of relapse and recidivism by an average of 6.9 years post-release. The researchers also found that the inclusion of aftercare strengthened the beneficial effects of the in-prison TC. Indeed, including ongoing support is critical; findings from multiple studies evaluating the effectiveness of TCs and aftercare have shown that program participants who complete the TC and aftercare components are the least likely to recidivate during an extended follow-up period when compared to participants who drop out of aftercare (Martin, Butzin, Saum & Inciardi, 1999). Furthermore, program participants with the highest levels of drug use severity benefit the most when they complete in-prison treatment and aftercare treatment components (Knight, Simpson, & Hiller, 1999; Olson & Lurigio, 2014; Wexler, De Leon, Kressel, & Peters, 1999). Support for the effectiveness of a full continuum of TC programming on reducing recidivism is further captured in the Mitchell et al. 2007 meta-analysis.

Despite these positive findings, research on the effectiveness of therapeutic communities for reducing recidivism and relapse has been mixed. For example, Jensen and Kane (2012) studied four in-prison TCs located in Idaho with participants who were released into the community in 2004. These researchers found that participation in the therapeutic communities had a significant effect on subsequent arrests for the treatment groups, but did not have statistically significant effects on reconvictions for the treatment groups. Zhang, Roberts, and McCollister (2011) evaluated a TC program in California and found no significant recidivism results after five years post-release between the treatment and the control group; however, they did find that the TC significantly reduced disciplinary infractions (Zhang, Roberts, & McCollister; 2009).

These discrepant findings are not surprising, given that achieving improved outcomes depends upon the fidelity of the treatment program; adherence to the risk, need, and responsivity principles for the planning and deliberation of each participant's plan; as well as ongoing measurement of participant responsiveness to dynamic factors throughout the treatment phases (Simpson, Knight, & Dansereau, 2004; Welsh, Zajac, & Bucklen, 2014). Individuals with substance use problems that come through the correctional system are a diverse group, requiring an individualized level of treatment depending on their risk of reoffending, the criminogenic needs that drive their relationship with crime, and their unique learning styles along with various cultural considerations. Assessment results are needed that provide data about the individual's current risk level as well as criminogenic needs. When available, this information can be used to establish the priority with which treatment is delivered, primarily based on the severity of the substance use disorder and other criminogenic needs that should be the focus of treatment. Assessments of individuals entering a treatment program is a pivotal step, as the assessment findings allow for tailored case planning and treatment management aimed at changing behavior in order to minimize one's potential for reoffending and relapsing (Knight, Garner, Simpson, Morey, & Flynn, 2006; Simpson et al., 2004).

The current study analyzes the impact of the SWICC program on recidivism over a three-year period, using the Illinois Department of Corrections' definition of recidivism as return to prison. First, the current study examined whether completion of the SWICC curriculum significantly reduced recidivism rates compared to non-completers of the SWICC curriculum. Second, the study examined subscales from the TCU Criminal Thinking Scales (CTS) and the TCU Client Evaluation of Self and Treatment (CEST) to assess the relationship between criminal thinking and poor psychosocial functioning (potential treatment targets) during treatment with subsequent recidivism.

Southwestern Illinois Correctional Drug-Treatment Program

Southwestern Illinois Correctional Center (SWICC) is a minimum security, all male, 720-bed facility that offers comprehensive substance abuse treatment. SWICC is the product of a collaboration between the Illinois Department of Corrections and the GEO Reentry Services, LLC, a private services provider that partners with public agencies to provide correctional programming. Using a modified therapeutic community (TC) model, GEO Reentry Services treatment professionals provide an addiction recovery and behavior modification curriculum encompassing four phases of treatment: Orientation and Lifestyle Changes (Phase I), Intensive Treatment (Phase II), Re-entry (Phase III), and Transition (Phase IV). During each of these phases, participants receive an average of 15 hours of treatment per week from quality, evidence-based programs along with pre- and post-treatment assessments used for case planning and progress monitoring. A participant is considered a successful curriculum completer if he has progressed through the Re-entry Phase, which usually takes a year of programming and phase progression. Individuals who have not completed the full curriculum are discharged upon sentence completion, and their non-completion status is documented. None of the participants in the current study were discharged from the TC for disciplinary reasons.

While it was not examined specifically as part of this study, it is worth noting that GEO has a dedicated methamphetamine recovery program at SWICC, targeted to the specific etiology of methamphetamine abuse and employing a comprehensive and groundbreaking clinical design (Roberts et al., 2010). Therapeutic interactions between counselors and treatment participants are adjusted to clients' varying degrees of cognitive impairment during early methamphetamine recovery, particularly regarding short-term memory

(Volkow, Chang, Wang, Fowler, Leonido-Yee, Franceschi, Sedler, Gatley, Hitzemann, Ding, Logan, Wong, & Miller, 2001). For example, the Orientation Phase of the methamphetamine program is two weeks longer than the typical Orientation phase for the other TC participants. Cognitive and behavioral skills are modeled repeatedly in different ways, in different group contexts, and over the full course of client's treatment so that participants can be helped to comprehend and retain basic recovery concepts. An advanced, meth-specific curriculum (the "Matrix Model") has been adopted for use in a prison treatment setting by Dr. Richard Rawson.

Groups at SWICC are designed to provide peer support and teach participants to pursue a prosocial lifestyle. Following Deleon's "Community as Method," the entire TC community is responsible for each other (their brother's keeper) and for reshaping the whole person, not just ameliorating the substance use disorder symptoms. In addition to providing participants with an opportunity to learn how to be free from substance dependency, both physically and mentally, participants have the opportunity to participate in other programs designed to better prepare them for the transition back to society. These programs include: 1) Certified Associate Addictions Professional (CAAP) program offering a hands-on training and educational experience geared toward enhancing participants' personal recovery as well as their professional and clinical experience, 2) Inside-Out Dad programming aimed at enhancing parenting skills, 3) the GEO Family Reunification Program (FRP), and 4) trauma-informed care. Before discharge, SWICC participants are provided with an aftercare plan. For purposes of the current study, the aftercare programming was not included in the analysis.

Methodology

Sampling

To assess the impact of SWICC's substance abuse programming on recidivism (return-to-prison within three years after release), program participants released between 2007 and 2014 were selected. All participants departed the facility in good standing. Program completion may or may not have been achieved, as some participants did not remain in the facility for sufficient time to complete the curricula—approximately 12 months.

Measures

Study measures include the following: Texas Christian University's (TCU) Criminal Thinking Scales (CTS) and Client Evaluation of Self and Treatment (CEST), and the Addition Severity Index (ASI). The TCU CTS and TCU CEST assessments were administered at intake, completion of each program phase, and within two weeks prior to successful release. The ASI scores were collected at intake to assist with evaluating the severity of the substance use disorder.

Scales Included from the TCU Criminal Thinking Scales (CTS)

The TCU CTS comprises 36 questions that are answered by the participant, and the tool uses a 5-point Likert scale. Because of the instrument's ease of administration, the TCU CTS is ideal for assessing programmatic impact on the participant's changes in criminal thinking. The TCU CTS measures the following factors of criminal thinking: Entitlement (sense of ownership and privilege), Justification (minimizes antisocial acts as being due to external circumstances), Personal Irresponsibility (willingness to accept ownership for criminal actions), Power Orientation (need for power and control), Cold Heartedness (lack of emotional involvement), Criminal Rationalization (negative attitude toward the law and authoritative figures). It is important to note, however, that correctional institutions and community-based programs do not target all six factors equally. For example, Cold Heartedness is a scale that seems to be less impacted by corrections programming than the other five. Thus, this study examines Entitlement and Criminal Rationalization, two criminal thinking domains that are targeted for change as part of the SWICC program.

Scales Included from the TCU CEST (Texas Christian University Institute of Behavioral Research, 2007):

Hostility. This subscale measures the level of hostility and anger in the participant.

Treatment Satisfaction. This subscale assesses overall satisfaction with the program, services offered, and the convenience of participating.

Peer Support. This subscale assesses the existence and quality of the relationship with peers in the program.

The Addiction Severity Index scores (ASI; McLellan, Luborsky, Woody, & O'Brien CP, 1980)

The ASI assess varying factors (i.e., legal problems, medical status, employment, drug/alcohol use, family/social relationships, psychiatric status) that correlate with three of the four top risk factors (history of criminal behavior, antisocial personality patterns, and anti-social associates; Andrews & Bonta, 2006).

Results

Demographic and sociodemographic variables are presented in Table 1 (next page). The total sample for the study of SWICC participants was $N = 4480$ and the median age was 33.37 years.

Overall, the sample showed that there was a higher percentage of Whites in the completers group versus non-completers. There was a higher percentage of African Americans and Hispanics among non-completers. At intake, the primary drug in the overall sample that led them to their arrest was alcohol, followed by cannabis, meth, heroin, and cocaine. Within those who showed alcohol, cannabis, and cocaine as their primary intake drug, there was a higher percentage of non-completers in comparison to completers of the SWICC curriculum. Looking at those whose primary drug was heroin or meth, there was a higher percentage of completers in comparison to non-completers. Finally, there was a significant difference between the ASI-drug score at intake between those who completed the SWICC curriculum ($M = 5.75$) versus non-completers ($M = 5.53$), $p \leq .001$.

With respect to the SWICC Curriculum criminal characteristics presented in Table 2 (next page), most of the participants were admitted due to a drug offense, and drug offenders showed a higher representation of those who completed the SWICC Curriculum. Next, and as expected, there was a longer prison sentence among those who were in the completers group ($M = 613.25$) in comparison to the non-completers group ($M = 296.89$). Finally, results showed that completers of the SWICC Curriculum ($M = 444.95$) took longer to return to prison compared to the non-completers ($M = 414.51$), $p = .043$. From a different perspective, 26.67 percent who completed the SWICC Curriculum recidivated within three years as opposed to 28.57 percent who did not complete the SWICC Curriculum (see Table 3, page 13).

The correlations among CTS and CEST

TABLE 1
Comparisons of Demographics and Socioeconomic Characteristics between SWICC SU Curriculum Completers vs. Non-Completers

Characteristic	Non-Completers n = 2114	Completers n = 2366	Total N = 4480
Intake Age[a]	M = 32.10	M = 34.50	M = 33.37
Race[b]			
White	41.91%	47.13%	44.67%
African American	50.47%	47.46%	48.69%
Hispanic	5.96%	4.31%	5.09%
Total	100.0%	100.0%	100.0%
Education Level[c]			
HS Graduate	52.18%	44.21%	52.03%
Not a HS Graduate	47.82%	55.79%	47.97%
Total	100.0%	100.0%	100.0%
Primary Drug[d]			
Alcohol	28.86%	25.78%	27.59%
Cannabis	27.44%	21.85%	24.49%
Cocaine	9.99%	9.80%	9.87%
Heroin	13.06%	14.58%	13.86%
Methamphetamines	13.58%	20.96%	17.48%
Total	100.0%	100.0%	100.0%
ASI-Drug Score at Intake[e]	M = 5.53	M = 5.75	M = 5.64

Note: ASI = Addiction Severity Index. [a]$t(7.91) = .005$, $p \leq .001$; [b]$X^2 = 22.60$, $df = 2$, $p \leq .001$; [c]$X^2 = 28.39$, $df = 2$, $p \leq .001$; [d]$X^2 = 64.64$, $df = 4$, $p \leq .001$; [e]$t(4.41) = 33.70$, $p \leq .001$.

TABLE 2
Comparison of SWICC SU Curriculum Completers vs. Non-Completers Criminal Characteristics

Characteristic	Non-Completers n = 2114	Completers n = 2366	Total N = 4480
Admission Offense[a]			
Drug Offense	41.53	45.22	43.48
DUI	7.99	5.28	6.57
Property	16.70	18.00	17.39
Robbery	8.50	10.44	9.53
Weapons	6.53	6.13	6.31
Total	100%	100%	100%
Days in Prison[b]	M = 296.89	M = 613.25	M = 463.97
Days to Return to Prison[c]	M = 414.51	M = 444.95	M = 430.06

[a]$X^2 = 62.92$, $df = 4$, $p \leq .001$; [b]$t(61.37) = 857.50$, $p \leq .001$; [c]$t(2.20) = .477$, $p = .043$.

variables were examined; variables to be included in the current model were not highly correlated, r's ≤ .45. The admission date range for the study spanned from March 2004 to April 2017 and the discharge date spanned from June 2007 to August 2017. Half of the sample had drug- and/or alcohol-related charges at the time of admission to SWICC.

To answer the study's second research questions, a multiple logistic regression was conducted predicting recidivism at three years on *Entitlement*, *Criminal Rationalization*, *Hostility*, *Treatment Satisfaction*, and *Peer Support* (see Table 4). Control variables were race (Black versus other) and ASI drug intake score. The dependent variable was measured on a dichotomous scale (0 = did not recidivate within three years, 1 = did recidivate within three years from discharge). The independent variables were continuous. Results from the analysis revealed that the overall model was statistically significant, $X2(7) = 59.99$, and the model explained 3.10 percent of the variance (Nagelkerke's $R2$). A test for the goodness of fit for the overall model was non-significant $X2(8) = 6.51$, $p = .590$, indicating a good fit. After controlling for race, HS graduate, and drug score from the ASI, results from this analysis showed that higher *Entitlement* (OR = 1.01, $p = .018$) and higher *Hostility* (OR = 1.02, $p \leq .001$) were associated with a higher odds ratio of recidivism within three years. For every one-unit increase in *Entitlement*, the log odds of returning to prison increased by .016 units; the logs odds of returning to prison increased by .02 units for *Hostility*. Results also indicated that completion of the program resulted in .8 odds ratio of not returning to prison, $p = .004$.

Discussion

Past research has documented the effects of in-prison TC outcomes. Specifically, evaluations of TC treatment show sustained impacts using national samples at two-year and three-year follow-up. Favorable outcomes of TC programming are believed to be due in part to the high intensity drug treatment programming, and to the therapeutic housing designed to cultivate an atmosphere focused on rehabilitation and positive change along with aftercare. Less is known about the thought processes and psychosocial variables related to recidivism outcomes. The current study examined the prediction of 3-year recidivism outcomes using multiple treatment process and psychosocial predictors, including subscale measures from the TCU CEST and CTS

collected at treatment discharge.

The current study's hypotheses were that the following subscales from the TCU CTS and the TCU CEST: *Entitlement*, *Criminal Rationalization*, *Hostility*, *Treatment Satisfaction*, and *Peer Support* at discharge were related to increased odds of recidivism within three years. After controlling for race and ASI drug score at intake, the results found that *Entitlement* and *Hostility* were related to recidivism. In other words, the predicted odds ratio of recidivism was higher for those who scored higher on ratings of *Entitlement* and *Hostility*. Likewise, the predicted odds of recidivism are greater than for someone who is discharged from SWICC with lower scores on *Entitlement* and *Hostility* than for those with higher scores. In light of these findings, programming efforts may benefit from targeting these client factors in an effort to reduce recidivism risk. The central theme between the subscales of *Entitlement* and *Hostility* seems to stem from criminogenic factors related to antisocial attitudes and antisocial personality variables (Andrews & Bonta, 2010). With respect to *Entitlement*, this provision of grandiosity and exaggerated prerogative could be a product of negative feelings towards the prison, personal grievances, or societal customs. In a like manner, *Hostility* could result from a charged aggressive psychosocial functioning, which may also stem from similar contexts.

Although SWICC and similar TC programs may not specifically target both *Entitlement* and *Hostility*, these factors should be evaluated at each phase of treatment. Adjustments in treatment planning for those individuals who continue to exhibit elevated scores on the *Entitlement* subscale of the TCU CTS and the *Hostility* subscale of the TCU CEST should be considered as these two variables are shown in the current study to be related to recidivism. By individualizing the treatment for those participants with elevated scores on these subscales, specific responsivity can be addressed moving away from the "one size fits all" approach. One possibility would be to increase the dosage of individual sessions with these individuals to work specifically on entitlement and hostility issues.

The importance of completing the SWICC Curriculum also deserves discussion. Our findings corroborate previous findings that there is a direct relationship between the full participation/completion and favorable outcomes (i.e., Olson & Lurigio, 2014). After controlling for all other variables in the model, the odds ratio was found to be directly related to not returning to prison within three years. And although a formal cost-benefit analysis was not conducted, the results of the current study found that individuals in the SWICC program, whether they completed the full curriculum or not (28.57 percent and 26.67 percent respectively), had lower rates of recidivism than the Illinois State rate of 43 percent (Illinois Sentencing Policy Advisory Council, 2018). The Illinois Advisory Council reported that one recidivism event costs the State $151,662 when the taxpayer, victimization, and indirect costs are factored into the equation. The Illinois Advisory Council findings indicate that a significant cost-avoidance would be realized if the recidivism rates were similar to SWICC. These findings suggest that significant cost avoidance is being achieved based on the current SWICC programming that is being provided.

As with any study, there were strengths and limitations to the design. The results were based on individuals who voluntarily participated in an in-prison TC. These individuals had also attained minimum security status. Given that risk scores were not available, it is unclear if these results would be found in a population with different risk scores. Furthermore, this study examined measures collected prior to discharge. It would be useful to examine data collected over time during treatment to assess the impact of positive changes on these measures in relation to reduced recidivism rates. In conclusion, future refinement of in-prison TC programming that takes into consideration an individual's level of criminal thinking and psychosocial functioning is likely to lead to even better post-release outcomes.

TABLE 3
Percentage Characteristics of Returning to Prison (Recidivism) among SWICC SU Curriculum Completers vs. Non-Completers

Characteristic	Non-Completers n = 2114	Completers n = 2366	Total N = 4480
Return to Prison (3yrs)			
Yes	28.57%	26.67%	27.57%
No	71.43%	73.33%	72.43%
Total	100%	100%	100%

TABLE 4
Logistic Regression Examining Recidivism (0 = No Return to Prison, 1 = Return to Prison) among SWICC Prisoners

Independent Variables	*B*	Wald	*p*	Exp(B) Odds Ratio
Race (Black vs. Other)	.161	4.21	.040	1.174
ASI-Drug at Intake	.080	8.48	.004	1.083
HS Graduate	-1.70	32.11	.001	.640
CTS Entitlement	.016	5.63	.018	1.016
CTS Criminal Rationalization	.006	1.07	.302	1.006
CEST Hostility	.020	10.81	.001	1.020
CEST Treatment Satisfaction	.011	3.00	.083	1.011
CEST Peer Support	-.005	.60	.440	.995
SWICC Curriculum Completion (1)	-.224	8.18	.004	.800

Note: ASI = Addiction Severity Index, CTS = Criminal Thinking Scales, and CEST = Client Evaluation of Self and Treatment

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Health Problems: Relationships to Demographics, Problem Severity, and Services for Substance Users in Treatment with a Legal Status

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AMONG THE ISSUES[1] faced by in-prison substance abuse treatment systems are broad-based cultural and socioeconomic disparities in health problems among those entering their drug treatment programs. This is significant as it involves public health and safety in an enormous number of drug-related incarcerations and subsequent community reentries (National Institute on Drug Abuse, 1999, 2006). While these problems have received some attention, often there is little information available to do strategic action planning. Hence, the purpose of this study is to examine the frequency of health problems and to explore them in relation to other background factors, as these may inform on the health-related needs of substance users who have a legal status upon treatment entry.

Health problems among substance users are clearly an area of public concern, as demonstrated by reports of anxiety reduction and self-medication as reasons for heroin use (e.g., Ryan & White, 1996; Simpson et al., 1986), illicit stimulant use effects on health (e.g., Falck et al., 2007), methamphetamine use and trauma (Schermer & Wisner, 1999), cocaine and cardiovascular issues (Lange & Hillis, 2001), and effects of alcohol and drug use on general health from the Medical Outcome Study (Stein et al., 1998). In a study of prevalence of medical and psychiatric conditions among 747 substance abuse patients and 3690 demographically matched controls in a HMO, it was found that approximately a third of the conditions were more common among substance abuse patients and many of these were among those most costly (Mertens et al., 2003). Poor physical health has been noted among the problems of those entering substance use treatment (Williamson, Darke, Ross, & Teesson, 2009).

The cost of healthcare is a major implication of health problems among substance users. As noted in a Milken Institute report (Devol & Bedroussian, 2007), more than 109 million Americans reported having at least one of seven diseases totaling over 162 million cases in the general U.S. population in 2003, with a corresponding economic cost of $277 billion. When loss of productivity was added to the treatment expenditures, the total cost exceeded $1.3 trillion. The way medical care is often accessed by many substance users is also of concern, because those who are medically noninsured commonly use acute emergency care settings, which often leads to spiraling healthcare costs. The economic issues with health care in the general U.S. population are applicable to substance users who enter into drug treatment, whether in community-based or prison-based treatment. Therefore, the types of healthcare access and use among substance using populations are equally important to address in respect to the types of problems that need attention.

A study of 6,009 substance users in 8 prisons located in 2 states (Joe, Lehman, Rowan, Knight, & Flynn, 2019) showed that half reported some physical ailment upon entrance, and the problem cited most frequently was bone/joint ailment (42 percent), followed by other problem (38 percent). Data from the National Center for Health Statistics show that the incidence of many diseases and health conditions (e.g., heart disease, hypertension, stroke, emphysema, sinusitis, bronchitis, cancer, diabetes, arthritis, mobility, vision, and hearing) differs considerably by demographics (Lucas et al., 2004). Accordingly, it might be expected that health problems among substance users with a legal status at treatment intake would vary also by gender, race-ethnicity, and age. The present study uses data gathered in a

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nationwide study that was used to evaluate the effectiveness of substance abuse treatment practices. As such, that data is limited but is sufficient for investigating further the relationship of health problems and access to care to sociodemographic markers and to a multi-indicator psychosocial problem severity index that was shown to be a factor in substance abuse treatment engagement and progress (Simpson et al., 1999). It is important to understand this relationship better, as it would contribute further information on health problems being another background area that impacts treatment.

Methods

Sample

The data being used are from the Drug Abuse Treatment Outcome Studies (DATOS) project, funded by the National Institute on Drug Abuse (NIDA) to study substance abuse treatment practices in their community-based settings (Flynn et al., 1997; Simpson & Brown, 1999; Simpson et al., 1999). While the data are older, they nevertheless are important, as they were collected in the last nationwide study conducted on substance users sponsored by the NIDA. They also are representative of the types of substance users who entered the major types of treatment modalities available at that time, including methadone maintenance, outpatient drug free, long-term residential (including therapeutic communities), and short-term residential. The current study used a total of 3,907 adult admissions with a legal status out of the 10,010 who had been admitted to 96 drug treatment programs in 11 cities located throughout the United States during 1991 to 1993.

These 3,907 substance users had completed the full (two-part) intake interview, which contained health information needed for this study. They averaged 31.5 years of age (22 percent were 17-25, 25 percent were 26-30, 39 percent were 31-39, and 14 percent were over 39); 72 percent were male; 44 percent were black, 41 percent white, and 13 percent Hispanic. About half (55 percent) worked at part-time or full-time jobs, and also about half (55 percent) had been in drug treatment previously. A small percentage (11 percent) considered themselves in "poor health," 29 percent rated themselves as "fair," 41 percent rated themselves as "good physical health," and 20 percent rated themselves as being in "excellent physical health" at the time of their admission to the study. About 80 percent reported using illegal drugs at least weekly before intake (including 51 percent cocaine, 26 percent marijuana, and 24 percent opioids). Half reported using illegal drugs daily (with 29 percent using cocaine and 20 percent using opioids on a daily basis).

Measures

Problem Severity Index. The *Problem Severity Index* (PSI) at intake represents patient problems in seven areas of functioning, comparable to the domains represented in the widely-used Addiction Severity Index (McLellan et al., 1992), and was used in the previous evaluation of the DATOS studies (Simpson et al., 1999). PSI components included employment, alcohol, multiple drug use, criminality, family and friend deviance, depression/anxiety problems, and an indicator of economic disadvantage based on medical insurance. Each was scored to define a "problem" as follows: (1) employment—less than full employment; (2) alcohol use—either a DSM-III-R diagnosis of alcohol dependence or self-reported daily consumption; (3) multiple drug use—weekly use of two or more drugs; (4) criminality—being on probation, parole, awaiting trial, case pending, or weekly involvement in illegal activity; (5) family/friend deviance—many family/friends with illicit drug use or if they were jailed, imprisoned, or placed in juvenile detention; (6) depression/anxiety—DSM-III-R diagnosis of depression or anxiety, a score above the median on the SCL-90 depression or anxiety scales, or self-reported suicidal ideation; and (7) low income indicator—lack of medical insurance from a private carrier. The latter was used as a general socioeconomic indicator because uninsured patients were significantly less likely ($p < .001$) to be employed (53 percent versus 69 percent) or to have completed high school (20 percent versus 35 percent) and were more likely to be on Medicaid (27 percent versus 3 percent).

While the scores for the total sample of 10,010 on the PSI were 0 for 2 percent, 1 for 7 percent, 2 for 16 percent, 3 for 23 percent, 4 for 23 percent, 5 for 17 percent, 6 for 9 percent, and 7 for 3 percent, the present study is concerned only with those with legal status. Therefore, among the 3,907 with a legal status, the corresponding percentages for these PSI scores were 1.3 percent, 9.6 percent, 21.6 percent, 26.4 percent, 23.4 percent, 14.1 percent, and 3.6 percent for the categories of 1, 2, 3, 4, 5, 6, and 7 problems, respectively (there were none with zero, as the sample consisted of those with a legal status). For comparability with previous research and to streamline interpretation of findings (Simpson et al., 1999), scores were combined to form three problem severity categories: 1-3 represented "low" problems (32 percent), 4-5 represented "medium" problems (50 percent), and 6-7 represented "high" problems (18 percent) for those with a legal status.

Health Problems

Each patient was queried about 10 categories of physical health problems during the 12 months before intake. These were *respiratory* (conditions related to the respiratory system or breathing problems such as bronchitis, asthma, hay fever, pneumonia, emphysema, shortness of breath, or wheezing); *heart* (heart or circulatory system problems including high blood pressure, irregular heartbeat, palpitations, heart murmur, or heart disease); *digestive* (digestive system or stomach problems such as ulcers, colitis, nausea, vomiting, persistent diarrhea, or heartburn); *liver/kidney* (hepatitis, cirrhosis of the liver, jaundice, or liver/kidney problems); *bone/muscle* (bone and muscle problems including paralysis, bursitis, arthritis, or permanent stiffness); *nervous system* (nervous system problems like seizures, epilepsy, migraines, convulsions, or blackouts); *STD* (venereal or sexually transmitted disease including gonorrhea, syphilis, chlamydia, or herpes); *TB* (tuberculosis); if male, *prostate* (prostate problems or problems with urinating), or if female, *gynecological* (female or gynecological problems like ovarian cysts, severe bleeding or severe cramps, endometriosis, fibroids, lower abdominal pain, breast lumps, or breast pain); and *other health problems* (other physical health problem or illness, including AIDS/HIV+).

Health Service Visits

An index for health service visits was the summed number of health-related visits to a doctor or other health care provider.

