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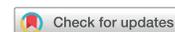
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Building recovery ready communities: the recovery ready ecosystem model and community framework

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ABSTRACT

Background: Public and private systems in the United States and around the World are impacted by substance use disorders (SUD). Despite recent attempts at bringing top down solutions, SUDs continue to be a leading cause of death, a leading correlate in violent crime, and a leading cause of lost productivity in the workplace. Community-based resources have been shown to positively affect SUD impact and SUD recovery, by orienting stakeholders towards the problem and creating continuity among support services. Community-based innovations, such as recovery community organizations and other recovery support services, have provided evidence of successfully scaling recovery efforts and improving the chance of sustained recovery for individuals that live within the community.

Methods: A theoretical model and framework, grounded in the recovery-oriented systems of care (ROSC) theorems, is proposed to identify components and connections that support a community's ability to support individual and group recovery from SUD.

Results: The *Recovery Ready Ecosystem Model (RREM)* and *Recovery Ready Community Framework* builds upon the early work of the ROSC, highlighting recently emboldened support structures such as harm reduction, educational recovery programs, and other traditional support structures in communities.

Conclusions: Enhanced community needs assessment can be informed by the RREM and Recovery Ready Community framework to identify gaps in their current community infrastructure. Further testing of the recovery readiness equation should be performed as a potential measure of efficacy of community ability to support long-term recovery from SUD. Exploration of potential application of the model and framework to international settings is also needed.

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Recovery-oriented systems of care; community; substance use disorder; recovery; community organizing; systems change

Introduction

Behavioral health disorders pose one of the largest social welfare and public health concerns that the United States has ever experienced (Health and Human Services (HHS), 2016). The 2016 U.S. Surgeon General's Report on Alcohol and Other Drug Use projects that behavioral health disorders cost the United States over \$420 billion dollars annually (HHS, 2016). Similarly, behavioral health disorders also pose a significant concern across the globe, with over 18% of the worldwide population (an estimated 900 million individuals) categorized as high episodic drinkers (WHO 2018) and over 31 million having a substance use disorder other than alcohol (United Nations Office on Drugs and Crime [UNODC] 2018)). With the rise of opioid related overdose deaths – over a 240% increase since 2001 in the United States (Rudd et al. 2016) and over 127,490 total opioid related deaths in 2016 worldwide (UNODC 2018) – untreated substance use disorders (SUD), including alcohol use disorders, opioid use disorders, and other substances, have recently become a recurring discourse in the national and international forum among public health officials and agencies.

Criminal justice systems are increasingly overwhelmed in the United States, and over 55% of the federal prison population was incarcerated in 2004 for a drug-related crime (Bureau of Justice Statistics 2004). Additionally, 83% of state prison populations and 79% of federal prison populations self-report life-time drug use, a staggering number that speaks to both criminal justice policy and the pervasive nature of substance misuse and use disorders in the United States (Bureau of Justice Statistics 2004). Internationally, the portion is dramatically lower, though still 1 in 5 individuals, with 20.1% of the incarcerated population having been so for drug-related crime (Walmsley 2016, 2017; UNODC 2018). Increased availability of treatment for SUDs has shown to reduce criminal activity, though capacity is generally lacking (Wen et al. 2017; UNODC 2018).

The private and public workforce sectors are also directly impacted by SUDs. In 1998, over 70% of the employer costs associated with alcohol use disorders were attributable to lost productivity (Harwood et al. 1998; Harwood 2000). Subsequently, it was found that employees who participated in SUD treatment improved previous-month absenteeism by over 25%, and that gains related to absenteeism and

productivity continued to improve proportionally to time spent in treatment (Jordan et al. 2008). The most recent estimate of economic impacts in the United States, completed in 2011 by Bouchery and colleagues (2011), estimate that 72.2% of impact is due to lost productivity, much of which is borne by private industry. Globally, the impact of lost productivity is similar for other high-income countries, with lost productivity weighted averages accounting for 72.1% of economic impact; however, this was slightly higher in middle-income countries, with a weighted average of 78.9% (Rehm et al. 2009).

The United States healthcare system also provides evidence of the detrimental impacts of substance misuse and SUDs. As of 2016, the total economic cost related to health care for substance misuse and use disorder totaled over \$64 billion – \$27 billion related to alcohol use, \$11 billion to illicit substance use, and \$26 billion to prescription opioid use (National Drug Intelligence Center 2011; Birnbaum et al. 2011; Sacks et al. 2015; Florence 2016). Across the globe, healthcare related costs account for 0.3% of gross domestic product (GDP) for high-income countries, and 0.1% of GDP for middle-income countries (Rehm et al. 2009).

In 2015, of the American population that needed SUD treatment, estimated at near 24 million, only 10.8% received such treatment (Center for Behavioral Health Statistics and Quality 2015). Worldwide, the receipt of SUD treatment is slightly higher, with an estimated 16% of individuals receiving services (UNODC 2018). Treatment for SUDs often contains elements of withdrawal management, outpatient, and inpatient programs (HHS 2016). While research has suggested that longer lengths of treatment are beneficial (National Institute of Drug Abuse (NIDA) 2012), the average treatment length of stay in the United States remains at less than 30 days (Walker 2009). As previously mentioned, treatment for employees has resulted in increased productivity and decreased absenteeism, often resulting in over a 23% return on investment for employers who provide insurance to employees that covers treatment services (Jordan et al. 2008). Treatment that results in successful sustained recovery for individuals is also likely to have larger effects on the burden to the United States, resulting from less criminal activity (Chandler et al. 2009) and increases in wage earning (e.g. taxable income) (Hoge et al. 2013), though the measured impact of such outcomes is lacking.

