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WASHINGTON UNIVERSITY IN ST. LOUIS

Brown School of Social Work

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Exploring the Service Utilization of Formerly Incarcerated Persons with Substance Use
Disorders

by

Sara Beeler-Stinn, LCSW, MPA

A dissertation presented to
The Graduate School
of Washington University in
partial fulfillment of the
requirements for the degree
of Doctor of Philosophy

May 2021

St. Louis, Missouri

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It will *always* take a village.

Sara Beeler-Stinn

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ABSTRACT OF THE DISSERTATION

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Washington University in St. Louis, 2021

Professor David Patterson Silver Wolf, Chair

Professor Brett Drake, Co-Chair

We are in a new era of mass reentry from years of mass incarceration (Chamberlain & Wallace, 2016) that will be complicated by challenging conditions at release (Mallik-Kane & Visher, 2008). Recent data suggests that rearrest rates within nine years of release are over 80% among individuals released from prison (Alper et al., 2018). These challenges are further complicated by drug and alcohol abuse with over 20 million individuals aged 12 and older reporting living with a substance use disorder (SAMSHA, 2019). Incarcerated and formerly incarcerated populations are estimated to have rates of substance use disorders (SUDs) often 10 to 12 times greater than the general population (McCarthy, 2017). Formerly incarcerated populations are often met with fragmented service delivery systems that are coupled with stigma that impact how and if needed treatment/services are accessed (Baillargeon et al., 2010; Begun et al., 2016).

There still remains a dearth of literature on the array of services that are being utilized after release by formerly incarcerated persons with substance use disorders (Mallik-Kane & Visher, 2009; Morse et al., 2017; Kahn et al., 2019). Additionally, there is still more to know on

the extent to which types of social support inform health behavior change among formerly incarcerated men and women (Nargiso et al., 2014). Further, the research would benefit in understanding how the collective services that are being utilized post-release, among formerly incarcerated men and women with SUDs, associate with reintegration outcomes (Mallik-Kane & Visser, 2009).

This dissertation study uses secondary data from a multi-state study of incarcerated men and women in stated prison preparing to release into the community (Pettus-Davis et al., 2019). The author utilized a subsample of the control arm focusing on those diagnosed with a SUD (alcohol and/or drug use disorder). The study, analysis, and interpretation were guided by the *Behavioral Model of Health Services Use* (Andersen, 1995), along with applying a *gender responsive treatment* perspective (Covington, 2002; Covington & Bloom, 2006) as well. Multilevel logistic regressions, bivariate mixed logistic regressions, and mixed effects regressions were utilized for respective chapters and aims. Implications for practice and research are discussed.

Chapter 1: Dissertation Introduction

Years of mass incarceration have created a new era and a new term – mass reentry – that signifies the staggering number of prisoners being released every year (Chamberlain & Wallace, 2016). Individuals face many challenging conditions upon their release (Mallik-Kane & Visher, 2008), including increased chances of reincarceration. The Bureau of Justice Statistics (BJS; 2018) analyzed rates of prisoners released in 2005 and found over 80% were rearrested within nine years following their release (Alper et al., 2018).

The nation's continual drug epidemic represents an additional challenge, not only within the general population, but for justice involved populations, in particular. Most recent estimates from the National Survey on Drug Use and Health (NSDUH) indicate over 20 million individuals aged 12 or older having a substance use disorder [SUD; Substance Abuse and Mental Health Services Administration (SAMSHA), 2019]. Rates of SUDs among inmates are often 10 to 12 times greater than the general population (McCarthy, 2017). Data from the most recent National Inmate Surveys (NIS; 2007 and 2008/2009) show rates of inmates meeting diagnostic criteria for drug dependence (excluding alcohol and nicotine) during their incarceration are 58% in state prisons (Bronson et al., 2017). Although treatment of SUDs is a critical element to successful community reintegration (Pettus-Davis & Kennedy, 2018), incarcerated individuals do not receive these needed behavioral health services (Bronson et al., 2017), with unmet treatment need reported as high as 70% (Cropsey et al., 2012; Mallik-Kane & Visher, 2008).

With over half a million men and women released in 2016 (Carson, 2018), the reentry period is often marked by fragmented service and delivery systems, difficulty in locating

providers, facilities and programs, and challenges in securing appointments in the community for SUDs treatment, mental health care, job counseling, and testing for sexually transmitted infections testing [Center for Substance Abuse Treatment (CSAT), 1998; Lorvick et al., 2015]. Aftercare (e.g. continuation of services or treatment received post-release) is a key outcome of SUDs treatment provided in criminal justice settings. However, this line of inquiry of aftercare is often limited to solely treatment for SUDs (Pelissier et al., 2007) even though most formerly incarcerated populations live with multiple health conditions (Binswanger et al., 2009; Mallik-Kane & Visser, 2008). In other words, given the host of behavioral and health condition experienced by individual with SUDs and incarceration histories, there is little known on the continuation of all needed services (i.e. aftercare) of formerly incarcerated persons with SUDs.

A major intended outcome of prison programming is reduction in recidivism. One key component of recidivism reduction is addressing and treating drug and alcohol use among those leaving incarceration, given the connection to crime (Tripodi et al., 2011). Unfortunately, substance use reduction has received less attention than general recidivism. For instance, a recent meta-analysis on incarceration-based drug treatment showed that less than 30% of studies tracked post-release drug use; recidivism outcomes were tracked in 73 of the 74 articles (Mitchell et al., 2012). Other outcomes of SUDs treatment in prison commonly reported in the literature include aftercare and psychological well-being (e.g., depression, anxiety, trauma; CSAT, 2005; DeAndrade et al., 2018; Perry et al., 2015; Morse et al., 2017; SAMSHA, 2017). While recidivism and aftercare are among the more studied outcomes in the literature, spanning criminal justice and addiction, there are still serious gaps in the literature that can help inform programming for formerly incarcerated populations with SUDs that will be identified in the following background section.

1.1 Background

1.1.1 Terminology

Substance Use Disorders (SUDs). Historically, conceptualization and measurement of SUDs have been complicated by terms being used interchangeably, such as: addiction, abuse, misuse, risky use, problem drinking/use, dependence, alcoholic, addict, etc. The term most commonly used and understood in the general public, addiction, is not just specific to alcohol and drug use, but may also include “harmful” behaviors related to sex, food, gambling, video games, social media, etc. The variance of terminology used impacts how SUDs are measured, and thus, validates the following review of terms.

Substance misuse is an earlier term used to characterize use of substances at a risky level. The U.S. Department of Health and Human Services (HHS) 2016 Surgeon General’s Report described it as “...the use of alcohol or drugs in a manner, situation, amount, or frequency that could cause harm to the user or to those around them” (p.1). Other terms that have been found in the literature include “substance abuse” and “substance dependence” (APA, 2000), which is how SUDs were identified and diagnosed in recent years. “Abuse” and “dependence” are two terms from prior diagnostic criteria that determined based on separate criteria for each diagnosis. d (APA, 2000).

The release of the Diagnostic Statistical Manual (DSM) 5 brought a new term to the literature by introducing “substance use disorder” (APA, 2013), which is the most current term. SUDs are diagnosed on a tier of mild, moderate, or severe depending on the number of criteria met, which is two to three, four to five, and six or more, respectively. Criteria are largely based on 11 specific criteria reflecting substance use that may be broadly grouped into 4 categories: impaired control (e.g., using more or for longer than intended); adverse social impacts (e.g.

giving up activities to use substances); risky use (e.g. continuing to use in spite of health problems caused by substances); pharmacological criteria (e.g. withdrawal) (APA, 2013; U.S. HHS, 2016). Within this project, “substance abuse treatment” will be referenced specific to variables in the study as this is consistent with the terminology used in the interviews for data collection. Additionally, treatment and/or services for SUDs will be used throughout introduction and discussion while incorporating existing research.

Gender. The term ‘gender’ in research refers to the ‘sex’ of the individual (biologically centered on anatomy at birth) and/or their identity under the socially constructed category of ‘gender’, however these terms are not synonymous (Clayton & Tannenbaum, 2016; NIH Office on Research of Women’s Health, n.d.). Throughout the introduction and background literature presented throughout this dissertation, there may be variation in terms of ‘women/men’ or ‘male/female’ which will depend on the article being cited; most health outcome research, particularly with SUDs and incarceration, has historically referred to a participant’s sex. The *5-Key Reentry* data utilized in this dissertation refers to a participant’s gender identity [Female, Male, or Other (specified)] and this term will be used throughout results and discussion, particularly as it relates to health outcomes such as SUD and incarceration. The term ‘gender’ will also be used as the implications of this research align with the broader historical, societal, and cultural contexts of gender (Clayton & Tannenbaum, 2016) and the inherent psychosocial factors of SUDs and criminal justice involvement.

Race/Ethnicity. “Race” and “ethnicity” are two separate categories/variables that can be used synonymously and/ or cause response confusion among individuals in research (Dein, 2006; United States Census Bureau, 2017; Worrell et al., 2019). “Race” is a social construction created to categorize individuals by how they look or the color of their skin; like many other socially

constructed categories, such as gender and class, “race” was created as a means of justifying ongoing oppression of Biracial, Indigenous, and other populations of color (Oluo, 2018).

Ethnicity can overlap with the construction of race and holds great heterogeneity; ethnicity can broadly refer to groups with shared culture, based on family, geographical location, or other sociocultural contexts (Dein, 2006).

While race and ethnicity are separate and categorical self-identified variables in the parent study utilized, this dissertation has condensed and combined the race and ethnicity variables into (non-Hispanic) Black, (non-Hispanic) White, LatinX/Hispanic and Other categories. The “other” category was constructed by combining remaining racial groups, each of which was far too small to be analyzed separately. As such, the “other” category is limited in meaning and in the degree to which it is informative. Differentiating by race/ethnicity is necessary to better understand and tailor interventions and programming to mitigate health disparities, often observed among racial and ethnic “minorities” (i.e. underrepresented in research; Pérez-Stable, 2018).

Recidivism. “Recidivism” is often dichotomous (yes/no) in research including populations impacted by the criminal justice system and operationalization of recidivism can include re-arrest, re-incarceration, return to prison, acquiring a new charge, and/or parole status at time of last follow-up. Preliminary findings from the 5-Key Multistate Trial offer support for the complexity of recidivism and that study participants who have recidivated are due to non-violent technical violations, including infractions such as violating curfew, missing check in with community corrections officer, coming into contact with police, and/or unpaid fines (Pettus-Davis & Kennedy, 2020). In the current study, recidivism is defined by rearrest after initial baseline incarceration, however this does not capture if the participant is subsequently charged.

1.1.2 Prevalence of Substance Use Disorders

Nationally, over 20 million individuals 12 and older (7.4 % of the population) report a diagnosed substance use disorder (alcohol and/or illicit drugs) in the past year (SAMSHA, 2019). These elevated rates of substance use are driven primarily by marijuana and the nonmedical use of prescription pain medicine (SAMSHA, 2019). When considering alcohol, these national numbers rise to almost 140 million individuals aged 12 and older that report drinking alcohol within a 30-day time frame (SAMSHA, 2019). Of the individuals drinking alcohol and or using illicit substances, over 20 million individuals aged 12 and older met diagnostic criteria for a SUD. Collectively, harmful substance use costs the nation more than \$400 billion dollars annually when considering crime, loss of work productivity, and health care (HHS Office of the Surgeon General, 2016).

Like individuals with other chronic health diseases, those with SUDs manifest demographic differences in terms of gender, sex, and race (HHS Office of the Surgeon General, 2016). There is scant literature that focuses on the gender and racial disparities among SUDs (Guerrero et al., 2014; SAMHSA, 2014), however, the limited research available suggest that these differences impact access to needed health care (HHS Office of the Surgeon General, 2016), such as treatment of SUDs. While SUD disparities research is limited among the general population, SUD disparities remain even further underexplored among criminal justice populations.

Most research establishing SUD prevalence come from national samples gathering 1) client-level admissions and discharge data from certified behavioral health centers receiving federal and/or state grants or 2) general population survey data on SUDs and mental health rates by state/area. A limitation of using these datasets is that it does not include undiagnosed

individuals in need of treatment or individuals with SUDs not enrolled in treatment, indicating the most vulnerable may not be captured. Incarcerated individuals could be among these vulnerable populations not captured by these efforts. While limited, there are reports from the Bureau of Justice Statistics (BJS) that are useful in establishing prevalence rates of currently incarcerated individuals.

Gender. In 2014, men accounted for 66% of SUD treatment admissions nationally (CBHSQ, 2015) and have higher drinking and illicit drug use rates than women (NIDA, 2018b); however, women diagnosed with SUDs report higher rates of psychological distress (SAMHSA, 2017). These notable differences between men and women may be partly due to differences in metabolism of alcohol and other drugs between women and men (McHugh et al., 2018). Similarly, compared to men, women are shown to have a faster progression of substance use to SUDs, a process known as “telescoping” (McHugh et al. 2018, p. 14). Another key difference observed between men and women suggest that when women enter SUD treatment they often present with more severe symptoms and impairment in medical and social domains, even when they have used substances for a shorter period (Greenfield et al., 2010). However, studies document a significant amount of heterogeneity within sex regarding substance metabolism (DeVane, 2009), and therefore these findings cannot be deemed unequivocal (McHugh et al., 2018). The interplay of biological and gender-related differences needs to be considered in future research as these neurobiological and environmental cues may account for variation and differences in research findings (McHugh et al. 2018).

While there are few representative sample studies and/or datasets that establish SUD prevalence within criminal justice institutions, a recent report from BJS suggests that just under 60% of all state prisoners report SUDs. Among these, almost 57% of male prisoners and 69% of

female prisoners are diagnosed with SUD at the time of their incarceration, with the difference between females and males being statistically significant ($p < .05$; Bronson et al., 2017).

Furthermore, women in prison are more likely to report using drugs in the 30-days prior to their incarceration, compared to males (47% v. 28%, respectively; Bronson et al., 2017). A recent literature review reported pooled (across studies) prevalence rates for men in prison in the United States with alcohol use disorders at 26% and for women at 20%. Pooled prevalence rates for drug use disorders for men and women in a United States prison were 30% and 51%, respectively (Fazel et al., 2017).

Race/Ethnicity. Even less is known about racial disparities associated with SUDs as most research tends to focus on the differences between ‘white’ and ‘black’, excluding other racial/ethnic categories, particularly Latinos (Guerrero et al., 2014; Guerrero, et al., 2013). Recent data show that White, non-Hispanic individuals have had the highest rates of SUD treatment admissions between 2004 and 2014, followed by Black, non-Hispanic, Hispanic, and Other races (CBHSQ, 2015). Of the limited extant literature examining SUDs etiology among race, one 2011 study examining progression of alcohol dependence among men and women in the general population found significant differences by race/ethnicity as White men and women indicated a younger mean age of diagnosis for alcohol dependence, as well as a faster onset from the age of first drink to development of alcohol use dependence compared to Black and Hispanic men and women (Alvanzo et al., 2011). The lower prevalence of SUDs among racial and ethnic minority populations may be accounted for in part by sociocultural factors (e.g. religiosity, acculturation; Alvanzo et al., 2011), or genetic factors including variations in the ALDH enzyme (aldehyde dehydrogenase or the alcohol metabolizing enzyme (see Li, 1997; Scott & Taylor, 2007). While this is a complex topic, data from The National Epidemiologic Survey on Alcohol

and Related Conditions (NESARC) have substantiated lifetime prevalence rates were highest for White and Native American respondents for both alcohol use disorders (33% and 43%, respectively; Grant et al., 2015a) and drug use disorders (11% and 17%, respectively; Grant et al., 2015b). However, these paramount studies indicate the need for this to be further studied, destigmatized, and understood in the context of effective treatment options (Grant et al., 2015a/b). For individuals in the criminal justice system with SUDs, there is even less known about racial/ethnic disparities with only a few national BJS reports available. For example, White prisoners have the highest rates of SUDs (62%) with SUD rates for African American and Hispanic prisoners lower (55% and 58% respectively). Moreover, prevalence of SUDs in African American and Hispanic prisoners were statistically significantly lower than in White prisoners (Bronson et al., 2017).