Results

Demographics and Health

More than half of the sample (54 percent) reported having at least one physical health problem, with 25 percent reporting one problem, 22 percent 2-3 problems, and 7 percent more than 3 problems. Table 1 shows the most frequent reports were for respiratory (20.6 percent), digestive (16.4 percent), bone/muscle (14.1 percent), nervous system (13.5 percent), heart (12.5 percent), and other health issues (10.0 percent). Among females, gynecologic problems were reported by 22.5

percent. The finding that respiratory and heart problems are two of the most frequently cited corresponds with the most prevalent health problems found for the general U.S. population by Devol & Bedroussian (2007). In order of frequency, the most regularly reported diseases from their survey were pulmonary conditions (17.4 percent), hypertension (13 percent), mental disorders (10.7 percent), heart disease (6.8 percent), diabetes (4.9 percent), cancers (3.7 percent), and stroke (.9 percent). Another large survey of a general population found that in a drug treatment sample health problems are somewhat higher. A Canadian study conducted by the Fraser Institute (Ramsay et al., 1999), found in a telephone survey of 1500 individuals that the 10 most frequently reported medical conditions were back and neck problems (30 percent), allergies (29 percent), arthritis/rheumatism (20 percent), difficulty walking (17 percent), frequent headaches (16 percent), lung problems (12 percent), digestive problems (12 percent), gynecological problems (10 percent), anxiety attacks (9 percent), and heart problems/chest pain (9 percent).

Contingency table analyses of the present drug treatment sample data, as shown in Table 1, indicated gender to be significantly related to most self-reported health problems, with the exception of TB and the Other Health category. Females reported more respiratory, heart, digestive, liver/kidney, bone/muscle, nervous system, and STD problems than males. Males and females were also significantly different on the composites of "Total Drug Use" and "Any Drug Use," with females more likely to report a problem and averaging more problems than males.

As shown in Table 2, age also proved to be significantly related to the self-reported composite health indicators and to the specific self-reported health problems, with the exception of respiratory and nervous system. Differences were noted for heart, digestive, liver/kidney, bone/muscle, STD, TB, and Other Health. Generally, the percentages were monotonically increasing with the categories of age for all the significant health problems, with the exception of STD (which was monotonically decreasing with the age categories). The two older age groups were significantly higher than the two youngest age groups on the two self-reported health composites and on self-reported heart, liver/kidney, bone/muscle, TB, and Other Health. The oldest category was also significantly higher than the two youngest on self-reported digestive problems. The youngest group had significantly higher rates on STD than did the two oldest age groups.

TABLE 1
Percentage of Health Problems by Gender

	Total	Male	Female	χ^2 (1)
Total (mean) (sd)	1.2 (1.4)	0.9 (1.3)	1.6 (1.6)	t=13.63****
Any	54.2	48.7	68.7	126.20****
Respiratory	20.6	16.9	30.3	85.47****
Heart	12.5	11.3	15.6	12.59***
Digestive	16.4	14.5	21.4	27.39****
Liver/Kidney	7.3	6.6	8.9	6.23*
Bone/Muscle	14.1	13.0	16.8	9.25**
Nervous system	13.5	11.6	18.6	32.64****
STD	7.4	5.1	13.6	82.88****
TB	1.8	1.9	1.5	.63 ns
Prostate (n=2890)	2.0	2.0	NA	NA
Gynecologic (n=1258)	22.5	NA	22.5	NA
Other Health	10.0	9.7	10.9	1.29 ns

**p < .01, ***p < .001 *****p< .0001

TABLE 2
Percentages of Health Problems by Age

		Age				
	Overall Average	17-25	26-30	31-39	40 and older	χ^2 (3)
Total (mean)	1.1	.9	1.0	1.2	1.4	F(3, 3901) =15.60***
Any	54.2	49.0	51.9	56.3	60.8	23.56****
Respiratory	20.6	20.8	19.8	19.9	24.1	4.83 ns
Heart	12.5	8.1	9.9	14.5	18.7	45.67***
Digestive	16.4	13.4	15.6	17.0	21.0	14.58**
Liver/Kidney	7.3	5.0	5.5	8.1	11.8	28.80****
Bone/Muscle	14.0	8.6	11.1	15.1	25.1	82.65****
Nervous system	13.5	13.2	14.0	14.1	11.2	3.11 ns
STD	7.4	9.5	8.3	6.7	4.5	14.07**
TB	1.8	.8	1.1	2.4	2.8	13.25**
Prostate (n=2888)	2.0	1.9	1.6	1.8	3.2	4.18 ns
Gynecologic (n=1258)	19.0	14.8	18.9	21.0	20.9	4.73 ns
Other Health	10.0	6.2	8.9	11.3	14.3	28.19****

**p < .01, ***p < .001

In Table 3 (next page), significant race-ethnic differences were found for the self-reported health composites (total health problems index and any health index) and for most of the specific health areas, with the exception of heart and other health. Whites reported significantly more health problems in terms of the health composites (total health problems index and any health problem index) than Blacks or Hispanics. Their self-reported percentages on respiratory, liver/kidney, bone/muscle, and nervous system were significantly higher than those reported by Blacks and by Hispanics. Additionally, Whites also reported more digestive problems than Blacks. In contrast, Whites had significantly lower self-reported TB rates than either Blacks or Hispanics. On the other hand, Blacks reported more STD problems than Whites or Hispanics.

Problem Severity Index and Health

The PSI had stronger relationships with

TABLE 3
Percentages of Health Problems by Race and Problem Severity

	Race-ethnicity					Problem Severity Index (PSI)			
Health Problem	White	Black	Hispanic	Other	χ^2 (3) Race	1-3	4-5	6-7	χ^2 (2) PSI
Total (mean)	1.2	1.0	.9	1.2	F(3, 3903)= 9.27****	.7	1.1	1.7	F(3, 3904)= 122.89****
Any	57.1	53.4	47.2	56.6	15.88**	40.2	55.4	70.6	171.69****
Respiratory	24.3	17.6	18.4	23.6	24.61****	13.3	20.9	30.1	78.36****
Heart	11.9	13.8	9.6	14.2	7.06 p<.07	8.4	12.9	17.2	32.31****
Digestive	15.6	13.1	16.2	21.7	27.73****	10.3	16.4	24.7	68.73****
Liver/Kidney	10.0	4.9	6.4	6.7	32.64****	3.2	6.8	14.1	80.98****
Bone/Muscle	16.5	12.9	10.2	15.1	15.65**	10.1	14.2	19.1	30.78****
Nervous System	17.6	10.8	9.7	12.3	39.98****	4.9	14.3	23.2	132.70****
STD	5.1	10.8	3.0	8.6	55.14****	4.1	7.6	11.5	36.98****
TB	.8	2.5	2.6	.9	15.47**	1.2	1.9	2.3	3.42 ns
Prostate	2.3	1.8	1.6	1.4	1.15 ns	1.0	2.0	3.5	10.04**
Gynecologic	19.6	19.6	13.4	29.0	6.32 p<.10	15.7	17.8	24.5	8.56*
Other Health	10.6	9.7	10.0	5.7	3.07 ns	7.5	9.7	14.3	23.55****

**p < .01, ***p < .001, ****p < .0001

the self-reported health composites and to each of the 11 health problem areas than did demographic characteristics, with the PSI displaying a monotonic increasing trend with each health problem. Individuals with more psychosocial problems (Simpson et al., 1999) tended to have the higher percentages for each health problem, and those with 1-3 problems showed the lowest percentages. The PSI was more discriminating than demographics when using the percentage differences between high- and low-severity groups. In particular, the percentage difference between the highest and lowest PSI groups for the health composite "any health problem" was approximately 30 percent, compared to 10 percent as the largest difference among categories for race-ethnicity, 12 percent for age, and 10 percent for gender. The PSI also was correlated with the total number of health problems (r = .25, $p < .0001$), and these differences were made clearer when categorized by groups. Specifically, the percentages of substance users with 2 or more health problems were 17 percent, 29 percent, and 45 percent in the low, middle, and high PSI severity groups, respectively.

Psychiatric Diagnosis and Health

Finally, health was also found to be related significantly with psychiatric diagnosis. A DSM-III psychiatric diagnosis (based on antisocial personality, depression, or generalized anxiety disorder) was correlated significantly (r = .18, p<.0001) with self-reported total health problems index, and when examined more closely, especially with a DSM diagnosis of depression (r = .23, p<.0001). Furthermore, the self-reported total health problems index was significantly correlated with suicidal ideation (r = .30, p<.0001), SCL-90 depression (r = .31, p<.0001), anxiety (r = .34, p<.0001), and hostility (r = .24, p<.0001). Together, these relationships emphasize the relationships of health problems with problem severity, consistent with the literature on psychopathology and physical health (e.g., Marshall et al., 2008; O'Donohue & Cucciare, 2005).

Within Gender Analyses

Analyses were conducted also within gender groups to assess race and age relationships to health. This was done because male and female substance users in an in-prison treatment setting will be treated separately, and it is important to determine whether gender might modify the previous total sample findings concerning race and age with health. Overall, the analyses within gender groups illuminated several differences. For instance, there were significant age differences on all health problems (with the exception of prostate [F(3, 2809) = 1.36]) and STD [F(3, 2819) = 1.23] problems) for males, and fewer differences in the age by health relationships for females. For example, while there were STD differences [F(3, 1068) = 4.78, p<.003] for age for males, in contrast there were no age differences on this health area for females. On the other hand, there were no significant differences by age on respiratory problems (F(3, 1071) = .22), digestive problems [F(3, 1071) = .91], TB [F(3, 1064) = 1.05], liver/kidney [F(3, 1070] = .98), and nervous system [F(3, 1068) = 1.39], or gynecological problems [F(3, 1059) = 1.01] for females, but age relationships for these health problems were found for males.

With regard to race and health within gender, it was found that males had significant differences on all health problems, with the exception of bone/muscle [F(3, 2824) = 1.39], prostate [F(3, 2811) = .34], and the other health problem group [F(3, 2795) = 1.53]. The examination of health by race for females, however, found significance with race by respiratory [F(3, 1071) = 3.18, p< .03], digestive [F(3, 1071) = 5.72, p< .0007], liver/kidney [F(3, 1070) = 6.50, p< .0002], bone/muscle [F(3, 1067) = 6.20, p< .0004], nervous system [F(3, 1068) = 3.27, p < .021], and STD (F(3, 1068) = 8.13, p< .0001), but no differences by race on heart (F(3, 1070) = .10), TB [F(3, 1064) = 1.35], gynecological problems [F(3, 1059) = 1.41], and the other health problems group [(F(3, 1063) = .06].

The analyses of PSI and health within gender also showed differences for males and females. Among males, there were significant relationships between PSI and all health problems with the exception of TB [F(3, 2822) = 1.37]. In contrast, for females, significant differences were found for respiratory [F(2, 1072)

= 5.18, p< .006], digestive [F(2, 1072) = 6.23, p< .002], liver/kidney [F(2, 1071) = 11.78, p< .0001], nervous system [F(2, 1069) = 20.02, p< .0001], and STD [F(2, 1069) = 8.94, p< .0001], but no PSI significant relationships with TB [F(2, 1065) = .71], heart [F(2, 1071) = 1.20], bone/muscle [F(2, 1068) = 1.86], and the other health problems category [F(2, 1064) = 2.09]. ,

Prior Drug Use and Health

Not surprisingly, health problems were significantly related to pretreatment history of illegal drug use; however, the strength of the relationship was not large. The strongest relationships involved sedative use, which was correlated with overall health (r = .13, p < .0001) and nervous system (r = .12, p < .0001). Furthermore, multiple drug use was associated with multiple health issues, including the overall health index (r = .17, p < .0001), as well as specific problems involving respiratory (r = .11, p<.0001), digestion (r = .10, p< .001), liver/kidney (r = .14, p < .001), and nervous system (r = .12, p < .0001). Health problems related to opioid use included the overall health index (r = .11, p < .001) and liver/kidney (r = .14, p < .001); cocaine use was associated with STD (r = .14, p < .001) and gynecological problems (r = .11, p < .001), and alcohol with total health problems index (r = .12, p < .0001) and nervous system (r = .11, p < .0001).

Health Care and Background Factors

As expected, the total health problem index was significantly related fairly strongly to the number of health care visits (r = .28, p < .001). Approximately 64 percent of the sample reported at least one health service visit (either to a doctor or other health professional). Sixty-one percent visited one or more doctors and 28 percent visited another type of health professional (nurse or physician assistant). Gender also was significant [F(1, 3899) = 43.68, p < .0001], with females averaging 8.3 and males 4.8 health service visits, respectively. The analysis by age was also significant [F(1, 3895) = 3.67, p < .012], with the number of health visits being 4.5, 5.5, 6.1, and 7.1 for those aged 17-25, 26-30, 31-39, and over 39, respectively. Analysis of variance showed health visits not to be significantly related to race-ethnic group [F(3, 3897) = 1.94, p < .12]. The health visit averages were 6.4, 5.3, 4.9, and 5.9 for whites, blacks, Hispanics, and other races, respectively.

Finally, health service visits were related to PSI [F(2, 3898) = 15.86, p < .0001], with 3.7, 6.2, and 7.3 visits for low, middle, and high problem groups, respectively. Even after covariate adjustments were made for the demographic variables of race, gender, and age, associations involving psychosocial problems remained significant [F(2, 3889) = 11.22, p < .0001].

Discussion

The findings of the current study affirm that a large percentage of drug users entering substance abuse treatment with a legal status have health problems that include a variety of ailments, a finding also noted in a sample of more current data (collected between 2009 and 2011) but limited to in-prison treatment participants in two states (Joe et al., 2019). The current study also discerned that the most frequently reported ailments were respiratory, digestive, nervous system, bone/muscle, and, among women, gynecologic. These areas correspond with previous findings for general populations, where pulmonary conditions was the most prominent category in the Milken Institute report (Devol & Bedroussian, 2007) and where lung problems, digestive problems, frequent headaches, arthritis/rheumatism, difficulty walking, and gynecological problems were among the 10 most frequently reported medical conditions found by the Fraser Institute (Ramsay et al., 1999). Relative to the percentages reported in these general population studies, the present research sample of drug users with a legal status was higher on respiratory, digestive, heart, and gynecological problems.

The largest gender-related differences involved respiratory problems and STDs. For age, heart and bone/muscle problems were major considerations. When race was examined, the principal differences appeared for liver/kidney, nervous system, STDs, and respiratory problems, particularly in contrasting whites and blacks. However, an index based on psychosocial problems (PSI) had a stronger relationship with health problems than did demographic categories. Psychiatric diagnoses were also found to be related to health problems, although these were based on scales keyed to DSM-III. Future research would need to examine how DSM-V diagnoses relate to health. A TCU Drug Screen 5 (Knight, Blue, Flynn, & Knight, 2018) has been developed that addresses DSM-V drug diagnoses and can be used in pursuit of that purpose.

The data analyzed in this study, collected between 1991 and 1993, are relevant today and contribute useful information on the relationships among health, other background problems, and treatment effectiveness. Previous studies of these patients have shown that those with high PSI scores have better follow-up outcomes when treated in higher-intensity residential programs rather than outpatient or short-term care treatment settings (Simpson et al., 1999). On the other hand, treatment intensity and setting carried less importance for outcomes of patients with low PSI scores. In terms of how those findings relate to the present analyses, they show patients with high PSI scores also have over twice the rate of multiple health problems, compared to patients with lower scores. That is, 45 percent of high-PSI patients reported two or more health symptoms, versus 17 percent of low-PSI patients. They likewise reported more preadmission visits to medical care or emergency clinics (7.3 versus 3.7 visits).

The present study is based on a large and diverse sample of sequential admissions to representative treatment agencies; however, it is limited by the use of "self-reported" health problems and use of health services. Official medical records were not accessible, but could potentially show that some problem areas were underreported and the prevalence of various health problems was underestimated. Reporting bias also might have differed across the subgroups. Further, the seriousness of medical care responses to health problems was not reported and could impact the extent to which individuals recognize a problem and seek medical help. Additionally, hepatitis information did not differentiate its subtypes, and their relationships to HIV could not be specified.

Conclusions

Substance users entering treatment often have health problems that exceed those reported by the general population; this is also true of substance users who enter treatment with a legal status. These problems have been shown to be related to obstacles to effective treatment, as shown in a previous nationwide study of community drug treatments. Patient background information commonly collected at intake to substance abuse treatment programs—and used in this study to calculate the PSI—identifies many of the high-risk and high-cost users of public health care. Systematic and integrated linkages for medical care and related services would comply more closely with a comprehensive addiction treatment care network, as advocated by the National Institute on Drug Abuse (National Institute on Drug

Abuse, 1999), and it could reduce significantly the need for subsequent medical care from comparatively expensive emergency care clinics. Just as Flynn, Kristiansen, Porto, and Hubbard (1999) have documented, substance abuse treatment-related cost benefits from crime reduction and health benefits also apply. Improving patient access to needed health care can be equally important, because resolving basic health problems may eliminate some of the reasons for substance abuse.

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Measuring Hope in Jail Inmates with Substance Use Problems

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TREATMENT RESEARCH HAS identified a variety of factors influencing the effectiveness of substance use treatment for criminal justice (CJ) populations (see review by Greenfield et al., 2007; Moos, 2007; Prendergast, Podus, Chang, & Urada, 2002). However, the literature has disproportionately focused on the reduction of pathological symptoms, such as reducing drug use, prolonging drug abstinence, and addressing related social and behavioral problems. There is an increasing call for research on the phenomenon of human flourishing and psychological strengths (Keyes & Haidt, 2003; Krentzman, 2013), and the delineation of relations between strengths and deficits (Woldgabreal, Day, & Ward, 2016). In practice, interventions should not only focus on reducing risk factors but also capitalize on psychological strengths or positive functioning (both terms are used interchangeably in this study). The current study measures one type of positive functioning (i.e., hope) and examines the relations between hope and risk factors in jail inmates, the findings of which could help practitioners develop programs responsive to address risk factors and promote a positive lifestyle and general well-being.

Hope

Hope is a psychological strength buffering the negative consequences experienced from adversity (Hellman & Gwinn, 2017) and facilitating general well-being (Magaletta & Oliver, 1999). Snyder (2000) defines hope as a cognitive-based motivational theory, in which two components—"pathways" and "agency"—work reciprocally towards the third component—goals. Pathway refers to mental strategies that would lead to goal attainment; agency is the mental energy or willpower that motivates oneself to attain the goals (Snyder, 2002). Research has indicated that hopeful thinking has the power to alleviate depression, assist in goal setting, and improve mental and physical health among high-risk populations (Hergenrather, Geishecker, Clark, & Rhodes, 2013; Rosenstreich, Feldman, Davidson, Maza, & Margalit, 2015). In the event of challenges, people with hope tend to evaluate potential barriers and develop strategies to overcome barriers or switch to alternative pathways to goal attainment (Snyder, 2000). Also, hopeful people may persevere by self-motivating and regulating emotions, thoughts, and behaviors to desirable goals (Snyder, 2000). In this sense, hope is particularly instrumental for high-risk individuals (such as those involved in the justice system) in propelling them to achieve desired goals in the midst of life adversity.

Despite being a highly desirable cognitive state in inmates, hope has not been addressed adequately in research with CJ populations (Stearns, Yang, & Boudreaux, 2018) or substance use treatment (Krentzman, 2013). With 100 jail inmates in Ontario, Martin & Stermac (2009) revealed that inmates with lower levels of hope are at high risk of being involved in illegal behaviors and persist in maintaining such a behavior. Marshall, Champagne, Brown, and Miller (1997) studied hope in sex offenders and indicated that increases in hope were associated with greater empathy, enhanced intimacy, and lowered feelings of loneliness. In the area of substance use treatment, research has revealed that hope is related to the deterrence of substance use (Irving, Seidner, Burling, Pagliarini, & Robbins-Sisco, 1998; Logan, Kilmer, & Marlatt, 2010), greater time abstinent (Irving et al., 1998), higher self-efficacy (Irving et al., 1998), and better treatment outcomes (Kaskutas et al., 2005; Kelly, Stout, Zywiak, & Schneider, 2006). In a pilot study, Stearns, Yang, and Boudreaux (2018) implemented a four-week intervention to develop and enhance hope among female jail inmates with substance use problems; the study found that resources that provide structure and discipline were necessary to successful delivery of the hope-based intervention among these women. This suggests that more research is needed to understand justice-involved individuals and factors that are associated with hope.

Characteristics of Criminal Justice Populations

Justice-involved individuals usually grow up in environments rife with stressors and challenges, such as poor social support, financial and legal challenges, unstable housing, and other criminogenic contextual factors (Boardman, Finch, Ellison, Williams, & Jackson, 2001; Morenoff & Harding, 2014; Naser & Visher, 2006) and are likely to be exposed to traumatic experiences (Green, Miranda, Daroowalla, & Siddique, 2005; James, 2004; James & Glaze, 2006; McClellan, Farabee, & Crouch, 1997). Thus, they are likely to develop psychological maladjustment in terms of the feeling of worthlessness, depression, and anxiety (Chamberland, Fallon, Black, Trocmé, & Chabot, 2012; Ge, Best, Conger, & Simons, 1996; Paredes, Ferreira, & Pereira, 2014) and turn to substance use as a

way to cope with these painful psychological consequences (Auerbach, Abela, & Ho, 2007; Gutierres & Van Puymbroeck, 2006; Kelly, Rollings, & Harmon, 2005; Weiss, 2004). Substance use aggravates their exposure to life adversity and reinforces negative feelings of worthlessness, depression, and helplessness (Gutierres & Van Puymbroeck, 2006; Weiss, 2004).

Furthermore, confinement in prisons or jails adds a layer of psychological risk; many inmates experience panic, anxiety, depression, rage, hopelessness, despair, and other psychological problems (American Psychological Association, 2014; Covin, 2012). The confinement also creates a disruption in their social relations, which compounds the weak attachment with a positive social network (Western, Braga, Davis, & Sirois, 2015). When social support or other assistance is not available, justice-involved individuals during reentry are at high risk of reoffending and reincarceration. Thus, research is needed that examines psychological strengths among justice-involved populations that are associated improved reentry and future crime deterrence.

Gender Difference

Gender plays a role in rehabilitation because males and females have different treatment needs (Coleman, Almond, & McManus, 2018; Salisbury, Van Voorhis, & Spiropoulos, 2009; Skrobecki, 2014). For example, compared to male counterparts, females tend to report extensive traumatic and abusive histories, have mental health problems, use substances to cope with physical and emotional pains, and have low self-esteem and self-efficacy (Carlson, Shafer, & Duffee, 2010; Salisbury et al., 2009). Males have more criminal involvement and use multiple drugs (Hser, Huang, Teruya, & Anglin, 2003). These different characteristics and treatment needs may reflect disparity in psychological functioning. For instance, males have reported high levels of self-esteem and decision-making confidence, and lower levels of risk-taking than females (Yang et al., 2015). Thus, it is possible that the relations between risk factors and hope would differ between genders.

The Current Study

CJ populations are typically characterized by high-risk factors, victimization experience, violent behavior, substance use, and mental health problems. Because hope is a mechanism that facilitates people's striving for better life outcomes and general well-being, it is essential to study hope in CJ populations, the population of which would benefit from such a cognitive capacity. With a jail sample, the current study intends to (1) assess hope, (2) examine the association between hope and several factors that characterize CJ populations with substance use problems, and (3) explore gender differences in the associations between hope and these factors.

Methods

Participants

Data were collected from 209 adults (81 percent male) in a local jail who volunteered to participate in the study. The demographic and background information is presented in Table 1. All of the participants had substance use problems before being arrested. The majority of the participants had a felony charge (81 percent), the remaining being charged with either misdemeanor (10 percent) or case pending (9 percent). The average length of time being held in custody was 170 days (range = 3 days—13 years). The average age of the first arrest was 19 (ranging from 10 to 49), with 48 percent of the participants having juvenile records. All participants provided informed consent to participation. The study has been approved by the author's university institutional review board.

Procedures

Data were collected in a classroom setting inside the jail with the assistance of jail officials. Potential participants were recruited from a substance use treatment program in groups (no more than 15 participants per group). Participation was voluntary and did not impact the treatment or legal status in any way. A correctional officer was on site to ensure safety and order; however, the correctional officer had no involvement in research. Those who declined to participate were asked to read their usual program materials. After all the participants completed the survey, inmates were escorted back to the cells together. The entire data collection was conducted between fall 2015 and spring 2018.

Measures

Risk factors included recent criminal involvement, recent medical treatment, need for public assistance, lifetime victimization, lifetime violence history, and substance use severity. The time frame for recent risks was referred to six months before being arrested. Recent criminal involvement (three items; e.g., "being arrested"), medical treatment use (four items; e.g., "being treated in an emergency room"), and need for public assistance (three items; e.g. "receiving any public financial support (food stamps, disability, public assistance)") were assessed by the Texas Christian University (TCU) A-RISK form (Institute of Behavioral Research, 2008). Lifetime victimization and violence were assessed by the MacArthur Community Violence Inventory (Steadman et al., 1998). Participants were asked in their lifetime (1) if they were victimized in eight categories (e.g., "has anyone thrown something at you," "tried to physically force to have sex against your will," and "threatened you with a knife or a gun or other lethal weapon") and (2) if they had violent behavior in nine categories (e.g.,

TABLE 1.
Demographic Characteristics and Background Information (N = 209)

Gender (male)	81 percent
Race (*n* = 199)	
White	39 percent
African American	47 percent
Others	14 percent
Education (*n* = 201)	
9 years education	24 percent
10-11 years education	20 percent
12 years or GED	35 percent
more than 12 years education	21 percent
Marital status (*n* = 201)	
Single (never married)	59 percent
Married	17 percent
Divorced	17 percent
Separated or widowed	5 percent
Primary Drug use (in the past 12 months before being locked up)	
Alcohol	21 percent
Marijuana	20 percent
Methamphetamine	11 percent
Stimulants	10 percent
Heroin	7 percent
Synthetic Marijuana	5 percent
Prescription Medications - Opioid Pain Relievers	5 percent
Others[a]	22 percent

Note: Others[a] include hashish, opium, Ketamine (1 percent), and others unspecified by the participants.

"pushed, grabbed or shoved anyone," and "used a knife or fired a gun at anyone"). The scale demonstrated good internal reliability (α = 0.85 for the victimization scale; α = 0.84 for the violence scale) with the current sample. The composite score was used in the data analysis. Substance use severity was measured by the TCU Drug Screen II (α = .89; Knight, Simpson, & Morey, 2002; e.g., "Did your drug use cause emotional or psychological problems?"). The items in risk factors are rated with a dichotomous scale (0 = no, 1 = yes).

Anxiety (seven items; e.g., "You have trouble sitting still for long," α = .75) and depression (six items; e.g., "You feel sad or depressed," α = .77) were assessed by the TCU Psychological Functioning (PSYFORM) assessments (Simpson, Joe, Knight, Rowan-Szal, & Gray, 2012). Optimism (e.g., "In uncertain times, I usually expect the best") was measured by the 10-item Life Orientation Test–Revised (Scheier, Carver, & Bridges, 1994; α = .51 for the current sample). Hope (possible scores ranging from 1 to 5) was measured by the 12-item Hope Scale (Snyder et al., 1991; α = .72 for the current sample), which included two subscales of agency (i.e., goal-directed energy) and pathways (i.e., planning to accomplish goals). Two sample questions are "I energetically pursue my goals" and "I can think of many ways to get out of a jam." The measures of anxiety, depression, optimism, and hope are rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Results

Descriptive statistics and correlations between hope and other key variables are presented in Table 2. Primarily, hope was negatively associated with recent need for public assistance (r = -0.13, p = 0.035), anxiety (r = -0.27, p < .001), and depression (r = -0.21, p < .001), and positively associated with optimism (r = 0.75, p < .001). With regard to gender difference, males (M = 35.48, SD = 6.15) reported a higher level of hope than did females (M = 32.48, SD = 6.66; t = 2.72, p = .007). Correlation analyses also revealed gender differences in the associations between hope and other variables. Specifically, anxiety (r = -.23, p = .004), depression (r = -.16, p = .05), and optimism (r = .74, p < .001) were significantly associated with hope for males; victimization (r = -.32, p = .04), substance use severity (r = -.33, p = .04), and optimism (r = .79, p < .001) were correlated to hope for females (see Table 3, next page).