Despite the ongoing need for treatment services among those Americans with medical need, recent data suggests that recovery often occurs along many different pathways (Kelly et al. 2017). Kelly et al. (2017) found that unassisted, or “natural”, recovery was used by 46.1% of Americans in recovery, while the remaining 53.9% used one or more assisted pathways (e.g. mutual-aid groups, medical treatment, recovery support services, medication, etc.). Similar prevalence studies have not yet been completed worldwide, though several observational studies of individuals in recovery have been completed in Canada (McQuaid et al. 2017), Australia (Turning Point et al. 2015), and the United Kingdom (Best et al. 2015).

Perhaps most important from the Kelly et al. (2017) study however, was that an estimated 22.35 million (9.1%) Americans are in recovery from a SUD. Recovery, or the process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential (SAMHSA 2011), is often the recommended outcome for individuals with a SUD, and has been found to occur more often than not for most individuals with the disorder (White et al. 2013). The successful recovery of individuals with SUDs is positively impacted by the use of medical, community, and social supports, especially within the first 5-years of the recovery process (Granfield and Cloud 2001; Hibbert and Best 2011; Jason et al. 2006; McKay 2017; Sheedy and Whitter 2009; White et al. 2013).

To increase the opportunity of successful recovery for individuals with a SUD, thus decreasing the negative economic and societal impact burdened by the United States, it has been suggested that a comprehensive continuum of care model of addiction, versus an acute model of care, be used as a practice standard (Davidson and White 2007; Kelly and White 2010; Dennis and Scott 2007; Humphreys and Tucker 2002). Additionally, the fact that most individuals will engage within processes of recovery within the community they live (HHS 2003), suggests that long-term supports will be most beneficial when they exist within an individual’s local community. The most prominent of these continuum of care models, the recovery-oriented system of care (ROSC), has been used in communities to leverage existing community resources and formal systems of care to provide wrap-around support to individuals initiating the recovery journey.

The ROSC model brings together existing resources and stakeholders at the micro and mezzo level, with the primary goal of providing continuity of services and care, provide all stakeholders a voice, and to continue to build upon existing resources to further support individuals in recovery (Sheedy and Whitter 2013). ROSC has continued to expand, with perhaps the most prominent examples in Philadelphia and Houston, allowing for communities and professional sectors to collaboratively provide infrastructure that has created a more “recovery-friendly” environment (Bitting et al. 2016; Evans et al. 2013). However, the ROSC model is focused on coordinating the current services and resources of a community and does not provide a framework or model for identifying all of the components in a community that may improve the recovery process of individuals. Further, the ROSC model is used as a practical tool for systems transformation and a model that can assess community recovery readiness, or the ability to promote successful recovery, is needed as in addition to the ROSC model.

In an effort to build upon the ROSC model, the current paper approaches the recovery process from a social-ecological systems perspective in an effort to create a model for communities to identify assets to promote recovery success and to assess gaps that may exist within their communities that are not, or cannot, effectively promote long-term recovery. Assessing assets, and orienting existing assets to support

recovery, can determine how communities respond to SUDs. Similar models are already in use by various communities to prepare for major medical and or disaster events (Acosta and Chandra, 2013). As an ongoing crisis, accentuated by the rise of opiate use, due diligence of communities dictates that comprehensive readiness models be formulated and deployed.

The *Recovery Ready Ecosystems Model (RREM)*, identifies micro, mezzo, and macro elements that have been found to support recovery or that can act as a barrier to the successful navigation of the recovery process. Additionally, we seek to provide a framework for further research into the quantifiable impact of communities that are more “recovery ready”, following from the model presented (e.g. do communities with more elements in place of the model promote greater success among individuals initiating and maintaining recovery in that community). The model has dual functions that both assesses supports and identifies barriers to recovery and recovery-related topography of communities, while creating a framework for the deployment and orientation of system elements to further enhance recovery success.

Theoretical foundation

The current article uses social-ecological systems theory to further explore the ability of communities to support recovery of individuals residing in the community. Supportive structures and resources at the micro, mezzo, and macro level are analyzed and then placed within a model framework. This framework is built upon the initial work of the recovery-oriented systems of care (ROSC) model, going further to suggest that the presence of an abundance of these supportive structures and resources allows communities to greater support recovery processes, or to be a “recovery ready ecosystem”.

Social-ecological systems theory applied to the recovery process

Social-ecological systems theory focuses and analyzes the natural contexts in which individuals live, the way in which these contexts are embedded and interact, and how the contexts impact the development of an individual (Bronfenbrenner 1979; Bronfenbrenner and Morris 1998). Understanding the recovery process of an individual can be aided by exploring the various intersections and interplay of the contexts, or ecosystems, that an individual engages in and with during the recovery process. The social-ecological model was proposed from Bronfenbrenner’s ecological systems theory (1979), using the individual context, interpersonal context, community context, institutional context, and the policy context to identify and explain the behaviors, barriers, and potential outcomes for an individual.