1.1.3 The Impact of Substance Use Disorders

SUDs are the most prevalent psychiatric disorders and are highly comorbid with other mental health diagnoses (McGue & Irons, 2013). While one substance defines the SUD (e.g. opioid use disorder, alcohol use disorder, etc.), polysubstance misuse (concurrent or simultaneous use drug and/or alcohol) is considered the norm among individuals, particularly among women, with rates reported around 89% among a recent study utilizing a nationally representative dataset (NSDUH; Jarlenski et al., 2017). A substantial amount of research has documented that women with substance use disorders, relative to men, report greater impairment across a myriad of domains, including mental health, medical issues, and social indicators such as employment and relationships (Compton, Thomas, Stinson, & Grant, 2007; Covington, 1998; Mallik-Kane & Visser, 2008; McHugh et al. 2018; NIDA, 2018b). Mallik-Kane and Visser (2008) completed a study including over 1,000 men and women reentering the community after a

period of incarceration and discovered as many as four in 10 men and six in 10 women reporting the presence of multiple conditions, such as SUDs, mental health, and physical health issues.

Mental Health. The etiology of SUD and other psychiatric comorbidities result from two underlying factors: “(1) externalizing psychopathology, or the tendency to act out and transgress social norms, and (2) internalizing psychology, or the tendency to experience intrapsychic distress” (McGue & Irons, 2013, p. 38). Specifically, these are referring to the connection of SUD to anxiety and depression (internalizing) and antisocial personality disorder (externalizing; McGue & Irons, 2013). Women with histories of substance abuse often have or develop co-occurring mental health disorders, such as PTSD (Brown, Read, & Kahler, 2003; NIDA, 2016). Co-occurrence of SUD and psychiatric disorders are shown to complicate outcomes for formerly incarcerated populations, such as entry into treatment and clinical outcomes after professional treatment services (Greenfield & Grella, 2009) and create a “revolving prison door” (Baillargeon et al., 2009).

Medical Issues. The CDC (2013) documents that overdose by prescription painkillers among women is rising quicker than in men with the percentage increase up by 400% since 1999. Specific to incarcerated/formerly incarcerated individuals, drug overdose is the leading cause of death, particularly within two weeks of leaving prison (Binswanger et al., 2007). Common ailments among incarcerated/formerly incarcerated populations include chronic diseases such as hypertension, asthma, and cancer, as well as infectious diseases including tuberculosis, hepatitis, and HIV (Binswanger et al., 2010; Dumont et al., 2012; Restum, 2005). Formerly incarcerated women are known to have poorer health overall, including sexually transmitted infections, infectious diseases, and more complex trauma histories, compared to their male peers with histories of incarceration (Covington, 2007; Messina & Grella, 2006). Overall,

incarceration is more likely to exacerbate preexisting health conditions (Wildeman & Wang, 2017).

Social Issues. Other factors that impact recovery from SUDs for individuals released from criminal justice institutions are other social stressors, including housing insecurity, unemployment, and lack of high school or college degree. The stress of these variables and/or disorders further complicate the challenges of reintegration, such as securing housing, finding employment, and locating affordable social services (Chandler et al., 2009; Mallik-Kane & Visher, 2008; Hamilton & Belenko, 2016; Hadden et al., 2018), including treatment for SUDs. Moreover, incarcerated women often are mothers, with a 122% increase observed since the early 1990s (Schirmer et al., 2009) creating implications and impact on trajectories of family and children. Culturally, compared to men, women are more impacted by the shame and stigma that society associates with drug use and criminal behavior, particularly for mothers (Chou et al., 2014), and have been found to use substances as a coping mechanism for emotional pain (NIDA, 2015). These multiple service needs can further complicate the SUDs of justice-involved individuals, putting them at further risk for reincarceration.

Criminal Justice Involvement. Given the illegal nature of illicit drug use and the propensity of committing crimes while under the influence of drugs or alcohol (Bronson et al., 2017), the high risk of becoming incarcerated is clear. The “War on Drugs” started in the 1980s and is responsible for the years of mass incarceration that have ensued over the past several decades (Baillargeon et al., 2009). SUDs are a critical entryway into the criminal justice system as currently the number of incarcerated individuals with drug charges account for almost 50% of the population in federal prisons (Carson, 2018; The Sentencing Project, 2018b). Current mass incarceration creates significant racial disparities, predominantly among Black and LatinX

populations (The Drug Policy Alliance, 2020; Mauer, 2009), as well as for women (Greenfield & Snell, 2000; Mauer, 2013; Ramirez, 2016).

1.1.4 Reintegration and Substance Use Disorders

Currently, there is limited service availability for SUD treatment in both rural and urban areas in the U.S. (Gilbert et al., 2011; Pullen & Oser, 2014). Further, recent data suggests that women are more likely to be incarcerated for drug offenses, compared to men (Mauer, 2013), with close to 70% of women in prison meeting diagnostic criteria for SUDs (Bronson et al., 2017). However, when men and women with SUDs are released, they have an increased likelihood of recidivating if treatment needs are not met (Mallik-Kane & Visser, 2008; Tangney et al., 2016). Coupled with unmet treatment needs, prior incarceration increases a person's chances of being re-arrested with rates just under 70% or higher within 5 years after initial release (Alper et al., 2018; Ramirez, 2016; Snyder et al., 2016).

Prison Treatment for SUDs. The history of how drug treatment started in the US correctional system can be considered controversial, at best (Kerrison, 2017). Therapeutic services were created and often disguised as manual labor for profit (see Conley, 1980) that often developed skills that were unable to be practiced or contributed to the community workforce given the lengthier sentences (Kerrison, 2017). Moreover, the treatment also included experiments to cause relapse of substances which had the caused lengthening of existing sentences. These problematic treatment methods enacted in 1938 continued until 1978 when the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1978) upheld ethics, standards and accountability for research conducted with prisoner populations (Kerrison, 2017; Cislo & Trestman, 2013).

Present day treatment in prison for substance abuse offers more ethical and science-based practices, however indicators and effectiveness are varied (Byrne, 2020; Duwe, 2017). The most common SUD treatment offered in prisons is known as ‘therapeutic communities’ (TCs) and are often cited as the most effective prison treatment used (SAMHSA, 2005; Messina et al., 2010). TCs typically last around six months at a minimum (SAMHSA, 2005) and are set up like typical community-based residential, inpatient SUD treatment systems (Shapiro, 2001). However, sometimes there is not adequate space for separate treatment wings within the institutions and participants reside among the general incarcerated population (CSAT, 2005). Generally, TCs follow a structured program with multiple treatment components built in, such as therapeutic groups, work, and recreational programming (CSAT, 2005). TCs have three or four stages depending on facility resources and programming, including: 1) orientation to TC and introduction of rules, 2) group and individual counseling, 3) recovery maintenance and relapse prevention, and 4) reentry planning and/or aftercare (Peters & Steinberg, 2000), and rely heavily on peer support (Malivert et al., 2012). While security is the primary focus within correctional settings, core goals of TCs in prison are: “(1) decline in or abstinence from substance use, (2) cessation of criminal behavior, (3) employment and/or school enrollment, and (4) successful social adjustment” (CSAT, 2005, p. 199). However, there is administrative discretion on various activities such as the length of the program and specific programming activities, which creates a high degree of variability among TC implementation and research (Malivert et al., 2012; Perry et al., 2015). TCs are one of the few options available in prisons for SUD treatment (NIDA, 2012; SAMHSA, 2005). Other treatments that may be offered or available in prisons for substance abuse can include medication assisted treatment, 12 step meetings (Narcotics Anonymous and

Alcoholics Anonymous), cognitive therapy, and mindfulness based services (Byrne, 2020; Duwe, 2017; Kerrison, 2017).

Community-based Treatment for SUDs. Aftercare typically implies receiving some level of ongoing, lower intensity care after initial treatment has already been received. SUD treatment that is received during reintegration into the community from prison may or may not be a condition of parole, however, community-based treatment is integral for parolees and SUD recovery (Messina et al., 2006). Standard community-based SUD treatment available for formerly incarcerated populations and among the general population are residential and outpatient treatment (CSAT, 2005; U.S. HHS, OSG, 2016). Additionally, incorporating a continuum of care from correctional institutions into the community is important so that both correctional supervision can happen along with receiving other needed services (Austin et al., 1992; Kassebaum, 1999). Coordinating with community agencies amongst the multitude and varied needs of incarcerated men and women present challenges and can lead to fragmented and inconsistent practices across correctional institutions (Smith et al., 2018).

Social Supports. Informal social supports are heavily relied on among men and women with histories of reincarceration that are reintegrating into the community (Pettus-Davis, 2012). Social supports often include family and other close loved ones (Pettus-Davis et al., 2014). Most families of incarcerated individuals offer some type of support that is critical to individuals releasing into the community, primarily housing (Cobbina et al, 2012). Formerly incarcerated persons also turn to families and other close social support networks for emotional support and other tangible support including advice, transportation, and financial support (Bakken & Visser, 2018). In fact, social support is so critical during post-release that one study found social support partners accurately and significantly predicted the kinds of problems men would end up facing

during their reintegration process from prison (Souza et al., 2015). Social support has been found to provide a foundation for health literacy (e.g. the understanding of health conditions and health need), including increasing the use of routine and preventative visits, which is particularly important for poor and marginalized populations (Lee et al., 2004), such as formerly incarcerated individuals. SUDs have been found to predict decreases in social support levels (Souza et al., 2016). Gender differences are also relevant among social support, particularly for individuals living with SUDs, as women have been found to place higher importance on social support and rely on them more post-release, compared to men (Barrick et al., 2014; Cobbina et al., 2012; Clone & DeHart, 2014).

1.1.5 Barriers to Treatment Pre- and Post-Release

Evidence suggests prison interventions have varying impacts on recidivism outcomes among men and women (Mitchell et al., 2017; Mitchell et al., 2012), but more tailored, gender-responsive interventions show promise in reducing recidivism among women (Gobeil et al., 2016). Research conducted by Tripodi and colleagues found decreases in recidivism when interventions were specific to SUD treatment needs of SUDs (2011) and targeting mental health problems (2019) among formerly incarcerated women, specifically. Yet, a significant amount of barriers still exist in ensuring effective treatments are available throughout prisons systems and the continuation of those services during reintegration into their communities.

A 1996 Center on Addiction and Substance Abuse (CASA) survey identified institutional budget constraints and inadequate spatial capacity as the primary reasons why individuals with SUDs are not able to receive services within the criminal justice system (CSAT, 2005), which has been documented in subsequent peer-reviewed research (Messina et al., 2006). Among the general population, a recent literature review with individuals suffering from co-occurring

disorders (which is common among individuals with SUDs) found several reasons for low treatment utilization post-release (Priester et al., 2016). Reasons include a lack of treatment availability, lack of specialized services, lack of coordination of care between incarceration and the community, far distances to access treatment, an inability to pay for treatment, and lack of insurance coverage (Priester et al., 2016). While Priester's review (2016) this is not specific to incarcerated populations, it is still pertinent to formerly incarcerated men and women given their prevalence of co-occurring disorders (Greenfield et al., 2007; Mallik-Kane & Visser, 2008).

Other barriers, like insurance coverage, are significant as Medicaid does not always fund SUD treatment, however it may be more receptive in covering other mental health services (Priester et al., 2016). Personal characteristics also act as a barrier to treatment; low service utilization may be the result of avoidance of treatment because of perceived societal stigma and lack of trust in treatment providers (Priester et al., 2016) which is of particular importance to women seeking treatment for SUDs (Chou et al., 2014; van Olphen et al., 2008). Fragmented service delivery systems along with an increased risk for stigma are critical barriers for formerly incarcerated persons accessing needed SUD treatment (Baillargeon et al., 2010; Begun et al., 2016).

Gender Differences. The prevalence of trauma and other mental health diagnoses among men and women in prison (Messina et al., 2006; Morrison et al., 2018) create a significant treatment need. Particularly, psychological distress post-release has been linked as a key recidivating factor for formerly incarcerated women (Messina et al., 2006). Generally, women are less likely than males to enter SUD treatment in their lifetime, however gender-responsive programming and barriers to treatment may impact the success of treatment if enrolled (Greenfield et al., 2007). For example, women are more likely to benefit from comprehensive

and integrated SUD treatment that also incorporates and acknowledges prevalence of trauma and other mental health disorders into their services and care. Additionally, onsite childcare is critical to the success of women in recovery as they are often the sole caretakers of minor children and, if not provided, may prevent access and/or engagement in needed SUDs treatment (Priester et al., 2016).

1.2 Theoretical Frameworks

Andersen's (1995) Behavioral Model of Health Services Use guided the variable selection and data analysis in this dissertation study. The model posits that access and use of services result from three factors: (1) predisposing factors (e.g. general demographics, larger social systems, and health beliefs.), (2) enabling factors (e.g. family, environment), and (3) health need (e.g. presence of or perception of health issue; Andersen, 1968; Andersen, 1995; Andersen & Newman, 1973). The Behavioral Model was originally established as the Framework of Health Services Utilization (Anderson, 1968) and was developed to explain the factors that influence service use among the general population for various healthcare settings (mainly primary health services including medical and dental). The framework is used to understand how formerly incarcerated men and women with SUDs utilize services, how perception of service need is associated with service use, and the differences in receipt of substance abuse treatment in prison.

Over time the model has been adapted to explain service use among various subpopulations including homeless women (Stein et al., 2007), criminal justice populations (Nowotny, 2017; Webster et al., 2005), and populations living with substance use disorders (Leukefeld et al., 1998). While this proposed study will not be the first to apply this model to criminal justice involved populations or among populations living with SUDs, this will be the

first to apply this model across a variety of service domains (i.e. life skills, mental health, substance abuse, relationships, job readiness, education, health, housing, and cognitive) instead of focusing solely on emergency room visits and/or primary health services (Babitsch et al., 2012). An intentional focus will be placed on differences in service use by gender and race, as there is still more to understand regarding differences in SUDs, unmet need, and service utilization by gender and race (Guerrero et al, 2013) along with impact on reintegration (i.e. recidivism; Ropes Berry et al. 2020).

This dissertation study is also informed by a gender responsive treatment perspective, with the acknowledgement that men and women's pathways into the criminal justice system and SUDs, are different, as are their service needs (Covington, 2002; Covington & Bloom, 2006). This perspective will be incorporated during analyses by testing differences by gender in service utilization, social support networks, and reintegration outcomes. Traditionally, the gender responsive treatment perspective has guided intervention development for women with SUDs and/or women involved with the criminal justice system. This perspective is based on three theories: 1) relational-cultural theory (Jordan, 1991); 2) addiction theory (Harris & Fallot, 2001; Herman, 2015); and 3) trauma theory (Covington, 2002). Ultimately, these three theories represent the importance of relationships, connection, pathways, and how trauma experiences influence trajectories and/or pathways into addiction and the criminal justice system.

Until now, these theories have been used to shape intervention development and inform how providers and organizations approach individuals seeking treatment for SUDs, particularly women. However, this theory has not been used to explore specific differences in reintegration outcomes, including problematic drug and alcohol use *and* recidivism outcomes among women and men. Application of this perspective will test the assumptions inherent in gender responsive

treatment by examining different service needs and utilization. Incorporating the gender responsive perspective into analyses can begin to open the black box of “cultural forces” (Walker, 2005) within society that shape how women and men respond to their SUDs and utilize services (Jordan, 2010; Walker, 2005).

1.3 Study Purpose & Research Aims

This study uses the control sample from a multistate study of incarcerated men and women in state prisons preparing to release into the community focused on understanding their reintegration experiences (Pettus-Davis et al., 2019). The project utilized a subpopulation of the randomly assigned control sample and included those diagnosed with a SUD (alcohol and/or drug use disorder); the longitudinal sample follows participants from their release through 15 months post-release. The study, analysis, and interpretation were guided by the *Behavioral Model of Health Services Use* (Andersen, 1995) to understand the factors of service utilization (i.e., life skills, mental health, substance abuse, relationships, job readiness, education, health, housing, and cognitive) and how this impacts reintegration. Additionally, the study applied a *gender responsive treatment* perspective (Covington, 2002; Covington & Bloom, 2006) to examine gender differences regarding service needs, service utilization and other characteristics among formerly incarcerated persons.