Regression analyses were used to explore the unique contribution of each variable to predicting hope with a stepwise method (using a criterion of p < .05) in the overall sample and each gender sample. The results of the overall sample indicated that substance use severity (β = -.24, t = -3.36, p = .001), and anxiety (β = -0.20, t = -2.72, p = .007) significantly predicted hope, while other variables did not emerge to be significant predictors ($R2$= .11). A stronger degree of substance use severity and anxiety were associated with lower levels of hope. For male offenders, anxiety predicted hope, while other variables were not significant predictors ($R2$= .05); more anxiety was associated with a lower level of hope (β = -0.23, t = -2.78, p = .006). Substance use severity predicted hope for females, in which more severe substance use was associated with a lower level of hope (β = -0.36, t = -2.37, p = .02; $R2$= .13). Because a small sample of females was recruited, the results of regression analysis only revealed tentative findings.

Discussion

The literature suggests that hope represents positive functioning that promotes mental health and well-being, whereas hopelessness is a powerful predictor of criminal behavior. Thus, it is essential to assess hope and examine the relationship between hope and factors that characterize justice-involved populations. The current study adopted Snyder's cognitive model to measure hope and identified four factors associated with the level of hope: recent public assistance, anxiety, depression, and optimism. A stronger need of recent public assistance (i.e., having a full-time job, looking for a job, or not relying on public financial support), higher levels of anxiety and depression, and lower optimism were associated with lower levels of hope, characterized by less energetically seeking pathways to achieve goals. Additional regression analyses also revealed that more substance use severity and higher levels of anxiety significantly predicted lower levels of hope. Filling an existing research gap, this study's findings

TABLE 2.
Mean, Standard Deviation (SD), and Correlations between Key Variables.

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 Age	32.98	9.21										
2 Victimization	4.89	2.57	-0.05									
3 Violence	5.12	2.64	-0.37 ***	0.49 ***								
4 Recent criminal involvement	1.52	1.10	-0.24 **	-0.04	0.09							
5 Recent medical treatment	0.95	1.13	-0.04	0.21	-0.04	0.00						
6 Recent public assistance	1.10	0.98	0.02	0.08	0.04	0.04	0.19 **					
7 Substance use severity	6.93	4.01	0.00	0.35 ***	0.17 *	0.05	0.26 ***	0.21 **				
8 Anxiety	25.76	8.47	0.11	0.22 **	0.06	0.05	0.30 ***	0.15 *	0.15 *			
9 Depression	28.95	9.41	0.08	0.33	0.10	-0.04	0.34 ***	0.10	0.25 **	0.70 ***		
10 Optimism	3.18	0.67	0.16 *	-0.18 **	-0.08	-0.03	-0.13	-0.03	-0.10	-0.38 ***	-0.28 ***	
11 Hope	3.49	0.63	-0.02	-0.01	0.03	-0.03	-0.04	-0.13 *	-0.12	-0.27 ***	-0.21 **	0.75 ***

Note. *** p < .001, ** p < .01, * p < .05.

revealed several risk factors and treatment needs that were associated with hope in a jail-based population. They suggest that treatment provisions for substance use and mental health problems not only address pathological symptoms, but they also have the potential to facilitate psychological strengths that propel them to strive for general well-being.

The literature suggests that CJ populations are more likely to rely on government or public assistance to support their lives because they often live in an environment with stressors, such as financial challenges and poor social support (Boardman et al., 2001; Morenoff & Harding, 2014; Naser & Visher, 2006). Individuals growing up in a difficult financial environment are often inflicted with economic pressure and psychological distress and may in turn use substance as a coping strategy (Auerbach et al., 2007). Substance use reinforces these negative feelings, which can translate into a negative outlook, despair, and hopelessness (Connell, O'Cathain, & Brazier, 2014). The current findings suggest that these stressors and mental health problems are detrimental to an individual's degree of hope, resulting in a struggle to believe that they are capable of reaching their goals and energetically seeking pathways to pursue positive life outcomes.

Males in the study reported a higher level of hope than females, which aligned with the literature indicating that justice-involved females typically possess more risks than do males (Yang et al., 2015). In this study, risk factors associated with hope also differed between genders. Males with mental health problems tended to develop low levels of hope, whereas victimization and substance use severity were deleterious to hope among females. These results are unique because most of the hope literature in CJ populations is focused on sex offenders (Marshall et al., 1997; Martin & Stermac, 2009). The associations between hope and victimization and substance use in females reflects the fact that justice-involved females are at high risk of trauma and adoption of substance to cope with physical and emotional pains (Carlson et al., 2010; Salisbury et al., 2009). In short, the current findings suggest that hope is important for both genders, and that interventions for enhancing hope are especially important for females because they may be experiencing a lower level of hope.

Clinical Implications

Given the association with several risks, low levels of hope should be considered an important treatment need in developing rehabilitation programs for justice-involved individuals. Strengths-based interventions represent a promising option. As acknowledged by researchers in other fields of psychology (e.g., Duckworth, Steen, & Seligman, 2005; Sin & Lyubomirsky, 2009), strengths-based interventions have important implications in criminal justice settings, because these interventions focus on the development and growth of strengths in an ongoing manner and striving for the potential to sustain positive outcomes (Berg, 2016; Harris, Brazeau, Clarkson, Brownlee, & Rawana, 2012; Krentzman, 2013). Substance users would benefit from developing positive feelings, behaviors, or cognitions (Sin & Lyubomirsky, 2009), in lieu of continuing maladaptive psychological processes and destructive behaviors. Because hope is a predictor of recidivism (Martin & Stermac, 2009), reentry programs also may want to consider including a strengths-based approach to help individuals envision and prioritize goals, visualize concrete pathways, and foster energy to attain desirable goals. Finally, the findings suggest that a holistic treatment approach is optimal—one in which treatment provisions of mental health problems, substance use, and traumatic experiences are necessary for successfully delivering interventions that foster and enhance positive functioning.

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TABLE 3.
Correlations between Key Variables for Each Gender Group

	1	2	3	4	5	6	7	8	9	10	11
1. Age		0.17	-0.24	-0.21	-0.07	-0.24	0.00	0.25	0.24	0.09	0.09
2. Victimization	-0.05		0.2	-0.19	0.15	0.06	0.4	0.27	0.46**	-0.29	-0.32*
3. Violence	-0.24**	0.59***		-0.16	0.05	0.04	0.13	-0.15	-0.05	-0.02	0.06
4. Recent criminal involvement	-0.26***	-0.02	0.04		-0.04	0.27	-0.09	0.15	-0.09	-0.03	-0.04
5. Recent medical treatment	0.13	0.20**	-0.05	0.06		0.44**	0.15	0.14	0.20	-0.17	-0.17
6. Recent public assistance	0.03	0.003	0.13	0.15	0.09		0.31*	0.19	0.004	-0.11	-0.14
7. Substance use severity	0.08	0.30***	0.21**	0.11	0.26***	0.11		-0.15	-0.08	-0.15	-0.33*
8. Anxiety	-0.05	0.14	0.14	0.09	0.32***	0.03	0.16*		0.71***	-0.41**	-0.24
9. Depression	-0.02	0.24**	0.17*	0.02	0.36***	-0.01	0.29***	0.66***		-0.28	-0.17
10. Optimism	0.01	-0.12	-0.15	-0.08	-0.1	0.1	-0.06	-0.35***	-0.24**		0.79***
11. Hope	-0.14	-0.04	-0.11	-0.1	-0.09	-0.07	-0.13	-0.23**	-0.16*	0.74***	

Note. *** $p < .001$, ** $p < .01$, * $p \leq .05$. Correlation coefficients below the diagonal were for male offenders; correlation coefficients above the diagonal were for female offenders.

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Gender Differences in a Disease Risk Reduction Intervention for People in Prison-based Substance Abuse Treatment[1]

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IN 2013, THE CENTER for Disease Control estimated that over 1 million people were living with HIV in the United States and well over 100,000 were unaware of being HIV+. HIV/AIDS was the eighth leading cause of death in the 25-34 age range, and ninth among those 35-44 (Centers for Disease Control, 2016). Although great strides have been made in the prevention and treatment of HIV, it remains a significant problem in certain subpopulations, including rates 3-5 times higher among people in the criminal justice system compared to others in the U.S. (Centers for Disease Control, 2015a; Westergaard, Spaulding, & Flanigan, 2013). Drug use is associated with risky behaviors for HIV through risky sex activities (e.g., sex without a condom and with multiple partners) and needle sharing (Centers for Disease Control, 2015b), and drug use among people in the criminal justice system is as high as 80 percent (James & Glaze, 2006). Furthermore, people in prison who participated in risky activities prior to incarceration often return to those activities after release from prison (Bureau of Justice Statistics, 2001; Braithwate & Arriola, 2003; Seal et al., 2003).

Women in CJ Treatment as a Population

Release from incarceration back to the community carries a number of high-risk stresses that include reconnecting with family, finding housing and employment, healthcare, substance use treatment, and often mental health issues. While return to criminal activity, drug use, and risky sex activities is high in this population, these stresses are especially acute for women. Frequently they have children to reconnect with and care for; they may be in unhealthy and abusive relationships or may have experienced trauma (Staton-Tindall et al., 2007), and they have reportedly significantly higher rates of psychiatric illnesses (Grella, Lovinger, & Warda, 2013).

In a qualitative study involving incarcerated women and correctional center staff, Martin et al. (2009) reported that five major themes emerged from focus groups and interviews regarding health concerns: 1) addictions and mental health; 2) HIV, hepatitis, and infections; 3) health care while in prison; 4) life skills for reentry to the community; and 5) relationships with family, children, and others. Janssen et al. (2017) found that successful reintegration into the community after incarceration for women was supported by health-related strategies, including health assessments at admission, treatment for mental health issues, and treatment for chronic medical problems. In part because of critical factors and needs specific to incarcerated females in substance abuse treatment, gender-responsive treatments have been implemented (e.g., Covington & Bloom, 2006) that are designed to specifically address pathways and factors unique to incarcerated women, and data have shown such programs to be effective for women (e.g., Messina et al., 2010).

The Centers for Disease Control and Prevention estimated that 19 percent of the almost 40,000 new HIV diagnoses in the U.S in 2017 were adult and adolescent women

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(Centers for Disease Control and Prevention, 2019). Men who have sex with men accounted for the most new and existing HIV infections among men, whereas among females, 86 percent of infections occurred through heterosexual contact and 14 percent through injection drug use. Although 65 percent of HIV-positive women received some care, only about half were retained in care and were virally suppressed. One in nine females with HIV was unaware of being infected, which means that 11 percent of HIV-positive females were not getting care and were not aware that they could pass the virus to their partners. In addition, women are often not aware of the risk factors of their male partners, so they may be less likely to have vaginal or anal sex with a condom. These HIV risks for females along with the additional stressors for women reentering the community after incarceration make them especially susceptible during this time period.

WaySafe Intervention

In order to address the high-risk period after return to the community from incarceration, a multi-session, highly interactive, group-based curriculum called *WaySafe* (Lehman et al., 2015) was developed to meet the challenges of providing education on sensitive materials in correctional settings and promoting integrated services to justice-involved individuals at risk for infectious diseases. The goals of *WaySafe* were to improve problem recognition, commitment to change, and strategies for avoiding behavioral risks of infections. Therefore, the *WaySafe* curriculum was designed to increase positive decision-making skills for healthy living, including skills for reducing disease risk behaviors among people who were incarcerated and in the last phase of their substance use treatment prior to release back to the community. Its curriculum employed the evidence-based TCU Mapping-Enhanced Counseling procedure to focus on the cognitive aspects of risky sexual and drug use behaviors during reentry. *WaySafe* consists of six highly interactive, hour-long sessions conducted weekly:

1. "Introduction to Mapping," which provides background about this thinking and problem-solving tool to help explore beliefs and decisions.
2. "Risks and Reasons," which provides opportunities to think about why people take risks and to examine personal beliefs about risk-taking.
3. "The Game," which uses a workbook to review personal knowledge and ignorance about HIV and other illnesses.
4. The "Should/Want Problem" considers the conflict between want and what should be done and how that influences our decisions.
5. "Risk Scenes: Everyone intends to avoid risks" addresses thinking ahead about risky situations to avoid HIV.
6. "Planning for Risks" deals with risks in life by thinking ahead and enjoying the resulting benefits.

Sessions were led by a trained counselor and generally included 10-15 participants (see Lehman et al., 2015 for more detail on *WaySafe* and study description).

Studies on *WaySafe* to date have documented its effectiveness in increasing knowledge, confidence, and motivation in terms of HIV knowledge confidence, avoiding risky sex, avoiding risky drug use, HIV testing awareness, and risk reduction skills. *WaySafe* participants had significantly greater knowledge, confidence, and motivation after *WaySafe* than did participants assigned to a treatment as usual condition. These benefits occurred within each of the eight participating prison facilities across two different states that differed by gender, treatment vendor, program length, and other factors (Joe et al., 2019; Lehman et al., 2015). In addition, *WaySafe* was shown to be effective for participants who varied on level of treatment engagement (Lehman et al., 2011). Some preliminary analyses also showed that pre-custody HIV risk behavior was a factor in the effectiveness of *WaySafe* and that the results differed by gender (Bartholomew et al., 2011). For males, higher levels of pre-custody injection risk and positive attitudes toward condom use were associated with greater pre-post changes for *WaySafe* participants, whereas for females, greater involvement in sex risk behaviors pre-custody was associated with less pre-post change for *WaySafe* participants.

Current Study

The purpose of the current study is to extend prior research on gender differences among incarcerated males and females who participated in the *WaySafe* curriculum. Our research questions include:

A. How do males and females differ on baseline socio-demographic and background risk factors (employment, health, criminal behavior)?
B. Do males and females differ on the *WaySafe* knowledge, confidence, and motivation (KCM) measures prior to *WaySafe* and do they differ on post-*WaySafe* measures?
C. Is program length, which varied among the three female facilities participating in *WaySafe* (4 months, 6 months, or 9 months), associated with *WaySafe* program success for females on the KCM measures?

Methods

Procedures

WaySafe was implemented in eight different prisons in two different states. Target participants were in the last phase of their prison-based substance abuse treatment and had about three months before their scheduled release to the community. Three of the facilities were female only and five were male only. Eligible participants were informed of the study by TCU research staff, and those interested in participating were asked to sign TCU IRB-approved Informed Consent forms. All participants who signed the forms were asked to complete a baseline survey in the week prior to the first *WaySafe* session. Following the baseline survey, groups of participants (e.g., those from the same wing or pod) were randomly assigned to either attend the 6 weekly *WaySafe* sessions or participate in treatment-as-usual (TAU) that consisted of normal substance abuse treatment programming. Following completion of the *WaySafe* intervention, both groups completed the post-intervention assessment. As part of normal clinical practice at the participating prisons, all residents completed a battery of TCU forms at intake, including the TCU A-RSKForm (described below), used in this study for demographic and background data.

Measures

Adult-background risk (TCU A-RSKForm). The adult background risk form (Institute of Behavioral Research, 2008) collects demographic and background information from adults at intake to treatment or prison. This form collects socio-demographic items as well as legal, medical, and health status during the six months prior to the current incarceration (Joe et al., 2004; Knight, Flynn, & Simpson, 2008).

Knowledge, Confidence, and Motivation (KCM) Scales. Baseline and post intervention surveys were developed to assess knowledge, confidence, and motivation around domains addressed by the *WaySafe* curriculum. Items assessed self-reported feelings of being knowledgeable about the domain, being confident in using that knowledge, and being motivated to act on that knowledge. Responses for all

items were on a 5-point Likert scale (1 = Strongly Disagree and 5 = Strongly Agree). Factor analyses found that the knowledge, confidence, and motivation items within each domain generally loaded together, so five scales were computed around each of the domains. These included HIV Knowledge Confidence, Avoiding Risky Sex, Avoiding Risky Drug Use, HIV Testing Awareness, and Risk Reduction Skills. The **HIV Knowledge Confidence and Motivation scale** (alpha = .89) included 13 items addressing knowledge about avoiding HIV and confidence and motivation to talk with others about avoiding HIV, including "You know enough to teach others what they should do if they think they have been exposed to HIV," "You feel very confident that you could be a role model for others in helping reduce HIV risks," and "You are totally committed to helping your friends and/or family avoid HIV/AIDS." **Avoiding Risky Sex** (alpha = .91) included 13 items that addressed knowledge about risky sex and confidence and motivation to avoid risky sex activities such as "You have promised yourself to avoid risky sex activities" and "You have learned to think ahead in order to make less risky decisions about sex." There were 12 items in the **Avoiding Risky Drug Use** scale (alpha =.85), which addressed knowledge about risky drug use and confidence and motivation to avoid risky drug use activities such as "If you do decide to inject drugs, you will always use a 'clean' needle" and "You are confident that even if you really need a fix, you will never share works." The HIV Testing Awareness scale (alpha = .76) consisted of 7 items addressing knowledge about getting tested for HIV and obtaining HIV services and motivation to get tested regularly, including "You plan on being tested regularly for HIV" and "You will get tested for HIV if you think that you might have been exposed." The **Risk Reduction Skills** scale (alpha = .85) included 14 items addressing having skills for preventing HIV and having the confidence and motivation to use those skills such as "You know how to stand up for yourself when someone tries to pressure you to take a risk" and "You have a clear mental plan for how to avoid people and situations that lead to problems." The post-test measures were identical to the pre-test.

Sample

Across the eight participating facilities, a total of 1,393 participants who had consented completed baseline surveys, and 1,257 of those completed post-intervention surveys. Because background information was only available on the TCU A-RSKForm, the sample included 1,091 participants who completed a baseline, post intervention survey, and a TCU A-RSKForm. Previous analyses (Lehman et al., 2015; Joe et al., 2019) showed that *WaySafe* participants demonstrated greater change on the knowledge, confidence, and motivation measures than did TAU participants, and these changes were observed in each of the eight participating facilities. Therefore, for the current study, we are restricting analyses to those participants who were randomly assigned to the *WaySafe* intervention (N = 736). We are primarily interested in examining gender differences in response to *WaySafe*. Of the 736 *WaySafe* participants, 653 completed a post-intervention survey and 570 participants also completed the TCU A-RSKForm.

Overall, of the 736 participants receiving *WaySafe*, 313 were female and 423 were male (291 females and 362 males completed post-intervention surveys). The female sample was recruited from three female-only facilities which differed in program length—4 months (N = 91), 6 months (N = 91), and 9 months (N = 109).

Analytic Approach

Analyses were designed to compare female and male participants in the *WaySafe* intervention in eight different prison facilities in two different states. We first compared females and males on demographic and background factors using t-tests for comparisons of means and chi-square tests for contingency tables and dichotomous background factors. To examine gender differences on knowledge, confidence, and motivation (KCM) factors, we compared females and males on the five KCM factors at baseline to examine pre-existing differences. SAS Proc Mixed was used for the analyses to account for nesting of participants within the eight facilities. Gender differences on the KCM factors after *WaySafe* were then examined using Proc Mixed and using the baseline measure as a covariate. The final analyses then compared the three women's facilities that differed in program length to determine whether program length was related to *WaySafe* success. We used SAS Proc GLM to compare the three programs at baseline and again at post-intervention using the baseline measure as a covariate. We also computed effect sizes (Cohen's d; Cohen, 1988) for the change in each of the KCM measures within each of the three facilities and compared the effect size across the three facilities.

Results

Gender Differences on Demographic and Background Factors

Table 1 shows demographic and background factors for the *WaySafe* sample. Overall, participants averaged about 34 years old, were 52 percent White and 19 percent Hispanic; 61 percent had a high school diploma or GED, 48 percent were singles, and 26 percent did not have any children. Compared to males in the sample, females were more likely to be White (60 percent to 45 percent), more likely to be divorced or separated (34 percent to 25 percent), and more likely to have 3 or more children (42 percent to 26 percent), while males were more likely to not have children (32 percent to 18 percent).

Data in Table 1 (next page) show high levels of criminal issues for this sample. Over 60 percent reported having been arrested in the prior six months, having been on probation or parole, or being in jail or prison. Additionally, in the six months prior to entering their present facility, other problems included unemployment and health. Only 49 percent worked full time, 29 percent were unemployed, 27 percent received public assistance. More than 20 percent reported being treated in an emergency room, treated for a mental health problem, or treated for illegal drug use.

These issues were especially prominent for females. In addition to higher rates of being divorced or separated and having 3 or more children, females reported significantly lower employment rates and higher unemployment rates, and much higher rates of having received public assistance (almost half of females). In addition, females were more likely to have been arrested in the prior six months and to have been on probation or parole. In terms of health issues, females were more than twice as likely as males to have been treated in an emergency room and treated for illegal drug use, and almost five times as likely to have been treated for a mental health problem.

Gender Differences at Baseline and Post-intervention on Knowledge, Confidence, and Motivation Measures

A primary goal of this paper is to examine gender differences in response to *WaySafe*. As noted above, females in participating facilities report significantly higher rates of social problems in terms of employment, criminal involvement, and health issues prior to *WaySafe*. We considered whether there are differences in how females and males

TABLE 1
Gender Differences on Demographic and Background Factors

	Females (N = 258)	Males (N = 312)	Total (N = 570)	
Mean Age (s.d.)	33.8 (9.6)	34.7 (9.4)	34.3 (9.5)	n.s.
Race				$p = .001$
% African American	21.4	32.0	27.2	
% White	60.7	45.4	52.3	
% Other	17.9	22.7	20.5	
% Hispanic	17.4	21.1	19.4	n.s.
% H.S. diploma, GED or higher	57.0	64.4	61.1	n.s.
Marital Status				$p = .007$
% Single	41.4	54.2	48.4	
% Married	24.2	21.2	22.5	
% Divorced/separated	34.4	24.7	29.1	
Number of Children				$p < .001$
% None	18.0	31.7	25.5	
% 1 to 2	39.8	42.3	41.2	
% 3 or more	42.2	26.0	33.3	
In the 6 months before entering this program or being "locked up," were you ever (% yes) –				
% employed full time?	34.4	61.2	49.0	$p < .001$
% unemployed and NOT looking for work?	34.9	24.0	29.0	$p = .005$
% receiving any public assistance?	45.4	11.5	26.8	$p < .001$
% arrested?	66.7	56.4	61.1	$p = .012$
% on parole or probation?	79.8	59.7	68.8	$p < .001$
% in jail or prison?	71.7	66.4	68.8	n.s.
% treated in an emergency room?	35.5	17.6	25.7	$p < .001$
% treated for a mental health problem?	38.2	7.7	21.6	$p < .001$
% treated for an alcohol use problem?	9.7	11.5	10.7	n.s.
% treated for illegal drug use?	32.3	14.8	22.8	$p < .001$

TABLE 2
Gender Differences on Knowledge, Confidence, and Motivation Scales at Baseline and Post-intervention

	Baseline*			Post Intervention**		
	Females (N = 313)	Males (N = 423)	prob.	Females (N = 291)	Males (N = 362)	prob.
HIV Knowledge confidence	40.49	38.64	0.047	44.94	44.51	n.s.
Avoiding Sex risk	40.29	37.29	0.028	44.40	44.50	n.s.
Avoiding Drug Risk	42.70	43.05	n.s.	46.01	45.69	n.s.
HIV Testing awareness	44.11	41.33	0.007	46.68	46.40	n.s.
Risk Reduction Skills	42.53	41.50	n.s.	45.70	45.34	n.s.

* Least squares means are presented accounting for nesting within facilities.
** Least squares means are presented accounting for nesting within facilities and controlling for baseline values.

responded to the *WaySafe* curriculum, taking into consideration their baselines on these measures. Table 2 shows baseline and post-intervention means on the five KCM scales used in the study separately for females and males. Prior to participation in the *WaySafe* curriculum, females reported significantly higher levels of knowledge, confidence, and motivation than did males in terms of HIV knowledge confidence, avoiding sex risks, and HIV testing awareness; females and males did not differ significantly on avoiding drug risks and risk reduction skills at baseline. However, there were not significant differences between females and males on the five post-intervention measures after controlling for the appropriate baseline score. These results show that in spite of pre-existing differences on the KCM measures, and in spite of females reporting much higher levels of background problems, both genders demonstrated about the same levels of improvement on their knowledge, confidence, and motivation for risk reduction after completing the *WaySafe* curriculum.

WaySafe Outcomes for Women's Facilities with Differing Program Lengths

Analyses have demonstrated high levels of baseline dysfunction among the present sample, with females reporting much greater levels than males; in addition, females reported greater knowledge, confidence, and motivation around risk behaviors at baseline than males, but females and males responded similarly to the *WaySafe* curriculum in terms of level of change. Some pre-existing dysfunction measures were associated with amount of change from before to after *WaySafe,* and some of these factors differed between females and males. Our final analysis focused on the three female facilities that differed in program length (4 months, 6 months, or 9 months). We wanted to examine whether program length was associated with amount of change from before to after participation in *WaySafe*. Table 4 shows baseline and post-intervention means on the five KCM scales separately for each of the three female-only facilities. The effect size for baseline/post change for each of the five scales was computed for each of the three facilities.

At baseline, the 4-month program had significantly lower scores on each of the five KCM measures than did the 6-month or the 9-month programs (except for avoiding risky drug use, where the 4-month and 9-month programs did not significantly

differ). However, the 6-month and 9-month programs did not differ at baseline on any of the five measures. At post-intervention, the three programs did not differ significantly on avoiding drug risk. However, on the other four KCM scales, the 4-month program did not differ from the other two programs, but the 6- and 9-month programs did differ significantly. Thus, even though participants in the 4-month program started with lower scores, they essentially "caught up" with the longer programs at the end of *WaySafe*. This is more clearly shown by the effect sizes for change within each program. Effect sizes for change in the 4-month program ranged from 0.84 to 1.12 across the five KCM scales; effect sizes for the 6-month program ranged from 0.35 to 0.63 for the 6-month program and from 0.41 to 0.72 for the 9-month program. Thus, participants in the 4-month program started lower on the scales but showed greater change than the longer-term programs. Effect sizes for all three programs showed moderate to large increases in KCM scores.

Discussion

The present study examined gender differences in a large incarcerated sample who attended *WaySafe* groups toward the end of their prison-based substance abuse treatment prior to release back to the community. Analyses examined gender differences in background and risk factors, in baseline and post-intervention knowledge, confidence, and motivation measures around health risk avoidance, and responses to *WaySafe* across female programs of varying lengths. As expected, there were substantial differences between males and females at baseline. Females often are not sentenced to prison until they have very serious substance abuse problems or serious criminal behaviors. Conversely, males often are imprisoned for less serious violations. In the present study, the female sample was much more likely to be white, more likely to be divorced or separated, more likely to have 3 or more children, and substantially more likely to have lower employment, to be on public assistance, to have previously been in the criminal justice system, and to have greater mental health and substance use issues. These background differences point to the need for specialized services for many women and support gender-responsive treatment (e.g., Covington & Bloom, 2006) and special interventions such as Seeking Safety, designed to address trauma and PTSD commonly occurring among women with substance abuse issues (Najavitz, 2002).