Two exceptionally important aspects of Bronfenbrenner’s theory are that taken together, subjective perception of supportive environments along with contextual and structural microsystems must be synthesized, or combined, with interdependence linkage of environments (meso-systems), to

affect developmental change. Essentially, that an individual’s perception of support within their proximal microsystems, must be considered along with the content and structure of that microsystem. Content and structure alone are insufficient without an individual perceiving such content and structure as being supportive. This must also be combined with adequate linkage and interdependency of ecologies (mesosystems) in which the individual may interact and hold multiple roles between (e.g. place of employment, family, proximal community). Thus, support for individual development occurs when multiple ecologies are linked in ways that are perceived by the individual to be supportive of their growth. This element of perceived supportiveness must coincide with functionally supportive content and structure of related ecologies in order to best facilitate change (Bronfenbrenner 1979, 1995). In addition to functioning content and structure contained within ecosystems, and role-supportive features, linkages that are actively engaged between ecologies are essential to facilitating recovery in particular. Assertive linkages that ensure transitions between ecologies allow for system response to individual needs and concerns in person-centered ways thereby orienting the individual towards goals, values, and visions held by various organizations, individuals, and environments that are recovery-affirmative (White and Kelly 2010; White and Kurtz 2008; Kidd et al. 2011; Evans et al. 2012). Such linkages may also help bring together mental health and SUD features to address co-occurrence between the two (Gagne et al. 2007).

Recovery oriented systems of care

The recovery-oriented systems of care (ROSC) model and framework was designed to support communities in the coordination of services supporting recovery from SUD (DiClemente et al. 2016; White 2009; Davidson and White 2007). Davidson and White (2007) describe the guiding principles of ROSC as: (1) recovery looks different for different individuals; (2) matches should be made to where an individual is in their recovery process with appropriate interventions and resources; (3) recovery is a process along a continuum; and (4) peer support, family support and involvement, and spirituality are important components of any recovery process. Davidson and White (2007) offer several key strategies, within the ROSC framework, that can facilitate successful recovery: (a) early identification and engagement; (b) use of role modeling; (c) increase motivation for change; (d) offer education; (e) provide effective treatments and interventions; (f) provide opportunities for individuals to occupy valued roles; (g) connection between individuals and the larger recovery community; (h) provide post-treatment monitoring and recovery coaching; (i) offer meaningful recovery support services (e.g. supported housing, supported employment, supported education); and (j) offer legal advocacy.

A key feature of ROSC is the recognition that recovery support often relates to non-SUD specific domains that allow for attainment of social capital (Davidson and White

2007). SUD is a complex pathology that often affects social spheres in negative and corrosive ways that degrade overall function and social support relationships during substance use careers (Cadet et al. 2014). Co-occurrence of mental health disorders, combined with social barriers, often present a formidable obstacle to recovery sustainment as recovery is a continuous process marked by benchmarks of social capital restructuring and goal attainment (such as education, stable housing, and recovery-affirmative activities and relationships) (Muller et al. 2016).

The development of the ROSC model, and the practical implementation of the theoretical model, provides the assertive linkage between recovery support services and resources within and surrounding a community. In doing so, the ROSC model helps to ensure that the individual perception of the benefit of services offered and/or rendered is positive, along with promoting effective services in and of themselves.

Medical and specialty treatment

As an initial intervention, the treatment of SUD is often successful in the detoxification and stabilization of an individual with the disorder with completion rates ranging from 45 to 95% (Timko et al. 2015). Treatment often occurs at the inpatient or outpatient level, at traditional medical settings (e.g. hospitals or doctors' offices) or specialty treatment settings (e.g. residential or partial hospitalization programs) and under the direction of qualified and licensed medical and mental health professionals (Van Wormer and Davis 2016). Though only an estimated 10% of the U.S. population that needs SUD treatment receives it annually, this is not only a cause of the availability and capacity of SUD treatment. It is also suggested that both the cost of SUD treatment and the discrimination/stigma associated with SUD also impact the low help-seeking prevalence among individuals in need (Corrigan et al. 2017) as well as actual treatment length (Luoma et al. 2014). Medical and specialty treatment often has a locus of abstinence in the United States, though in the midst of the current opioid epidemic, calls for the expansion of treatment supported with medication (i.e. pharmacotherapy) have become more frequent (Clark 2017). Success rates of treatment are largely considered in terms of abstinence periods, with many studies suggesting that treatment is successful 20–60% of the time (NIDA 2012). However, SUD treatment is an acute intervention, and when combined with long-term recovery support, outcomes can improve dramatically (Simoneau et al. 2017).

Prevention services

Prevention services applied to substance use and misuse have proven effective in reducing the latent harmful effects within communities in the United States. Programs such as adolescent education and screening and brief intervention have been used in multiple settings to reduce risk and healthcare costs associated with substance use and misuse (Kumpfer 2002). Despite this effectiveness, many in the

United States do not receive or have access to prevention services (Arndt et al. 2002; Weisner and Matzger 2003).