The specific aims and related research questions that guided this project centered on men and women diagnosed with a substance use disorder at incarceration are as follows:

1. Understand the relationship between substance abuse prison treatment and post-release service utilization.

Is there an association between prison substance abuse treatment and service utilization (i.e. substance abuse, mental health, life skills, relationships, job readiness, education, health, housing, and cognitive) post release?

2. Understand if the relationship type of the closest social support influences post-release service utilization.

Is there an association between the social support relationship type (i.e. Romantic Partner, Parent, Other Family, Other Support) and type of service(s) used (i.e. life skills, mental health, substance abuse, relationships, job readiness, education, health, housing, and cognitive) post-release?

3. Understand post-release service utilization and its association with problematic drug and alcohol use and rearrest.

What services or combination of services are associated problematic drug and alcohol use and/or rearrest?

1.4 Overview of Dissertation Chapters

This first chapter provides an introduction and background to the state of knowledge on substance use disorders and the criminal justice system. It also outlines the purpose of this dissertation project, along with the theoretical framework and gaps in knowledge that have informed the project's aims and research questions.

Chapter 2 (manuscript 1 for Aim 1 and 2) titled *Predictors of Post-release Service Utilization Among the Formerly Incarcerated*, examine how substance abuse prison treatment and social support relationship type influence post-release service utilization. Perceived service need is also explored as a mediator between these two models, with findings from this variable highlighted. Implications for prison treatment and service delivery systems are discussed. Andersen's *Behavioral Model of Health Services Use*²⁷ are applied in the discussion.

Chapter 3 (manuscript 2 for Aim 3) titled *How Does Service Utilization Influence Reintegration Among a Sample of Formerly Incarcerated Men and Women?*, explores the impact of post-release service utilization across nine different service domains on reintegration, specifically 1) problematic drug and/or alcohol use and arrest. Implications of the current service

delivery systems are discussed and review suggestions for programming and treatment for formerly incarcerated individuals with SUDs.

Chapter 4 (manuscript 3) titled *Reintegration Among A Formerly Incarcerated Sample with Substance Use Disorders: Exploring Gender and Race*, was designed to address the low sample size of gender and race in the sample of this dissertation study that prevented including gender in the multivariate models, along with a gender and race interaction (see Table 1).

However, the purpose of this paper is to add to the scant literature on gender and race among incarcerated populations with SUDs utilizing a control subsample from a longitudinal multi-state trial. Specifically, this paper examines observed differences of gender and race among perception of service need, post-release service utilization, problematic drug and alcohol use, rearrest, and attrition. Gender-responsive treatment implications are reviewed and discussed in connection to results.

Chapter 5 summarizes the findings of the three papers and interpret how it connects to existing literature outlined in this chapter. Additionally, the findings are discussed within the context of the theoretical frameworks and their contribution to the aforementioned knowledge gaps. The final chapter highlights strengths of this study, reviews limitations, and provides implications of the dissertation for practice and research.

Table 1*Gender and Race Distribution among Men and Women in 5-Key Control Sample with SUDs at Baseline*

(N=504)	Black		White		LatinX/Hispanic		Other		Total Gender	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Gender										
<i>Male</i>	203	44.91	159	35.18	60	13.27	30	6.64	452	100.00
<i>Female</i>	8	16.67	31	64.58	5	10.42	4	8.33	48	100.00
<i>Non-binary/Missing</i>	2	50.00	1	25.00	0	0.00	1	25.00	4	100.00
Total Race	213	42.26	191	37.90	65	12.90	35	6.94	504	100.00

Chapter 2: Predictors of Post-release Service Utilization Among the Formerly Incarcerated with Substance Use Disorder

High rates of substance use disorder (SUDs) persist throughout the US with over 20 million individuals age 12 and above (7%) reporting an alcohol and/or drug use disorder (SAMSHA, 2019). Individuals with incarceration histories have established rates of SUDs as much as 10 times the rate of the general population (McCarthy, 2017) with recent estimates suggesting almost 60% in people in prison have drug use disorders (Bronson et al., 2017) and up to 26% experience alcohol use disorders (Fazel et al., 2017). Treatment for SUDs is a critical part of recovery for individuals living with SUDs (Oesterle et al., 2020), and forms a critical component of reintegration upon release from prison (Pettus-Davis & Kennedy, 2018). Despite this, there are high rates of unmet need for behavioral and other health services that is reported at both pre- and post-release periods (Bronson et al., 2017; Cropsey et al., 2012; Mallik-Kane & Visher, 2008).

Despite the need for treatment for SUDs, availability is limited in prisons as various budget and spatial/facilities constraints prevent the provision of formal treatment (e.g. therapeutic communities, psychological services, medication-assisted treatment; CSAT, 2005; Messina et al., 2006). In the community, treatment for SUDs is most commonly available in either general healthcare settings or specialty treatment centers (e.g. residential/outpatient behavioral health centers; SAMSHA, 2019; US HHS OSG, 2016). Often, service utilization in

general for SUD is low after release, except for emergency department visits for acute problems (Mallik-Kane & Visser, 2008), which likely indicates that chronic care needs are not being met.

Formerly incarcerated people heavily rely on social support when reintegrating into the community and include family and other close loved ones (Pettus-Davis, 2012; Pettus-Davis et al., 2014). Most families of incarcerated individuals offer some type of support that is critical to individuals releasing into the community, primarily housing (Cobbina et al., 2012), but also emotional support, advice, transportation, and financial assistance (Bakken & Visser, 2018). Although research has established the importance of the role of social support networks in the lives of incarcerated and formerly incarcerated persons, how a person's social support system impacts perceived service needs and related service utilization has not been extensively studied and is not well understood (Degan et al., 2019; Edwards et al., 2013; Lee et al., 2004).

This will be one of the first studies to our knowledge, to perform an in-depth examination of services utilized post-release among a sample of incarcerated men and women in connection with treatment received in prison as well as and social support reported pre- and post-release. This paper will add to the growing, albeit limited literature on the prevalence of SUDs treatment in prisons and the association with the types of services utilized post-release across eight other service domains aside from SUD treatment, including life skills, mental health, relationships, job readiness, education, health, housing, and cognitive.

2.1 Background

2.1.1 SUDs Treatment and Perception of Treatment Need

There is scant literature on how the perception of service need moderates the relationships between prison treatment and use of services post-release. Perception of service need is well studied among the general population and has been linked to increase in health

literacy and service utilization (Harris et al., 2016; Mojtabai et al., 2002; Paasche-Orlow & Wolf, 2007). There is, however, a need to explore this more among formerly incarcerated and incarcerated populations as service utilization. One of the few studies examining perception of service need among formerly incarcerated men and women found perception of service need for mental health and substance abuse services were lower than estimates in national samples. Other results suggest that over half of participants that perceived service need for SUDs treatment received treatment (Hamilton & Belenko, 2016), suggesting awareness of service need can potentially increase service utilization, which is consistent with literature on the general population. This recent study confirms the need for future studies to address the gap of examining factors that increase treatment access for formerly incarcerated populations across a broad range of service needs (Hamilton & Belenko, 2016).

2.1.2 Social Support & Service Utilization

Social support can also help establish a foundation for health literacy and help seeking, including increasing the use of routine and preventative visits. This is particularly important for poor and marginalized populations (Lee et al., 2004), such as formerly incarcerated individuals (Degan et al., 2019). Additionally, social support networks and relationships can change due not only to treatment of SUDs, but also to incarceration as well (Kahn et al., 2019; Liu & Visser, 2019; Nargiso et al., 2014). Also, relationships are a key treatment component of gender-specific treatment (Covington, 2001; Covington et al., 2008), given that strained relationships can act as a pathway to criminal justice involvement for women (Covington, 2002).

Extant literature surrounding social support and criminal justice populations has established 1) the importance of social support to successful reintegration and 2) differences in levels of social support by gender (Cobbina et al., 2012; Pettus-Davis et al., 2018; Pettus-Davis

et al., 2011). Among a sample of incarcerated men and women, men reported higher rates of negative social support, whereas women reported higher rates of mixed and positive social support. However, when examining the women in the sample, those diagnosed with SUDs had significantly decreased odds for reporting positive social support, particularly for individuals using marijuana, heavy drugs, and alcohol (Pettus-Davis et al., 2018). This same study also found African American/Black participants to report a higher number of support persons upon their release compared to the White participants. The results suggest a longitudinal examination of reentering prisoners that looks at gender and reports of social support is needed (Pettus-Davis et al., 2018).

While the type of social support relationship has been linked to decreased recidivism (Duwe, 2017), there is limited research examining the impact of social support on service utilization among formerly incarcerated populations. Concerning populations with SUDs, positive social support has been linked to longer abstinence and increased self-agency (Pettersen et al., 2019). Additionally, one study examining social networks among incarcerated women with co-occurring depression and SUDs found that on average, women had a substantial portion of their social network comprised of drinkers and/or drug users (44%). However, high support for SUDs treatment and low acceptance of alcohol and drug use across family, friends, and romantic relationships was reported. While incarcerated, no significant changes were observed in strength of network and types of support, however from incarceration to three months post-release the support for treatment significantly decreased across family, friends, and romantic partners. This decrease in treatment support could be because the majority of women experienced a relapse post-release and thus cause a decrease in belief that treatment would be effective (Nargison et al., 2014). While the impact of social networks on health behavior change (i.e. service utilization)

has been more broadly studied among the general populations (Latkin & Knowlton, 2015), more research is needed among justice-involved populations to explore the impact of social support on treatment across various service types, with a larger sample, by gender and race, and for a longer duration post-release.

2.2 Theoretical Framework

Andersen's (1995) *Behavioral Model of Health Services Use* will guide the variable selection and data analysis. The model posits that access and use of services result from three factors: (1) predisposing factors (e.g. general demographics, larger social systems, and health beliefs.), (2) enabling factors (e.g. family, environment), and (3) health need (e.g. presence of or perception of health issue; Andersen, 1968; Andersen & Newman, 1973; Andersen, 1995). The *Behavioral Model* was originally established as the *Framework of Health Services Utilization* (Andersen, 1968) and was developed to explain the factors that influence service use among the general population for various healthcare settings (mainly primary health services including medical and dental). The framework will be used to seek understanding of how formerly incarcerated men and women with SUDs utilize services, how perception of service need is associated with actual service use, and the differences in receipt of SUDs treatment in prison.

Over time the model has been adapted to explain service use among various subpopulations including homeless women (Stein et al., 2007), criminal justice populations (Nowotny et al., 2017; Webster et al., 2005), and populations living with substance use disorders (Luekefeld et al., 1998). This will be the first to apply this model across a variety of service domains (i.e. life skills, mental health, substance abuse, relationships, job readiness, education, health, housing, and cognitive) instead of focusing solely on emergency room visits and/or primary health services (Babitsch et al., 2012).

Aims

The main aims of this paper are to understand 1) the relationship between substance abuse treatment in prison and post-release service utilization across nine service domains (outlined below) and 2) if social support relationships pre- and post - release influence post-release service utilization.

2.3 Methods

2.3.1 Data

The current study utilized data from the control group arm of an ongoing randomized controlled trial (*Multi-site Randomized Controlled Trial of the 5-Key Model for Reentry*; Pettus-Davis & Kennedy, 2018) designed to provide theoretically and empirically supported reentry support to men and women recently released from prison. The data includes incarcerated individuals, from state prisons located in Florida, Kentucky, Pennsylvania, and Texas. Local research teams (including data collectors and practitioners) were hired in each state to implement study activities, including recruitment. Study recruitment started in May 2018 and was not influenced by the Department of Corrections (DOC) or other state agencies. Randomization for the treatment (participants receiving the 5-Key Model intervention; Pettus-Davis et al., 2019) and control (no treatment or coordinated access to existing services in their release destination) groups occurred using a random number generator; the research team did not make decisions regarding randomization, and preliminary results suggest no statistically significant demographic differences between the groups. Data collection focuses on understanding how well incarcerated individuals are prepared for reentry and on identifying the key ingredients to successful community reentry (Pettus-Davis & Kennedy, 2018).

2.3.2 Sample

Participants were recruited while incarcerated in 2018 where baseline measures (T0) were obtained. Eligibility criteria were as follows: (a) at least 18 years old, (b) has a scheduled release date within the study window, (c) releasing to one of the study counties, (d) conversational in English, and (e) cognitively capable of consent. Follow-up is conducted immediately upon release (T1), and then 4 (T2), 8 (T3), and 15 months (T4) after release from prison. The sample for this study includes participants with a diagnosis of SUDs at baseline, who numbered 504 individuals, reflecting 67% of the entire control sample at baseline).

2.3.3 Measures

Substance Use Disorders

SUDs are diagnosed utilizing the Mini-International Neuropsychiatric Interview (MINI)-SUD and MINI-Alcohol Use Disorder (AUD) administered by trained research staff. The MINI is a commonly used assessment tool for SUDs (including AUDs); psychometrics indicate strong reliability (.93) and validity (.81-.82) for drug and alcohol dependence (currently diagnosed as AUD/SUD; Lecrubier et al., 1997). The timeframe for diagnosis was asking about lifetime experiences at baseline while the participants were incarcerated.

Dependent Variables

Post-release Service Utilization. This construct is comprised of nine different dichotomous variables to represent nine different service domains. All variables are yes (1)/no (0) and indicate if the service was utilized at any post-release time point (i.e. upon release through 15 months). The service categories are as follows: 1) substance abuse (i.e. for drug use, alcohol use, or related activities), 2) mental health (i.e. emotional problems, therapy, clubhouse, other personal recovery-oriented services), 3) life skills (i.e. help with budgeting, time

management, grocery shopping, other related activities), 4) relationships (i.e. anger management, problem solving, or other communication related activities), 5) Job Readiness (i.e. resumes, help getting a job, job interviews, or related activities), 6) education (i.e. help with school testing, completing school, enrolling in trade school, other related activities), 7) health (i.e. going to the: dentist, doctor/physician, hospital, emergent care, other related services), 8) housing (i.e. help with housing applications, rental assistance, finding/buying a home/rental place, housing rights, other related services), and 9) cognitive (i.e. help with criminal thinking, attending day report, other related activities; 5-Key Baseline Codebook, n.d.). All services use domains were collected upon release, six, eight, and 15 months after release. In addition, Substance Abuse and Mental Health service use were also collected at baseline.

Independent Variables

Substance Abuse Treatment in Prison. This variable records if substance abuse treatment was received while in prison (yes/1 v. no/0). Substance abuse treatment receipt in prison is inclusive of both formal services (i.e. psychological services, case management, hospitalization, or medication assisted treatment) and informal (i.e. support groups, self-help, peer support, or other).

Social support relationships. This construct captures 1) the type of relationship with the social support person they are closest to as reported by the participant and 2) a relationship depth score indicating the level of closeness with this person. This variable was asked from baseline (while still in prison) through 15 months post-release and center. The relationship of the person they are closest to was recoded from 10 plus category variable [girlfriend; boyfriend; spouse/partner; father of my child; mother of my child; my father; my mother; intimate partner; friend; neighbor; coworker; other (specify)] to a four-category variable (romantic partner; parent;

other family; other support) to consolidate overlap and improve distribution of the variables.

Both variables are part of a broader instrument called the Quality Relationships Inventory (QRI) designed to measure perception of support, conflict, and depth of relationship; psychometric properties indicate a Cronbach's alpha of 0.84 (Pierce et al., 2001).

Other Covariates.

Demographics. Other Demographics include state of interview/incarceration, age, marital status, sexual orientation, number of children, education, employment (at time of arrest); these variables were aggregated for the purpose to describe the sample only but are not part of the multivariate analyses. The reason for this is that these demographics are not integral to the model or questions outlined previously as these are variables that are important to understand sample characteristics.