We examined the implication of these differences between men and women in terms of the effectiveness of *WaySafe*. In spite of substantially greater magnitude of problem areas in employment, health, and substance abuse treatment among incarcerated women, they had significantly higher knowledge, confidence, and motivation at baseline regarding HIV knowledge confidence, avoiding sex risk, and HIV testing awareness. Perhaps women have had more prior exposure to these issues due to significantly higher rates of previous treatment for mental health problems or illegal drug use. Nevertheless, there were no significant differences between men and women after completing the *WaySafe* curriculum, suggesting that *WaySafe* effectiveness is rather robust to pre-intervention differences, findings that have been reported in other analyses. Although the *WaySafe* curriculum for men and women is identical, the highly interactive nature of *WaySafe* sessions using mapping-enhanced counseling approaches allows same-sex groups to explore issues relevant for each group.

Finally, we also found that although *WaySafe* was effective across the female facilities that differed in program length, women in the short-term (3 month) program had lower scores on all five measures at baseline than women in longer programs, possibly due to women in the longer programs having more exposure to HIV education prior to the beginning of *WaySafe*. However, women in the short-term program "caught up" to women in the mid-term program (6 months) at post-intervention and had much larger effect sizes for change than did women in the longer programs.

WaySafe has been shown in this study and other analyses to effectively improve knowledge, confidence, and motivation around planning for and avoiding health risks. It helps prepare people who are incarcerated and in the last phase of their substance abuse treatment for the risky, post-release period. Although such training is also critical after participants are back in the community, it is often difficult to implement multi-session, interactive group trainings. Subsequently, we used many of the cognitive elements involved in training for risk reduction in *WaySafe* and developed a decision-making training around health risks for people in the community under community supervision. This training, called

TABLE 3
Baseline, Post Intervention Means, and Effect Sizes for Female Facilities with Differing Program Lengths

	4 Month (N = 91)			6 Month (N = 91)			9 Month (N = 109)		
	Baseline	Post	Effect Size	Baseline	Post	Effect Size	Baseline	Post	Effect Size
HIV Knowledge confidence	39.04[a]	44.02[ab]	1.12	40.69[b]	43.54[a]	0.63	41.39[b]	44.85[b]	0.72
Avoiding Sex risk	38.10[a]	43.75[ab]	1.01	40.83[b]	43.21[a]	0.63	41.91[b]	44.27[b]	0.61
Avoiding Drug Risk	41.10[a]	45.57	0.84	43.46[b]	45.11	0.38	43.44[ab]	45.31	0.41
HIV Testing awareness	42.48[a]	46.13[ab]	0.95	44.80[b]	45.72[a]	0.35	44.98[b]	46.73[b]	0.60
Risk Reduction Skills	40.89[a]	44.83[ab]	1.07	43.09[b]	44.65[a]	0.53	43.42[b]	45.58[b]	0.65

Note: Comparisons across the three facilities were made separately at baseline and at post-intervention (controlling for the baseline score). Facilities that were not significantly different (at baseline or post-intervention) share a superscript (a, b, or c). Facilities that were significantly different do not share a superscript. Thus, at baseline, the 4-month program, with superscript "a" was significantly different from the 6-month and 9-month programs, with superscript "b" on avoiding sex risk, and the 6- and 9-month programs did not significantly differ. For avoiding drug risk at baseline, the 4-month program did not share a superscript with the 6-month program indicating significant differences. However, the 9-month program was not significantly different from the 4-month program (they shared the superscript "a") or the 6-month program (they shared the superscript "b").

StaySafe, is designed to be self-administered on tablet computers using an evidence-based approach based on analytically created schemas (ACS). We have implemented *StaySafe* in community supervision samples in several large probation departments and have found effects similar to *WaySafe* in terms of improving HIV knowledge confidence, avoiding risky sex, HIV testing awareness, and risk reduction strategies (see Lehman et al., 2018 for more information regarding *StaySafe*). In addition, qualitative interviews and analysis (see Pankow et al. in this issue) show how the knowledge base and decision-making training provided in *StaySafe* has led to increased awareness of HIV issues and resulting behavior changes in terms of motivation for HIV testing and relating to others who are HIV+, and to using the decision-making training for self-regulation of their behavior.

Limitations

Several limitations about this study should be noted. Although the study took place at eight different prison facilities in two different states, these facilities may not be representative of other facilities in other regions of the country or even within the same states. All responses on the TCU A-RSKForm and the baseline and post-intervention surveys were self-report, and the outcome KCM measures are based on attitudes measured prior to release from incarceration and may not predict risk reduction or other behavior change in the community.

Conclusions

This study found significant gender differences in background and risk factors and in baseline knowledge, confidence, and motivation factors. However, these results also suggest that the effectiveness of *WaySafe* is rather robust given that, in spite of pre-existing differences in background and baseline attitudes, there were no significant gender differences on post-intervention measures, meaning that both males and females benefited from the *WaySafe* curriculum in equivalent ways. In addition, results showed that females benefited from *WaySafe* across programs with substantial program length differences. In conclusion, *WaySafe* is a useful tool for helping to shape participants' knowledge, confidence, and motivation to avoid risks around health issues to help prepare them to plan for and avoid risks in the community. These results directly led to the development and implementation of a community-based tool, *StaySafe*, which built on the concepts included in *WaySafe* but extends them to those in the community under community supervision.

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Facilitating Self-exploration and Behavioral Change Associated with HIV Risk Reduction: A Qualitative Study of Individuals on Probation and Their Experiences Using a Decision-Making App[1]

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TRANSITION FROM INCARCERATION or other restricted treatment settings (e.g., residential) back into the community is associated with high-risk behaviors known to contribute to HIV, hepatitis, and other sexually transmitted infections (MacGowan, et al., 2003; Hearn, Whitehead, Khan, & Latimer, 2015). Poor decision-making fueled by substance and/or alcohol use during reentry elevates this level of risk (Bureau of Justice Statistics, 1999), particularly when behaviors involve intravenous drug use or having unprotected sex (Abiona, Balogun, Adefuye, & Sloan, 2009; Inciardi, 1993). For those in recovery, reentry means exposure to "triggers"—people, places, and things that induce cravings, which may lead to relapse (Preston & Epstein, 2011). Research from Texas Christian University's (TCU) Institute of Behavioral Research targeted this high-risk transition period with the development of an intervention (called *StaySafe*) that combines a decision-making strategy (WORK IT) with CDC health and resource information for individuals to use in thinking about, planning for, and avoiding health risk situations. This app-based intervention is administered on a hand-held tablet, delivered in 12 self-directed sessions. The tablet approach provides a way to view sensitive health information privately, a potential benefit for anyone who might otherwise be uncomfortable talking to counselors or probation officers. Additionally, health messages contained in the intervention are consistently and uniformly delivered to any number of individuals as opposed to contradictory information from other sources (e.g., from peers or staff). Unlike treatment provided in group settings, the individualized, brief approach of the *StaySafe* intervention (a session can be completed in 10-12 minutes) allows for flexible scheduling in coordination with post-release supervision and treatment requirements.

Intervention Development and Content

StaySafe incorporates elements of its predecessor, *WaySafe*, a manualized decision-making intervention that was developed for the first 5-year Disease Risk Reduction (DRR1) research project (Lehman et al., 2015). Translating the original intervention into an app involved adapting the TCU mapping-enhanced *group* counseling strategy (Dansereau, Joe, & Simpson, 1993; Dees, Dansereau, Simpson, 1994) to a self-directed format, incorporating mapping elements and evidence-based health information into the interactive tablet curriculum. Rather than administering the intervention to individuals in small interactive groups prior to release from incarceration, the app-based intervention approach (known as the DRR2 project; see Lehman et al., 2018) extended to the probation waiting rooms where individuals arrive for post-release meetings and behavioral health services. The core feature of the app-based approach is the evidence-based WORK IT strategy, shown to be effective for improving decision skills, self-awareness, and problem recognition in studies with adolescents (Becan, Knight, Crawley,

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Joe, & Flynn, 2015; Knight et al., 2015/2016). WORK IT is an acronym for the steps (see Table 1) that guide the participant through a health risk scenario selected from the Problem Menu (see Table 2). After a participant completes the WORK IT steps for "W," a list of four options (step "O") for responding to the health risk become available to the participant; each option is reinforced with health facts to assist the participant with rating the options (step "R") to determine which one will become the final decision (step "K") for responding to the risk situation. The remaining two steps ("I" and "T") are aimed at helping the participant create a mental roadmap for turning the decision into action. Conceptually, the WORK IT steps are based on the idea that judgments and decisions about risk are made on the basis of past experiences and memories of those events—information that is easily recalled for quick response in a risky situation (Kahneman, 2011). The *StaySafe* intervention was designed so that participants repeat the WORK IT steps multiple times during the 12 sessions, thus making the decision strategy more easily retrievable in the face of real-life risk situations.

TABLE 1
WORK IT Strategy

W	What's the problem? Who will be affected by your choice? Who can help you with this decision?
O	Think about your Options
R	Rate your options
K	Knowing what decision to make
I	Imagine how you will turn your choice into actions
T	Time to test the results

TABLE 2
Problem Menu

Category	Health Topic
People	1. My partner has HIV – what now?
	2. Telling others about testing positive for HIV
	3. Asking a partner about his or her HIV testing
	4. Hanging out with friends who inject
Places	5. Favorite high-risk places to hang out
	6. Returning to the old neighborhood
	7. Finding medical help for HIV care
Things	8. Practicing safe sex
	9. Getting tested for HIV
	10. Fear of getting HIV testing
	11. Myths about HIV and where to find the facts

A tablet session begins with selecting a health topic from the Problem Menu. The session opens with a short video that demonstrates people handling a similar situation, followed by the WORK IT steps that guide the participant through the decision strategy. Each session concludes with a maze game activity that reinforces the health messages in the intervention. The app contains more than 80 instances of evidence-based HIV health risk information from the CDC, National Institutes of Health (NIH), and current health research. For example, one health fact states, "without treatment, HIV attacks the immune system leading to cancers and other health problems"—information aimed at increasing awareness about the impact of HIV on other types of health problems (NIH, 2013). It's important that health information stay current; thus, the app was designed with a "back office" where content can be updated and Problem Choices can be changed. Another feature of the app-based intervention is the drug and alcohol content, carefully drafted with attention to treatment concepts (e.g., scenarios dealing with relapse triggers), so that *StaySafe* aligns with substance use/alcohol treatment delivered as part of the requirements of community probation.

Changing Behavior to Reduce Risk

The ability to change addictive behavior requires self-awareness and a desire or motivation for change (Baumeister & Vonasch, 2015). For many, achieving abstinence is difficult and often includes periods of relapse. One way to support recovery efforts, especially for anyone struggling through relapse, is to provide opportunities for success, as well as opportunities to test the ability to be successful (Center for Substance Abuse Treatment, 2005). Experiencing success at any level inspires motivation, an essential element of substance use treatment engagement (Simpson, 2004), as well as for managing other types of behavioral changes aimed at self-regulation (Teixeira et al., 2015). *StaySafe* incorporates several features (WORK IT, health information, and a game-like interactive app) that are designed to enhance motivation, knowledge, and decision-making to engage the participants in the learning process. For the current study, we were interested in learning if participants made changes in behavior specifically related to using the adapted app-based intervention and what elements influenced the change (e.g., WORK IT strategy, health information, interactive curriculum, etc.).

Methods

Participant Interview Sample

Volunteer participants for the interviews were recruited from the main *StaySafe* study, which was implemented with adults on probation in three large county probation settings: two community probation offices and two

TABLE 3
Participant Characteristics

Gender male	47%
Hispanic	18%
White	47%
Black	41%
Race Other	12%
Self-reported primary substance use	
Stimulants (methamphetamine)	41%
Heroin or Opium	12%
Cocaine (powder)	6%
Marijuana	6%
Alcohol	6%
Ketamine/PCP	6%
None	6%
Unreported	17%
Education – highest grade completed	
7 – 9	12%
10 – 11	18%
12 or GED	29%
More than 12	41%
Marital Status	
Single	59%
Married	24%
Separated	18%
Number of children	
0	24%
1	29%
2 or more	47%
During the last 6 months in the community:	
Employed 35+ hours per week	35%
Received treatment for alcohol use	35%
Received treatment for drug use	53%

N = 17. Source: study intake survey

correctional residential substance abuse treatment centers. Researchers met at each of these locations to describe the main study research and administer informed consent. Those who were interested in participating completed baseline surveys before being randomly assigned to one of two conditions: the 12-session intervention or no intervention (treatment as usual) condition.

Participants received compensation in the form of payment made directly toward probation fees for completed study elements (e.g., $10 for completing a session and $20 for the interview). For the current study, a subset of participants (N=17) from one residential and one community probation program who completed a minimum of six tablet sessions were invited to meet with a researcher to provide feedback on their experiences with the intervention. Participation in the interview was voluntary, and each interviewee completed a new informed consent and media release form for the interview prior to scheduling the interview with a member of the research team. Table 3 shows characteristics of the interview participants: 53 percent were women, 41 percent reported stimulants (methamphetamine) as their primary drug, and 12 percent reported heroin or opium (three were unreported on the intake survey). The mean age was 34 and the number of *StaySafe* sessions completed ranged from 9 to 12 (M=11.7).

FIGURE 1

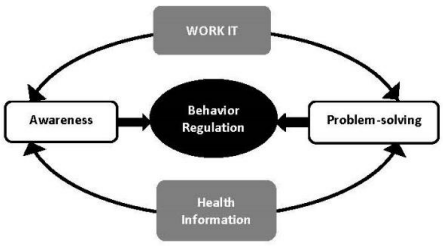

TABLE 4
Interview Guide – Sample Questions*

What was your overall feeling about using *StaySafe*?
Do you think WORK IT can be useful in your everyday life?
Can you give an example of using WORK IT to help you make a decision in your everyday life?
Has the information presented in *StaySafe* helped you to change some behaviors; if so, in what ways?
Do you plan to use information and techniques from *StaySafe* in the future and if so, in what ways?
What was the top thing you learned from the content in *StaySafe*?

**The complete guide contains 24 questions on* StaySafe *and 3 on using tablet technology*

Qualitative Procedures

The TCU researcher met with each participant to complete the interview in a private, closed-door setting. Interviews were scheduled for 30 minutes; the average length was 19 minutes. The researcher asked each participant for verbal consent to record the interview (in addition to the written consent at the time of recruitment). To protect against issues with the equipment, two recorders were used and recordings were evaluated for quality for transcription purposes. The researcher conducted the interview from a set of 24 questions, mainly open-ended (see Table 4). Because we were interested in learning about specific parts of the app-based intervention, visual aids showing various elements in the app were also available during the interview. The audio recordings were transcribed by a professional transcript service. Transcripts were audio-proofed and de-identified by the research team prior to coding with Atlas.ti 6.2 software.

Qualitative Analytic Plan

Codebook development was accomplished with a 2-stage approach: Main codes were primarily based on themes in the interview questions, and secondary codes were determined through iterative review of the transcripts by two coders. A draft set of codes was tested on a subset of transcripts to refine code definitions and to evaluate coding agreement between the qualitative research team—a step aimed at enhancing the trustworthiness of the data. Researchers addressed coding disagreement with a consensus approach to debriefing on the final coded segment. Main and secondary coding for the qualitative dataset resulted in 969 quotes for analysis.

Results

The primary focus for this study (participants' use of WORK IT to make changes) launched our review of the data on examples of behavior change. Additionally, we were interested to hear from participants about their perception of the most important feature of *StaySafe*. Two distinct themes emerged in the feedback: components of the intervention that raised *awareness* and components that were used in *problem-solving*; themes that play an important role in *behavior regulation* (see Figure 1). The most prominent components—those that participants indicated were "top take-aways"—grouped into either the decision-making strategy, WORK IT, or the *Health Information* provided throughout the intervention.

Theme: Awareness

During the course of the research project, we learned that participants who completed *StaySafe* were interested in how to access health information on the web and where to find more information on local HIV testing resources. During the interviews, many participants identified HIV health information as the most relevant component of the intervention, raising awareness about health risks.

> *"Just to be more cautious in life instead of just being carefree and not really thinking—thinking that I'll never get it or like, 'Oh, I can't get that. Just what I do, it's not going to affect me.' Because now it's just like, 'whoa, I could have been affected.' You know what I mean? Like I'm blessed that I didn't get infected, just because of the lifestyle I was living. So [StaySafe] just opened my eyes to that." [P15]*

> *"I mean, it hasn't made a change in my behaviors, but it's made me open up to see that, you know—that there is a way you can go through, if you do have AIDS, or you know, if I ever chose not to use a condom and end up getting it or something, or going back to drugs or whatever." [P13]*

One of the key health messages in *StaySafe* is the importance of testing for HIV, which is incorporated multiple places in the sessions (e.g., in maze game questions, in videos, and in problem scenarios). The interviews provided evidence that the HIV testing message resonated with participants.

> *"Just you've really got to protect yourself and know your spouse or, what is it—your other half, I guess, and getting tested for sure." "To wear condoms. To take protection for myself and really, you know, more than anything." [P8]*

> *"I guess the biggest thing I learned was that everyone should get tested frequently." [P7]*

For others, WORK IT raised awareness about ways to approach decisions with a

systematic method.

> *"I can identify what my problem is and have a game plan, like a little road map of how to get through it, instead of just taking it on and trying to solve that just big problem, breaking it into little problems to get to the solution would be fun." [P3]*

> *"StaySafe left us to basically—the whole program led to logical thinking. You know what I'm saying. That's what I liked about it, logical thinking." [P11]*

The app-based intervention content, particularly the risk behaviors link to substance abuse, is consistent with substance use treatment, so it's not surprising that some participants expressed a familiarity with the *StaySafe* intervention. In this way, the intervention has additive value in reinforcing treatment.

> *"I look at my options. I don't have to go there. I don't have to go to a bar. Because that's dangerous territory for me. Because like I said before, it was my use of alcohol and going to clubs that I was introduced to HIV. And so I know to stay away from it. I'm implementing that in my life. So the answer is really simple once you make up your mind that's what you're going to do." [P1]*

Theme: Problem-Solving

Participants described examples of problem-solving with using WORK IT, and in some cases, the strategy was applied to issues other than health risk. Below, participants responded to a question asking if they had an opportunity to use what they have learned in *StaySafe*. Their replies suggest that WORK IT is an effective evidence-based strategy to facilitate self-regulation.

> *"Yeah, before I wouldn't think. I just would go off on somebody, yeah. I mean, [WORK IT] helped me to think and go back and try to just calm myself down. Because if I stayed the way I used to be I probably would've already been back to County." [P12]*

> *"Arguing with a roommate over the bathroom and actually looking to see, is this a problem that I can handle now or a problem that I can address later, after thinking through the solutions." [P10]*

> *"Yes, [WORK IT] definitely helped me be less impulsive when it comes to making decisions." [P14]*

HIV health information also played a major role in changing behavior for several participants, including the two interviewees below.

> *"We had a girl come into the [building] who was HIV positive and before I would've like not wanted to talk to her or be around her, but, you know, I became her friend and we're pretty cool now. I feel like I acted that way towards her because of what I learned from StaySafe." [P15]*

> *"Yes, I'm definitely going to get tested. I've been tested, since I did StaySafe, I got tested here." [P5]*

Discussion

Interviews with 17 participants who completed an app-based intervention called *StaySafe* provided evidence that supports the use of the intervention in raising awareness about HIV health risk. It also was consistently described as facilitating behavioral change for individuals under community supervision. In fact, the health information component of the app-based intervention was associated with decisions to change behaviors related to reducing HIV risk and the need for HIV testing. In some cases, health information was new, and participants were enthusiastic to learn about options for care (e.g., pre-exposure prophylaxis or PrEP medication taken daily to lower the risk of contracting HIV). For others, health information dispelled myths about HIV, and participants appreciated the use of evidence-based sources to support the content. The WORK IT strategy component was also stated as instrumental to changing behaviors by several participants in relation to self-regulation with impulsivity and anger management. For those participants, WORK IT helped them to think through a problem in a logical, organized way—for some, reducing stress, and for others, reducing impulsive or angry responses. Participants received 12 sessions that provided an opportunity to practice WORK IT—important repetition designed to enhance recall of the steps outside of the research setting. It is perhaps not surprising that participants generally did not offer examples of using WORK IT to problem-solve HIV risk situations, as the majority of the interviewees were housed in a county correctional residential treatment program in gender-segregated units. However, several participants in the residential setting described instances in their everyday interactions with others in which WORK IT helped them to think through conflict and decide on a different strategy for dealing with the situation rather than reacting negatively to it. Thus, the decision-making strategy generalized for the participants beyond health and HIV risks.

This study's approach to qualitative data analysis identified patterns of responses rather than evaluating the frequency of certain codes in the data. The model (Figure 1) illustrates the relationship between Awareness and Problem-solving themes with two components (Health Information and WORK IT) that functioned as mechanisms for most participants in raising awareness about HIV and other health risks or facilitating a change in behavior. As Baumeister and Vonasch (2015) describe, behavior change involves self-awareness and a desire to change. This app-based intervention approach provides a strategy that can be applied to any number of situations where decisions have an impact on behavior, and importantly on behavior associated with an increased risk for HIV and other areas of health concern (Schüz et al., 2014).

Limitations

Most prominently, the majority of the interview participants were in a county correctional residential treatment setting with fewer opportunities to engage in risky behavior, although many of them recognized how *StaySafe* helped with making better daily decisions. We do not know how the intervention will impact their health behaviors after return to the community; however, our small community interview sample did provide insight on using it to change health and other behaviors. Even though the study took place in two different probation departments in large cities, they were located in a single state and may not generalize to other departments or locations.

Conclusions

Tablet-based interventions have the potential to provide an easily administered cost-effective way to present HIV health content in correctional settings. Because of the technology, intervention content can be updated to

keep health recommendations current and to provide resource information to community corrections settings. Further research is needed to gain a better understanding about the mechanisms by which app-based interventions such as *StaySafe* impact behavioral regulation long term.

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Using Law Enforcement to Improve Treatment Initiation and Recovery[1]

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PROPORTIONATELY, DELAWARE HAS one of the highest rates of drug use and overdoses in the country. Delaware recently ranked ninth in drug overdose deaths nationally (Hedegaard, Warner, & Minio, 2017). Of these overdoses, 61 percent involved fentanyl, 39 percent involved heroin, and 29 percent involved other opioids (multiple counts, Delaware Division of Forensic Science, 2018). New Castle County, located in the northern region of Delaware, contains 60 percent of the state's population but 69 percent of the opioid-related overdoses for the entire state of Delaware. From 2016 to 2017, the New Castle County Police Department (NCCPD) witnessed a 77 percent increase in non-fatal overdoses and a 46 percent increase in fatal overdoses related to heroin. In order to respond to the bleak situation of the state and even bleaker situation of the county, the New Castle County Police Department implemented the *Hero Help* program to increase access to addiction assistance.

Background

Both criminal justice and social service in the United States have been working to address the increase in overdose deaths and injuries related to opioid use. Rather than relying solely on drug war tactics focused on arrest, some police departments are implementing programs to make treatment more readily available (Reichert, 2017). This includes facilitating treatment referrals for those who self-present to police headquarters seeking treatment (e.g., ANGEL programs) or offering structured treatment alternatives in lieu of arrest (e.g., LEAD programs) (Sonka, 2018; Schiff et al., 2016). While these programs have striven to increase the accessibility of treatment and to prevent individuals from becoming entangled in the criminal justice system, little research is available on evaluating specific components that could improve participant outcomes.

One important aspect noted by researchers is the importance of continuous follow-up with participants throughout their addiction treatment process. This would involve a protocol similar to that seen in chronic illness programs, with ongoing check-ins during treatment and aftercare that have demonstrated increased adherence to treatment protocols (McLellan et al., 2005). Despite the recognition that continuous check-ins are valuable, previously implemented police-led addiction programs have only had limited resources available to provide ongoing case management and care coordination for individuals in these programs. For example, in the Massachusetts-based Angel program, only 57 percent of participants received a follow-up phone call within the first 9 months after receiving a referral service (Schiff et al., 2016). The present research examines a program that provides a means for oversight and follow-up to clients yet is still cost conscious to law enforcement. It evaluates how hiring a full-time care coordinator influences various success measures of police-led addiction assistance, with the primary role of the coordinator being to continuously support, engage, and encourage participants via in-person check-ins, phone calls, treatment progress reports, and email.

Hero Help Program

The Hero Help program was first implemented

[1] The authors would like to thank the officers of the New Castle County Police Department for their assistance in the evaluation that led to this article. The research team had open access to data, line officers, and senior staff, as well as the Hero Help Coordinator. Research of this nature cannot be conducted without cooperation from law enforcement and for that we are grateful. Additionally, we are thankful for the cooperation and assistance provided by the treatment facilities involved in this evaluation. Without such assistance, this evaluation would not have been possible. This research was supported in part by funding from the University of Baltimore, PTE Federal Award No: G17799ONDCP06B and Grant No. 19-395 from The Division of Public Health, Delaware Department of Health and Social Services.

in May 2016 in response to the increasing rate of heroin and opioid overdoses in the area. The program was modeled on the nationally accredited Angel Program, which is a collaborative effort between law enforcement and public health services (Schiff et al., 2016; Reichert, 2017). Rather than only accepting those who self-present to police buildings for treatment, individuals can also be referred by treatment staff or police informally or in lieu of arrest into the program. Additionally, civilian staff and police officers assist participants, rather than relying on volunteers (MSP Angel Program Brochure, n.d.). The intention of Hero Help is to provide better access to treatment for individuals who desire substance use treatment. Treatment through Hero Help can be provided by two main pathways. First, an individual can self-present to either a detoxification center, the New Castle County Police Department (hereafter, police department), or a local hospital and request treatment. Second, individuals can be referred to treatment by police officers either in lieu of arrest or unofficially (without a pending charge). The purpose is not only to provide treatment to those who have come to the attention of law enforcement through involvement in low-level crime, but also to limit criminal justice involvement and avoid the past mistake of "arresting our way out of substance use"—as seen during previous responses to drug use (Musto, 1999; MacCoun & Reuter, 2001). In this sense, Hero Help is not simply reacting to the opioid crisis, but also pro-actively assisting in treatment accessibility. The police have worked in conjunction with state health agencies and treatment providers to ensure that persons entering treatment through the Hero Help program will not be responsible for treatment payment, and when possible assist in requesting scholarships for out-of-state treatment.

The early stages of the program were less pro-active, based on officer referrals in which persons could contact the police department in search of treatment, and the officers would assist in getting them transported and admitted to a detox program. However, with limited available resources to facilitate follow-up and re-engagement with participants, many individuals appeared to fall through familiar cracks—leaving detox against medical advice, unsuccessful transference of care, facing relapse without having someone to follow up, and lack of communications between treatment provider and law enforcement. Recognizing these familiar limitations, in the fall of 2017, the police department applied for and received funding from the University of Baltimore's "Combatting Opioid Overdose through Community Initiative" to expand the Hero Help program. The police department proposed to increase the effectiveness of Hero Help by hiring a civilian care coordinator to be a single point of contact for all participants regarding treatment and the criminal justice system (direct needs), and other services such as housing, employment, mental health, and transportation (indirect needs). This person would also be responsible for conducting outreach and swiftly assisting non-fatal overdose victims, as well as training interested individuals in the safe use and storage of naloxone and providing a free kit. Importantly, this civilian care coordinator would also be part of the police department, not an outside service provider.