Harm reduction services

Harm reduction services provide two primary functions within the continuum of care of SUDs: as a means to reduce harm (e.g. mortality, healthcare costs, societal impact, etc.) as it relates to active substance use and to engage an individual using substances in the service delivery system (MacMaster 2004). As an array of services, harm reduction can encapsulate needle exchange programs (Ashton 2004), contraceptive distribution (Wynn et al. 2007), safe injection facilities (Marshall et al. 2011), and others.

Recovery support services

Recovery support services (RSS) are an array of services, delivered via professional or peer channels, concerned with promoting the long-term outcomes of an individual's recovery process (Kaplan 2008; Sheedy and Whitter 2009; White 2008, 2009). As a set of services and resources, RSS often fall into the domains of education, employment, housing, and social/peer support in an effort to improve the functioning and wellness of individuals (Kaplan 2008).

Education

Increased educational opportunity supports those in the recovery process by improving self-esteem, self-efficacy, and increasing long-term gainful employment opportunities. Supportive programs to take and pass the General Education Diploma (GED) test, reengage in secondary education (i.e. high school) or post-secondary education (i.e. college) can improve the trajectory of individuals in the recovery process. The most widely available form of educational recovery support services is collegiate recovery programs (CRP) and recovery high schools (RHS), with over 200 of these programs available in the United States (Association of Recovery Schools 2017; Association of Recovery in Higher Education 2017; Transforming Youth Recovery 2017). CRPs have previously found that students engaged have a national relapse average of less than 10% (Laudet et al. 2014). Additionally, CRPs and RHSs often contain many other elements of recovery support services (e.g. peer services, housing, vocational, advocacy, etc.) (Laudet et al. 2014).

Employment

Unemployment is associated with SUD, thus finding and sustaining gainful employment is considered one benchmark within recovery capital (Cloud and Granfield, 2008). Employment recovery support services are focused on both increasing the vocational and technical skills of individuals, and with finding gainful employment opportunities during the recovery process (White et al. 2012). Services that help individuals craft resumes and cover letters, fill out job applications, practice interviewing skills, or secure interview attire, are all employment recovery support services. These

services and resources exist for a variety of individuals, but those that are recovery-informed may pay special attention to previous SUDs, criminal records, recovery stigma and disclosure status, and be delivered by individuals currently in the recovery process themselves. Increases in employment among individuals in recovery has shown to increase recovery capital, and employment days and income derived from employment has also been found to increase lengths of abstinence (Dennis et al. 2007).

Peer services

Peer recovery support services (PRSS) – sometimes referred to as recovery coaching – are peer-delivered services focused on the individual navigation of the recovery process (White 2009). PRSS should not be confused with mutual-aid recovery services (e.g. 12-step groups), as PRSS differ in several ways. Perhaps most importantly, PRSS are delivered through formal and specialized roles by individuals with personal experience in the recovery process (i.e. lived recovery experience) (White 2009). PRSS may exist as a service within a physical recovery support service location, such as within a collegiate recovery program or a recovery residence, but also may be delivered as part of medical treatment (Laudet and Humphreys 2013). A recent systematic review of the literature on PRSS found that the inclusion of these services often improved outcomes (Bassuk et al. 2016).

Housing

Housing, as a recovery support service, provides supportive living arrangements (e.g. sober and safe living environment) for individuals in the recovery process. Many models of recovery housing exist within the United States, including Oxford HousesTM, non-clinically supported recovery residences, and clinically supported recovery residences (Polcin 2001; Jason et al. 2012). Additionally, for individuals in sustained recovery (e.g. greater than 1-year in the recovery process), housing first resources that allow for the securing of safe and affordable housing should also be considered a recovery support service (Tsemberis et al. 2012). Recovery housing stays have been linked to increases in global functioning and wellness, decrease relapse rates, and improved recovery capital scores for individuals in the recovery process (Jason et al. 2006, 2012; Polcin et al. 2010).

Recovery community organizations

Recovery community organizations (RCO) serve as formal entities that support the individual recovery process through a variety of mechanisms. These can include (a) offering a physical space (e.g. recovery community center) for recovery related activities and service delivery; (b) engaging in and organizing advocacy efforts at the local, state, and federal level meant to improve policy and increase availability of recovery resources and services; (c) offering recovery support services, often as peer recovery support services, meant to enhance the recovery process; and (d) educate the local community on SUDs and the recovery process. RCOs can

exist as standalone entities, but may also exist within faith-based communities, tribal communities, educational communities (e.g. collegiate recovery programs and recovery high schools) (Taylor 2009).

Mutual-aid organizations

Different from peer recovery support services (PRSS), mutual-aid organizations (i.e. 12-step groups/programs) are both a pathway into recovery and a community-based recovery support service. Mutual-aid organizations are informal, decentralized, and autonomous, and perhaps the most available recovery support service in the United States (Donovan et al. 2013). Multiple studies support mutual aid as effective means of recovery access. As a public good, mutual aid organizations offer key elements of recovery support, namely that they are free, local, and available to anyone (Kelly 2017). Studies examining the role of 12-Step mutual-aid organizations have found the organizations to be important to both clinical and public spheres by encouraging recovery through the utilization of mechanisms of change similar to formal treatment (Kelly et al. 2012; Kelly 2017).