Race/Ethnicity. Racial/ethnic background from the original study included the following categories reported by the participant: Black; Latino/a; White; Asian or Pacific Islander; Native American/Alaska Native/Inuit; Multi-racial; and Other. An additional question was also asked about Hispanic ethnicity [yes (1)/no (0)]. To include as many categories as possible to analyze the impact of race across a variety of categories, while considering distribution, the racial/ethnic categories were recoded as follows: Black (1); White (2); LatinX/Hispanic (3) (includes Latino/a and Hispanic identifies); and Other (4; includes Asian or Pacific Islander, Native American/Alaska Native/Inuit, Multi-racial, and Other identities).¹

¹ The author recognizes that there is great heterogeneity among Latinx identifying populations, as well as the Hispanic ethnicity, and that these terms are not synonymous. Additionally, an "other" race category is not ideal, however, these categories were combined to acknowledge and understand racial/ethnic differences among an area that is often analyzed based on White and Black race categories. The author hopes to incorporate race/ethnic categories as close to the original variable to better understand true differences by race/ethnicity if access to more waves is permissible.

Other Mental Health Problem at Baseline. This variable indicates if there was presence of an additional mental health diagnoses at the time of the baseline interview (yes/1 or no/0). Presence of mental health conditions were assessed using the Mini-International Neuropsychiatric Interview (MINI), a diagnostic assessment for a variety of mental health conditions with psychometrics that indicate strong reliability and validity for all mental health diagnoses (kappa coefficients: .72 to .97; Lecrubier et al. 1997). Presence of one or more of these conditions at baseline counted as yes (1) for presence of other mental health problem at baseline: major depression, manic episode, social anxiety, mood disorder, psychotic disorder, generalized anxiety, and/or post-traumatic stress disorder.

Perception of Service Need. This construct is comprised of nine different dichotomous variables to represent perception of service need across each of the nine service domains. All variables are yes (1)/no (0) and indicate if the perception of need for each of the services was present at any post-release time point (i.e. upon release through 15 months). The service domains for perception of need are as follows: 1) substance abuse, 2) mental health, 3) life skills, 4) relationships, 5) Job Readiness, 6) education, 7) health, 8) housing, and 9) cognitive.

Assessments. Four assessments were included to better understand trauma history, readiness for treatment, perception of health, and presence of psychological distress. The Trauma History Questionnaire (Green, 1993) is a reliable and valid instrument used to assess trauma history with (interrater reliability reported from .76 to 1.00; Hooper et al., 2011). Circumstances, Motivation, Readiness (CMR) Measure is an instrument used to gauge a participant's overall agreement to participate in treatment that is based on internal/external factors, along with their self-awareness; the CMR shows strong psychometric properties with a Cronbach's Alpha ranging from .60-.80 (DeLeon et al., 1994); CMR was collected at baseline online. Perception of

overall general health was measured using the RAND Short Form (SF-36) Health Survey (Cronbach's Alpha of .78, RAND Corporation, n.d.). Finally, presence of psychological distress post-release was measured using Kessler's Psychological Distress, a valid tool used to assess mental health conditions (Hides et al., 2007); this Kessler 10 question survey used in this study reports an area under the receiver operating characteristic (ROC) curve at 0.854, suggesting strong diagnostic ability (Kessler et al., 2003). While these broad constructs are commonly controlled for in social science research, these covariates were included in this study as these general demographics, trauma history, treatment readiness, health perception and psychological distress have been suggested as influential to receipt of behavioral health treatment (i.e. substance abuse and mental health services; Hamilton & Belenko, 2016), which are included among the dependent variables in this study.

2.3.4 Analyses

Bivariate analyses included cross-tabulations and correlation analyses to understand the nature of the relationship among the relevant model variables. To assess the relationship among prison substance abuse treatment and social support on post-release service utilization, while controlling for demographic and other covariates, multilevel mixed-effects logistic regressions were conducted utilizing participant level data. Average marginal effects were also conducted to understand the predicted probability; both estimates are provided to understand consistency of the significance. The dependent variables were dichotomous indicating whether the service was received post-release and were independent for each of the nine service domains.

Two models (see Education and Health, Table 2) indicated very small estimates of random effect variance, specifically for health service utilization and education service utilization models, and thus, sensitivity analyses were run to verify and confirm results of the

mixed effects models. Sensitivity analyses included 1) running logit models to see what occurred when the random effect variance was ignored and 2) increasing integration points to the analysis to add precision to the estimation within the models; in both instances results were not substantially different from the multilevel mixed-effects logistic regressions.

2.4 Results

2.4.1 Sample Description

SUD diagnoses consisted of the following: 12% alcohol use disorder, 53% drug use disorders, and 35% had both alcohol and drug use disorders. Males represented 90% of the sample with majority around 36 years of age ($M= 35.75$, $SD= 10.48$). Forty two percent of the sample identified as Black and 52% were employed prior to their incarceration. ($N=213$, 42.26%). The majority of the participants were parents (68%) and 43% reported achieving less than high school education prior to their incarceration. Most of the sample from the first phase of the multistate trial comes from Texas (41%), followed by Florida (25%), Pennsylvania (19%), then Kentucky (15%). See Table 1 for more descriptive characteristics.

The 504 participants of the sample produced a total of 1,128 observations across all assessment time points. Only participants that received any post-release follow up ($n= 237$; upon release, 4 months, 8 months, and/or 15 months) were included in the analytic sample that comprised 625 observations. Observations are the unit of analysis to account for the participant follow up. Each model had their respective observational sample size that accounted for missing data. The most perceived service need across all observations was mental health services (33%), which was inclusive of the baseline timepoint. Similarly, substance abuse service was the highest service to ever have perceived need among the participants across timepoints at 59%, which is also inclusive of the baseline timepoint. The highest perceived need across observations and to

have ever been perceived at any post-release timepoint (that was not inclusive of baseline) was job readiness, 23% and 42% respectively. Of the participants that ever perceived a need for services, mental health and substance abuse services had the highest perceived need over time (76% and 64%, respectively); education and job readiness services were the highest perceived need over time out of the participants that had ever perceived a need at any time post-release timepoint (60% and 56%, respectively).

The highest utilized services post-release among all observations were job readiness (16%) and mental health (15%). Job readiness was also the highest percentage of post-release services to ever be utilized (31%), next to mental health services (26%). However, substance abuse, mental health, and education services had the highest over time percentage post-release (>50%), indicating that of the participants that reported ever utilizing these services post-release, they utilized these services during most of the follow up timepoints.

2.4.2 Main Models

Table 2 shows the association of substance abuse services in prison *and* the relationship type of their social support (i.e. the person they report as being closest to) with post-release services across the nine service domains (i.e. substance abuse, mental health, life skills, relationships, health, job readiness, education, housing, and cognitive).

Nine total models were run to understand the relationships between substance abuse service receipt in prison and post-release service utilization for each of the respective service domains. All models were statistically significant at the $p \leq .01$ level or greater except for post-release cognitive service utilization. The most prominent and consistently statistically significant variable across each of the nine models for the respective service domain was perceived service need. Perceived service need was statistically significant ($p \leq .05$) with very high odd ratios (OR >

20) across all service utilization models suggesting that perceiving a need for any of the service domains multiplied the odds of utilizing any of the respective nine service domains by at least 20, holding all covariates constant. Specifically, when perceiving a need for any of the services (except for cognitive services), the average predicted probability of utilizing the respective service were at least 39% higher compared to those who did not perceive a need for services.

Overall, substance abuse service receipt in prison was not statistically significantly associated with post-release service utilization. Social support relationships were generally not significantly associated with post-release service utilization either, except for post-release health service utilization. Other support relationships were statistically significant ($p \leq .05$) with health service utilization post-release suggesting an increase the odds of receiving this service, holding all other variables constant. The average predicted probability of receiving health services were 7% higher when the closest relationship fell in the “other” category, compared to remaining relationship categories.

Identifying as LatinX/Hispanic was statistically associated with utilizing relationships ($p \leq .05$) and education services ($p \leq .05$) suggesting the odds were multiplied substantially higher (OR >6) for receiving these services, compared to white participants while holding all other variables constant. Identifying as Black was also statistically associated with utilizing education services post-release ($p \leq .01$) and multiplied the odds of receiving education services by 23 compared to whites, holding all other variables constant. The average predicted probability was also statistically significant ($p \leq .01$) for receiving education services post-release for LatinX/Hispanic and Black participant observations were seven and 5% higher, respectively, compared to White participants.

Observations of participants that reported presence of an additional mental health issues at baseline (i.e. incarceration) were significantly associated with mental health *and* health services utilization post-release ($p \leq .05$) meaning that the odds of received services are around 70% less than those without additional mental health issues; the average predicted probabilities of receiving mental health *and* health services post-release were around seven and 5% lower, respectively, compared to observations of participants that did not have additional mental health issues reported at baseline. Additionally, overall health rating, CMR score, and post-release psychological distress are all statistically associated with utilizing substance abuse services post-release ($p \leq .05$) with about a 2% percent increase in odds with each unit increase in score, while holding all other variables constant. The predicted probabilities for utilizing substance abuse services post-release are 0.6% percentage points higher for each unit increase in CMR and post-release psychological distress scores; in other words, the more motivated a person is or the higher their level of psychological distress, the higher the probability of utilizing substance abuse services post-release. Finally, THQ score has a statistically significant relationship with life skill service utilization post-release ($p \leq .05$) suggesting the more lifetime traumatic experiences reported decrease the odds of receiving life skills post-release by a little over 40%; specifically, the predicted probability of utilizing life skills post-release are almost 3% less with each unit increase in THQ score.

2.5 Conclusion

Eight of the nine models examining the impact of substance abuse services and relationship type of closest social support in prison on post-release, while controlling for other variables, were statistically significant ($p \leq .01$ or greater; except the cognitive service model). It

is important to note, however, there were no statistically significant relationships observed between substance abuse treatment in prison and the eight independent outcome service utilization variables (substance abuse, mental health, life skills, relationships, health, job readiness, education, and housing), indicating the statistically significant relationship observed between these variables is the results of the covariates included. Except for the post-release health services model, the relationship type of closest social support partner was not statistically significant with post-release service utilization. Given the lack of statistically significant relationships between the independent variables (prison substance abuse treatment and social support) and post-release service utilization, it can be assumed that only part of the model was supported.

2.5.1 Limitations

While a key strength of this study is the preliminary nature of the results as this is of the first studies to examine collective post-service needs among a sample of formerly incarcerated men and women, there are several noteworthy limitations. First, there was a high attrition rate of the baseline sample (52%) that prevented the ability to account for differences by gender and race in the multivariate models. This larger attrition rate caused some variables to have low cell size and observations that caused inflated odds ratios; the sensitivity analyses mentioned in the analyses yielded very similar parameter estimates suggesting the high coefficients are the result of distribution (e.g. most participants went on to use services only if they perceived a need for said service). Running these analyses again with a larger sample size may provide more adequate power and allow for more reliable estimates. Finally, another limitation is there were several instances of quasi-separation (Allison, 2008) that occurred in the models (see Other race in

Substance Abuse and Cognitive models, Table 2) resulting from low cell size and distribution of covariates.

While the parent study is a *longitudinal, multi-state randomized control trial*, the gold standard of research, and can be considered a strength of this paper, the results cannot be generalized outside of the four states (Texas, Kentucky, Pennsylvania, and Florida). Moreover, although the covariates selected were grounded in research, the elevated number of covariates risk parsimony of the models. The large number of covariates are the result of the exploratory nature of the research aims and are balanced with a robust method, yet this limitation needs to be considered and addressed in future studies. Related to parsimonious models, there were several covariates that would be an important control given the sample that were not available in the present analysis, including: treatment mandates, charge/offense type of the baseline incarceration, and prior treatment attempts. Future iterations of this draft may be able to include Department of Corrections data that will strengthen results.

2.5.2 Implications

Practice

Perceived need for service utilization was an important variable throughout all the models with statistical and practical significance. Ultimately, the most powerful predictor of service utilization across *all* services and *all* participants was whether the participants perceived a need for the service. This presents an opportunity to center programming efforts, pre-and post-release, on increasing health literacy to improve help-seeking behavior, such as service utilization, among formerly incarcerated populations with SUDs; this has been found as a common indicator of success and disease progression among other chronic illnesses, such as diabetes and kidney disease (Taylor et al., 2017; Tseng et al. 2017). While psychoeducation is a component of

traditional services for SUDs, this study suggests an enhanced attention to increasing health literacy assist in the path to health and wellness among men and women releasing from prison with SUDs.

Research

This study presents an opportunity to further explore differences in barriers experienced for each service domain, particularly for participants that perceived a need for services and then did not go on to receive the service. There is an opportunity to explore this within the existing *5-Key Reentry* parent study. This line of research will help to understand how this connects to the attrition subsample and what needs to be included in future intervention studies to facilitate engagement in treatment and other needed services/programs.

The interaction of race and gender within treatment for incarcerated and formerly incarcerated women with SUDs is understudied (Bloom et al., 2003) and has been shown to inform differences in reintegration outcome (Ropes Berry et al., 2020). Future research from this existing study could include additional wave/phases of the *5-Key Reentry* that can help understand differences and interactions that can inform future development of gender- and culturally- responsive treatment for individuals with SUDs impacted by the criminal justice system. Research among individuals living with substance use disorders, particularly those with incarceration histories, will need to be inclusive of the specific barriers to treatment that are experienced by oppressed racial and ethnic populations (Creedon & LêCook, 2016).

Chapter 3: How does Service Utilization Influence Reintegration Among a Sample of Formerly Incarcerated Men and Women?

The United States is in an era of mass reentry that is marked by the staggering number of prisoners released yearly that is the direct result of mass incarceration (Chamberlain & Wallace, 2016). Most individuals with incarceration histories are found to have experienced a substance use disorder (SUDs; including alcohol and/or drugs) at some point during their incarceration (Bronson et al., 2017; Fazel et al., 2017; Mallik-Kane & Visher, 2008). Not only are individual with SUDs found to have high co-occurring and complex health needs, but these health and behavioral needs are often worsened during incarceration (Cropsey et al., 2012; Wildeman & Wang, 2017). Formerly incarcerated persons *and* individuals diagnosed with SUDs live with unmet service needs across a myriad of domains (Mallik-Kane & Visher, 2008; Cropsey et al., 2012). Upon release, the reintegration experience is riddled with fragmented service and delivery systems, difficulty in locating providers, facilities and programs, and challenges in securing appointments in the community for SUDs treatment, mental health care, job counseling, and testing for sexually transmitted infections (CSAT, 1998; Lorvick et al., 2015). Existing research will be enhanced by understanding the extent to which service utilization of all types but especially SUD treatment informs the reintegration process among a sample of formerly incarcerated men and women with SUDs.

3.1 Background

Living with many health conditions has been found to cause health strain (Agnew, 2006) that may result in using illicit drugs to cope with and alleviate (at least temporarily) pain and stress (Stogner & Gibson, 2011). Services are not being utilized (Cropsey et al., 2012; Potter, 2014; Mallik-Kane et al., 2008) despite evidence that persons with SUDs benefit from comprehensive and long-term care (Ducharme et al., 2016). A recent study by Visher and colleagues (2017) found that among a sample of formerly incarcerated men age 35 and under, pre-release services across 12 service domains [practical services (case management, needs assessment, reentry plan, reentry classes, life skills, employment services) and individual change services (mental health treatment, substance abuse treatment, personal relationship training, criminal attitudes training, anger management, and education)] can reduce recidivism. Specifically, the study found that the practical services (reentry classes, life skills, and employment services) were associated with a decrease in the number of days from release to first arrest. However, more positive results were found among individual change services (education and criminal attitude thinking) which showed longer time between release and first arrest and number of post-release arrests. Surprisingly, substance abuse treatment was not found to have a significant effect on recidivism measures, however this could be indicative of a lack of aftercare in the community when released (Visher et al., 2017). The findings from this study are particularly relevant to the current report given that there is overlap in the service domains, and yet suggest further research is needed to explore the how these services that are received *post-release* impact reintegration.

Exploring the post release service utilization across a range of health and service domains will allow for a clear picture of reintegration and relationship among services. For example, in a

recent qualitative study among justice-involved men and women with behavioral health diagnoses (including SUDs), researchers found that physical health conditions interfered with the ability to find and gain employment. Moreover, participants with co-occurring medical/physical conditions and behavioral health disorders (including SUDs) reported a need for multiple appointments with various providers and described how this created a treatment burden that interfered with the ability to work and their personal life (Kahn et al., 2019). While that study utilized qualitative methods to understand the complex system of service utilization among formerly incarcerated men and women, there is currently a scarcity of research evaluating long-term impact of such utilization on post-release outcomes (Kahn et al., 2019).