After hiring the coordinator, the police department initiated an extensive effort to advertise the Hero Help program to raise awareness in the community to potential clients, their families, and friends who might benefit from detox/treatment services. These efforts were in response to a concern that the community was not aware of the program. Advertising included a tri-fold brochure for distribution around New Castle County, a pocket information card that officers carry to provide information about the program to potential candidates, notices left on doors of individuals targeted for outreach, window posters distributed to New Castle County facilities, and posters that were displayed in the police holding area as a reminder to officers, as well as to alert those currently being held about the program.

Along with these strategies, posters were displayed throughout the interior of a major shopping center in the county, advertisements were placed on the side of buses travelling throughout the county, and a 15-second video played for about 10 weeks in various movie theaters in the county before all PG-13- and R-rated films. These efforts likely raised awareness of the program among not only future participants, their families, and loved ones, but also police officers who would be responsible for referring individuals to Hero Help.

There are various advantages to enrolling in Hero Help. First, individuals who request treatment and are eligible are fast-tracked into a treatment facility. This eliminates long waitlists that can result in continued and significant risk of drug-related harms or feeling troubled by the inability to access treatment (Sigmon et al., 2015). Second, with the addition of the coordinator provided for with grant dollars, participants are connected with a specialized substance use treatment and criminal justice liaison. Participants are provided with support in navigating treatment, insurance, reentry, criminal justice system issues, and other fundamental needs that help boost chances of sobriety and reaching and maintaining recovery (Cloud & Granfield, 2008). Third, participants are not just fast-tracked into detoxification, or even their first treatment facility; they are then supported throughout the entire duration of their recovery process. In fact, there is no "set completion time" for Hero Help; the coordinator offers support "without an expiration date." This is important, as longstanding recovery can be preceded by episodic relapse. Fourth, not only do participants receive services provided by the coordinator, but they also have access to mental health professionals by referral to treatment facilities or from the mental health officers in the police department who are involved in Hero Help. Overall, the Hero Help program offers a more holistic and wraparound approach to addressing addiction and related crime.

The New Castle County Police Department contracted with the Center for Drug and Health Studies at the University of Delaware to conduct an evaluation of the impact of the Hero Help Coordinator. It should be noted that the evaluation did not assess the impact of the advertising campaign, but the increase in walk-in participants described below is thought to be the result of program awareness resulting from the advertising portion of the campaign.

Data Collection

Data for this evaluation were collected from March 2018 to October 2018 at the partnered detoxification center (hereafter, detox center) and the New Castle County Police Public Safety Building. Data collection took place in real time, as well as retrospectively. In order to capture how Hero Help functioned prior to hiring a coordinator, data were gathered to measure treatment outcomes for those who had previously enrolled in Hero Help before the coordinator was hired. These data reflected the time period from May 2016 to February 2018, and the information predominantly came from case notes written by the coordinator and from the computerized data base at the detox center. Following this, data were gathered biweekly on current enrollees

in the program. Again, this was done predominantly through case notes written by the coordinator and through the computerized records at the detox center provided by treatment staff. The evaluation design was based on 1) a pre-post method, with the hiring of the coordinator serving as the dividing line between pre and post, and 2) a comparison group method comparing persons entering treatment through Hero Help to a control group of persons entering treatment by any other means, excluding Hero Help.

To create a control group to measure comparable outcomes of individuals who did not enroll in Hero Help, data were collected from the detox center with the assistance of treatment staff. A random sample using three levels of randomization was done by sampling the fourth person admitted into the detox center every other day during the time frame that the current Hero Help data were being collected. Additionally, participants were sampled from rotating shifts. So, the first person sampled was from Shift 1, the second person from Shift 2, and so on, rotating back to Shift 1 and beginning the cycle again.

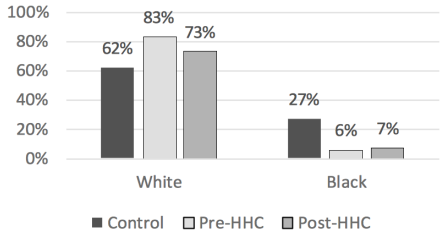
In addition to the quantitative data and written qualitative data, a research assistant observed the working environments of the detox center and the police department during collection periods. This included becoming familiar with the coordinator, police officers working with Hero Help, the detox center staff, and the director of the detox center. These observations provide insight beyond the quantitative information captured and presented in the data tables and inform the analytic explanations and recommendations.

Results

Participant Demographics

The average participant enrolled in Hero Help is a non-Hispanic White male aged 33. Figure 1 shows that the diversity of Hero Help enrollment is less than that of the control group and of New Castle County, in general. While 27 percent of the participants in the control group are Black, only 6 percent of participants in Hero Help before the coordinator was hired are, and this percentage only marginally increased after hiring the coordinator. It should be noted that the police department does not have jurisdiction over the city of Wilmington, which contains a large minority population; however, the detox center accepts patients from the entire county, which could explain some of the disparity. The age range of participants is 18-67 years, with the mean being 33 years and the median 30 years.

FIGURE 1
Race Highlighting Difference by Program Condition



According to the data available on drug use, the majority of participants (74 percent) had used heroin in the past 30 days. When including other opiates, this number increases to 86 percent. Following heroin, the next most commonly used drug was cocaine or crack cocaine (46 percent). The only other drug that had been used by more than 20 percent of participants in the past 30 days was marijuana (32 percent). Finally, of those who used heroin, 52 percent also used cocaine, and of those who used cocaine, 85 percent also used heroin. This shows that while heroin and other opioids are gaining national attention, addiction-related services should retain a wide focus on all substance use and on addressing the underlying issues related to substance use in general, rather than one specific drug.

TABLE 1:
Demographics

Male	65%
Female	33%
Black	6%
White	71%
Other (or missing)	23%
Age (Mean)	33

Program Improvements: Treatment Program Outreach

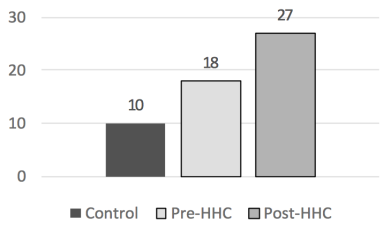
One of the keys to a successful treatment infrastructure is access to enough beds and treatment centers to accommodate persons in need of care. Beyond participation and police participation, the Hero Help Coordinator was tasked with expanding the number of service organizations used by the program. To measure this outcome, the number of different treatment facilities that individuals were being referred to after detox were counted from the control group, the pre-coordinator group, and the post-coordinator group.

Figure 2 shows that there was a steady increase in the number of treatment partners from control group through the post-coordinator group. While implementing the Hero Help program (Pre-HHC) seems to provide patients with access to more treatment facilities, adding a coordinator, who understands and knows the local treatment infrastructure, provides more options, as shown in Figure 2. As addiction is characterized by episodic relapse and sobriety, individuals may not want to go back to a treatment facility they have been to multiple times. This could be due to bad experiences there or the need for a new environment with new staff. By having the coordinator as a point of contact aware of such client concerns, more treatment centers become available, which increases the possibility of individualized care that those recovering from substance use need.

Program Improvements: Non-Fatal Overdose Victim Outreach

A unique and invaluable part of Hero Help is the extensive non-fatal overdose outreach efforts and naloxone training provided. Patrol officers accompany emergency medical services (EMS) personnel when responding to an overdose call. This provides data on the time and location of all overdoses in the county responded to by EMS. The Hero Help team used the information to conduct home visits to overdose victims, intending to use the overdose incident as a teachable moment that may make one willing to enter treatment. The coordinator, a registered nurse, and a patrol officer visit the homes of persons who have overdosed. During the study period, the team was able to reach approximately 70 percent of non-fatal overdose victims. During this outreach, the coordinator offers addiction treatment alternatives and case management services not only to the victims of the overdose, but also to any family or friends present. As of October 2018, the coordinator had conducted 28 outreach events, visiting 156 locations. From these events, 56 individuals enrolled in some type of treatment or counseling—including not just those enrolled in

FIGURE 2
Number of Treatment Partners by Program Condition



Hero Help, but also family and loved ones who received the support they needed. This effort has also resulted in providing 28 free Narcan kits and training to individuals present at these outreach events.

Participant Results

Participant outcomes focus on program enrollment, detox completion, acceptance of post-detox treatment referral, and recidivism. Due to program re-enrollments, data are presented on a case by case basis rather than per individual. Some percentages will not equal 100 percent due to missing or non-applicable data. Missing data are most often due to data limitations or because an individual did not need a certain measured service (for example, did not need detox so were streamlined to the appropriate level of care). Data limitations include incomplete paperwork in the computerized records system, lack of participant documentation before the coordinator was hired, and missing information due to miscommunications between treatment and law enforcement.

With respect to program enrollment, before hiring the coordinator, 69 individuals enrolled in the program and 3 re-enrolled. After hiring the coordinator, 107 individuals were enrolled in the program and 32 re-enrolled. However, due to the different time frame of Hero Help before and after the coordinator was hired, this increase is best compared using rates of enrollment per month. As shown in Figure 3, before hiring the coordinator, there were about 3 enrollments per month. After hiring the HHC, enrollment increased to about 13 enrollments per month. When including both enrollments and re-enrollments, these numbers increase from the pre-coordinator period to the post-coordinator period from 4 per month to 17 per month, respectively. Hiring a coordinator successfully increased participation in Hero Help by 10 individuals per month and 13 cases per month.

A second indicator of program improvement is completion of the detox intervention, typically after a period of five days in a residential detox facility. After enrolling in the program and being successfully admitted to detox, one of the first check-in points is whether or not individuals completed their detox successfully or not. This translates to whether they left unsuccessfully (e.g., against medical advice, therapeutically discharged) or successfully completed their treatment stay. For this portion of the results, a control group is included to show the average outcomes of individuals who were not enrolled in Hero Help but attended the same detox center used by most Hero Help participants.

FIGURE 3
Hero Help Enrollments Per Month by Program Condition

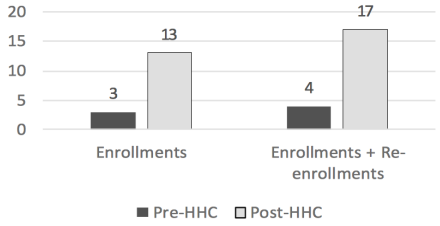


FIGURE 4
Percent Successful Detox Discharge by Program Condition

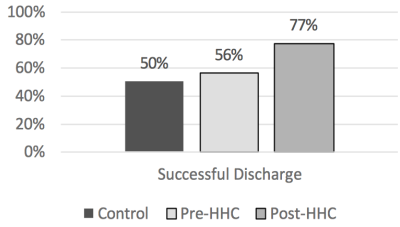


FIGURE 5
Percent Accepted Next Level of Care Post Detox by Program Condition

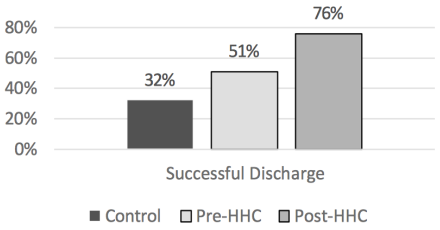
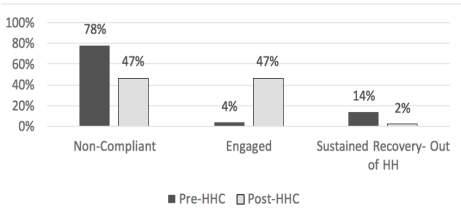


FIGURE 6
Client Status at End of Evaluation Period by Program Condition



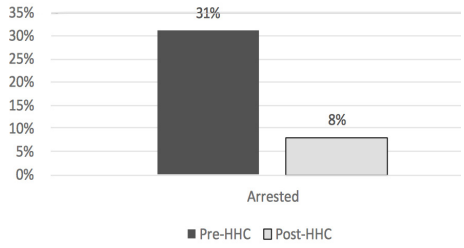
While there is only a minor difference in the successful detox completion rate between the control group and the Hero Help group pre-coordinator, there is substantial difference in the completion rate between the control group and the Post-HHC rate. Successful discharge from the detox center increased 21 percent after the hiring of the coordinator. Of note, 31 cases were excluded from these numbers in the post-coordinator period because the individuals did not undergo detox and instead went directly into a treatment program. This is a pattern that was only found in the post-coordinator group. This is likely due to the better individualization of treatment plans identified by the coordinator. Further, more people were re-enrolling and therefore may have already undergone detox prior to their second, or even third, enrollment.

After completing detox, participants were offered referral to the next level of care. At this point, individuals were able to either reject the treatment referral and discontinue their substance use treatment or accept a treatment referral and be directly transferred to that treatment facility. A strength of working with the detox center was that they practice "warm hand-offs," with the transportation of a client to the next level of care. Figure 5 shows the same increasingly positive trend, from the low rate of 32 percent of individuals in the control group who had accepted their treatment referral, to a 20 percent increase for Hero Help participants before the coordinator was hired, and finally, an additional 25 percent increase once the coordinator was brought on board. Thus, it appears the addition of the Hero Help coordinator significantly increased the likelihood of individuals accepting their clinically recommended next level of care.

Figure 6 shows the percentage of participants who were noncompliant, currently engaged in Hero Help, in sustained recovery (as of last contact) and no longer active in Hero Help, or deceased. As evidenced in this table, those who were enrolled when there was a coordinator on staff have fared far better than those who were enrolled prior to the hiring of the coordinator. For example, prior to the hiring of the coordinator, 78 percent of participants were noncompliant, compared to 47 percent afterwards. Only 4 percent were engaged in treatment in the pre-coordinator period compared to 47 percent after the coordinator was hired; although part of this contrast is due to the number of individuals enrolled prior to the Hero Help coordinator who reached sustained recovery during the time period before or during this evaluation.

Finally, in order to understand how Hero Help has benefitted the participants' ability to navigate and avoid further criminal justice involvement, recidivism was measured among program participants. Recidivism was defined as arrest after initiation into Hero Help. Rearrest data should be interpreted with caution, because some participants have

FIGURE 7
Percent Rearrested by Program Condition



had the full follow-up period of one year post enrollment, while others did not reach that point due to the rolling nature of enrollment and analysis. Even so, the preliminary results of rearrest data are presented in Figure 7. This figure depicts a 23 percent decrease in those who were rearrested when comparing the period before the coordinator was hired and the period after the coordinator was hired. Further, when looking specifically at those who enrolled in lieu of incarceration before the coordinator, 56 percent (or 5 out of 9) were rearrested. This compares to 15 percent (or 2 out of 13) of those who were enrolled in lieu of incarceration after hiring the coordinator. Although the numbers here are small, the pattern of results suggest that the coordinator may not only support individuals in recovery logistics, but also motivate individuals to avoid rearrest and remain in treatment.

A Sample of Participant Narratives

While the quantitative data speak on behalf of the increased efficacy and success of Hero Help after hiring a coordinator, the stories of individual experiences regarding the services provided by the coordinator also speak to the utility of this role.

Case 1: One participant who was enrolled in Hero Help after being engaged during an outreach effort conducted by the coordinator had left the program and begun using again. Following a second overdose and additional outreach effort, this person re-enrolled in Hero Help. However, the person again left the program. Upon subsequent re-enrollment, the individual entered detox and accepted the referral to the next level of care. Through all of the ins and outs, the coordinator was in contact to ensure that the participant was okay and to follow up about interest in the program. At the end of data collection, this person had a month in Hero Help, remained drug-free, and was compliant with treatment. This suggests the value not only of the outreach initiative, but of being patient, available, and persistent in re-engaging with clients—even after they leave the program.

Case 2: Another example of the utility of having a coordinator concerns a participant who had re-enrolled shortly after the coordinator was hired but who was rearrested and discharged from the program. This person had a parent reach out to the coordinator to ask for help upon the adult child's release and reentry. From this exchange, the coordinator provided support not only to the adult child, but also to the parent. Currently, this individual has been in sustained recovery and is on the job market. The coordinator has played a critical role in supporting these efforts and was asked for a letter of recommendation for potential employers. The coordinator worked to support not only the direct needs of recovery (i.e., treatment), but also the indirect needs that provide recovery capital (i.e., emotional support, employment, etc.).

Case 3: Finally, to illustrate the wraparound services the coordinator provides, there is the experience of a participant who had been in and out of treatment and struggling to maintain his time in recovery. This individual had recently found out that he was going to be a parent, and the coordinator realized that this life event could create new stress and perhaps trigger relapse—especially as this participant was in the very early stages of sobriety. The coordinator had conducted various check-ins with the individual and asked how he was feeling about the news. The participant admitted to being stressed, but doing okay. As a result, the coordinator offered to connect him with a previous Hero Help participant who had undergone a similar experience and could offer support during this phase of life. The individual was very enthusiastic and took the coordinator up on this offer. This example illustrates a part of Hero Help that is not captured in the data alone, showing the efforts of the coordinator to connect previously successful participants with newer participants to offer a network of peer support.

Conclusion and Policy Implications

Hiring a Hero Help Coordinator increased participation and successful outcomes of Hero Help participants. This is reflected in the numerical data presented, as well as the narrative accounts. These data suggest that there are various aspects of the Hero Help Coordinator's job, some obvious and some not, that produce the mechanisms that increase success within Hero Help.

The first policy lesson is, when funds are available, to hire a dedicated coordinator within police-led addiction assistance programs. This person should have an extensive background in substance use treatment, know the ins and outs of health insurance and the criminal justice system, and be available for contact outside of general business hours. One of the most advantageous benefits of having the Hero Help Coordinator is the assistance he or she provides in navigating not only the initial legal issues and initial treatment stay, but also the continuous follow-up and support. This wraparound support includes helping individuals navigate from detox to the treatment facility to aftercare options and offering support to go back to treatment after relapse.

The second lesson is to provide informal support after a person has been discharged because of continued substance use or lack of treatment compliance. The importance of this constant communication is being able to keep individuals engaged longer, and re-engage those who were discharged from the program for noncompliance. Because of the continuous reaching out to those engaged with Hero Help but also those who have fallen out of the program, individuals demonstrated greater success. Continued contact was facilitated by issuing the coordinator a dedicated cellphone so participants could be in contact whenever they needed assistance, even outside of regular work hours. Additionally, for those who are engaged in lieu of arrest, having this continued follow-up results in a chance to re-engage in treatment prior to subsequent arrest.

The final policy lesson is that the police department needs to be enthusiastically invested in the goals of the program. While the patrol officers need to perceive their job roles to be aligned with the philosophies of Hero Help that encourage rehabilitation efforts rather than purely law enforcement, the management of the department also needs to encapsulate this ideology within the department. This can be done through leading by example by upper level officers' endorsement of the program and encouraging the officers' participation in Hero Help. A policy modification that should be made is that performance measures such as arrests should be modified to include treatment referrals. At the police department, not only is the coordinator involved in Hero Help-related presentations and work, but upper level management is also involved. This creates a working environment that makes treatment values acceptable and encouraged among patrol officers. Program

acceptance was bolstered by quantitative and qualitative quarterly data on treatment efforts presented at meetings and successes distributed through inter-office memos to boost morale as well as by locating the coordinator in an office space that permitted easy interaction with patrol officers and leadership.

The Hero Help Program, run by the New Castle County Police Department, has seen a marked increase in efficiency since hiring the Hero Help coordinator. Under the Hero Help coordinator's watch, participation and successful outcomes of participants have increased and large outreach efforts have been conducted. The coordinator has provided valuable support in navigating both substance use treatment and the criminal justice system, and, perhaps most importantly, provided encouragement and incentives for participants to continue their recovery process and return to recovery after relapse. Beyond this role as a substance use treatment and criminal justice liaison, the coordinator has also provided support services in finding basic necessities such as housing and employment—which are crucial to successful recovery and reentry (Henkel, 2011; Walter, Gerhard, Duersteler-MacFarland, Weijers, Boening, & Wiesbeck, 2006; Binswanger et al., 2012). Overall, the role of the coordinator goes above the responsibility of logistically ensuring treatment and criminal justice compliance, expanding into helping clients navigate all aspects that could affect their addiction and recovery path. Jurisdictions implementing police-based treatment referral programs can clearly benefit from the addition of a coordinator to track and maintain contact with persons enrolled in such programs. Expansion of Hero Help type programs can provide an additional tool for communities in addressing drug addiction; adding a coordinator increases the utility of the tool.

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Fidelity in Evidence-based Practices in Jail Settings[1]

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INTERVENTIONS FOR SUBSTANCE use disorders (SUDs) occur across a wide range of settings, including outpatient, intensive outpatient, short- and long-term residential, inpatient, and corrections. In the last decades ever-increasing research with addiction has led to more effective interventions, which have been termed Evidence-Based Practices (EBPs). In fact, federal and state governments, in funding intervention programs and research, often require the use of EBPs. In the U.S., the Single State Authorities (SSAs) allocate the federal block grants and state general funds to programs with specific requirements for EBPs in their contracts (Torrey, Lynde, & Gorman, 2005; Riekmann, Kovas, Cassidy, & McCarty, 2011). Commitments to implementing EBPs vary from state to state and SSAs face challenges in realizing the adoption of EBPs due to unintended consequences of policy mandates as well as insufficient support structures during and following implementation (Mueser, Torrey, Lynde, Singer, & Drake, 2003; Goldman, Morrissey, & Ridgely, 1994; Goldman et al., 2001; McHugh & Barlow, 2010). In addition, there is much variation in how funding sources monitor implementation and fidelity of EBPs and how they evaluate outcomes against their expectations (D'Aunno, 2006; Rapp et al., 2005).

With increased focus on EBPs, there is also concern over the degree to which any substance abuse intervention provider can implement an EBP under real-world conditions (Aarons, Hurlburt, & Horwitz, 2011; Garner, 2009; Glisson et al., 2008; Hennessy, Finkbiner, & Hill, 2006; Hennessy & Green-Hennessy, 2011; McHugo et al., 2007; Mendel, Meredith, Schoenbaum, Sherbourne, & Wells, 2008; Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001; Steinberg & Luce, 2005). In addition, questions remain regarding how portable even the most promising research-based interventions are where disparities in interventionist training and expertise, complex client comorbidities, non-traditional intervention settings, and consumer choices about their care can result in discrepancies in EBP fidelity and, by extension, to expected outcomes (Bond, Salyers, Rollins, Rapp, & Zipple, 2004; Garner, 2009).

Given the demand for demonstrably effective treatment outcomes and the high importance attached to the implementation and outcomes of EBPs, a thoughtful exploration is needed to identify and analyze how—and to what extent—EBPs can be implemented in real-world practice environments with a reasonable degree of fidelity. While the literature has examined the fidelity of certain EBPs in purely clinical settings, little has been done to determine exactly how the fidelity of EBPs can be measured and ensured in the messy world outside of controlled clinical settings, such as in jails or prisons, where an increasing number of inmates receive substance abuse interventions.

One EBP that has extensive empirical support of its effectiveness with substance using populations is Motivational Interviewing (MI) (Miller & Rollnick, 1992; 2002; Carroll et al., 2006; Vader, Walters, Prabhu, Houck, & Field,

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2010). However, the effectiveness and efficacy of MI has been largely examined among voluntary clinical participants. Its association with change-talk and open-endedness has been well established, and it is an open communication style rather than a specific treatment protocol or fixed set of topics (Miller & Rollnick, 2009; Morgenstern et al., 2012). Thus, research on the implementation fidelity of MI should have important implications for its dissemination into various correctional settings and non-traditional intervention environments. While recent studies have examined the fidelity of MI implementation among probationers, it remains an open question as to how and whether EBPs can be successfully delivered in correctional settings (Spohr, Taxman, Rodriguez, & Walters, 2015).

Delivery of EBPs in real-world settings with disenfranchised populations is particularly relevant in areas where treatment resources are limited, such as rural Appalachia. The Appalachian region of the U.S. has some of the highest rates of health disparities and service limitations in the nation (America's Health Rankings, 2015). The Appalachian region also ranks highest in the county for prescription opiate abuse (Appalachian Regional Commission, 2017). Despite the prevalence of substance abuse, SAMHSA's Treatment Episode Data Set indicates that only 7 percent of all substance abuse treatment admissions take place in rural areas, and that rural admissions are more likely to be referred from the criminal justice system compared to urban treatment admissions (SAMHSA, 2012). Therefore, conducting research on the effectiveness of substance use interventions in jails as venues to reach out to high-risk drug users is critical—not only because jails typically house a high volume of drug users (Karberg & James, 2005), but also because many of these individuals will never be referred for treatment or engaged in an intervention.

This study is part of a larger NIDA-funded grant (R01DA033866; Staton et al., 2018) that examines the effectiveness of an evidence-based motivational interviewing (MI) program targeting high-risk drug use and risky sexual practices (Weir et al., 2009) compared to usual jail-based health information services for high-risk behavior among incarcerated women (Staton et al., 2018). This study examines the steps to validate the delivery of MI in a challenging real-world environment with rural drug-using women. MI was selected because it allows for a tailored approach to individualized risk behaviors that are driven by clients. The intervention was also selected because MI has been successful in reducing high-risk sexual practices among women offenders, and MI is considered one of the most supported EBPs (Seng & Lovejoy, 2013; Weir et al., 2009). Specifically, this study will (1) describe and examine the fidelity in the use of 10 MI components; (2) describe the characteristics of participant collaboration; and (3) examine the correlation between interventionist statements and participant collaboration. The overall goal of this article is to illustrate the feasibility of attaining a sufficient degree of EBP fidelity in a real-world, non-therapeutic environment of a rural jail.

Method

Participants

As part of the larger parent project (Staton et al., 2018), potential participants were randomly selected from the jail population and were provided with informed consent to participate in a study that included random assignment to an intervention group or a comparison group. All participants were screened for substance use using the NIDA-modified Alcohol, Smoking, and Substance Involved Screening Test (ASSIST, NIDA, 2009). During the study period, rural drug-using women (N=400) entered the trial, and after completion of a baseline interview, 199 were randomly assigned to the MI intervention group and 201 were assigned to an education session. Of those in the MI condition, 20 percent (n=40) were randomly selected for fidelity assessment for this study.

Materials

The baseline clinical assessment instruments for the women covered socio-demographics, drug use and related risk behaviors, stage of change, and use of services. For the fidelity measurement for this study, three coding tools were developed by modifying the Motivational Interviewing Skill Code (MISC 2.1) (Miller, Moyers, Ernst, & Amrhein, 2008; Moyers, Manuel, & Ernst, 2014). The MISC 2.1 was modified for use with a rural incarcerated sample. Coding focused on two primary scales from the MISC 2.1: 1) the *Global Facilitator Rating Scale* and 2) the *Global Interaction Rating Scale*. The *Global Facilitator Rating Scale* was modified from 6 original items (acceptance, egalitarianism, genuineness/congruence, empathy/understanding, warmth, and spirit) to 10 scale items by separating measures for empathy and understanding and by adding interactiveness, narrative, and summarizing to capture additional components of motivational interviewing. The scale was used to assess interaction between the interventionist and the participant along a 7-point Likert scale, with higher scores indicating more adherence to the traditional motivational interviewing approach.