Re-entry support services

Given the frequent co-occurrence of criminal activity and substance use (Bureau of Justice Statistics 2004), reentry support services for individuals in the recovery process can be viewed as a recovery support service as well. Recovery informed reentry services that focus on the expungement of criminal records; navigating educational, employment, and housing needs with a criminal record; and advocacy efforts within the criminal justice system can play an important role in improving the successful recovery of individuals (Lyons and Lurigio 2010). Recidivism is reduced through reentry support services, and when these are delivered in collaboration with recovery support services, the reduction in criminal activity and recurrence of substance misuse often has a net-benefit on society and the individual in the recovery process (Lyons and Lurigio 2010). Additionally, as recidivism and relapse are often outcomes despite efforts to support recovery, the presence of drug courts (or recovery courts) as an entryway back into the recovery process are becoming increasingly common in the United States (Stinchcomb 2010).

Law/policy

Local, state, and federal legislation, regulation, and policy directly impacts the recovery process of many individuals. For example, NIMBY (or not in my backyard) policies are often involved in legal cases of the operation of recovery residences in certain localities. At the state level, legislation related to compulsory treatment (Werb et al. 2016), Good Samaritan (Zadoretzky et al. 2017), and naloxone access (Humphreys 2015), have likely had impact on the recovery process. Federally, policies such as the Mental Health Parity and Addiction Equity Act (Beronio et al. 2014) and the

Comprehensive Addiction and Recovery Act (Kennedy-Stewart 2016), have likely had an impact on the ability of individuals to both receive treatment and engage with recovery support services.

Advocacy efforts

Though recovery community organizations (RCO) often use advocacy as a means of education and policy change, stand-alone advocacy organizations also exist. Advocacy organizations serve two primary functions – the education of the community and positive policy change – that can impact the recovery process. The presence of advocacy organizations within a community can help support the creation of new recovery support services, the changing of discriminatory public policy, and increased funding of institutional and community service systems (White 2007).

Recovery ready model and framework

The availability and accessibility of resources and services (e.g. medical treatment, recovery support services, reentry support services, and nondiscriminatory policies/laws) are likely to improve the chances of successful recovery for an individual within a community. Building upon the recovery-oriented systems of care (ROSC) model, the following model is a result of a comprehensive framework to identify the ability of communities to produce more successful recovery outcomes for individuals that belong to the community. Availability implies that a resource and/or service is operational within the community, and accessibility pertains to the nature of successful access of said resources and/or services by individuals in the recovery process. The theoretical framework that follows from the recovery ready ecosystems model provides suggestions, based on availability and accessibility, that the number of a type of resource and/or service

may increase a community's ability to more successfully support the recovery process.

The recovery ready ecosystems model

The *recovery ready ecosystems model (RREM)* (Figure 1) contains the following levels from the social ecological model put forth by Bronfenbrenner (1979): (1) individual and intrapersonal levels (combined), (2) the community level, (3) the institutional level, and (4) the policy level. The combination of the individual and interpersonal (family) level are combined in the model as though elements within this context/level can impact the recovery process, we are chiefly concerned with the elements of a community that can promote recovery success; the individual elements included in the individual and intrapersonal level are likely to be impacted by the contexts/levels surrounding it, so are included in the final model as the end beneficiary. Additionally, the policy level is included as factors at play within this content/level impact the availability and capacity of the resources and services within the institutional and community level. Both the individual/intrapersonal and policy levels are also included in the final framework showing their role within and upon the individual in the recovery process. The community and institutional level are described, as the primary focus of the final framework, are discussed in more detail below. This model is used to define the location of beneficial services and resources, as well as provide evidence of the interplay between services and resources across different ecosystems. The model can then be used as a guide to further define the recovery ready community framework.

Community level

As an ecosystem, the community level houses the majority of recovery and re-entry support services that can be of