Aim

This present study will add to the literature by examining the association of post-release service utilization among a sample of formerly incarcerated men and women with SUDs upon reintegration outcomes. The reintegration outcomes include 1) presence of problematic drug and/or alcohol use and 2) rearrest.

3.2 Methods

3.2.1 Data

Data utilized in the present study is from a recent Phase 1 multi-state trial designed to understand the reintegration experiences of formerly incarcerated men and women (*Multi-site Randomized Controlled Trial of the 5-Key Model for Reentry*; Pettus-Davis et al., 2019) The sample is drawn from prisons in four states - Florida, Kentucky, Pennsylvania, and Texas. Recruitment of participants started in May 2018 and randomization for the treatment (participants receiving the 5-Key Model intervention; Pettus-Davis et al., 2019) and control (no

treatment or coordinated access to existing services in their release destination) groups occurred using a random number generator on a computer and were not influenced by any members of the research team. Data collection focuses on understanding how well incarcerated individuals are prepared for reentry and on identifying the key ingredients to successful community reentry. The present study did not meet federal regulations for human subjects research and, thus, a non-human subjects determination was received from Washington University in St. Louis's Institutional Review Board (IRB).

3.2.2 Sample

The analytic sample for the present study included participants from the control group only. Participants were recruited while incarcerated in 2018 where baseline measures (T0) were obtained. Eligibility criteria were as follows: (a) at least 18 years old, (b) has a scheduled release date within the study window, (c) releasing to one of the study counties, (d) conversational in English, and (e) cognitively capable of consent. Follow-up is conducted immediately upon release (T1), and then 4 (T2), 8 (T3), and 15 months (T4) after release from prison. The sample for this report includes participants with a diagnosis of SUDs at baseline (N=504), who reflect 67% of the entire control sample at baseline.

3.2.3 Measures

Substance Use Disorders

The sample for this study includes men and women who met diagnostic criteria for either a drug and/or alcohol use disorder [referred to as substance use disorder (SUD)] during incarceration at the baseline data collection time point. SUDs are diagnosed utilizing the Mini-International Neuropsychiatric Interview (MINI)-SUD and MINI-Alcohol Use Disorder (AUD). The MINI is a commonly used assessment tool for SUDs (including AUDs); psychometrics

indicate strong reliability (.93) and validity (.81-.82) for drug and alcohol dependence (currently diagnosed as AUD/SUD; Lecrubier et al., 1997).

Dependent Variables

Problematic drug and/or alcohol use (primary). The primary reintegration outcome measures presence of a problematic drug and alcohol use as determined by participant's self report on the MINI for alcohol and substance use (i.e. presence of at least one substance use disorder *or* alcohol use disorder symptom) at any of the follow-up assessments. This outcome measure is coded as yes/1 v. no/0.

Rearrest (secondary). The secondary reintegration outcome measures recidivism indicating a rearrest (not necessarily charged) after release from their baseline incarceration. This is a self-report outcome measure coded as yes/1 v. no/0.

Independent Variables

Post-release Service Utilization. This construct is comprised of variables representing nine different service domains. All variables are yes (1)/no (0) and indicate if the service was utilized at any post-release time point (i.e. upon release through 15 months). The service use categories are as follows: 1) substance abuse (i.e. for drug use, alcohol use, or related activities), 2) mental health (i.e. emotional problems, therapy, clubhouse, other personal recovery-oriented services), 3) life skills (i.e. help with budgeting, time management, grocery shopping, other related activities), 4) relationships (i.e. anger management, problem solving, or other communication related activities), 5) Job Readiness (i.e. resumes, help getting a job, job interviews, or related activities), 6) education (i.e. help with school testing, completing school, enrolling in trade school, other related activities), 7) health (i.e. going to the: dentist, doctor/physician, hospital, urgent care, other related services), 8) housing (i.e. help with housing

applications, rental assistance, finding/buying a home/rental place, housing rights, other related services), and 9) cognitive (i.e. help with criminal thinking, attending day report, other related activities; 5-Key Baseline Codebook, n.d.).

Other Covariates

Demographics. Other Demographics include state of interview/incarceration, age, marital status, sexual orientation, number of children, education, employment (at time of arrest); these variables were aggregated for the purpose to describe the sample only are not part of the multivariate analyses. The reason for this is that these demographics are not integral to the model or questions outlined previously as these are variables that are important to understand sample characteristics.

Race/Ethnicity. Self-reported Racial/ethnic background from the original study included the following categories: Black; Latino/a; White; Asian or Pacific Islander; Native American/Alaska Native/Inuit; Multi-racial; and Other. An additional question was also asked about Hispanic ethnicity [yes(1)/no(0)]. To include as many categories as possible to analyze the impact of race across a variety of categories, while considering distribution, the racial/ethnic categories were recoded as follows: Black (1); White (2); Latinx/Hispanic (3), including Latino/a and Hispanic identifiers; and Other (4; includes Asian or Pacific Islander, Native American/Alaska Native/Inuit, Multi-racial, and Other identities).

Social Support Relationships and Quality Rating. This construct captures 1) the type of relationship with the social support person they are closest to as reported by the participant and 2) a relationship depth score indicating the level of closeness with this person. This variable was asked from baseline through 15 months post-release. The relationship of the person they are closest to was recoded from 10 plus category variable [girlfriend; boyfriend; spouse/partner;

father of my child; mother of my child; my father; my mother; intimate partner; friend; neighbor; coworker; other (specify)] to a four-category variable (romantic partner; parent; other family; other support) to consolidate overlap and improve distribution of the variables. Both variables are part of a broader instrument called the Quality Relationships Inventory (QRI) designed to measure perception of support, conflict, and depth of relationship; psychometric properties indicate a Cronbach's alpha of 0.84 (Pierce et al., 2001).

Other Mental Health Problem at Baseline. This variable indicates if there was presence of an additional mental health diagnoses at the time of the baseline interview (yes/1 or no/0). Presence of mental health conditions were assessed using the Mini-International Neuropsychiatric Interview (MINI), a diagnostic assessment for a variety of mental health conditions with psychometrics that indicate strong reliability and validity for all mental health diagnoses (kappa coefficients: .72 to .97; Lecrubier et al. 1997). Presence of one or more of these conditions at baseline counted as yes (1) for presence of other mental health problem at baseline: major depression, manic episode, social anxiety, mood disorder, psychotic disorder, generalized anxiety, and/or post-traumatic stress disorder.

Perception of Service Need. This construct represents perception of service need across each of the nine service domains, coded separately for each domain as yes (1)/no (0) to indicate if the participant perceived a need for each of the services was present at any post-release time point (i.e. upon release through 15 months). The service domains for perception of need are as follows: 1) substance abuse, 2) mental health, 3) life skills, 4) relationships, 5) Job Readiness, 6) education, 7) health, 8) housing, and 9) cognitive. In addition, Substance abuse and mental health are the only service domains of perception of service need that are also captured at baseline.

Assessments. Four assessments were included to better understand trauma history, readiness for treatment, perception of health, and presence of psychological distress. The Trauma History Questionnaire (Green, 1993) is a reliable and valid instrument used to assess trauma history with (interrater reliability reported from .76 to 1.00; Hooper et al., 2011). The Circumstances, Motivation, Readiness (CMR) Measure is an instrument used to gauge a participant's overall agreement to participate in treatment that is based on internal/external factors, along with their self-awareness; the CMR shows strong psychometric properties with a Cronbach's Alpha ranging from .60-.80 (DeLeon et al., 1994); CMR was collected at baseline only. Perception of overall general health was measured using the RAND Short Form (SF-36) Health Survey (Cronbach's Alpha = .78, RAND Corporation, n.d.). Finally, presence of psychological distress post-release was measured using Kessler's Psychological Distress, a valid tool used to assess mental health conditions (Hides et al., 2007); this Kessler 10 question survey used in this study reports the area under the receiver operating characteristic (ROC) curve at 0.854, suggesting strong diagnostic ability (Kessler et al., 2003). These covariates were included in this study as these general demographics, trauma history, treatment readiness, health perception and psychological distress have been suggested as influential to receipt of behavioral health treatment (i.e. substance abuse and mental health services; Hamilton & Belenko, 2016), which are included among the dependent variables in this study.

3.2.4 Analyses

Bivariate analyses included cross-tabulations and correlation analyses to understand the nature of the relationship among the relevant model variables. To assess the relationship among prison substance abuse treatment and social support on post-release service utilization, while controlling for demographic and other covariates, a multilevel mixed-effects logistic regression

was utilized involving study participant level data. Average marginal effects were also conducted to understand the predicted probability; both estimates are provided to understand consistency of the significance. The outcome variables were dichotomous indicating whether there was presence during the post-release time frame of 1) problematic drug and/or alcohol use and 2) report of arrest.

3.3 Results

3.3.1 Sample Description

SUD diagnoses consisted of the following: 12% alcohol use disorder, 53% drug use disorders, and 35% had both alcohol and drug use disorders. The majority was on average a 36-year-old ($M= 35.75$, $SD= 10.48$) Black male that was employed prior to their incarceration ($N=213$, 42.26%). Most participants were parents (68%) and 43% reported having less than high school education prior to their incarceration. Most of the sample from the first phase of the multistate trial comes from Texas (41%), followed by Florida (25%), Pennsylvania (19%), then Kentucky (15%). See Table 1 for more descriptive characteristics.

The 504 participants of the sample produced a total of 1,128 observations. Only participants that contributed a post-release follow up ($N= 237$; upon release, 4 months, 8 months, and/or 15 months) were included in the analytic sample that comprised 625 observations. Each model had their respective observational sample size that accounted for missing data.

Table 2 shows the mixed-effects of post-release service utilization across nine different service domains (i.e. substance abuse, mental health, life skills, relationships, health, job readiness, education, housing, and cognitive) and their relationship to problematic drug and/or alcohol use. Table 3 showed the mixed-effects of post-release service utilization on rest; Tables

4 and 5 shows the average predicted probabilities among post-release service utilization and problematic use and arrest, respectively.

3.3.2 Problematic Drug and Alcohol Use

All nine models were statistically significant at the $p \leq .05$ level or greater suggesting post-release service utilization across all domains have a statistically significant relationship with problematic drug and/or alcohol use, while controlling for covariates. The most prominent and consistently statistically significant variables across each of the nine models included psychological distress scores and quality of relationship scores. Consistent results across all nine models will be discussed below, along with specific results from particular models when appropriate.

Psychological distress scores were statistically significant ($p \leq .01$ level or greater) with presence of problematic drug and/or alcohol use suggesting that with each unit increase in score increased the odds of reporting problematic drug and/or alcohol use between 9 and 11% across the nine service models. The average predicted probability of reporting presence of problematic drug and/or alcohol use increased by around .8 to .9 percentage points across all nine services models with each unit increase in psychological distress score, holding all other variables constant; in other words, the higher report of psychological distress increased the likelihood the participant was to report problematic drug and/or alcohol use post-release across all service models.

Quality of relationship scores were also statistically significant ($p \leq .01$ level or greater) with presence of problematic drug and/or alcohol use suggesting that each unit increase in score decreased the odds or were around three times less likely to report problematic drug and/or alcohol use. The average predicted probability for each unit increase in quality of relationship

score of participants to their closest social support partner decreased around 8 to 10% across all service models, holding all other variables constant.

Additional variables that held a statistically significant relationship to report of problematic drug and/or alcohol use post-release included both utilizing substance abuse services post-release ($p \leq .01$) and perceiving a need for substance abuse services post-release ($p \leq .001$). Post-release service utilization for substance abuse decreased the odds of reporting the presence of a problematic drug and/or alcohol use by almost 85%; the average predicted probability of reporting a drug and/or alcohol use problem post-release decrease by around 12% when utilize substance abuse services post-release, compared to participant observations that did not. Further, perceiving a need for substance abuse service post-release increased the odds of reporting a problem with alcohol and/or drugs eight-fold; specifically, perceiving a need for substance abuse services increases the average predicted probability of reporting problematic drug and/or alcohol use by almost 25%.

3.3.3 Rearrest

None of the nine service models yielded statistically significant results suggesting that post-release service utilization across the nine service domains do not statistically influence arrest post-release. However, the trauma history questionnaire score was statistically significant with arrest ($p \leq .05$ or higher) suggesting the odds of arrest were increased by at least 58% for each unit increase in score across substance abuse, mental health, life skills, relationships, job readiness, education, and cognitive service models; statistically differences were observed among the average predicted probabilities were increased by 2% across each of the seven domains for each unit increase in THQ score.

Additional variables with statistically significant relationships with arrest included perceiving a need for substance abuse services ($p \leq .01$) which multiplies the odds of arrest by 7.6; this is not surprising given the statistically significant relationship with perception of substance abuse service need with problematic drug and/or alcohol use mentioned above. However, there was no statistically significant difference in the average change in predicted probability between those that perceived a need for substance abuse services and those that did not. Although the full model was not statistically significant, utilizing post-release job readiness services was statistically significant with arrest ($p \leq .05$) suggesting the odds of arrest were decreased by 86%; the average change in predicted probability of arrest post-release decreases by 6% when receiving job readiness services post-release, compared to those that do not.

3.4 Conclusion

All service utilization models were statistically significant ($p \leq .05$ level or greater) with the primary outcome of the presence of problematic drug and/or alcohol use outcome. However only one independent variable (post-release substance abuse service use) was statistically significant relative to the outcome variable; this is expected given the sample size is comprised solely of individuals that were diagnosed with SUDs at their baseline incarceration. Substance abuse utilization post-release decreased the odds of reporting problematic drug and alcohol use by almost 85% compared to those that did not utilize substance abuse treatment post-release. For the remainder of the service models and problematic drug and/or alcohol use, the statistical significance of the model was largely explained by psychological distress and quality of relationship scores. While the model was not significant, there was an interested finding

regarding the statistical significance ($p \leq .05$) between post-release job readiness services and arrest suggesting this service domain decreased the odds and the predicted probability of arrest.

3.4.1 Limitations

The present study had several strengths including utilizing data from a longitudinal, multi state randomized control trial and is of the first to examine the impact of service utilization or aftercare across a variety of service domains and the impact on reintegration. However, there are several limitations that are noteworthy. First, the high attrition rate of the baseline sample (52%) prevented the ability to account for differences by gender and race in the multivariate models, which is an identified gap in the literature (Bloom et al., 2003; Ropes Berry et al., 2020). Additionally, although the present study is longitudinal and inclusive of multiple states, the results cannot be generalized outside of Texas, Kentucky, Pennsylvania, and Florida. Causality cannot be determined in this present study, although the analyses included several controls to better understand the nature of the relationship among the variables. The existing findings here are associations. Future iterations of this work and related research should control and include a time control variable that can better understand the impact of service utilization post-release and the reintegration outcomes.

Parsimony of the models are questionable for these models given the level of covariates included in the analysis. While the control variables were supported by the research, the number of controls had the potential to overpower the model; however, the mixed effects analyses are robust enough method to handle this limitation. Relatedly, there were several covariates that would be an important control given the sample and aims of the paper including: treatment mandates and charge/offense type of the baseline incarceration. Future iterations of this draft

may be able to include Department of Corrections data that will strengthen the explanatory power of these models.

Finally, preliminary findings from the *5-Key* Multistate Trial offer support for the complexity of recidivism. These early findings suggest recidivism for some *5-Key* study participants are not necessarily reincarcerated due to violent and/or drug charges, but as a result of non-violent technical violations, including. violating curfew, missing check in with community corrections officer, coming into contact with police, unpaid fines(Pettus-Davis & Kennedy, 2020). In future iterations of this research, the reason for arrest can be included to help further understand the complexity of recidivism and how this is informed by service utilization.