The *Global Interaction Rating Scale* was adapted to include the original measure of "collaboration" between interventionist and participant, but also expanded to include the level of participant "cognitive" capability, and the level of participant "interaction" and engagement with the interventionist. The addition of cognitive capability was critical following pilot testing due to several participants apparently lacking the basic cognitive skills and introspection to fully engage in the intervention process.

Procedures

As part of the parent study, all participating women agreed to all research and clinical procedures through informed consent approved by the University of Kentucky Medical IRB. In addition, a Certificate of Confidentiality was obtained from the Office of Health and Human Services due to the sensitive and confidential nature of the questions and intervention activities in a jail setting.

For purposes of fidelity monitoring, participants in the MI group were asked for permission to audiotape the sessions. For this analysis, 40 participants (20 percent) in the MI group were randomly selected for their audio and transcribed records to be evaluated by the reviewers. Participants in the sub-study sample attended an average of 3.1 MI intervention sessions. MI was used throughout all sessions as the standardized intervention approach. Using an established, manualized approach (Weir et al., 2009), we intended to use MI to facilitate change in high-risk drug use and risky sexual practices following the women's release from jail.

All audio-recorded sessions were entered into a voice record data file in a secure, encrypted-access server and later transcribed into a Word document. Since each woman could participate in up to four sessions prior to release, only one recorded session per participant was randomly selected for fidelity assessment. Two independent raters rated these sessions using the modified MISC scales. The raters were trained in MI and given refresher training sessions following their initial coding. Examples of MI-congruent and MI-incongruent

statements were used in the training to try and titrate rater decisions about what might or might not fit within MI specifications.

Rating scores were entered into a database and were reviewed by the investigators and interventionist. In addition, the data were shared with the raters early in the study to probe for variations in interpretative ratings when major differences were found. In some instances, the differences were found to be due to misunderstanding of variable intent. Thus, raters were given new definitions of variable meaning and intent for adjusted ratings and for future ratings. In addition, given that MI is characterized not by specific treatment content items but by relational style, detailed interview audio recording and transcription were used during training to capture "soft" elements of the interviews such as the context of sentences and discussion flow. This approach was used despite suggestions that it is labor intensive (Essock et al., 2015).

Interventionist and Rater Preparation

An interventionist with extensive case management experience was recruited from the Appalachian area to aim for cultural congruence. The interventionist held a master's degree in social work and had over four years supervised practice before her three years with this project. All intervention sessions were provided by the same interventionist, who received 20 hours of clinical supervision on MI coupled with over 90 hours of other case supervision with the PI. She also obtained a certificate from the Institute of Family Development (http://www.institutefamily.org/) for participating in 40 hours of clinical training on family interventions, and she had intern experience in a rural domestic violence center. The study team included two members with considerable clinical experience and experience as clinical supervisors. Clinical supervision used audio-recorded sessions with feedback to the interventionist, information about diagnostic possibilities, and modeling of MI-consistent ways of communicating with participants. The interventionist also received biweekly supervision with the PI to review cases and self-identified questions about the MI approach, as well as quarterly case conferences and clinical supervision sessions during each year of the project.

Similar to the interventionist, all raters were trained in MI by study investigators in seminar settings with lecture and question and answer format. Examples of MI-congruent and non-congruent statements were presented for the raters to evaluate. The six interview raters were trained to rate audio and transcribed interview verbatims on 10 MI interventionist characteristics and three characteristics pertaining to participant responses.

Results

Participant Demographics

Participants selected for the fidelity sub-group analysis did not differ significantly from the larger parent study. Women were about 32.8 years old, white (98 percent), and had approximately 11.1 years of education. Less than one-quarter of women (22.8 percent) were employed in the six months before incarceration, and 32 percent were married at the time of interview. Women reported an average of 5.9 adult incarcerations, and they reported a lifetime average of 16.2 months of incarceration.

Mental health problems were common among women in the study, with self-reported depression affecting 68.5 percent of the sample. Self-reported symptoms of anxiety and post-traumatic stress affected 45.3 percent and 67.4 percent (respectively) of the sample. Women were recruited into the sample as drug users, with the most commonly used drugs including illicit prescription opioids (70.9 percent of women in the 30 days before jail) and benzodiazepines like Xanax® and Valium® (55.8 percent in the 30 days before jail). The majority of women reported using multiple substances per day during the six months before jail (80.9 percent), with about 75 percent having a history of IV drug use, and being high on most days during that time period (average of 135.3 days).

MI Component Ratings

The 6 independent raters scored an average of 14 cases (range of 4-25 cases). Each rater scored at least two cases for training purposes, and two raters scored three. A total of 40 participants were evaluated in 83 separate reviews by the six members of the rating team. Table 1 shows the mean rating scores for the 10 MI interventionist characteristics that were measured by the team of six raters. The mean scores are derived from the 7-point Likert values, with 7 being the highest value. Rater 2 had the lowest mean score rating of the MI characteristics across all interviews, and rater 6 had the highest ratings, although rater 6 also had the fewest cases (4).

The MI interventionist characteristic with the higher-end scores was interventionist *acceptance,* with four of the six raters giving ratings that varied from 6.0 to 7.0 on the 7-point scale. The mean score for *acceptance* was 6.4. The characteristic of interventionist *warmth* received the next highest number (3 raters) of high-end ratings, with a range of 5.8 to 6.8 and a mean rating of 6.0. Third highest rating of interventionist characteristics was *empathy*, with raters 3 and 6 giving 6.1 and 6.8 respectively, and the characteristic had an overall range from all six raters of 5.5 to 6.8, with a mean of 6.0. The interventionist characteristics that received lower-end ratings were *spirit* and *summarizing,* which had overall score ranges from 4.0 to 5.8 and 4.5 to 6.0 respectively and overall means of 5.3 and 5.6. Five of the interventionist characteristics had overall mean ratings of 6 or better and none had mean ratings under 5.

TABLE 1
Scores on the *Global Facilitator Rating Scale* across all six reviewers (n=40)

Rater	1	2	3	4	5	6	Range	Team Mean
Acceptance	5.9	6.0	6.0	6.7	7.0	6.8	5.9-7.0	6.4
Egalitarianism	5.9	5.7	5.8	6.2	6.1	6.0	5.7-6.2	6.0
Empathy	5.7	5.5	6.1	6.1	5.7	6.8	5.5-6.8	6.0
Understanding	6.2	5.8	5.6	6.1	6.3	5.5	5.5-6.3	5.9
Genuine	5.7	5.7	5.8	5.9	6.1	6.8	5.7-6.8	6.0
Warmth	6.6	5.8	6.1	6.4	6.7	6.8	5.8-6.8	6.4
Spirit	5.5	4.0	5.2	6.0	5.0	5.8	4.0-5.8	5.3
Interactive	5.8	4.5	5.8	6.2	5.4	6.3	5.4-6.3	5.7
Narrative	6.5	5.1	6.0	6.2	5.2	6.3	5.2-6.5	5.9
Summarizing	5.3	4.5	5.9	5.9	5.8	6.0	4.5-6.0	5.6
Overall mean	5.9	5.3	5.8	6.2	5.9	6.3		
Range	5.3-6.6	4.0-6.0	5.2-6.1	5.9-6.7	5.2-7.0	5.5-6.8	5.2-7.0	

Ratings of Participant Interaction and Effects on MI

Table 2 examines three other measures of MI fidelity (*collaboration, cognition,* and *interaction*) that were aimed at assessing participant characteristics or engagement in the intervention sessions. Interaction had the highest rating across the six raters and cognition rated the lowest. Participation appeared to be high even though cognitive ability was rated somewhat lower. Participant collaboration also rated rather high on the 7-point Likert scale. All three components received positive ratings, even though the rating of cognitive responsiveness was the lowest of the three.

Correlations between Interventionist and Participant Interaction

To further examine the interventionist's fidelity to MI approaches while considering participant interaction, bivariate correlations were also examined to better understand if the perception of participants' interaction or cognitive abilities would have made adherence to MI components more challenging. As shown in Table 3, findings support an overall positive relationship between ratings on the delivery of MI and the participants' degree of engagement. Specifically, ratings of acceptance were significantly and positively related to ratings of collaboration (r=.556, p<.001), cognition (r=.522, p<.01), and interaction (r=.434, p<.01). In addition, ratings of understanding were positively and significantly associated with collaboration (r=.389, p<.05) and cognition (r=.448, p<.01).

Discussion

This study examined fidelity in delivering core MI components in a challenging, real-world correctional environment with a largely treatment-resistant population. The MI approach was used in this study in a difficult environment (jail) to evaluate the portability of this extensively studied EBP to a non-therapeutic setting. A by-product of the study was information about the care and supervision that are needed to implement EBPs by clinicians in community practice. This study highlights the steps that must be taken to ensure faithful implementation of EBPs outside of carefully controlled study conditions like those found in jails and prisons. This study shows that MI can be used in challenging environments like jails, but considerable training, support, and feedback may be necessary for faithful implementation of this EBP.

This study was something of an acid test of the implementation of an EBP in a challenging correctional environment with a difficult-to-serve population. In examining the study findings on the interventionist's congruence of language to the 10 MI components, average ratings were well over 5 and in most cases, closer to an average of 6 on a 7-point scale. These findings are consistent with MISC or MITI ratings noted in other studies using MI in more controlled settings (Bertholet, Palfai, Gaume, Daeppen, & Saitz, 2014; Moyers, Martin, Manuel, Hendrickson, & Miller, 2005; Spohr, Taxman, Rodriguez, & Walters, 2015). Thus, findings suggest that a sufficient threshold of fidelity was achieved in this application of MI in a non-therapeutic setting.

Findings also suggest that MI fidelity was not significantly affected by participants' level of engagement in the intervention sessions. Initial concerns related to this non-treatment-seeking jail population were that lower levels of cognition and/or interest in the intervention could make MI implementation more challenging. Findings demonstrated that the performance of the 10 MI components remained high even with limited active engagement from participants in a number of cases. Findings also supported a positive relationship between measures of collaboration and cognition when examined along with the primary MI components. To our knowledge, this relationship has not been examined in other studies of MI fidelity. However, the relationship between participant-level factors, particularly cognition, should be examined further in future research on MI fidelity, even though this factor lies outside of usual MI fidelity evaluation. These findings suggest that when working with challenging participant populations (such as incarcerated rural women drug users), being able to tailor the approach in a way that is most congruent with the culture may be critical for the success of MI. This also raises important questions for providers in clinical settings when considering EBPs related to "what characterizes a good candidate client for MI?"

Fidelity in Difficult Pre-treatment Settings

This study examined MI implementation in rural jails among a pre-treatment population of rural women where there are multiple challenges to positive outcomes. By comparison to urban areas, the rural areas where this study was conducted have more structural

TABLE 2
Scores on the Global Interaction Rating Scale by reviewers (n=40)

Rater	1	2	3	4	5	6	Range	Team Mean
Collaboration	5.4	5.3	4.6	6.1	5.9	6.0	4.6-6.1	5.5
Cognition	5.6	4.9	4.3	5.9	4.9	6.8	4.3-6.8	5.4
Interaction	6.3	5.3	4.4	6.5	5.7	6.3	4.4-6.5	5.8
Overall mean	5.8	5.2	4.4	6.2	5.5	6.4	4.4-6.4	5.6
Range	5.4-6.3	4.9-5.3	4.3-4.6	5.9-6.5	4.9-5.9	6.0-6.8		

TABLE 3
Correlations between interventionist MI ratings and participant engagement

Primary MI components	Collaboration	Cognition	Interaction
Acceptance	.556***	.522**	.434**
Egalitarianism	.260	.346*	.206
Empathy	.011	.008	.012
Understanding	.389*	.448**	.311
Genuine	.256	.261	.173
Warmth	.228	.168	.127
Spirit	.261	.239	.155
Interactive	.029	.222	.135
Narrative	.068	.239	.251
Summarizing	.231	.193	.124

*p<.05, **p<.01, ***p<.001

constraints on health and wellbeing, such as lower education rates, lower incomes, higher rates of unemployment and disability, and more limited services and more barriers for women who need protection from partner violence—all of which tend to work against responsiveness to interventions (ARC, 2008; Eastman & Bunch, 2007; Harrington, 1997; Iceland, 2003; Pruitt, 2008a; 2008b; Porter, 1993). In addition to this regional context, the rural jails afford few health-promoting opportunities.

This study clearly demonstrated that the amount of preparation, training, and watchfulness over the interventional processes is critical to implementation. This study suggests that any notion that an EBP can be lifted off the shelf, briefly trained among qualified providers, then confidently implemented is seriously questionable. Moreover, doubts regarding the fidelity of EBP implementation are compounded when considering a difficult to severe target population, such as the one in this study. This project did not face institutional reluctance or systemic barriers other than what might be expected in any detention facility *per se*. That is, the detention staff members were facilitative and not resistant to the project.

Implications for Policy-makers and Practice Professionals

Indicators of MI fidelity for this project were high, but the implications for the practice environment is that considerable clinical support is not only desirable, but essential. The idea that simply attending a training session will lead to greater use of EBPs appears naïve in the extreme. This study suggests that investment in training and guidance is critical not only on the front end of things, but also throughout. Real-world EBP implementation might be like a child's gyroscope that, once wound up, does very well at first and then gradually shifts into wider wobbles as client characteristics and clinical practice habits intrude on the plan. The presence of episodic clinical supervision and feedback may have proven critical to the delivery of this MI intervention. This study also suggests that, particularly when delivering an EBP in real-world settings, the importance of fidelity should not be limited by scores on rating scales, but should take into consideration a varying "threshold" of acceptance of MI approaches that might be seen as congruent with the client population.

Limitations

This study had several limitations. First, raters inevitably interpret in order to categorize and score the verbal actions of both the interventionist and participants. There is an unavoidable limit to fidelity measurement of MI using measurement of audio records due to subjectivity in evaluating the combination of voice tone and specific semantic and associational meanings of words and sentences, versus the overall conative sense of the communications by both parties. These limitations were somewhat mitigated in this study by using one study interventionist who was born and raised in the same culture as the participants, and her voice and manner became familiar to the reviewers. However, the raters were not all from the same region, and thus interpretations of language may be biased in subtle ways. Second, attempts were made to capture open-ended and close-ended statements by the interventionist, but the flow of conversation and cultural idiom led to many statements that required too much interpretation to reliably say they fit in either category. Many statements were grammatically close-ended, but in the context of the conversation, had the intent and effect of open-ended statements.

Implications for Future Research

Despite these limitations, this study contributes to the literature on how evidence-based practices can be delivered by practitioners in real-world settings with a high degree of fidelity. One conclusion from this study might be that the training and skill-sustaining process of clinical supervision is essential in research projects using EBPs. The implications are serious for the successful delivery of EBPs, as well as for the ethical principle of practitioner competence. For example, a program may state that its practitioners use EBPs, but they may actually lack competence with the EBP. Absent any sustained effort to assess implementation of any EBP, managed care organizations and funding sources remain dependent on providers merely asserting that they use certain EBPs.

This study calls for further research on thinking about fidelity along a continuum. Many institutional factors make EBP implementation possible, including the professional investment in fidelity training, supervision, and monitoring, as well as the interventionist characteristics along with client-level factors that may significantly affect intervention adherence. This study suggests no short-cuts; if anything, it suggests that great institutional support is critical to implementing any EBP.

More importantly, substance abuse treatment and research funding often require the use of an EBP, often with no stipulations about what should be incorporated to ensure fidelity of implementation. Future funding of intervention programs with an EBP requirement should also require evidence of at least some effort at fidelity evaluation. And unless research projects undertake serious fidelity measurement, their findings about the effects of EBPs should be taken with a large grain of salt.

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Operationalizing a Behavioral Health Services Cascade of Care Model: Lessons Learned from a 33-Site Implementation in Juvenile Justice Community Supervision[1]

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ADOLESCENTS (AGE 12-17) in the community who self-report contact with the juvenile justice system (JJS) through probation, parole, or detention during the past year are significantly ($p<.05$) more likely than those who were non-JJS involved to report meeting criteria for substance use disorder (SUD) (APA, 2013) across substances (21.4 percent vs. 3.7 percent, odds ratio [OR]=7.1), as well as specifically related to cannabis (12.1 percent vs. 2.0 percent, OR=6.7), alcohol (9.4 percent vs. 1.7 percent, OR=6.2), heroin or other opioids (3.5 percent vs. 0.4 percent, OR=9.7), and cocaine or other stimulants (1.3 percent vs. 0.3 percent. OR=4.6; SAMHSA, 2018). In the subset of adolescents with SUD, those with JJS contact are significantly more likely than those without contact to receive substance use (SU) treatment (25.2 percent to 6.3 percent, OR = 5.0); however, 3 out of 4 of them still did not

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access any kind of SU treatment.

Consistent with the numbers above, prior research suggests that 27 percent to 65 percent of the youth formally in parts of the JJS meet criteria for some kind of SUD—going up with the intensity of involvement. Unfortunately, the research also suggests that only 5 to 35 percent of the JJS youth "in need" receive any kind of SU treatment (Baumer et al., 2018; Becan et al., 2019; Dennis et al., 2009; McReynolds, Wasserman, & Ozbardakci, 2017; Shufelt & Cocozza, 2006; Teplin et al., 2002; Timmons-Mitchell et al., 1997; Wasserman et al., 2002; 2010). Although community supervision (CS) is one of the most common dispositional alternatives in the JJS (Kaeble & Glaze, 2018), it is also one of the least studied in terms of SUD prevalence and treatment (Wilson et al., 2009). A just-released survey from a national probability sample of counties (Scott et al., 2019) estimates that there are 770,323 youth under CS by 3143 CS agencies in the U.S. The subset (45 percent) of CS agencies that collected and had data available on substance use problems reported that 51 percent of their youth had a substance use problem, including cannabis (49 percent), alcohol (25 percent), prescription drug misuse (19 percent), and/or any other drug (18 percent). Most (91 percent) of these CS agencies referred all or most of these youth to SU treatment providers in their community. On the bright side, most of these programs used a range of evidence-based practices and also provided programs for youth with co-occurring mental health needs. Unfortunately, this survey and other research reviews (Belenko et al., 2017; Knight et al., 2016) also document widespread challenges related to the processes of identification, referral, and treatment initiation and retention between systems. This is important because continued SU and SUD are among the key risk factors of long-term delinquent behavior and recidivism; conversely, initiation, engagement, and continuing care in SU treatment is associated with reduced SU, SUD, and recidivism (Clark, 2004; D'Amico, Edelen, Miles, & Morral, 2008; Evans-Cuellar et al., 2006; Hicks et al., 2010; Hoeve et al., 2013; 2014; Kandel & Davies, 1992; Kandel & Yamaguchi, 2002; McReynolds et al., 2010; NIDA, 2006; 2014; Pankow et al., 2019).

The Behavioral Health (BH) Services Cascade

There is a well-established history of tracking the process of SUD identification, referral, initiation, and retention in treatment across complex systems of care in general (Chandler et al., 2015; DiPrete et al., 2019; Dennis et al., 2003; 2012; Morgan et al., 2016; Montgomery et al., 2019; Scott & Dennis, 2009; Scott et al., 2018; Williams et al., 2018, 2019a&b), and specifically in the movement from the justice system to substance use treatment (Scott & Dennis, 2012; Scott et al., 2017). The Behavioral Health (BH) Service Cascade (Belenko et al., 2017; Williams et al., 2018) was specifically developed as a way to quantify and track movement along the following desired pathway: screening/clinical assessment, identification of need, referral to SU Treatment, and actual SU Treatment initiation, engagement, and continuing care. We use the term behavioral health (BH) because two-thirds of the primary SU treatment providers used by CS agencies are also their primary provider of mental health (MH) treatment services and operate co-occurring SU/MH programs (Scott et al. in press and in the programs participating here). The BH Service Cascade is also being used: a) as a framework for improving and harmonizing measurement across CS and SU Treatment agencies within and across communities; b) to identify which stages of the process need improvement; and c) to evaluate if "attempted fixes" improve these rates in actual practice (Becan et al., 2018; Leukefeld et al., 2017).

Although the BH Service Cascade provides a useful heuristic tool for conceptualizing the SU treatment services process in justice settings and helps define the types of data needed to analyze this process, there has been little research to date on a) how the BH Service Cascade framework can be operationalized in multi-system settings, b) the availability and quality of the data needed to analyze Cascade outcomes, or c) how well the Cascade framework captures actual screening, referral, and treatment processes in real-world practice settings.

This paper provides one of the first examinations of a large multi-site study of JJS CS agencies and their SU Treatment provider records to address three aims: (1) provide an empirical test of how well the BH Service Cascade framework works in practice; (2) identify methodological challenges in implementing the framework; and (3) provide recommendations for the next generation of juvenile justice and behavioral health data systems.

Method

Overview of the JJ-TRIALS Data Source

Data are from the Juvenile Justice-Translational Research on Interventions for Adolescents in the Legal System (JJ-TRIALS) cooperative agreement funded in 2013 by the National Institute on Drug Abuse (NIDA; Knight et al., 2016; Leukefeld et al., 2017). The cooperative includes six research centers (RCs: Columbia University, Emory University, Mississippi State University, Temple University, Texas Christian University, University of Kentucky), each working closely with a JJS partner in seven states (Florida, Georgia, Kentucky, Mississippi, New York, Pennsylvania, Texas), a coordinating center (CC; Chestnut Health Systems), and the scientific officer from NIDA. Its purpose is to improve identification and receipt of substance use-related services for treatment services youth under CS, and facilitate more effective collaborations between the JJS and BH systems. The cooperative includes multiple studies: 3 national surveys (Scott et al., 2016; 2019), a substance use prevention pilot study, a HIV prevention pilot study, and a multisite trial to use the BH service cascade to identify gaps in the systems of care and evaluate attempts to address them in a multisite cluster randomized trial (Knight et al., 2016). This paper uses data from the latter study.

Records data are from JJS CS/SU treatment records collected in 33 counties in 7 states on 31,308 youth under CS entering JJS between March 2014 and November 2017. While there were originally 36 county sites, one site withdrew from the study prior to randomization to study condition and two other sites were dropped from this analysis because they were almost entirely limited to post release from detention and had very different trajectories that will be looked at separately. Because the CS agencies varied in whether they had early diversion and the type of early diversion programs, records were excluded if contact was limited to early diversion programs. Thus, this article focuses on youth whose justice contact has been directly and primarily overseen by juvenile community supervision (CS).

Records and Participants

We include 31,308 JJS CS agency/SU Treatment provider youth records as our primary units of analysis. These records come from 24,490 unique youth on CS, with 17 percent of the youth having 2 to 9 records where the previous episode of community supervision ended more than 30 days earlier and a referral for a new offense was made to the juvenile justice system. Other than excluding the withdrawn/detention reentry sites and the youth only on early diversion, there were no other exclusion criteria. Thus, these represent a census of all

the remaining youth on CS in the 33 counties. All record abstraction and recoding was done under the supervision of the respective institutional review boards (IRB) of the JJS agencies, RC and CC.

Measures

The cooperative developed a list of common record measures related to demographics, biological drug testing results, clinical problems, charges, adjudication, recidivism risk, justice system status, and BH service cascade outcomes. The specifications included a description of each item's variable name, definitions, common coding of response set, and coding of missing data. Each RC evaluated the available records data sources to determine which items they were able to collect within current systems, and, if not currently collected, if there was a feasible way to add items to site data collection procedures. Each RC also assessed local item definitions to determine if there would be any issues recoding to the common item definitions, and reviewed records to determine any issues with significant missing data. Any issues with availability or coding were brought to the Cooperative's Measurement and Data Management working group to evaluate and reach a group consensus on final inclusion or definition. In the end, the collaborative requested sites to compile data on 72 variables that all JJS partners agreed "ideally should be" in CS JJS records (see appendix—more detailed specifications also available from the first author).

Table 1 (adapted from Knight et al., 2016) provides the final operational definition and shows how the relative rates were calculated for each step of the BH service cascade in JJ-TRIALS. Three major changes were made to address limits in the data: 1) we looked at screening results even if the date was missing, 2) we dropped a clinical assessment step that previously happened between screening and referral, and 3) due to increasing missing data in later steps of the cascade, the number of sites considered at each step was limited to those with data. In the results, retention to each step is considered in two ways: 1) *simple rate*: the n retained to the step as a percentage of the total n of youth referred to CS; and 2) *relative rate*: the n retained in each step relative to the denominator for youth entering the location. The latter is defined in the last column of Table 1 as: screening & need relative to the total n; referral and initiation relative to the n who were "in need" of SU treatment; and engagement & continuing care relative to the n who initiated SU treatment.

Data Abstraction and Coding Procedures

Data were abstracted from a mix of state and local electronic databases, as well as from either scanned or physical paper records. Data from SU treatment providers often had to be added to JJS records or separately obtained. Data were then compiled and cleaned in an iterative process: first by several of the larger JJS local or state agencies, then by the 6 RCs, and finally by the CC. In the final step, records were combined and rechecked for consistency of coding across the cooperative; feedback on any anomalies was generated and returned to each RC for further investigation. All data included in this paper were collected and submitted by September 2018.

Records were collapsed within youth when there were multiple juvenile justice referrals that were collapsed by the court. After submission, the CC began with 33,508 records. Within each record, service records were excluded (screening, clinical assessment, referral to treatment, treatment intake, and treatment discharge) when the date of service preceded the referral to the juvenile justice system due to services occurring across multiple referral episodes. A small number of records (n=12) were removed during the data cleaning process due mostly to missing data.

Because of variation in CS agency record practices (e.g., one had a separate referral for each charge and another just added to existing referral), the CC further collapsed all JJS referral episodes within 0 to 30 days for a unique youth into the first record (reduction of n=1,603 records). Records were further excluded by the CC for youth with less than 90 days between referral to juvenile justice and the final record abstraction for the site (n=585), as they did not have the opportunity to move through the entire service cascade. Due to some overlap, this resulted in the final dataset of 31,308.

Within each record, the date or flag for a given type of BH service cascade was considered sufficient to code as indicating it happened. For need, any indicator (screening, clinical assessment, urine drug testing, referral, charges) was considered sufficient and included 555/14,906 (4 percent) where the specific "basis or source" of the need for SU treatment was not documented in the record. Since the majority of records followed the cascade (discussed further below), records missing documentation on early steps were recoded if they had any of the later steps (e.g., referral without "need" documented, initiating treatment without "referral" documented). The exception was that "need" was not considered sufficient evidence to recode the flag for "screening." Otherwise records were recoded as the event "not happening."

Analytic Methods

Missing data was a significant obstacle to the analysis and happened in many forms. Some JJS agencies did not collect a given variable, had a field with open text or scanned documents that could not be easily coded, had partial information (event but not date or vice versa), or had staff that inconsistently filled in the field or did not fill it in at all. Also, it was clear that documentation was much more likely to exist in the records when an event happened (e.g., a screening or positive drug test) than when an event did not happen (e.g.,

TABLE 1
Behavioral Health Services Cascade Definitions

Step	Operational Definition	Relative Rate
a. JJ Referrals	Total number of referrals to juvenile justice in time period with a disposition starts date, less any youth already in treatment at that time.	—
b. Screened	Subset of JJ referrals (a) with a screening record.	b/a
c. Need Identified	Subset of JJ referrals (a) with a need for substance use treatment based on screener, urinalysis, clinical assessment, or other sources of information.	c/a
d. JJ Referrals to Treatment	Subset of those in need (d), referred by the juvenile justice system to substance use treatment.	d/c
e. Initiated Treatment	Subset of those referred to treatment (e) who have treatment start date.	e/c
f. Engaged In Treatment	Subset of those who initiate treatment (f) who stay in treatment for at least 6 weeks (based on treatment discharge minus treatment start date).	f/e
g. Continuing Care	Subset of those engaged in treatment (g) that are still getting treatment after 90 days (whether via retention, transfer, or booster).	g/e

an expected screening not done or a negative test result for a given drug).