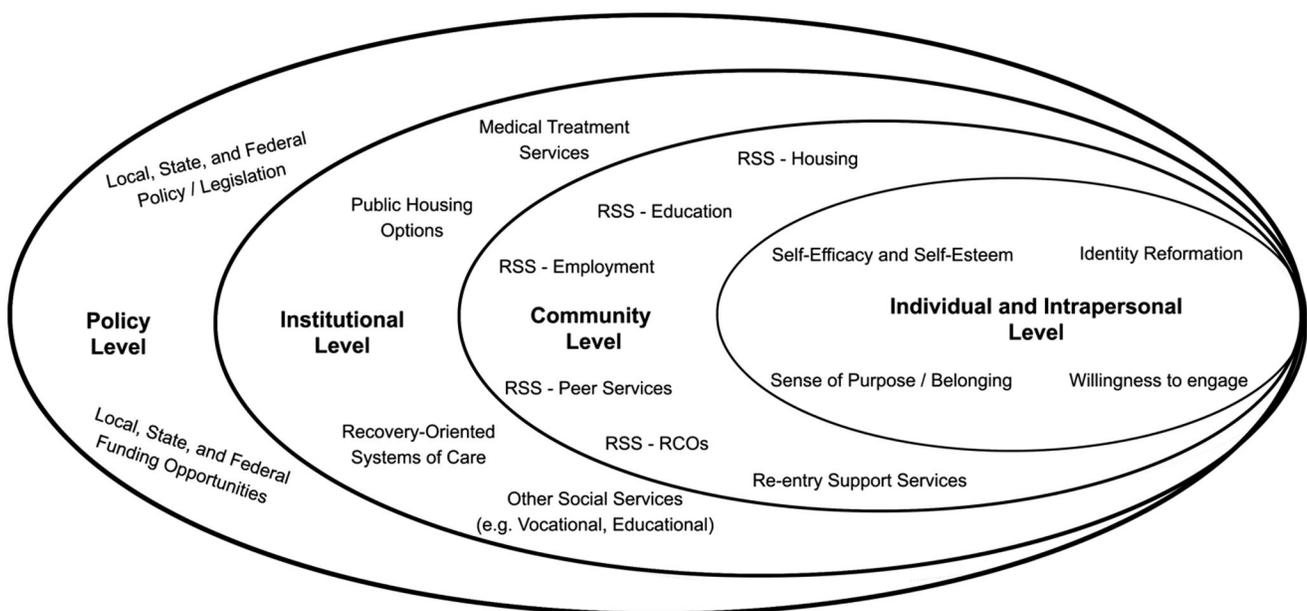


Figure 1. Recovery Ready Ecosystems Model (RREM).

benefit to an individual in the recovery process. Within the community, the availability of supportive housing, education, employment, and peer based services are necessary to provide a diverse array of services to individuals to promote long-term global functioning gains and support recovery goals such as abstinence or reduction in substance use. Additionally, recovery community organizations, including recovery centers, exist within the community level and provide both a physical location for recovery support services to be delivered and additional overall capacity for recovery support services, often times employing the professionals and peers that are trained to deliver the services. While the prevalence of the services and resources included within the community level should meet or exceed the population of individuals in the recovery process in any given community, at baseline the presence of at least one of each resource or service is beneficial to creating a health environment supportive of recovery.

Institutional level

The institutional level contains the supportive services and resources that are funded and maintained by local governments, such as medical treatment and public housing options. The difference between the institutional level and

community level lies within the controlling bodies (e.g. community level is controlled by local community members whereas the institutional level is controlled by formal systems of government). Additionally, institutionalized services and resources within this level may overlap with those in the community level, serving as a different means of engagement and increases in capacity. The institutional level also houses the ROSC efforts, given the nature of a ROSC to coordinate all services available for people in the recovery process.

The recovery ready community framework

The *recovery ready community framework* (Figure 2) contains the principal services and resources within the institutional and community levels of the recovery ready ecosystems model. The goal of the framework is to describe the services and resources, that when present in a community, provide the necessary elements to promote the successful recovery process of individuals living and engaging within in that community. The services and resources in the final framework include: (a) recovery informed institutional services; (b) prevention organizations; (c) harm reduction organizations; (d) reentry services organizations; (e) recovery community centers; (f) collegiate recovery programs; (g) recovery / drug courts; (h) mutual-aid organizations; (i) recovery community organizations; (j) peer recovery services; (k) recovery high schools; (l) harm reduction organizations; (m) re-entry services organizations; (n) recovery residences; (o) medical treatment services; (p) advocacy organizations; (q) recovery high schools.