3.4.2 Practice and Research Implications

Given the importance of positive perception of social support to decreases in report of problematic drug and/or alcohol use, the findings further stress the importance of intervention and programming (pre- and post-release) occurring at the familial and social support level. Preliminary results from this study suggest the quality rating of social support is a protective factor against problematic drug and/or alcohol use post-release, across almost all service domains. This is further supported by the environmental context of addiction and SUDs and highlights the importance of environment and surroundings in recovery, particularly the individual's social network and family context. Intervention and epidemiology research will also be strengthened with consistent inclusion of social support and/or family members to better understand the most effective timing and programmatic mechanisms that are useful in encouraging decreases in problematic drug and/or alcohol use, as well as increasing help seeking behaviors, such as service utilization. These findings will be critical to further understanding

how to decrease high rates of recidivism that are observed among formerly incarcerated men and women.

Chapter 4: Reintegration Among A Formerly Incarcerated Sample with Substance Use Disorders: Exploring Gender and Race

Evolving research is starting to refer to addiction as a “brain disease” (Volkow et al., 2016; NIDA, 2020) and, like other chronic diseases, demographic differences exist among individuals diagnosed with SUDs by gender (often times used synonymously with sex) and race (U.S. HHS OSG, 2016). There is scant literature that focuses on the gender and racial disparities among SUDs (Guerrero et al., 2014; Volkow et al., 2016), however, the limited research available suggests that these differences impact access to needed health care (U.S. HHS OSG, 2016). While SUD disparities research is limited even among the general population, most of SUD disparities remain underexplored among criminal justice populations. This is particularly important given the disproportionate representation of populations of color, particularly Black/African American individuals, within the criminal justice system (Carson, 2018).

4.1 Background

4.1.1 Service Needs

Prevalence estimates in incarcerated populations for substance use disorders (SUDs; i.e. drug and alcohol use disorders) are as high as 51% for alcohol use disorders among men and 69% for drug use disorders among women (Fazel et al., 2017). Cross-sectional data from the 2007 and 2008/2009 National Inmate Surveys (NIS) reveal similar rates for drug use disorders with 58% of individuals incarcerated in state prisons and 64% of those serving a jail sentence meeting diagnostic criteria (Bronson et al., 2017). Prevalence of SUDs among incarcerated

individuals is 10 to 12 times higher when compared to members of the general public (McCarthy, 2017).

Individuals diagnosed with SUDs are prone to experiencing a host of other medical illnesses including asthma, high blood pressure, diabetes, heart disease and stroke (Scott et al., 2016). Incarceration is likely to exacerbate these preexisting health conditions (Wildeman & Wang, 2017). While prisons and jails are constitutionally mandated to provide healthcare (Estelle v Gamble, 1976), there is concern regarding unmet service needs within the criminal justice system; particularly regarding SUDs treatment (Cropsey et al., 2012; Hamilton et al., 2016; Taxman & Belenko, 2012). While treatment in prison has been linked to continuation of care in the community (e.g., aftercare; Peters & Steinberg, 2000; Galassi et al., 2015; Malivert et al., 2012; Perry et al., 2015; Werb et al., 2016), this is often explored within the context of substance use disorder treatment only as opposed to looking at the array of services utilized. The extent to which treatment for SUDs in prison informs other types of service utilization has yet to be explored. This is important given the high rates of service needs among formerly incarcerated populations, particularly those with substance use disorders, that has the potential to impact their reintegration experience.

4.1.2 Perception of Service Need

Health literacy and perception of service need has a powerful relationship with help seeking behaviors (Paasche-Orlow & Wolf, 2007). The relationship between perception of treatment need and health literacy can impact an individual's likelihood of receiving services and can ultimately lead to an increase in help-seeking behavior (Mojtabai et al., 2002). Health literacy among the general population has been found to increase a person's ability to communicate with providers and receive adequate care (Lee et al., 2004). Mojtabai and

colleagues' (2002) examined perceived treatment need among individuals in the general population diagnosed with either a mood disorder, anxiety or SUD. Only 14% of study participants meeting the criteria for SUD perceived a need for treatment, with less than half of those with a SUD (3%) seeking help from a mental health professional. Health literacy specific to individuals living with SUDs is lower compared to the general population; this limited research base calls attention to more research to understand engagement in services utilization (Degan et al., 2019, 2020).

Health literacy research is also understudied among incarcerated populations. In one of the only studies examining this, Hadden and colleagues (2018) discovered that 60% of their sample had low health literacy which was associated with more emergency department visits and less confidence managing medications. The participants were also more likely to have burdensome chronic health conditions, as well as less education. While this study did not screen for or include SUDs, these findings suggest that lower health literacy connects to a lack of understanding or confidence in attending to one's health conditions. Moreover, it suggests that lower health literacy may decrease the chances that formerly incarcerated persons with health conditions will be seeking and/or utilizing the care and services that are most appropriate (Hadden et al., 2018). Essentially, an increased understanding of or improved literacy of health illnesses, such as SUDs, could increase the chances that formerly incarcerated persons will seek out, use and maintain the treatment they need.

4.1.3 Gender and Race

Research has found differences between men and women's pathways into addiction and criminal justice involvement and outcomes (Chesney-Linda & Pasko, 2013; Steffensmeier &

Allan, 1996). Men are more likely to be incarcerated and charged with a violent offense (Carson, 2018), yet women are more likely to be charged with a drug-related offense, have higher rates of abuse victimization (sexual and physical) from childhood throughout adulthood, higher rates of SUDs (Bronson et al., 2017; Fazel et al., 2017) and have increased prevalence of co-occurring SUDs and mental health disorders (Brown et al., 2003; Greenfield et al., 2007; James & Glaze, 2006). Race, along with gender, should be considered when examining pathways of involvement with the criminal justice system and the reentry/reintegration experience given the overrepresentation of populations of color (Berry et al., 2018; Fedock & Covington, 2017).

On average among the general population, men account for more treatment admissions and have been found to have higher rates of drinking and illicit drug use compared to women upon intake (CBHSQ, 2015; NIDA, 2018). However, women often present with more severe SUDs, which is likely attributed to a process known as “telescoping” (McHugh et al. 2018, p. 14), which represents the faster progression of substance use to SUDs. Additionally, women diagnosed with SUDs often report higher rates of psychological distress (SAMHSA, 2017) and impairment in medical and social domains, even when they have used substances for a shorter period (Greenfield et al., 2010). However, studies document a significant amount of heterogeneity within sex differences regarding substance metabolism (DeVane, 2009), and therefore these findings cannot be deemed unequivocal (McHugh et al., 2018) with more calls to study this extensively (Mazure & Fiellin, 2018).

Even less is known about racial disparities associated with SUDs with most research focusing on the differences between ‘White’ and ‘Black’, excluding other racial/ethnic categories, particularly Latinos (Guerrero et al., 2014; Guerrero, et al., 2013). The most recent treatment admission data show that White, non-Hispanic individuals have had the highest rates

of SUD treatment admissions between 2004 and 2014, followed by Black (non-Hispanic) individuals (CBHSQ, 2015). Of the limited extant literature examining SUDs etiology by race among the general population, one study found statistically significant differences by race/ethnicity with White participants (men and women) showing a younger mean age of diagnosis for alcohol dependence and faster onset from age of the first drink, compared to Black and Hispanic participants (Alvanzo et al., 2011)

For individuals in the criminal justice system with SUDs, there is even less known about racial/ethnic disparities with only a few national BJS reports available. For example, White prisoners have the highest rates of SUDs (62%) and a substantial proportion of African American and Hispanic prisoners meet diagnostic criteria for SUDs (55% and 58% respectively). Moreover, the differences in SUDs for African American and Hispanic prisoners were statistically significantly lower than White prisoners (Bronson et al., 2017).

4.2 Theoretical Models

The present study is largely informed by a *gender responsive treatment perspective* (Covington, 2002; Covington & Bloom, 2000). Until now, this perspective has been used to shape intervention development and inform how providers and organizations approach individuals seeking treatment for SUDs, particularly women. However, this perspective has not been used to explore specific differences in reintegration outcomes, including problematic drug and alcohol use and recidivism outcomes among women *and* men. Application of this perspective will test the assumptions inherent in gender responsive treatment by examining different service needs and utilization. Incorporating the gender responsive perspective into analyses can begin to open up the black box of “cultural forces” (Walker, 2005) within society

that shape how women and men respond to their SUDs, utilize services (Jordan, 2010; Pollock, 2002), and identify gender and race differences. Additionally, health and service-related variables were informed largely from Andersen's (1995) *Behavioral Model of Health Services Use*. This particular model will be used to understand how formerly incarcerated men and women with SUDs utilize services, how perception of service need is associated with service use, and the differences in receipt of substance abuse treatment in prison.

Aim

The aim of this paper is to create a basic description of the experiences of previously incarcerated persons, including their experiences in prison and post-release among individuals with substance use disorders. The study will use the control sample of a multi-state randomized controlled trial. The emphasis is on gaining a better understanding of factors related to substance use and reintegration as a platform for future practice and research. This paper explores gender and race across the 1) prevalence of SUD treatment during incarceration, 2) SUD diagnosis severity, and 3) changes in perception of treatment need and service utilization over time (up to 15 months post-release) across nine service domains. Additionally, characteristics of the attrition sample will be tabulated to understand this subsample.

4.3 Methods

4.3.1 Data

The present study utilizes data from an ongoing randomized controlled trial (*Multi-site Randomized Controlled Trial of the 5-Key Model for Reentry*) designed to provide theoretically and empirically supported reentry support to men and women recently released from prison as well as to better understand reintegration experiences (Pettus-Davis & Kennedy, 2018). The data includes incarcerated individuals from Florida, Kentucky, Pennsylvania, and Texas. Study

recruitment started in May 2018 and was not influenced by the Department of Corrections (DOC); additionally, randomization for the treatment (participants receiving the 5-Key Model intervention; Pettus-Davis et al., 2019) and control (no treatment or coordinated access to existing services in their release destination) groups occurred using a random number generator on a computer and were not influenced by the research team. This present study did not meet federal regulations for human subjects research and, thus, a non-human subjects determination was received from Washington University in St. Louis's Institutional Review Board (IRB).

4.3.2 Sample

The sample for the present study included participants recruited while incarcerated in 2018 when baseline measures (T0) were obtained. Eligibility criteria for subjects were as follows: (a) at least 18 years old, (b) has a scheduled release date within the study window, (c) releasing to one of the study counties, (d) conversational in English, and (e) cognitively capable of consent. Follow-up was conducted immediately upon release (T1), and then 4 (T2), 8 (T3), and 15 months (T4) after release from prison. The sample size for this project includes participants from the control group *with* a diagnosis of SUDs (inclusive of alcohol use disorders and drug use disorders) at baseline (N=504).

4.3.3 Measures

Substance Use Disorders & Severity

The sample for this project proposal includes men and women who met diagnostic criteria for either a drug and/or alcohol use disorder [referred to as substance use disorder (SUD)] during incarceration at the baseline data collection time point. SUDs are diagnosed utilizing the Mini-International Neuropsychiatric Interview (MINI)-SUD and MINI-Alcohol Use Disorder (AUD). The MINI is a commonly used assessment tool for SUDs (including AUDs).

The MINI is a commonly used assessment tool for SUDs (including AUDs); psychometrics indicate strong reliability (.93) and validity (.81-.82) for drug and alcohol dependence (currently diagnosed as AUD/SUD; Lecrubier et al., 1997). Additionally, the severity for the level of the SUD is included in this assessment, including mild (presence of two to three symptoms), moderate (presence of four to five symptoms), and severe (presence of 6 or more symptoms). Diagnoses and severity level are representative of the 12 months prior to their incarceration.

Substance Abuse Treatment in Prison

This is a dichotomous variable used to determine whether substance abuse treatment was received while in prison (yes/1 v. no/0). Substance abuse treatment receipt in prison is inclusive of both formal services (i.e. psychological services, case management, hospitalization, or medication assisted treatment) and informal (i.e. support groups, self-help, peer support, or other).

Gender and Race/Ethnicity

These are two variables that ask 1) the participant's gender identity and 2) their racial/ethnic background. Gender options were male, female, and other; given the study distribution, gender was recoded as dichotomous to male (0; n= 151) and female (1; n=48). Given the low cell size of non-binary/missing (n=4), these participants were excluded from the analysis. Racial/ethnic background from the original study included the following categories: Black; Latino/a; White; Asian or Pacific Islander; Native American/Alaska Native/Inuit; Multi-racial; and Other. An additional question was also asked about Hispanic ethnicity. After considering the distribution, racial/ethnic categories were recoded as follows: Black (1); White (2); LatinX/Hispanic (3; includes Latino/a and Hispanic identities); and Other (4; includes Asian or Pacific Islander, Native American/Alaska Native/Inuit, Multi-racial, and Other identities).¹

Other Mental Health Problem at Baseline. This variable indicates if there was presence of additional mental health diagnoses at the time of the baseline interview (yes/1 or no/0). Presence of mental health conditions were assessed using the Mini-International Neuropsychiatric Interview (MINI), a diagnostic assessment for a variety of mental health conditions with psychometrics that indicate strong reliability and validity for all mental health diagnoses (kappa coefficients: .72 to .97; Lecrubier et al. 1997). Presence of one or more of these conditions at baseline counted as yes (1) for presence of other mental health problem at baseline: major depression, manic episode, social anxiety, mood disorder, psychotic disorder, generalized anxiety, and/or post-traumatic stress disorder.

Other Demographics & Additional Assessments

Other Demographics include state of interview/incarceration, age, marital status, sexual orientation, number of children, education, employment (at time of arrest); these variables were aggregated for the purpose to describe the sample only are not part of the bivariate stratification. The reason for this is that these demographics are not integral to the existing gaps in knowledge or the questions outlined previously.

Four assessments were included to better understand trauma history, readiness for treatment, perception of health, and presence of psychological distress. The Trauma History Questionnaire (Green, 1993) is a reliable and valid instrument used to assess trauma history with (interrater reliability reported from .76 to 1.00; Hooper et al., 2011). Circumstances, Motivation, Readiness (CMR) Measure is an instrument used to gauge a participant's overall agreement to participate in treatment that is based on internal/external factors, along with their self-awareness; the CMR shows strong psychometric properties with a Cronbach's Alpha ranging from .60-.80 (DeLeon et al., 1994); CMR was collected at baseline online. Perception of overall general

health was measured using the RAND Short Form (SF-36) Health Survey that holds a Cronbach's Alpha of .78 for general health rating (RAND Corporation, n.d.). Finally, presence of psychological distress post-release was measured using Kessler's Psychological Distress, a valid tool used to assess mental health conditions (Hides et al., 2007); this Kessler 10 question survey used in this study reports the area under the receiver operating characteristic (ROC) curve at 0.854, suggesting strong diagnostic ability (Kessler et al., 2003).

These demographic and assessment constructs are often standard in social science research; moreover, these covariates were included in this study as these constructs (general demographics, trauma history, treatment readiness, health perception and psychological distress) have been suggested as influential to receipt of behavioral health treatment (Hamilton & Belenko, 2016), which is one of the variables of focus explained below.

Post-release Service Utilization

This construct is comprised of nine different dichotomous variables to represent the nine different service domains. All variables are yes (1)/no (0) and indicate if the service was utilized at any post-release time point (i.e. upon release through 15 months). The service categories are as follows: 1) substance abuse (i.e. for drug use, alcohol use, or related activities), 2) mental health (i.e. emotional problems, therapy, clubhouse, other personal recovery-oriented services), 3) life skills (i.e. help with budgeting, time management, grocery shopping, other related activities), 4) relationships (i.e. anger management, problem solving, or other communication related activities), 5) Job Readiness (i.e. resumes, help getting a job, job interviews, or related activities), 6) education (i.e. help with school testing, completing school, enrolling in trade school, other related activities), 7) health (i.e. going to the: dentist, doctor/physician, hospital, emergent care, other related services), 8) housing (i.e. help with housing applications, rental assistance,

finding/buying a home/rental place, housing rights, other related services), and 9) cognitive (i.e. help with criminal thinking, attending day report, other related activities; 5-Key Baseline Codebook, n.d.).