To include the maximum number of records in the analysis, each of the BH service cascade flags was interpreted as "yes" (they were retained to this step of the cascade) vs. "other." The "other" includes all answers of "no," legitimate skips due to missing prior steps, and other "missing data" in record. Allowing all missing data to be treated in this way provided us with a *lower bound* and conservative estimate of the rates of retention at each step of the cascade.

As a sensitivity analysis, we also examined the impact using weighted hot deck imputation (Little & Rubin, 2002) to replace some "missing" data with "yes" values in order to make an *upper bound* and more liberal estimate of the rates of retention at each step. Specifically, data were sorted by site, maximum charge level (felony, misdemeanor, citation/violation, status), gender, supervision type (probation, parole, or juvenile drug treatment court vs. other CS/diversion), and cascade step. The cascade variables were imputed in order of cascade step, with the imputed version of each preceding step being the final sorting criteria for the next step. This means that a record with missing data on an item was surrounded in the list by records that were both mostly similar and that had reached the same point of the cascade. Missing data was then replaced with the median of the nearest 20 valid (non-missing) values. The median was used instead of the mean because cascade variables are all yes/no and vary dramatically in the percent of yes. Using the median within 20 values produces unbiased estimates of the mean and standard error at the group level. To judge the appropriateness of this kind of imputation, we assessed the extent to which the data were "missing at random (MAR)" by comparing the inter-item correlation of the lower bound (without imputation) and the upper bound (with imputation) estimates across maximum charge level, gender, supervision type, and the 6 BH service cascade steps sorting variables. Across the 81 comparisons, the inter-item correlations between the two methods above differed by an average of only r=0.05, with 5 of the 6 cascade steps averaging a difference of r=.1 or less, and the referral step having an average difference between methods of r=.13. This is relatively good evidence of meeting the assumptions of MAR and suggests that this is a reasonable approach.

There was one CS agency that did not have referral data documented and another 10-14 sites that were not able to obtain access to reliable data (less than 5 percent of expected records with yes or no) on SU treatment initiation, discharge, engagement, or continuing care. For these steps we dropped the sites without (reliable) data.

Results

Youth Record Availability and Prevalence of Characteristics

No CS agency record had all variables, and the median number of variables available per record was only 49 out of 72 (68 percent) in these actual CS agency records. The appendix gives the percentage of data available for each variable, the prevalence where it was available, and the site variation in terms of minimum and maximum prevalence. The prevalence of characteristics below is based on the subset of records with data available across sites and columns from column 2 of the appendix.

The youth records were related to juveniles who were primarily aged 11-17 (99 percent; 63 percent 15-17) and male (73 percent). They were primarily white (49 percent) or black (47 percent), with an overlapping 21 percent having Hispanic ethnicity. Clinically, the records showed that 56 percent had some kind of a substance problem, with those substances including cannabis (28 percent), alcohol (9 percent), prescription drugs (1 percent), and any other drugs (7 percent). Multiple other co-occurring problems were documented in the records, including serious family problems (43 percent), violence towards others (39 percent), internalizing (17 percent) or externalizing (19 percent) mental health problems, victimization (13 percent), suicide risk (11 percent), and learning or developmental disabilities (9 percent). Their most common charges were related to property (30 percent), violence (25 percent), substance use (14 percent), probation/parole violations (12 percent), and/or status offenses (11 percent); with their maximum severity being a felony (33 percent), misdemeanor (56 percent), summary/citation (3 percent), status (3 percent), or other (5 percent). Their risk of recidivism was rated as low (31 percent), medium (32 percent), high (16 percent) or very high (3 percent). At various times their justice status included probation (49 percent), detention (30 percent), child in need of supervision (11 percent), diversion (5 percent), juvenile drug treatment court (1 percent), parole (0.2 percent), other community supervision (67 percent), and other justice status (7 percent).

In terms of the BH service cascade variables, 81 percent were screened with one or more standardized tools with evidence bases, including the MAYSI-2 (19 percent), YASI (12 percent), PACT (9 percent), SASSI (3 percent), CRAFT (2 percent), and GAIN-SS (1 percent), as well as other state (31 percent) measures or a local measure (2 percent) with unknown psychometrics. Of the youth records screened, 28 percent indicated a positive need for SU treatment. In addition, 23 percent of the youth were clinically assessed, with 5 percent indicating a positive need for treatment. Other sources for the identified need for SU treatment variable included JJS staff recommendation (12 percent); clinical assessments (5 percent); youth, family, or other referral sources (3 percent); judicial mandate (0.2 percent); and undocumented reasons (0.2 percent). Across all of these sources, 54 percent of the youth records had one or more indicators of need, and 24 percent were referred to SU treatment. One CS agency did not document referrals at all and was dropped from this step.

Only half the records had any information on SU treatment initiation (53 percent) or discharge date (51 percent). Of those that did, only 15 percent indicated the date of SU treatment initiation and 11 percent the date of discharge (both necessary for directly calculating engagement for at least 6 weeks and continuing care for 90 days or more). The primary level of care was outpatient (10 percent), followed by no documented level of care (4 percent) and all other higher levels of care combined (1 percent). Sites that did not systematically document treatment initiation (10), engagement for at least 6 weeks (11), or continuing care for 90 or more days (12) were dropped for these respective steps.

The BH Services Cascade Across Counties

The columns of Table 2 show the location, steps of the BH service cascade, and the two methods for estimating the rates for each step of the cascade. The rows show the method, number of sites with data that could be used, the n of yes or imputed yes, total, and the three rows for the percentage of simple rate (i.e., youth records with yes/total records); youth records with yes/those records indicating " in need"; youth records with yes/those records indicating that SU treatment was initiated; and the relative rate (repeating lowest row for each column). While the number of sites and total are the same across methods, imputation increases the number of records with yes and consequently the percentage of

the total for every pair of columns. Given the changing number of sites and denominator, the last two rows are calculated by dividing the total percentage for the column by the column percentage for the reference listed (e.g., 15 percent referred/48 percent in need = 31 percent in the "Percentage In Need" row). Because imputation increases both numerator and denominator, the imputation method produces relative rates that can be higher (e.g., first 3 of 4 pairs for percentage in need) or lower (fourth comparison for percentage in need row, both comparisons for percentage initiating treatment row; and all 4 comparison in the final row that is used below).

Figure 1 graphs the simple rate or "Percentage of the Total n" of records for each step by location, step, and method within step. At each step, the rates that included only the original "yes" answers (solid color on left) are always lower; the rates that include the original and "imputed yes" answers (slash marks on right) are always higher. In theory the rates should be the same or lower at each subsequent step—and this is the case for the original yes answers. The imputed yes rates, however, go up from referral (27 percent of total) to treatment initiation (30 percent of total). As shown in Table 2, this is because the number of sites and total used in the denominator is going down in the last 4 steps. Substantively the figure shows that the participating CS agencies were screening the majority (68-71 percent) of the youth and found that about half (48-58 percent) were in need of SU Treatment. However, it also shows that only a fraction of these were referred to (15-27 percent of total) or initiated (10-30 percent of total) SU treatment. Moreover, half or less of those who initiated treatment stayed engaged for at least 6 weeks (5-7 percent of total) or received continuing care 90 days or more later (2.7 to 2.8 percent of total).

Figure 2 provides an alternative perspective of the BH service cascade using the "relative rate," this time graphing the last row in each column of Table 2, for each of the two methods. As noted earlier, because imputation is increasing both the numerator and the denominator, these rates can be higher or lower than the rates based on only the original yes answers. While the imputed rates are higher for the first two steps, they are actually lower than the original rates in the last 4 steps. Substantively, this more clearly illustrates the first common problem in CS setting—that during the transition between systems less than a third of the youth on CS identified as "in need" of SU treatment get referred to (26-31 percent of "in need") or initiate (17-21 percent) SU treatment. It also illustrates the second common problem—that even among those youth who initiated treatment, fewer than half engaged in treatment for 6 weeks (16-47 percent) or continuing care for at least 90 days (9 percent-26 percent). While there was significant variation in these rates by sites, this pattern of problems is consistent—with most youth being lost in the transition between systems, followed by low retention once they initiate treatment.

Validations of BH Service Cascade Estimates

Given the high rates of missing data and site to site variation, it is important to also validate the BH service cascade estimates. The first way we did this was to verify that screening, need, and referral were in fact the most common pathway to treatment initiation. Of the 2,613 youth records where SU treatment was initiated—75 percent followed all three steps along this expected pathway, 22 percent followed two steps in order with the third missing information, and 2.5 percent had only 1 of 3 steps. For the latter two patterns, data on the other steps was largely missing. Only 0.5 percent of the youth records documented SU treatment initiated without the CS agencies taking any of the first three steps in the cascade.

Second, we examined the predictors of each step both by univariate and multivariate analyses considering all potential sources of need and prior steps. Formal "Screening" was the strongest predictor of documenting "Need" in the record in both analyses (OR=114.6 & 932.7 respectively). "Need from any source" was the strongest univariate predictor of "referral" in the univariate analysis and the second strongest in the multivariate analysis (OR=9.0 & 2.7 respectively); "need from screening" was the second strongest in the univariate analysis and the strongest in the multivariate analysis (OR=4.6 & 2.9 respectively). A formal "Referral" by CS agency in turn was the strongest predictor of which youth actually initiated treatment (OR=195.1 & 141.6 respectively). These are all very large odds ratios. Also note that this was all prior to recoding approximately 1 percent of the cases where a latter step occurred with the prior step missing.

The only originally proposed BH service cascade step that did NOT fit was "Clinical Assessment." This activity was recorded less

TABLE 2
BH Services Cascade Number of Sites and Records by Step

Location	Juvenile Justice System				Transition				Substance Use Treatment			
BH Cascade Step	Screened		In Need		Referred		Initiated Treatment		Treatment Engagement		Continuing Care	
Method	Yes/ Total	Imputed Yes/ Total	Yes/ Total	Imputed Yes/ Total	Yes/ Total	Imputed Yes/ Total	Yes/ Total	Imputed Yes/ Total	Yes/ Total	Imputed Yes/ Total	Yes/ Total	Imputed Yes/ Total
N of Sites	33		33		32		23		20		19	
N = Yes	21,382	22,298	14,906	18,220	4,711	8,298	2,613	8,009	1,070	1,626	597	623
Total n of records	31,308		31.308		30,692		26,371		22,994		21,959	
Simple Rate												
% Total	68%	71%	48%	58%	15%	27%	10%	30%	4.7%	7.1%	2.7%	2.8%
% of In Need					31%	47%	21%	52%	10%	12%	6%	5%
% of Initiation									47%	24%	27%	9%
Relative Rate (lowest row above)	68%	71%	48%	58%	31%	47%	21%	52%	47%	24%	27%	9%

often than expected, often only on those who had screened positive, and in several agencies only after or as part of initiating treatment. Collapsing it into screening or dropping it (as we have done here) did not impact any of the rates by even 0.1 percent and would not change any of the reported results.

Third, we compared the relative rates reported in Table 2 with available national data (Figure 3). The first two columns on the left side are the relative rates of 2017 National Household Survey on Drug Use and Health (NSDUH; SAMHSA, 2018) and its broader definition of need for SU treatment (already in treatment, weekly use, or SUD) for youth (ages 12-17) without JJS contact (white with gray dots) and with JJS contact (gray with white dots). The next two columns show the relative rates from youth on community supervision as reported above in Table 2 and Figure 2. Relative to youth with any contact, youth on CS here had higher rates of need and similar rates of initiation. The second two columns on the right side show the relative rates from the 2013 Treatment Episodes Data Set-Discharge (TEDS-D; SAMHSA, 2015). Youth initiating treatment are again divided into those without JJS contact (white with gray dots) and with JJS contact (gray with white dots). The solid and hatched light grey, medium gray, and black bars are still from Table 2 and Figure 2. Youth without and with any JJS contact have relatively similar rates of SU treatment engagement for 6 weeks and continuing care for 90 days or more. Youth on CS in this study were found to have lower rates when based on the first method of original yes answers and much lower rates when using the second method with imputation (impacting both denominator and numerator).

FIGURE 1
Behavioral Health Services Cascade from Juvenile Community Supervision to Substance Use Treatment: Simple Rate (% of Total) of Surviving Step by Method

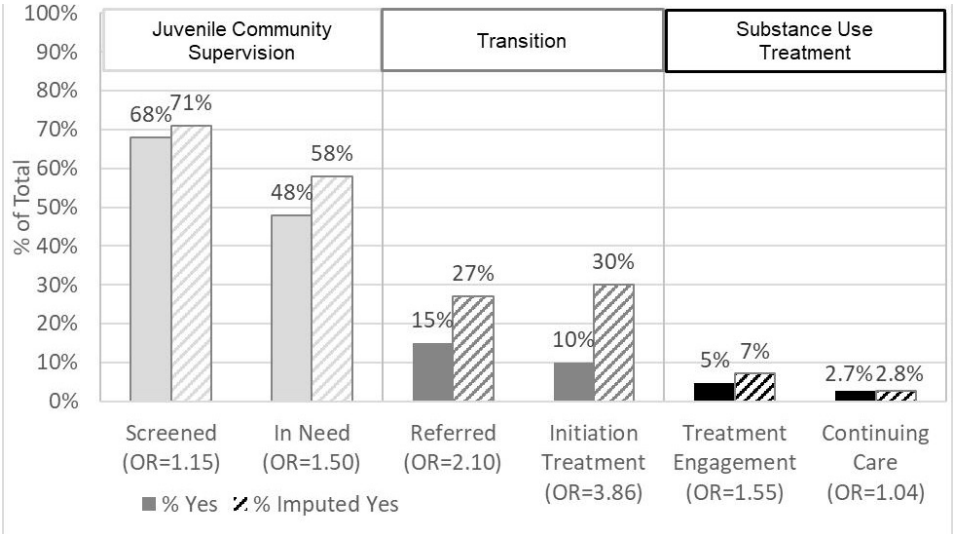
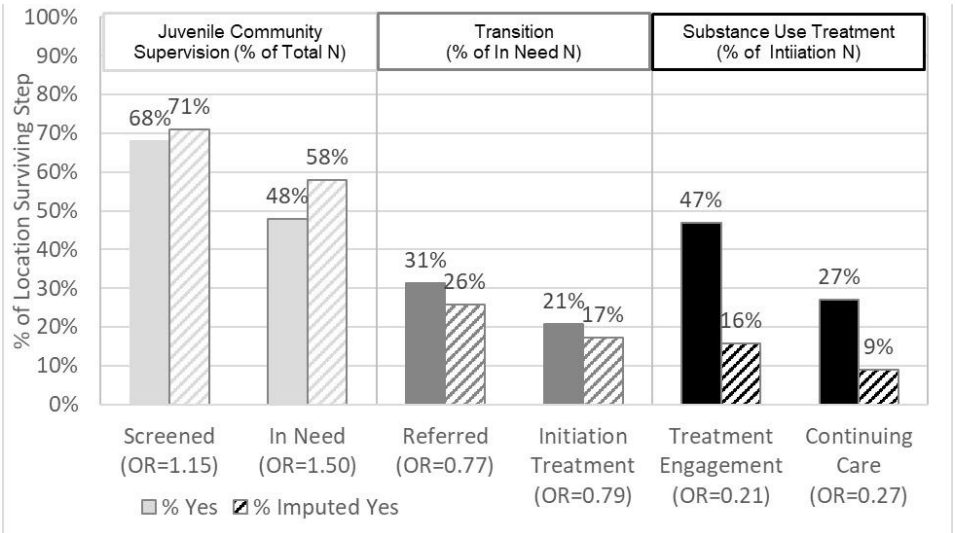


FIGURE 2
Behavioral Health Services Cascade from Juvenile Community Supervision to Substance Use Treatment: Relative Rate (% of N Entering Location) of Surviving Step by Method



Key Lessons about Current Practice

The study produced several key lessons about current practice listed below:

- **Data existed across multiple locations/ systems:** Where it existed, the 72 variables we sought were often collected through electronic and/or paper records and were not always readily accessible to the CS staff.
- **Terms and Definitions varied by CS agency:** A stay of probation contingent on good behavior was called different things in different sites (e.g., delayed probation, informal probation, diversion) and basic definitions and data capture procedures varied by agency (e.g., one state added multiple and subsequent charges to an existing record; another created separate records for each charge; a third allowed multiple charges in a record but started a new record if the youth had been released).
- **Data that are "Electronic" were not necessarily coded or available:** Instead it was often free text or a scanned document; there was also inconsistency in whether and how staff used these fields.
- **Dates were often missing:** Although date fields were common and/or expected in notes, they were frequently missing. When they existed, some dates referred to earlier encounters with CS (e.g., an earlier charge/ CS episode).
- **Some juvenile justice agencies did not allow the RC to have direct access to some information on justice records:** This meant that their attempts to combine records and data from a relational data set were often error prone, had to be indirectly "discovered," and had to have the dataset recreated (in one case multiple times) to ensure the most accurate data.
- **Staff turnover at the CS agency compounded problems:** Failure to keep sufficient documentation and/or having more than one person cross-trained on data tasks led to several short-term setbacks; this was potentially exacerbated if data tasks were added to the role of a CS person who was already overloaded.
- **Treatment data were not always readily**

accessible: In spite of their best efforts, about a third of the CS agencies could not obtain reliable data on SU treatment initiation, discharge, engagement, or continuing care.

Thus, although the justice partners working with each RC thought that all of the 72 variables proposed would be readily available; they initially overestimated the degree of access to and amount and quality of the available data within their respective systems.

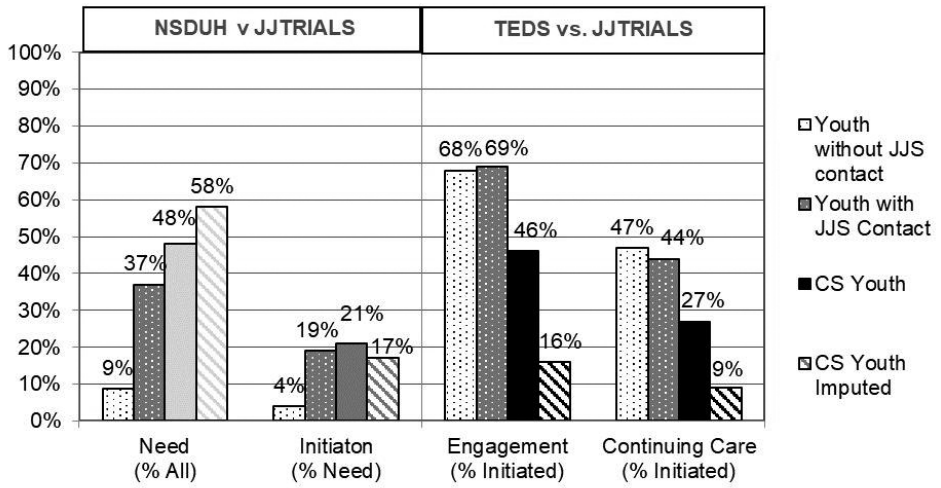
Discussion

Reprise of Findings

In spite of a wide array of issues and high rates of missing data, this article demonstrates the feasibility of using the BH Service Cascade framework in practice. With 1 in 8 adolescents with SUD passing through the JJS each year, the JJS is second only to schools as one of the best places to identify and intervene with youth that have SUD (Dennis, Clark, & Haung, 2014). The results here show that the JJS participating here were doing well at screening and identifying youth in need of SU treatment relative to national CS agency data (Scott et al., in press). However, the cascade results also show that two-thirds of the youth on CS with need were dropping out in the transition between systems of care (e.g., SU Treatment referral and initiation). Moreover, among those who initiated SU treatment, over half were out before six weeks of engagement. The latter is important, because six weeks is the threshold as a minimum amount of care as defined by the Healthcare Effectiveness Data and information Set (HEDIS) used by the National Commission on Quality Assurance (NCQA), Medicaid, and the Office of the National Coordinator (ONC) of the Affordable Health Care Act (https://www.ncqa.org/hedis/measures/initiation-and-engagement-of-alcohol-and-other-drug-abuse-or-dependence-treatment/). Even fewer were retained, stepped down, or had any kind of continuing care for the 90 days after SU treatment initiation recommended by researchers as more effective (NIDA, 2006; 2014). While there was CS Agency to Agency variation in rates, these were consistent empirical findings. These findings also rang true for the participating JJS partners.

Confidence in these findings were further strengthened by several types of validation. Among the youth who eventually initiated SU treatment, movement through the cascade in the order shown was the most common pattern observed, followed by moving through 2 steps in order with the other missing; only 0.5 percent initiated treatment without going through at least one of these steps in the CS agency. This suggests that indeed the BH Service Cascade is currently the main route for these youth on CS to enter treatment. This is very important to the JJS because, as noted in the literature review, continued substance use is a risk factor for recidivism, and access to treatment is associated with reducing both substance use and recidivism. Relative to national data, the rates were very similar for the first method of using only documented yes answers. For the second method of changing some missing to imputed yes answers, the rates were similar for need and initiation, but much lower for engagement and continuing care. While the population estimate increased, the reason for the latter is that the denominator population estimates were increasing even more.

FIGURE 3
Comparison to Relative Rates from National Data



Source: SAMHSA (2018) National Survey on Drug Use and Health (NSDUH), SAMHSA (2015) Treatment Episode Data Set-Discharge (TEDS-D), and JTRIALS Table 2 from this paper

Limitations and Methodological Challenges

It is important to acknowledge that the kinds of real data from actual CS agencies have several limitations and present methodological challenges to use. For most of the CS agencies, data were missing for many different reasons, including that it was not collected, not in the right form or not collected consistently, in a difficult or unusable format, missing from the field, or simply not available (e.g., when a state or SU treatment provider would not send it). The RC and JJS partners were able to work through many but not all of these issues with the collaborating CS agencies and states. Although this was one of the largest multisite studies of CS agencies to date, JJ-TRIALS did not use a representative sample. However, the characteristics of the youth and agencies were diverse and similar to what was reported in a survey of CS agencies from a nationally representative sample of counties (Scott et al., in press). The fact that the national survey using only agency-level reports and this study using only CJS/SU Treatment records reach similar conclusions further strengthens confidence in the findings in spite of these limitations.

Recommendations for CS Agencies Going Forward

1. Review the 72 variables and their response sets identified by the JJ-TRIALS cooperative agreement and either adopt them or have clear rationales for why some of them may not be needed or a more detailed or different response set may be needed for your agency (note other/existing variables can be kept for other reasons if needed).
2. Set up a quality assurance protocol to review data completion and consistency in use.
3. Use electronic systems with automating checks (e.g., dates preceding current intake or after current date), simple recodes (e.g., skip outs), and data sharing with other systems (e.g., state, SU treatment providers) where possible.
4. Set up documentation on key terms, definitions, data management protocols/syntax, including how to generate and interpret reports for consistency over time and to address staff turnover/training; updating when changes are necessary or agreed upon).

5. Dedicate staff or set up a memo of understanding (MOU) to work with a local university or consultant to provide support to manage the above, generate reports and/or help CS agencies interpret reports/suggest alternatives, and evaluate them.
6. Encourage CS staff to gather and record treatment referral, initiation, and progress data on their clients in a consistent and systematic way (e.g., through training, incentives, and increasing the "user-friendliness" of data systems).
7. Have the youth on CS and their parent/guardian complete/sign a "limited release" or "disclosure of information" request at the time of referral that is good for at least 12 months.

The last step follows the regular system by which SU treatment agencies share data with each other and other health care providers whether by paper, fax, or electronically—which is important, since JJS is less likely to be the major funder of SU treatment than the Medicaid, state block grants, managed care, or private insurance providers.

Finally, there is also the question of whether or not to impute yes answers from missing data. If the goal is to examine and track improvements on these rates, the first method of actual yes answers vs. other is simpler, easier to explain, closer to rates from other sources, and likely the best to use. If the goal is to estimate the population size of youth in need or what will happen to it if practice is changed, then using both methods (as we have here) may give a better lower and upper bound. But as shown here, one must be aware that the imputed version may actually have lower rates in the later steps of the cascade due to larger denominators.

Conclusion

The hypothesized BH Service Cascade (Belenko et al., 2017) works in actual juvenile CS agencies as expected with the exception of the clinical assessment step—which can be collapsed into screening or dropped (as we have) with minimal to no consequence. When used across sites as done here, it is important to recognize and address the variations in data availability by site. In this example we can evaluate intervention designed to changes in the first 3 steps of the cascade (i.e., JJS CS screening, need, referral) with data from all sites. But to evaluate interventions designed to change the last 3 steps of the cascade (i.e., SU treatment initiation, engagement, and continuing care), the analyses have to be limited to the 19-21 sites with SU treatment data in their records. Future state/regional systems or research studies with multiple sites will need to similarly take into account data availability when evaluating the impact of other interventions.