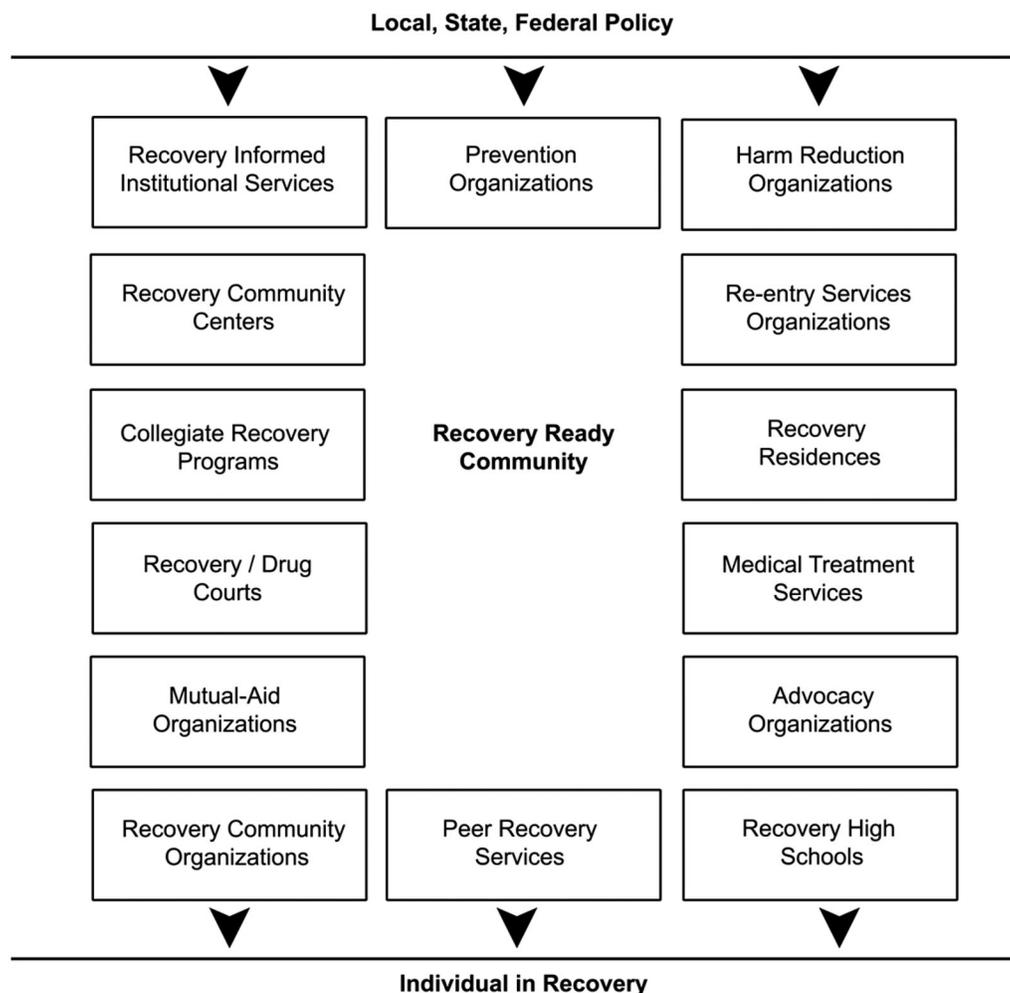


Figure 2. Recovery Ready Community Framework.

recovery/drug courts; (h) mutual-aid organizations; (i) recovery community organizations; (j) peer recovery services; (k) recovery high schools; (l) advocacy organizations; (m) medical treatment services; and (n) recovery residences.

The framework should be viewed as local, state, and federal policies (including funding) impacting the availability and presence of the services and resources, and that the services and resources being available within a community impact the individual in the recovery process. The framework itself suggests that the presence of each service and resource within a community will improve the chance of successful recovery for an individual. The lack of an individual service and resource, or a set of services and resources, thus decrease the chance of successful recovery for an individual.

Identifying level of recovery readiness

In order to provide additional usefulness for the recovery ready framework, we also propose the following equation to quantify the level of recovery readiness within a community. Extant literature has not yet identified the exact mechanisms of support, or the magnitude of such support, that each type of service and resource may provide. As such, we have placed a maximum threshold (e.g. 2) on the gain in community level of recovery readiness that multiple services and resources of the same type have so as to control for potential overweighting. It should be noted that additional testing of the proposed equation is necessary as it may not be that: (1) each service and resource is held at an equal weight of promoting successful recovery, (2) that there is no upper limit of the change in recovery readiness that duplicate resources and services have.

Let X = recovery support service or resource from the RREM; Max $X = 14$

Let $Y_1, Y_2 \dots Y_{14}$ = the presence of multiple of each X within the community (e.g. 2 recovery community centers, $Y_2 = 1$; 1 recovery community center $Y_2 = 0$; max $Y = 2$)

Let RR = community level of recovery readiness

$$RR = (Y_1 \dots + Y_{14}) + X$$

Scoring:

Scoring Range: 0-28

$RR \leq 7$, low level of recovery readiness

$7 < RR \leq 21$, mid-level of recovery readiness

$RR > 21$, high-level of recovery readiness

Discussion

Multiple systems of both the public and private sphere have significant exposure to the SUD population as well as innate structures that could be oriented toward a recovery ready system (e.g. emergency departments, police, schools). As the organizing paradigm for SUD treatment and recovery continues to move towards a more chronic care approach, the need to provide models and frameworks to provide a basis for infrastructure enhancement is needed. The proposed

recovery ready ecosystems model and the recovery ready communities framework provides a basis for communities to identify the services and resources that are available, and missing, in their local areas. The framework suggests that communities with more recovery support services and resources are more likely to impact successful recovery outcomes including improved quality of life, recovery capital, and abstinence lengths.

The framework is not purely theoretical, and we believe that enhanced community needs assessments focused on behavioral health should employ these tools to identify resources and services that may be missing from their locality. In doing so, these “recovery community needs assessments” can help communities craft strategic plans that strive to increase the number of recovery services and resources available in an effort to mitigate the financial and social impacts of SUDs on the criminal justice, health, and private and public workforce sectors. It is also critical that any improvement or analysis of resources and services within a community, in an effort to identify and improve recovery readiness, be completed in conjunction with the implementation of a ROSC.

As a ROSC provides the underlying framework for linkage and collaboration of services, communities can ensure that the existing and newly developed recovery support services and resources are linked together in a cohesive manner that emulates a recovery-informed chronic care approach and also improves chances of individual perception of benefit of receiving these services and resources. While a fully implemented ROSC is not a necessity to undertake these activities, certain elements should be considered as prerequisites for many communities. These prerequisites, taken as a synthesis from the ROSC model and the RREM model put forth in the current paper, include a mechanism for integration and communication between services and resources (e.g. referral and linkage), collaboration between services and resources providing services to different milieus (e.g. identity, cultural, gender, and age-specific), and a commitment to the removal of engagement and retention barriers. Of import is to take notice that the prerequisites themselves require little in the term of resources, which communities can often lack, but rather focus more on the planning and commitment stages of change.