Presence of Problematic Drug and/or Alcohol Use Post-Release & Arrest Post-Baseline

Incarceration

The presence of problematic of problematic drug and/or alcohol use post-release from the baseline incarceration is dichotomous. Presence (yes/1) is determined by presence of at least one symptom of the Mini-International Neuropsychiatric Interview (MINI)-SUD and/or MINI-Alcohol Use Disorder (AUD; Sheehan et al., 1998) as of the interview timepoint. Additionally, status of arrest was measured of the participants and is a dichotomous variable that identifies if this participant was arrested (not charged) since the release from the baseline incarceration.

4.3.4 Analyses

Given the low cell counts among some of the variables, particularly gender, bivariate analyses are included to describe and begin to address a gap in research on prevalence. Fishers exact tests were run to correct for small cell size and Kruskal- Wallis tests were run for variables that violated assumptions of normality. For the repeated measure data, bivariate mixed logistic regressions were conducted for the dichotomous variables and mixed effects logistic regressions were conducted for the continuous variables. Additionally, bivariate analyses across time varying variables will be conducted to understand characteristics of the sample, between participants, and within participant observations that will illuminate change in rates over time. Statistical and observed differences will be noted and discussed.

4.4 Results

4.4.1 Sample

100% of the sample was diagnosed with either an AUD or SUD or both at baseline (incarceration; N= 504). Males represented 90% of the sample with the average participant 36 years of age (M= 35.75, SD= 10.48). Forty two percent of the sample identified as Black and 52% were employed prior to their incarceration. (N=213, 52%). The majority of the participants were parents (68%) and 43% reported achieving less than high school education prior to their incarceration. Most of the sample from the first phase of the multistate trial comes from Texas (41%), followed by Florida (25%), Pennsylvania (19%), then Kentucky (15%).

The participants at baseline (N=504) comprised a total number of 1,029 observations across five data collection timepoints (baseline; upon release; six months post-release; eight months post-release; and 15 months post-release). Most of the sample did not receive follow up after incarceration (24%). No substantive differences were observed between the average number of follow up visits between males and females. For racial/ethnic groups, White participants had the highest average number of follow ups at nearly 3 visits, compared to around 2 for the other groups. See Table 1.

4.4.2 Attrition

Statistically significant differences were not observed among any baseline characteristics between attrition and retention groups. At an observed level, there were larger rates (>10%) observed for the attrition group compared to the retention group in the following areas: females (58% v. 42%), Latinx/Hispanic participants (68% v. 32%), alcohol use disorder (60% v. 40%), severe diagnoses (56% v. 44%), and presence of mental health problems at baseline (57% v. 43%). See Table 2.

4.4.3 Gender

Among the participants interviewed at baseline with the presence of SUDs (N=504), there was a statistically significant relationship between SUD diagnoses severity and gender ($\chi^2=16.95, p\leq.001$), with females having much higher prevalence of severe disorders (94%) compared to males (67%). Circumstances, Motivation, and Readiness Score (CMR) also yielded a statistically significant relationship with gender [$t(-2.54)= 0.01$], with female participants average score at baseline ($M= 56.25, SD= 5.99$) indicating higher agreeability to treatment and service utilization, compared to males ($M= 52.97, SD= 7.90$). Other observed differences between gender categories, included females reporting higher rates of substance abuse services in prison compared to males (75% v. 63%) and presence of other mental health problems at baseline (40% v. 27%). See Table 3.

Results of the bivariate mixed logistic regression among the follow up sample inclusive of gender observations (N=1,129) did not yield statistically significant differences between males and females among perception of or utilization of services. . However, there were statistically significant differences observed among the mixed effects regressions for THQ score ($z= 2.03, p\leq.05$) and overall health rating ($z= -2.73, p\leq.01$). Female participants had higher observational means ($M=4.31$) compared to males ($M=3.42$) suggesting females indicating females experienced a higher number of lifetime traumatic events. Conversely, male observational means ($M=72.59$) were higher compared to females ($M=64.20$) suggesting male participants had a great perception of general health. For both assessments, females standard deviations suggesting higher variability in scores across time points. See Table 4.

4.4.4 Race/Ethnicity

Among the participants interviewed at baseline with the presence of SUDs (N=504), there was a statistically significant relationship between SUD diagnoses severity and race ($\chi^2=33.57, p\leq.001$); while most of the participants at baseline qualified for a severe SUD, White participants had the highest prevalence of severe disorders (83%) compared to the other race/ethnicity categories with Black participants at the lowest (58%). Receipt of substance abuse services in prison was statistically significant across race/ethnicity ($\chi^2=24.30, p\leq.001$), with Other race participants reporting the highest substance abuse service utilization rate in prison (76%) and Black participants reporting the lowest (54%). Presence of other mental health problems at baseline also held a statistically significant relationship with race/ethnicity ($\chi^2=9.43, p\leq.05$) indicating White participants reporting the highest prevalence of other mental health problems (35%) and LatinX/Hispanic with the lowest (18%). Further, CMR scores hold a statistically significant relationship with race/ethnicity ($F=3.81, p\leq.01$), with White participants average score at baseline ($M=54.44, SD=7.87$) indicating the highest agreeability to treatment compared to other groups. See Table 5.

Results of the bivariate mixed logistic regression among the follow up sample inclusive of race/ethnicity observations (N=1,129) also yielded statistically significant differences between groups among perception of substance abuse service need post-release only (yes=1; $\chi^2=14.55, p\leq.01$) and perceived need for housing services (yes=1; $\chi^2=7.92, p\leq.05$). For post-release perceived need for substance abuse services, White participants had the most observations across timepoints after incarceration that included a report of perceived need for substance abuse (n=43); however, participants identifying as 'other' race had the highest rate of maintaining *ever* perceiving a need for substance abuse services (100%), however it was representative of one

participant. Regarding perception of housing service need, black participants had the highest observations across timepoints after incarcerations that included a report of perceived a need for housing services (n=47), with Latinx/Hispanic participants having the highest maintenance of their perception of need among participants that *ever* reported perceiving need post-release (60.42%).

Additionally, statistical differences were observed among racial/ethnic categories for overall health ($\chi^2= 12.94, p\leq.01$). For overall health, LatinX/Hispanic participant observations had the highest average score ($M= 75.90; SD=22.74$), indicating their overall perception of general health was highest among the racial/ethnic groups. Moreover, Other race participants experienced the greatest variability among their participant means across time points (Observational $M= 68.33; SD=12.67$) indicating higher instability of perception of general health over time. See Table 6.

4.5 Discussion

Statistically significant differences in gender were observed by higher SUD severity among females ($p\leq.001$) and CMR scores ($p\leq.01$), suggesting higher agreement and readiness for services among females as well. Additionally, there were statistical differences found overtime by gender for THQ score ($p\leq.05$) and overall health ($p\leq.01$). Among race/ethnicity, statistically significant relationships were observed with SUD severity ($p\leq.001$), substance abuse treatment in prison ($p\leq.001$), presence of other mental health conditions at baseline ($p\leq.05$), and CMR scores ($p\leq.01$). At baseline, White participants were found to have the highest rates of severity; other mental health conditions at baseline; and higher mean score of CMR indicating higher agreeability to services. Black participants had the lowest severity rate, along with the lowest receipt of substance abuse services in prison. Over time, statistically significant

differences were also observed for perception of service need for substance abuse services post-release ($p \leq .01$) and perception of housing need ($p \leq .05$). Black participants Additionally, statistically significant differences among race/ethnicity were observed among overall health ($p \leq .001$). Overall health was found to have White participant observations have the lowest perception of general health, Latinx/Hispanic populations with the highest perception of health, with Other race participants found to have the greatest variability in overall health score suggesting instability in their perception of general health overtime.

4.5.1 Limitations

It should be noted the interpretation and application of these bivariate findings should be conservative given the lower cell size and observation. Additionally, perceived need and service utilization is representative and inclusive of those that reported “yes” and cannot be assumed the inverse for those that did not perceive need or utilized services. The low cell size of gender prevented adding gender into the multivariate models to inquire about gender differences, as well as the interaction of gender and race/ethnicity. Additionally, race/ethnicity, particularly the LatinX/Hispanic and “Other race” category, had lower cell sizes and thus does not allow for an accurate representation of race/ethnicity differences. However, there is still a gap in research on gender and race/ethnicity differences, particularly among SUDs, criminal justice, service utilization, reintegration outcomes. The results of this stratification of gender and race add to the limited research on this topic and creates a foundation from which to pursue intervention research, particularly concerning health literacy and help seeking behaviors.

4.5.2 Implications

These findings offer preliminary evidence that race/ethnicity and gender differences do exist among prevalence of SUDs, perception of health, mental health, as well as perception of

and of services. Results suggest that when an individual perceives a need for any services, their rates of maintaining this perception of need are high. However, while those ever perceived a need maintained their perception over time, it needs to be noted that the count of those perceiving a need were relatively low across almost all service domains post-release. There is a possibility this low perception of need could, particularly for pertaining to services for behavioral health, could be being under-reported out of fear. This speaks to the prevalence of stigma that is still present concerning accessing treatment for drug and alcohol use, mental health issues, or any service or treatment need of formerly incarcerated individuals (Williams, 2007). Moreover, while strides are being made regarding progressive drug policy, existing policy are still punitive pertaining to drug use and/or possession leading to fear of reporting a need. Increasing or encouraging this perception of need has the potential to address unmet need that will not only have impact to overall societal public health (Williams, 2007) but also decrease the potential for criminal justice system (Han et al., 2017). This supports focusing efforts in treatment and programming for individuals with SUDs releasing from prison to enhance psychoeducation programming, which can be used to help increase health literacy of substance use disorders.

These findings also suggest that offering a one size fits all approach to treatment will not be adequate to address the growing number of SUDs and individuals releasing from prison. This is a tenet of gender-responsive treatment in that offering comprehensive services tailored to unique needs of the individual will yield the best outcomes. Existing treatment practices are developed around predominantly white populations and bivariate results suggest that there are gender and race/ethnicity differences that need to be attended to. Specifically, these findings have suggest the most severe diagnoses for alcohol and drug use disorders were found among White participants, not Black participants which challenges this historical narrative of the

“criminal addict” in prison that has largely been painted among Black men and women (Kerrison, 2017). Additional research needs to incorporate interaction of gender and race/ethnicity that help further highlight how to individualize treatment that is a focus of most clinical interventions. This line of research can also be extended into looking at differences in the barriers experienced by gender and race/ethnicity by service domain that will provide preliminary evidence to how complex service delivery systems need to be to best service individuals with SUDs releasing from prison.

Chapter 5: Dissertation Conclusion

Years of mass incarceration have given way to mass reentry (Chamberlain & Wallace, 2016), with an annual estimate of 600,000 releases from state and federal institutions (Carson, 2018).² Rates of substance use disorders (SUDs) complicate reentry and reintegration as there is high prevalence of SUDs among formerly incarcerated populations (Bronson et al., 2017; Fazel et al., 2017; McCarthy, 2017). Unmet treatment need is also elevated among incarcerated and formerly incarcerated populations, and this is complicated during reintegration by fragmented and overburdened service delivery system (CSAT, 1998; Lorvick et al., 2015). Like many other chronic and relapsing diseases, SUDs require treatment (Volkow et al., 2016), which is essential for successful community reintegration. Unfortunately, we know there are a range of barriers preventing service utilization post-release (Pettus-Davis & Kennedy, 2018), particularly among individuals with SUDs and other behavioral health conditions (Priester et al., 2018).

This dissertation study utilized data from the *Multi-site Randomized Controlled Trial of the 5-Key Model for Reentry* (Pettus-Davis et al., 2019) focusing on a subset of men and women diagnosed with SUDs (alcohol and/or drug) at incarceration (i.e. baseline) and followed up to 15 months post-release. Andersen's (1995) *Behavioral Model of Health Services Use* informed predictor and control variables for the models that sought to answer/understand: 1) the association between prison substance abuse treatment and post-release service utilization (substance abuse and others), 2) if the relationship type of the participants closest social support

² While the national pandemic has slowed annual release numbers to decrease spread of COVID-19, this is also the result of a decrease in prison admissions (Prison Policy Initiative, 2021). Most criminal justice institutions are still operating at max capacity (Prison Policy Initiative, 2021) thus, this trend is not anticipated to continue long term.

partner influences post-release service utilization (substance abuse and others), and 3) how post-release service utilization informs reintegration outcomes (problematic drug/alcohol use and rearrest). Additionally, a *gender responsive treatment* perspective (Covington, 2002; Covington & Bloom, 2006) was applied to examine observed differences among men and women with incarceration histories across key service utilization and reintegration variables. A summary of the dissertation findings, their implications, study strengths and limitations, and next steps will be presented below.

5.1 Summary of Findings

5.1.1 Aim 1 and 2

Eight of the nine models examining the impact of substance abuse services *and* relationship type of closest social support in prison on post-release, while controlling for other variables, were statistically significant ($p \leq .01$ or greater; except the cognitive service model). However, there were no statistically significant relationships observed between substance abuse treatment in prison and the eight independent outcome service utilization variables (substance abuse, mental health, life skills, relationships, health, job readiness, education, and housing), indicating the statistically significant relationship observed between these variables is the results of the covariates included. Except for the post-release health services model, the relationship type of closest social support partner was not statistically significant with post-release service utilization. The exception to statistical significance was found to be with the “other support” relationship with post-release health service utilization ($p \leq .05$) by increasing the average predicted probability of receiving health services post-release by 7%, compared to other relationship types; however, this finding should be approached with caution as it is likely the category makeup of “other support”, which included “service providers” (from the other

specification/write in in data collection) and could have included doctors or other medical professionals. Overall, the model significance is largely the result of covariates selected as informed from the *Behavioral Model of Health Services Use* (Andersen, 1995).

Specifically, a mediating relationship was observed between perceived service need across all post-release service utilization categories indicating a statistically significant ($p \leq .05$ and greater) increase in the odds ($OR \geq 6$) of reporting service utilization across all service domains post-release. In other words, participants were more likely to use services post-release when they perceived a need for the service. These findings are consistent with one of the few studies examining health literacy (a proxy of perceived need; Paasche-Orlow & Wolf, 2007) among formerly incarcerated populations and that lower levels of understanding of health need translated to lower help seeking behavior (i.e. service utilization; Hadden et al., 2018). This finding was confirmed by another study involving participants with behavioral health disorders that found participants with SUDs had low service need perception for treatment (14%), with only 3% going on to seek professional help (Mojtabai et al., 2002). Given the lack of statistically significant relationships between the independent variables and post-release service utilization, it can be assumed that only part of the model (see Chapter 2) was supported. The significance of perceived need and service utilization confirms the influence of Andersen's (1995) model.

5.1.2 Aim 3

All nine services models were statistically significant ($p \leq .05$ level or greater) with the presence of problematic drug and/or alcohol use outcome, however only one independent variable (post-release substance abuse) was statistically significant relative to the outcome variable. Specifically, post-release substance abuse utilization decreased the odds of reporting problematic drug and alcohol use by almost 6.5 times compared to those that did not utilize

substance abuse treatment post-release. For the remainder of the service models and problematic drug and/or alcohol use, the model statistical significance can be explained by other covariates supported in addiction recovery and recidivism research.

Namely, the covariates of psychological distress and quality of relationships scores were consistently statistically significant ($p \leq .05$ level or greater) across the post-release service models; these results suggest that the higher the score (or level of psychological distress) post-release the more likely the participant was to report presence of problematic drug and/or alcohol use. Specifically, with each unit increase in psychological distress score increased the odds of reporting problematic drug and/or alcohol use post-release, holding all other variables constant. The quality of relationship score for the social support partner the participant was closest to (e.g. the degree to which the relationship is positive) was also consistently statistically significant across all service models in relation to presence of problematic drug and/or alcohol use ($p \leq .01$ level or greater) and decreased the likelihood of reporting problematic drug and alcohol use about three times with each unit increase in score, holding all other covariates constant. In other words, presence of a positive and supportive social support person among formerly incarcerated men and women with SUDs decrease the overall probability of reporting the presence of problematic drug and/alcohol use. This is consistent with other literature, particular among women, that has found positive social support to be integral to recovery from SUDs (Andersen et al., 2017; Nargiso et al., 2014; Pettus-Davis et al., 2018). The findings from this dissertation add to literature on the importance of “other” service needs, outside of substance abuse services, among individual living with SUDs and its connection to successful reintegration and present an opportunity for further research.