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APPENDIX.
Data Availability, Prevalence, and Site variation in the JJS Youth Records

	% Available	% Prevalence	% Site Min Prev.	% Site Max Prev.
Record Information				
Episode Close Flag	77%	70%	7%	100%
Episode Close Date	53%	70%	7%	100%
Adjudication Flag	97%	35%	4%	100%
Adjudication Date	58%	62%	0%	100%
Record Update Date	100%	100%	100%	100%
Biological Testing				
Biological Testing Flag	83%	45%	0%	86%
Alcohol Results	77%	0.2%	0%	5%
Amphetamine Results	83%	3%	0%	15%
Cannabis Results	83%	19%	0%	49%
Cocaine Results	83%	1%	0%	4%
Opioid Results	83%	1%	0%	3%
Other Drug Results	83%	3%	0%	13%
Substance Use Screening				
Substance Use Screen Flag	85%	81%	24%	100%
SU Screen First Date	84%	81%	22%	100%
SU Screen Last Date	84%	80%	22%	100%
SU Screen Type	86%	—	—	—
Local measure	—	2%	0%	76%
CRAFFT	—	2%	0%	35%
GAIN-SS	—	1%	0%	51%
MAYSI-2	—	19%	0%	97%
SASSI	—	3%	0%	38%
YASI (from notes)	—	12%	0%	100%
PACT (from notes)	—	9%	0%	100%
Other instruments	—	31%	0%	98%
SU Screen Positive	83%	28%	2%	87%
Clinical Assessment				
Clinical Assessment Flag	53%	45%	0%	100%
CA First Date	38%	23%	0%	100%
CA Last Date	32%	9%	0%	100%
CA Type	44%	—	—	—
Local measure	—	0.3%	0%	100%
ADI	—	0.01%	0%	0.1%
Child and Adol. Funct. Assess. Scale	—	0.1%	0%	95%
CRAFFT	—	0.1%	0%	0.7%
DISC - Other scales	—	0.02%	0%	0.2%
GAIN-Q3	—	0.3%	0%	27%
MAYSI-2	—	2%	0%	7%
SCID	—	12%	0%	70%
SASSI	—	1%	0%	13%
Other instruments or combinations	—	32%	0%	71%
CA Independent Flag	47%	20%	0%	100%
CA SU Positive	49%	5%	0%	99%

	% Available	% Prevalence	% Site Min Prev.	% Site Max Prev.
Other Source of Information on Needs				
Other SU Positive	66%	—	—	—
No details given	—	64%	0%	100%
Judicial Mandate	—	0.2%	0%	6%
Other staff recommendations	—	12%	0%	55%
Undocumented need	—	0.2%	0%	3%
Other (describe in notes)	—	3%	0%	100%
Need from All Sources				
Need Tx or CA Flag	88%	54%	13%	99%
Need Tx Flag	58%	11%	0%	40%
Referral to Substance Use Treatment				
Referral To Tx or CA Flag	62%	24%	3%	100%
Referral to Tx Flag	54%	6%	0%	100%
Referral to Treatment Date	59%	20%	0%	100%
Substance Use Treatment				
Treatment Flag	53%	16%	0%	100%
Treatment Intake Date	53%	15%	0%	100%
Treatment Discharge Date	51%	11%	0%	100%
Tx Level of Care	51%	—	—	—
Outpatient	—	10%	0%	58%
Intensive outpatient/day program	—	0.1%	0%	0.6%
Group home	—	0.0%	0%	0.2%
Residential/inpatient	—	0.8%	0%	15%
Other	—	0.1%	0%	2%
Treatment Type	50%	—	—	—
Local treatment program(s)	—	0.1%	0%	3%
MET/CBT	—	1.3%	0%	10%
MI	—	0.01%	0%	0.1%
Other SU Tx	—	9.0%	0%	51%
Demographics				
Age	100%	—	—	—
0-10	—	1%	0%	4%
11-14	—	36%	18%	58%
15-17	—	63%	40%	81%
18+	—	1%	0%	8%
Date of Birth	90%	100%	100%	100%
Gender	100%	—	—	—
Female	—	27%	8%	39%
Male	—	73%	61%	92%
Hispanic	85%	21%	0%	100%
Race	98%	—	—	—
Asian/Hawaiian/Pacific Islander	—	1%	0%	6%
Black/African-American	—	47%	5%	96%
White/Caucasian	—	49%	4%	91%
Native American/Alaskan Native	—	0.2%	0%	2%
Other Race	—	2%	0%	15%
Mixed or Multiple Races	—	1%	0%	13%

	% Available	% Prevalence	% Site Min Prev.	% Site Max Prev.
Clinical Problems				
Any SU Problem	56%	56%	14%	100%
Alcohol Problem	56%	9%	0%	45%
Cannabis Problem	47%	28%	0%	59%
Rx Drug Misuse Problem	47%	1%	0%	7%
Other Drug Problems	47%	7%	0%	25%
Tobacco Problems	35%	1%	0%	5%
Risky Sexual Activity	0.2%	2%	0%	100%
Risky Needle Activity	0.2%	0%	0%	0%
Victimization	40%	13%	0%	100%
Violence	32%	39%	0%	100%
Externalizing MH Problems	47%	19%	1%	86%
Internalizing MH Problems	51%	17%	1%	100%
Suicide Risk	49%	11%	1%	74%
Physical Health Problems	45%	2%	0%	14%
Serious Family Problems	38%	43%	0%	100%
Learning or Develop Disabilities	35%	9%	0%	48%
Charges				
Violent Charge	99%	25%	2%	39%
Property Charge	99%	30%	6%	65%
AOD Related Charge	99%	14%	0%	31%
Probation/ Parole Violation	67%	12%	0%	31%
Weapons Offense	99%	7%	0.2%	23%
Other Status Offense	99%	11%	0%	51%
Other Charges	99%	32%	1%	64%
Charge Severity	93%	—	—	—
Felony	—	33%	12%	86%
Misdemeanor	—	56%	14%	87%
3 Summary/citation	—	3%	0%	22%
Status	—	3%	0%	44%
Other	—	5%	0%	60%
Risk of Recidivism				
Recidivism Assessment Type	74%	—	—	—
Staff rating	—	0.1%	0%	2%
Local measure	—	8%	0%	100%
PACT	—	26%	0%	100%
YASI	—	15%	0%	100%
YLS/CMI	—	13%	0%	100%
Other measure	—	10%	0%	100%
Recidivism Risk Level	75%	—	—	—
Low	—	31%	0%	57%
Medium	—	32%	0%	60%
High	—	16%	0%	55%
Very high	—	3%	0%	29%

	% Available	% Prevalence	% Site Min Prev.	% Site Max Prev.
Justice System Status				
Child In need of Supervision	78%	11%	0%	63%
Diversion	85%	5%	0%	37%
Probation	100%	49%	13%	100%
Parole	88%	0.2%	0%	1%
Juvenile Drug Court	80%	1%	0%	9%
Other Community Supervision	100%	67%	0.1%	95%
Detention	85%	30%	0%	83%
Other justice status	83%	7%	0%	62%

\a "Not Applicable/Skip" coding is treated as "available," but not broken out as a % in prevalence.

The Validity of TCU Drug Screen 5 for Identifying Substance Use Disorders among Justice-Involved Youth

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THE RATE OF SUBSTANCE use (SU) among individuals involved in the juvenile justice (JJ) system is high. JJ-involved youth are nine times more likely to develop a substance use disorder (SUD) when compared with youth who do not come into contact with the JJ system (Substance Abuse and Mental Health Services Administration, 2015). In fact, nationwide, 78 percent of JJ-involved youth report alcohol use, 85 percent report marijuana use, and 7 percent report opioid use (Zhang, 2004; Mulvey, Schubert, & Chassin, 2010; CASA, 2004; McClelland, Elkington, Teplin, & Abram, 2004). SU among this vulnerable JJ population is related to increased risk of delinquent behavior as well as future recidivism (Aalsma et al., 2015; Schubert, Mulvey, & Glasheen, 2011).

Identifying youth at risk of SUD as they enter the JJ system is an essential component of any approach designed to address SU and reducing recidivism risk (Farabee, Shen, Hser, Grella, & Anglin, 2001). As specified in the risk-need-responsivity (RNR) model, three principles should guide assessment and treatment for persons involved in the justice system (Andrews, Bonta, & Hoge, 1990; Andrews, Bonta, & Wormith, 2011). The risk principle highlights the importance of first identifying an individual's level of risk of future offending in order to determine the necessary level of program intensity. The need principle states that rehabilitation programs should place emphasis on targeting the needs of the individual that are directly related to his or her criminal behaviors. The responsivity principle underscores the importance of choosing an intervention that aligns with the individual's learning style and capabilities. Increasingly, the RNR framework has been used to guide JJ system reforms and has resulted in systematic efforts to identify the unique needs of youth as agencies work toward lowering recidivism rates and increasing public safety (e.g., Schwartz, Barton, & Orlando, 1991; Seigle, Walsh, & Weber, 2014).

According to the Juvenile Justice Behavioral Health Services Cascade (Belenko et al., 2017), the first step in a best-practice approach to addressing SU needs among youth is through universal and evidence-based screening. This means that all youth should be screened upon entry into the JJ system using a brief tool that has been validated through systematic research and that maps to clinically meaningful indicators of SU problems. Screening results above a given threshold should be used to trigger a comprehensive assessment, and information from both screening and assessment should inform the frequency, intensity, and content of recommended treatment services (Belenko et al., 2017). JJ agencies, however, often fall short of screening 100 percent of youth. Indeed, only 78 percent of youth who enter the JJ system ever receive a screening instrument, and only 52 percent ever receive a full assessment (Dennis et al., 2018). As a result, only 65 percent of youth entering the JJ system have their needs identified (Dennis et al., 2018).

Furthermore, many existing SU screeners in use with JJ-involved youth are not validated and/or do not map directly onto state-of-the-art clinical diagnostic tools such as the Diagnostic and Statistical Manual of Mental Disorders V-R (DSM-5; American Psychiatric Association, 2013). While commonly used within JJ setting, risk assessment tools that include SU items are not designed to diagnose SU or mental health problems (Vincent, Guy, & Grisso, 2012); yet many JJ agencies rely solely on risk and need assessments when making SU referral decisions. Identifying SU treatment needs also can be hindered by limited staff resources (e.g., lack of training on how to administer

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and interpret screeners), financial resources (e.g., costs associated with some validated instruments), and time to administer (e.g., unnecessarily lengthy instruments).

These barriers highlight the need for an evidence-based screening tool that is readily accessible, brief, maps on to the DSM-5 criteria for SUDs, and is easy to administer and interpret. One promising brief (and free) screener is the TCU Drug Screen 5 (TCU DS 5), which comprises 17 self-report items that map directly onto the DSM-5 criteria for SUDs. Originally developed based on the DSM-3R (Knight, Blue, Flynn, & Knight, 2018), the TCU DS was updated to reflect changes put forth in the DSM-5 (e.g., use of "disorder" instead of "dependence;" addition of three classifications: mild, moderate, and severe disorders). When the two versions of the TCU DS were compared in a sample of justice-involved adolescents and adults, results indicated similar SUD classification rates; however, the TCU DS 5 diagnosed significantly more individuals with a SUD, most of whom were classified as mild (Knight, Blue, Flynn, & Knight, 2018).

Despite the TCU DS 5's superiority in identifying individuals with SU problems, the validity of the TCU DS 5 has yet to be demonstrated, particularly among a JJ population. Therefore, the purpose of the current study is to assess the validity of the TCU DS 5 screener by comparing it against a state-of-the-art assessment instrument: the Global Appraisal of Individual Needs (GAIN).

Adolescent self-reports of SU on the GAIN have previously been shown to be consistent with parent reports (Dennis, Titus Diamond, et al., 2002) and on-site urine analyses (UAs; Godley, Godley, Dennis, Funk, & Passetti, 2002). Additionally, 24 months after intake, GAIN self-reports of SU were found to be consistent with any self-report, positive UA, or positive saliva test for any drug, cocaine, opioids, and marijuana (Dennis, Scott, & Funk, 2003).

Method

Participants

The study sample consisted of 320 male detainees, recruited from two male-only Midwestern JJ centers. Participant age ranged from 13 to 20 years old ($M = 16.67$, $SD = 1.33$); 63 percent of the sample identified as African American, 23 percent as white, and 14 percent as Hispanic. Seventeen participants were excluded from analyses due to missing data on the TCU DS 5 or GAIN subscales, resulting in a final sample of 303 male adolescents.

Procedure

Approval from the Institutional Review Board was obtained prior to study implementation. Data were collected from the juvenile participants at the two Midwestern correctional facilities. All new admissions between January and May 2016 completed the TCU DS 5 screener and GAIN assessment during the intake process. A data-sharing agreement was enacted between the agency and research center and de-identified data were shared through a secure data service. Before submitting the datasets to the research center for secondary analysis, JJ agency staff assigned a unique identifier to each youth (which enabled linking TCU DS 5 and GAIN data) and ensured that all personally identifiable information was removed.

Measures

The TCU DS 5 is an evidence-based screener that can be administered to both adolescents and adults (Knight, Becan, Landrum, Joe, & Flynn, 2014; Knight, Blue, Flynn, & Knight, 2018) as an independent self-report or during small groups (with respondents following along as a proctor reads each item aloud). Participants first respond to a series of yes/no questions regarding their SU over the last 12 months (prior to being incarcerated, if applicable). There are 17 items in total, taking approximately five minutes to complete. The first 11 items can be summed to produce a total score ranging from 0 to 11 ("yes" to either item 10a or 10b [tolerance criteria; e.g., "Did you need to increase the amount of a drug you were taking so that you could get the same effects as before?"] and either 11a or 11b [withdrawal criteria; e.g., "Did you ever keep taking a drug to relieve or avoid getting sick or having withdrawal symptoms?"] each counts as 1). Although items 12 through 17 are not included as part of the total score, these items inform treatment decisions (e.g., "Which drug caused the most serious problem during the last 12 months?"). Interpretation of the TCU DS 5 total score corresponds with the DSM-5 criteria for SUDs (American Psychiatric Association, 2013): a score of 0-1 indicates no SUD, 2-3 indicates a mild SUD, 4-5 indicates a moderate SUD, and 6 or higher indicates a severe SUD.

The Global Appraisal of Individual Needs (GAIN; Dennis, 1999) is an evidence-based comprehensive assessment administered in an interview format that can also be used with both adults and adolescents. It takes approximately 120 minutes to complete the full GAIN assessment (Dennis, Titus, White, Unsicker, & Hodgkins, 2003). To assess convergent validity of the TCU DS 5, three SU subscales were used: Substance Frequency Scale (SFS), Substance Problem Scale—Lifetime (SPSL), and Substance Problem Scale—Past Month (SPSM). The SFS is the average percentage of days (in the past 90 days) reported of any alcohol or other drug use, including marijuana, crack/cocaine, heroin/opioid, and other drug use. The SPSL is a count of lifetime symptoms of substance abuse, dependence, and substance-induced health and psychological disorders based on the DSM-IV. The SPSM is composed of the same items as the SPSL, but responses are given for the past month.

To assess discriminant validity, four additional GAIN subscales were analyzed. The Treatment Motivation Index (TMI) represents a count of five items endorsed regarding the client's perception of sources of external pressure to be in treatment and his or her own need for treatment, support for treatment, and hope for health through treatment (e.g., "Do you currently feel you can get the help you need in an alcohol or drug treatment program?"). The Self-Efficacy Scale (SES) is a count of five items on the number of ways the client believes he or she could avoid thinking about or using alcohol or drugs (e.g., "Do you currently think you could avoid using alcohol or drugs with your friends?"). The number of non-SU DSM diagnoses and the number of prior convictions were also assessed via the GAIN.

Analytic Plan

Cross tabulations were used to compare TCU DS 5 and GAIN classifications, and Kappa coefficients were used to measure the degree of chance-corrected agreement between the classification rates. Because the GAIN subscales correspond to three categories (no SUD, abuse, or dependence) and the TCU DS 5 corresponds to four categories (no SUD, mild, moderate, or severe SUD), TCU DS 5 outcomes were collapsed so that Kappa coefficients could be calculated: TCU DS 5 "no diagnosis" (score of 0-1), mild/moderate SUD (score of 2-5), and severe SUD (score of 6 or greater). The analyses were performed a second time, further collapsing GAIN outcomes into "no diagnosis" versus "diagnosis" and TCU DS 5 outcomes into "no diagnosis" (score of 0-1) versus "diagnosis" (score of 2 or greater).

Convergent and divergent validity was assessed using a Pearson product-moment correlation to examine the relationship

between GAIN and TCU DS 5 outcomes with theoretically related GAIN subscales (convergent validity) and theoretically unrelated GAIN subscales (divergent validity). For convergent validity, GAIN and TCU DS 5 outcomes were analyzed against the TMI and SES of the GAIN. For divergent validity, GAIN and TCU DS 5 outcomes were analyzed against the number of non-SU DSM diagnoses and number of prior convictions.

Results

The average number of items endorsed among juveniles on the TCU DS 5 was 3.18 (*SD* = 3.85). For the GAIN, average scores for the SFS, SPSL, and SPSM were 18.53 (*SD* = 18.41), 5.83 (*SD* = 4.57), and 1.13 (*SD* = 2.63), respectively. Results revealed a statistically significant, positive correlation between the continuous measures of the TCU DS 5 and the SFS ($r = 0.14$, $N = 303$, $p = .014$, $R2 = 0.02$) and SPSL ($r = 0.25$, $N = 303$, $p \leq .001$, $R2 = 0.06$); however, there was no significant correlation between the continuous measures of the TCU DS 5 and SPSM ($r = 0.03$, $N = 303$, $p = .580$, $R2 = 0.001$). The TCU DS 5 classification rates are summarized in Table 1.

The drug that triggered the most serious problem during the previous 12 months, according to responses on the TCU DS 5, was marijuana (34.6 percent), followed by alcohol (4.8 percent), synthetic marijuana (often referred to as "K2" or "spice"; 3.2 percent), and methamphetamine (2.6 percent). Interestingly, despite only 34.6 percent of the sample reporting marijuana as causing the most serious problem, 43.3 percent reported daily marijuana use. Among the other most problematic substances, 4.8 percent reported daily alcohol use, 3.8 percent reported daily synthetic marijuana use, and 1.9 percent reported daily methamphetamine use.

Cross tabulations were conducted comparing TCU DS 5 SUD classification (0 = score of less than 2, 1 = score of 2 or greater) to any SFS, SPSL, or SPSM SUD classification (0 = score of 0, 1 = score of 1 or greater; see Table 2). Cohen's Kappa coefficients were calculated to determine if there was agreement between the TCU DS 5 and GAIN subscales diagnosis of any SUD for the juveniles. There was significant agreement between TCU DS 5 and SFS diagnosis of any SUD, $\kappa = 0.15$, $p = .002$, 95% CI [0.06, 0.25]. There also was significant agreement between TCU DS 5 and SPSL diagnosis of any SUD, $\kappa = 0.15$, $p \leq .001$, 95% CI [0.07, 0.23]. However, agreement between TCU DS 5 and SPSM diagnosis of any SUD was not significant, $\kappa = 0.05$, $p = .307$, 95% CI [-.05, .15]. These results indicate that the TCU DS 5 and GAIN SFS and SPSL subscales are diagnosing youth SUD in a similar manner.

Cross tabulations were again used to compare TCU DS 5 SUD severity diagnosis (0 = score of less than 2, 1 = score of 2-5, 2 = score of 6 or greater) to SFS SUD severity diagnosis (0 = score of 0, 1 = score of 1-13, 2 = score of 14 or greater), SPSL (0 = score of 0, 1 = score of 1-9, 2 = score of 10-16), or SPSM SUD diagnosis (0 = score of 0, 1 = score of 1-9, 2 = score of 10-16; see Table 3, next page). Cohen's Kappa coefficients were calculated to determine if there was agreement between the TCU DS 5 and GAIN subscales' diagnosis of SUD severity for the juveniles. Again, there was significant agreement between TCU DS 5 and SFS severity of SUD, $\kappa = 0.11$, $p = .002$, 95% CI [0.04, 0.19]. There was also significant agreement between TCU DS 5 and SPSL severity of SUD, $\kappa = 0.09$, $p = .004$, 95% CI [0.03, 0.15]. However, agreement between TCU DS 5 and SPSM severity of SUD was not significant, $\kappa = 0.01$, $p = .883$, 95% CI [-0.07, 0.08]. These results again indicate that the TCU DS 5 and GAIN SFS and SPSL subscales are diagnosing youth SUD in a similar manner.

To test for convergent validity, Pearson product-moment correlations between TMI and Self-Efficacy Scale and the continuous scores for the TCU DS 5 and GAIN SFS, SPSL, and SPSM were computed. The results revealed that TCU DS 5 was significantly positively related to TMI scores ($r = 0.25$, $N = 299$, $p \leq .001$). TMI scores were also positively related to SFS ($r = 0.25$, $N = 307$, $p \leq .001$), SPSL ($r = 0.65$, $N = 307$, $p \leq .001$), and SPSM ($r = 0.35$, $N = 307$, $p \leq .001$). Additionally, TCU DS 5 was significantly negatively related to SES scores ($r = -0.15$, $N = 303$, $p = .011$). SES scores were also significantly negatively related to SFS ($r = -0.30$, $N = 311$, $p \leq .001$), SPSL ($r = -0.48$, $N = 311$, $p \leq .001$), and SPSM ($r = -0.39$, $N = 311$, $p \leq .001$). These results provide evidence for the convergent validity of the TCU DS 5.

TABLE 1
TCU Drug Screen 5 classification rates.

	No SUD	Mild SUD	Moderate SUD	Severe SUD
# of Juveniles	161	41	29	81
% of Sample	51.6%	13.1%	9.3%	26.0%

Note: SUD = substance use disorder.

TABLE 2
TCU Drug Screen 5 and GAIN Substance Frequency Scale, Substance Problem Scale—Lifetime, and Substance Problem Scale—Past Month classifications of SUD or no SUD.

		TCU Drug Screen 5		
		No SUD	SUD	Total
Substance Frequency Scale	**No SUD**	49 16.2%	24 7.9%	73
	SUD	106 35.0%	124 40.9%	230
	Total	155 51.2%	148 48.8%	303
Substance Problem Scale—Lifetime	**No SUD**	34 11.2%	10 3.3%	44
	SUD	121 39.9%	138 45.5%	259
	Total	155 51.2%	148 48.8%	303
Substance Problem Scale—Past Month	**No SUD**	117 38.6%	104 34.3%	221
	SUD	38 12.5%	44 14.5%	82
	Total	155 51.2%	148 48.8%	303

Note: SUD = substance use disorder.

TABLE 3
TCU Drug Screen 5 and GAIN Substance Frequency Scale, Substance Problem Scale—Lifetime, and Substance Problem Scale—Past Month classifications of SUD.

		TCU Drug Screen 5			
		No SUD	Mild/Moderate SUD	Severe SUD	Total
Substance Frequency Scale	No SUD	49 16.2%	9 3.0%	15 75.0%	73
	Abuse	44 14.5%	23 7.6%	17 5.6%	84
	Dependence	62 20.5%	38 12.5%	46 15.2%	146
	Total	155 51.2%	70 23.1%	78 25.7%	303
Substance Problem Scale—Lifetime	No SUD	34 11.2%	2 0.7%	8 2.6%	44
	Abuse	44 14.5%	13 4.3%	10 3.3%	67
	Dependence	77 25.4%	55 18.2%	60 19.8%	192
	Total	155 51.2%	70 23.1%	78 25.7%	303
Substance Problem Scale—Past Month	No SUD	117 38.6%	46 15.2%	58 19.1%	221
	Abuse	22 7.3%	9 3.0%	12 4.0%	43
	Dependence	16 5.3%	15 5.0%	8 2.6%	39
	Total	155 51.2%	70 23.1%	78 25.7%	303

Note: SUD = substance use disorder.

To test for divergent validity, Pearson product-moment correlations between number of non-SU DSM diagnoses and number of prior convictions and the continuous scores for the TCU DS 5 and GAIN SFS, SPSL, and SPSM were computed. The results revealed that there was no significant relationship between TCU DS 5 and number of non-SU DSM diagnoses (r = 0.09, N = 283, p = .128). Number of non-SU DSM diagnoses also were not significantly related to SFS (r = -0.01, N = 290, p = .899), SPSL (r = 0.11, N = 290, p = .055), or SPSM (r = 0.03, N = 290, p = .606). Additionally, TCU DS 5 was not significantly related to number of prior convictions (r = -0.04, N = 304, p = .511). Number of prior convictions also was significantly unrelated to SFS (r = -0.06, N = 311, p = .290) or SPSM (r = -0.08, N = 311, p = .140). However, SPSL was significantly negatively related to the number of prior convictions (r = -0.13, N = 311, p = .027). These results provide evidence for the discriminant validity of the TCU DS 5.

Discussion

The current study helps establish the validity of the TCU DS 5 as an evidence-based SU screener by comparing it to a well-established and well-validated assessment instrument. The TCU DS 5 is comparable to the GAIN, especially with assessment questions designed to diagnose SUD over similar time frames. The TCU DS 5 appears to be more in line with lifetime SU scales from the GAIN rather than past month, which is not surprising given that the time frame for the TCU DS 5 is 12 months (identical to the DSM-5 and closer to "lifetime" for some adolescents). The TCU DS 5 was related to expected domains of treatment motivation and self-efficacy, and not related to divergent domains (number of non-SU DSM diagnoses and prior convictions). When examining the interrelations among SU and other indicators, patterns of associations with the TCU DS 5 are similar to those seen for comparable GAIN scores. These results justify the use of the TCU DS 5 as a quick, cost-effective method for screening for SU in adolescents in JJ settings.

The TCU DS 5 represents a viable and cost-effective option for JJ agencies seeking to identify and link youth with SUDs to needed services. The TCU DS 5 is available for free, and can be easily implemented as part of a comprehensive best-practice approach to addressing SU among juveniles (Belenko et al., 2017). Because it maps directly on to DSM-5 criteria, it can serve as a supplement to standard needs and risk assessments administered to all youth as part of standard intake procedures and can more appropriately inform referral decisions regarding further assessment of appropriate levels of care (Mee-Lee, 2013).

Incorporating any new tool into standard practice, including the TCU DS 5, should be done systematically, particularly given the implementation challenges typically experienced within justice settings (see Aarons, Hurlburt, & Horwitz, 2011). For example, if an oversight agency mandates use of a specific screener that does not map to the DSM-5, agency leadership may need to train individuals responsible for conducting youth screening protocols on the benefits of adding a new tool in order to reduce resistance and gain buy-in. Likewise, agencies might consider piloting the new screening tool with a subset of incoming youth, solicit input (e.g., from probation or court officers, behavioral health partners to which JJ refers youth) and address any problems in implementing it prior to agency-wide roll out. Ideally, experts in the JJ field recommend that screens be given to youth within 24 hours of admission, repeated regularly while they are in custody, and given again prior to release (Wasserman et al., 2003). Timely screening of youth as they enter the JJ system would result in increased identification of youth in need of referral to services. Additionally, timely screening could improve communication between adolescents and juvenile probation officers during the intake process, which in turn could facilitate communication of the identified needs between the probation officers and behavioral health staff (particularly because DSM-5 criteria are used by behavioral health clinicians; McLellan & Meyers, 2004). The results of the screens can then be used to outline explicit decision criteria for service referrals within the JJ system.

Despite the positive implications of this study, there are limitations that should be addressed. First, this study is limited by the differing timetables of the TCU DS 5 and GAIN. While the TCU DS 5 uses a 12-month

time frame (identical to the DSM-5 time frame), the GAIN covers the past 90 days (SFS), lifetime (SPSL), or past month (SPSM). Although the results follow a similar pattern, with the TCU DS 5 identifying fewer instances of SUD than SPSL and more instances of SUD than SFS and SPSM, it would be helpful to compare the TCU DS 5 to an assessment that covers SU during the past 12 months. The TCU DS 5 maps on to the DSM-V, while the GAIN maps on to the DSM-IV. The different versions of the DSM categorize SUD differently: the DSM-IV categorizes SUD as none, abuse, or dependence, while the DSM-V categorizes it as none, mild, moderate, or severe. Due to this limitation, the analyses performed required that the TCU DS 5 (DSM-V) be collapsed across the mild and moderate categories. Additionally, the sample consisted of only male juveniles, and findings may not generalize to females or adolescents in non-justice settings. For these reasons, the results should be replicated with female and non-justice samples.

The current study provides a case for the validity of the TCU DS 5 as a SU screener for JJ-involved youth. The TCU DS 5 can be implemented into routine intake procedures within JJ systems, which would increase the number of youth whose SU needs are identified. As a result, more youth potentially would be linked to treatment services and matched with the appropriate level of care. In instances where quick decisions need to be made regarding referral for SU services (e.g., when staff resources and time do not permit comprehensive assessment), the TCU DS 5 offers a valid and viable means for determining which youth should be linked to behavioral health providers. While this screener is not intended to replace comprehensive assessment in cases where a potential SUD is identified, it offers a simple way to improve identification and streamline existing assessment and treatment linkage protocols. Consistent use of evidence-based SU screeners is the first step in identifying and addressing the behavioral health treatment needs of this vulnerable population and reducing likelihood of continued substance use and delinquency.

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