Overall, the results from Aim 3 can highlight the ways in which post-release service utilization influence reintegration outcomes. While no statistical significance was observed in the service models and the rearrest outcomes, it does show post-release service utilization is protective against problematic drug and/or alcohol use, specifically substance abuse treatment services among formerly incarcerated women and women diagnosed with SUDs while incarcerated. The importance of treatment for SUDs has been supported in the literature (NIDA, 2020; Oesterle et al., 2020), particularly for individuals with incarceration histories (Cropsey et al., 2012; Pettus-Davis & Kennedy, 2018). Although the eight other independent post-release service utilization variables were not statistically significant predictors of the presence of problematic drug and/or alcohol use, the statistical significance of the models suggest an opportunity for further exploration in future research on the impact of these “other” service variables.

5.1.4 Stratification

Statistically significant differences in gender were observed by SUD severity ($p \leq .001$) and CMR scores ($p \leq .01$), suggesting higher agreement and readiness for services among female participants. Additionally, statistically significant differences were observed over time by males and females between THQ scores and Overall Health rating. Female observational means ($M=4.31$) for THQ scores were higher compared to their male peers ($M=3.42$), indicating a higher number of life traumatic events experienced; female observations also indicated higher variability in their scores across timepoints. Male observations means ($M=72.59$), however, were higher for overall health scores compared to their female peers ($M=64.20$), indicating a higher perception of general health. However, female observations were also observed to show higher variability in their health score across time points.

Among race/ethnicity, statistically significant relationships were observed with SUD severity ($p \leq .001$), substance abuse treatment in prison ($p \leq .001$), presence of other mental health conditions at baseline ($p \leq .05$), and CMR scores ($p \leq .01$). Additionally, statistically significant differences were also observed for perception of service need for substance abuse services during post-release only ($p \leq .001$) and perception of post-release housing service need ($p \leq .05$) over time among race/ethnicity. White participants had the highest severity levels for their SUD diagnosis at 83%, compared to Black participants with the lowest rate of severity at 58%. Black participants also had the lowest rate of prison substance abuse treatment at 54%, with Other race participants having the highest substance abuse treatment in prison at 76%. Additionally, White participants had the highest presence of other mental health problems at baseline at 35%, with Latinx/Hispanic participants with the lowest at 18%. Finally, CMR scores measuring motivations and readiness to treatment were relatively similar across race/ethnicity groups, White participants indicated the highest mean at 54.44. These preliminary findings confirm that there are statistically significant differences by gender and race that need to be further explored utilizing an intersectional lens to best understand the complexities of treatment needs.

5.2 Interpretation of Key Findings

5.2.1 Influencers of Post-release Service Utilization

Extant literature has yet to examine in depth the association of prison-based treatment on post-release help-seeking behavior such as post-release service utilization, outside of aftercare (i.e. the continuation of substance abuse programming from release to the community). However, recidivism is one of the most tracked and chosen outcomes of any prison programming (Duwe, 2017). Byrne (2020) found in a review of literature from 1980 to 2011 that formal treatment options have *modest* impact on recidivism (arrest within three years post-release), indicating

some statistically significant differences were observed among the more rigorous research conducted exploring the impact of prison-based substance abuse programming on post-release outcomes (see Drake, 2012; Galassi et al., 2015; Mitchell et al., 2012); however the differences were minimal and not always sustained at the extended follow up time periods (Byrne, 2020). Duwe (2017) reviewed more recent evidence on the impact of residential and ‘other’ (i.e. non-therapeutic community) prison-based substance abuse treatment programming and found positive outcomes for recidivism for both residential and non-residential programs.

This brief overview of the evidence on the influence of prison substance abuse treatment is provided to highlight the need for more post-release measurement as recidivism is not always a proxy for criminal behavior or rehabilitation, particularly for further marginalized formerly incarcerated populations including those with substance use disorders and Black, Indigenous, and other populations of Color. Additionally, this evidence was reviewed to underscore the preliminary nature of these findings and the associations with post-release service utilization outside of non-substance abuse service domains. The relationship between substance abuse treatment in prison and post-release did not have an independent statistically significant relationship, and only part of the model was support which suggests this needs to be further explored and tested with a larger sample given the foundational nature of this analysis.

A major underpinning of the Aim 1 model is to *begin* to understand if substance abuse programming in correctional institutions influence help seeking behavior, namely the aggregation of post-release services utilized across nine different domains. This line of inquiry is important for several reasons. Firstly, correctional institutions are mandated to provide needed healthcare services to avoid violating the Eight Amendment (e.g. banning cruel and unusual punishment; *Estelle v. Gamble*, 1976). Second, there are high rates of comorbid and cooccurring

disorders among formerly incarcerated populations and populations living with SUDs with some research suggesting unmet needs, or *health strain* (Agnew, 2006), increase illicit substance and alcohol use to cope among adolescents (Stogner & Gibson, 2011) and prison misconduct among adult inmates (Semenza & Grosholz, 2019). Finally, the extent to which correctional services improve rehabilitation needs to be studied outside the metric of recidivism as society continues to utilize prisons (Duwe, 2017). This is of particular importance to this study as it was found perceived need was relatively low post-release but was a key factor in utilizing services. It is unclear if this low service need was the result of the low rate of prison substance abuse treatment received in prison among a sample of incarcerated men and women with most presenting with severe SUD levels. This study was of the first to begin to understand how, if at all, prison substance abuse treatment influences post-release outcomes outside of recidivism; this line of research should continue so that we may better understand how and to what extent prison programming is contributing to rehabilitation (Drake & Fumia, 2007) and how it can increase perception of service need.

5.2.2 Gender and Race/Ethnicity

A legal epidemiological framework was used to examine how existing prison treatment and punitive laws reinforce current states of wellbeing among incarcerated populations that aligns well with this study's population (Kerrison, 2017). Kerrison (2017) reviewed the history of substance abuse treatment in carceral systems and found existing prison-based substance abuse programming, backed by drug policy, are "conditioned by race" (p.584) suggesting programming and policy have largely been developed to address the growing number of White populations incarcerated with drug and alcohol issues. While some treatments adopted within prisons, such as mindfulness-based programming, show promise in addressing racial injustices

that are experienced within carceral institutions and in communities of Color, particularly for Black and Latinx groups, there is still more research needed to understand the impact and implementation needs across racial and ethnic identities (Kerrison, 2017).

This history stresses the importance of continuing to examine the impact on post-release service use as the legal system and other systems exist as significant determinants of health (see Burris et al., 2015). Levitsky (2013) speaks to the impact of legal systems and laws and their impact on the health, environment, beliefs and behaviors of the larger society and, thus, requires that the impact of prison treatment continue to be examined (Drake & Fumia, 2017).

The existing narrative and visual painted of the United States's incarcerated population and drug epidemic has largely been in disservice of populations of Color, namely Black and Latinx individuals, that has caused limited resources and supports within their networks and communities (Sanders & Powell, 2012), which has largely fueled the “non-White criminal addict stereotype” (Kerrison, 2017, p. 576). The findings from this study suggest the most severe diagnoses for alcohol and drug use disorders were found among White participants, not Black participants which challenges this historical narrative of the “criminal addict” in prison that has largely been painted among Black men and women.

Black and White differences in access and utilization in prison and outside are also substantiated in past research that has shown a disparity in access to services among Black populations and women compared to their White peers (Phelan & Link, 2015). However, distrust among providers is also a prevalent factor in healthcare and service utilization among individuals with behavioral health issues (Priester et al., 2018). This distrust among healthcare providers has been noted more prevalent among Black and Latinx populations, compared to their White peers (Sewell, 2015). Kerrison (2017) notes that racism in health delivery produce bias that have

serious consequence and impact the quality of treatment and provision of services and could impact long term help seeking behavior. However, approaching assessment and practice within health care practices with a “colorblind” perspective

Additionally, race neutral practices in health care assessment have been touted as “colorblind” but have found to produce discriminatory outcomes and practices that need to be considered in the context of this study (Benjamin, 2019). While it is hard to say within the context of this study, the discriminatory experiences (including microassaults; see Sue et al., 2008) by non-White populations within multiple societal systems, particularly the criminal justice system could further explain the lower service use rates in prison for substance abuse observed among Black participants. These experiences among non-White populations needs to be acknowledge, validated and remediated in future practice and research utilizing an intersectional lens to better understand how to improve well being and health for populations outside the margins of power (hooks, 1984), particular by race, gender and class (Crenshaw, 1990).

5.3 Practice and Research Implications

5.3.1 Practice

Implications drawn from these data can help shed some light on the complexity of service delivery systems and how services are utilized. They also inform psychoeducation programming, which can be used to help increase health literacy of substance use disorders. This programming would be applicable to pre-release programming as well as community-based agencies. Given the significance of perceived need in relation to actual service utilization across all nine service domains, there is an opportunity to increase health literacy and education on chronic disease management and recovery that is often the focus among other chronic illnesses

(i.e. asthma, diabetes, cancer) and is an indicator of progression and recovery (Taylor et al., 2017; Tseng et al. 2017). While psychoeducation is a component of most community-based agencies and addiction programming, this study suggests that increasing health literacy could help with recovery and successful reintegration among men and women releasing from prison with SUDs. Historically, improvement in health literacy among substance use disorders is a relatively understudied topic. A systematic review on examining interventions targeting health literacy among behavioral health risk factors (smoking, nutrition, alcohol, and weight/physical activity) found the most common intervention was group education with over 70% showing improvement in health literacy (Taggart et al., 2012); however, this was not well studied among alcohol use and findings did not suggest an improvement in health literacy. Stage of change was one of the most common indicators of improvement (Taggart et al., 2012), which is often a target of Motivational Interviewing (Miller & Rollnick, 2004), particularly among addiction (DiClemente et al., 2004). A system review on randomized control trials conducted that had an influence on health during incarceration and up to one year post-release found interventions focused on SUDs found motivational interviewing produced positive results among women with histories of alcohol and drug abuse and decreased alcohol use among a sample of first time charged with driving under the influence (DUI); however results were not unequivocal as three of the eight studies reviewed did not produce positive results pertaining to drug and alcohol use post-release (Kouyoumdjian et al., 2015). Community-based treatment options were found to show promise among formerly incarcerated populations and drug and alcohol use post-release well as increase in health service use (Kouyoumdjian et al., 2015). This brief review suggests MI could be a promising method to influencing health literacy among formerly incarcerated and

individuals with substance use disorders, particularly housed in community-based treatment settings.

Additionally, implications include possibly that interventions need to occur at the familial level – while this study does not yet tell us this explicitly in these models, it does suggest that service utilization, when controlling for quality rating of social support, is important protective factor against problematic drug and/or alcohol use post-release. This is further supported by the environmental context of addiction and SUDs and highlights the importance of environment and surroundings in recovery, particularly the individual’s social network and family context.

5.3.2 Research

Existing evidence shows drops in social support after relapse (Nargiso et al., 2017), even though relapse is considered a normal part of the recovery process (NIDA, 2020). Similar to the practice implications, intervention and epidemiology research will be strengthened with consistent inclusion of social support and/or family members to better understand the most effective timing and programmatic mechanisms that are useful in encouraging decreases in problematic drug and/or alcohol use, as well as increasing help seeking behaviors, such as service utilization.

Another research implication from this study is the need to look more carefully at barriers to service use for people that perceived a need for services and then did not go on to receive the service. There is an opportunity to explore this within the existing *5-Key Reentry* parent study. This line of research will help to understand how this connects to the attrition subsample and what needs to be included in future intervention studies to facilitate engagement in treatment and other needed services/programs.

Finally, the interaction of race and gender within treatment for incarcerated and formerly incarcerated women with SUDs is vastly understudied (Bloom et al., 2003). Existing treatment practices developed around predominantly white populations may not be effective when applied to African American, Hispanic, and other underrepresented (in the data) populations. This inclusion will help to understand not only what works, but how to overcome specific barriers to treatment that are experienced by oppressed racial and ethnic populations (Creedon & LêCook, 2016). This intersectional approach counters the *neutral* perspective found in the literature that has been argued to be unbiased by gender and/or race/ethnicity. Research has found gender neutral policy and programming to be harmful as it does not acknowledge the ways in which gender shapes social institutions and informs human behavior (Daly, 2006) and is critical to the trajectory of women involved in the criminal justice system (Van Voorhis et al., 2010). Additionally, Kerrison (2017) aptly summarizes that the encouragement of race-neutral practices in the face of disproportionate health disparities by race is further reinforcement of racist practice. Future practice needs to incorporate the intersecting identities in the design of our research, trials, and curriculum in service of translating this research into clinical practice that better supports social justice (Buchanan & Wiklund, 2020) within the service delivery system.

5.4 Strengths & Limitations

Exploring the collective and individual service utilization (i.e., life skills, mental health, substance abuse, relationships, job readiness, education, health, housing, and cognitive) of formerly incarcerated persons with SUDs is the greatest strength of the study. Further, it is of the first known study to explore differences across nine different service type domains among formerly incarcerated populations with SUDs. Moreover, the longitudinal nature and mixed

effects methods analyses allowed for a rigorous analysis and accounts for within and between effects of the selected variables which allows for a more accurate inference of results.

A few limitations are noteworthy. First, there was a high attrition rate among this sample (52%, n= 267). While this attrition rate is not uncommon among research participants with incarceration histories (Alper et al., 2018), it does limit the ability to generalize and explore differences among relevant categories, as is the case with race/ethnicity and gender in this present study. Specifically, research substantiates the different pathways into addiction and the criminal justice system among men and women (Covington, 2008; Pollock, 2002; Steffensmeier & Allen, 1998). Additionally, in this project, causality cannot be determined, although the analyses included several controls to better understand the nature of the relationship among the variables. The existing findings here are associations and are not indicative of sequence or order of events; it is important to also note that future iterations of the work and related research should control and include a time control variable that can better understand the nature of the association and variables, particularly concerning the impact of service utilization post-release and the reintegration outcomes.

Another limitation to note is the instances of quasi-separation (Allison, 2008) that occurred in a few models in Chapter; this was caused from low cell size and distribution of covariates. Additionally, recidivism is a complex construct to include in research. While the presence of rearrest was one of the more stable and well-distributed variables available, it may not be the most accurate variable that represents the reintegration experience. Access to additional Department of Correction variables and additional data from the 5-Key Reentry studies may help bolster this outcome variable.

Other limitations include the absence of certain variables, namely: treatment mandates and charge/offense type of the baseline incarceration. Future iterations of this draft may be able to include Department of Corrections data that will strengthen inference of results. Additionally, the parsimony of the full models are questionable given the number of covariates included in the model, however, this was done given the exploratory and foundational nature to the research aims and questions. Application of these findings should be interpreted conservatively and cautiously given the high parameter estimates and distribution of the data; this suggests additional research is needed to further understand the findings from this preliminary work. Additionally, the sample is comprised of four states (Texas, Florida, Kentucky, and Pennsylvania), and while a strength of the study is multi-state representation, the findings are not inclusive of a national sample and thus generalizability outside of these states is not encouraged.

Overall, this study has expanded our knowledge around the reintegration of individuals with SUDs. Chapter 2 found that perceived need is overwhelmingly important to the service utilization of men and women leaving prison with SUDs; further, it found that when perception of service need occurred, it stayed. Chapter 3 highlighted the important of quality social supports in presence of problematic drug and alcohol use; although post-release substance abuse services were important, this stresses the need to include familial and social support into the treatment process. Further, psychological distress was found to be an important predictor of not only drug and alcohol use but arrest also; this stresses the importance of including comprehensive and tailored services as a standard of care within SUDs treatment. Finally, Chapter 4 offered preliminary findings in support of gender-responsive treatment and that there are key race/ethnicity differences in reintegration experiences that need to be attended to; additionally, it offered evidence that trauma and overall health are indicators of study drop off that can be

mitigated in future studies. The hope is that these findings can be of use to practitioners, policymakers and researchers in the future as we continue to learn more about this growing and underserved population.

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