The proposed recovery readiness equation also provides a starting hypothesis that postulates that the presence of recovery services and resources has an impact on the systemic capacity of communities to successfully support the recovery process. Future efforts should be undertaken, using both the framework and equation, to further explore several important questions. The first relates to the actual impact of individual recovery services and resources on successful recovery outcomes (i.e. are all resources and services as supportive as others or should they be weighted differently). The second concerns the availability of individual recovery services and resources and should focus on the geographic proximity of available resources having an impact on successful recovery outcomes (i.e. closer resources and services have a greater impact than those further away). Finally, it is

important to identify capacity-related issues of individual resources and services, as any modeling of recovery readiness should weight the efficiency of resources and services over time (i.e. identifying the number of individuals a resource or service can support in a community so that communities may develop an adequate number of individual resources and services based on the estimated number of individuals in the recovery process in their community).

Limitations

Though the model and framework are grounded in previously completed studies, the field of recovery science is relatively new. New resources and services that align with community recovery goals may be discovered through future research. Furthermore, the model and framework does not take into consideration alternative support systems, such as digital communities; the rise of technology-based interventions and applications that enhance recovery should be explored in future research. The current model and framework remain untested in real communities, though they are based in real-world tested models such as the recovery-oriented systems of care. The current model is also centered in systems of care readily available in the United States; similar systems exist internationally but may be described or operate differently. As such, the model may not easily be transferrable to international contexts outside of the United States.

Conclusion

Given the economic and social impact of substance use and other behavioral health disorders, as well as the current opioid crisis impacting the United States; there is a strong need for additional models that may help to inform community leaders and policy makers on the benefits of a recovery-informed approach to treatment and recovery. As recovery science continues to expand, the tangible economic and social benefits to society at large are increasingly hard to ignore. Promoting the long-term recovery of individuals in the locations they live and work is critical. Equipping communities with the knowledge to analyze their local resources and services and further improve local recovery infrastructure is an important step in providing individuals the highest chance of long-term success. With increased political pressure to implement solutions to the opioid crisis and other SUD issues, a framework for identifying needs and for suggesting funding priorities may prove useful. The theoretical recovery ready ecosystems model and recovery ready community framework provides the underpinnings to both inform policy makers where money should be allocated and may equip communities with the practical tools needed to identify gaps and strengths within their localities.

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References

- Acosta J, Chandra A. 2013. Harnessing a community for sustainable disaster response and recovery: an operational model for integrating nongovernmental organizations. *Disaster Med Public Health Prep.* 7(04):361–368.
- Arndt S, Schultz SK, Turvey C, Petersen A. 2002. Screening for alcoholism in the primary care setting: are we talking to the right people? *J Fam Pract.* 51(1):41–46.
- Ashton M. 2004. Needle exchange: the Vancouver experience. *Addict Res Theory.* 12(5):445–460.
- Association of Recovery in Higher Education. 2017. Collegiate recovery program members. <http://collegiaterecovery.org/programs/>.
- Association of Recovery Schools. 2017. Find a school. <https://recovery-schools.org/find-a-school/>.
- Bassuk EL, Hanson J, Greene RN, Richard M, Laudet A. 2016. Peer-delivered recovery support services for addictions in the United States: a systematic review. *J Subst Abuse Treat.* 63:1–9.
- Beronio K, Glied S, Frank R. 2014. How the affordable care act and mental health parity and addiction equity act greatly expand coverage of behavioral health care. *J Behav Health Serv Res.* 41(4): 410–428.
- Best DW, Albertson K, Irving J, Lightowlers C, Mama-Rudd A, Chaggar A. 2015. UK Life in Recovery Survey 2015: The first national UK survey of addiction recovery experiences. Sheffield (England): Helena Kennedy Centre for International Justice, Sheffield Hallam University and Action on Addiction. shura.shu.ac.uk/12200/1/FINAL%20UK%20Life%20in%20Recovery%20Survey%202015%20report.pdf.
- Birnbaum HG, White AG, Schiller M, Waldman T, Cleveland JM, Roland CL. 2011. Societal costs of prescription opioid abuse, dependence, and misuse in the United States. *Pain Med.* 12(4): 657–667.
- Bouchery EE, Harwood HJ, Sacks JJ, Simon CJ, Brewer RD. 2011. Economic costs of excessive alcohol consumption in the U.S., 2006. *Am J Prev Med.* 41(5):516–524.
- Bronfenbrenner U. 1995. Developmental ecology through space and time: a future perspective. In: Moen P, Elder GH Jr, Lüscher K, editors. *Examining lives in context: perspectives on the ecology of human development.* Washington (DC): American Psychological Association; p. 619–647.
- Bronfenbrenner U. 1979. *The ecology of human development: experiments by nature and design.* Cambridge (MA): Harvard University Press.
- Bronfenbrenner U, Morris P. 1998. The ecology of developmental processes. In: Lerner RM, editor. *Theoretical models of human development: handbook of child psychology.* Vol. 1. New York (NY): Wiley.
- Bitting S, Nash A, Ochoa A. 2016. Houston recovery initiative: a rich case study of building recovery communities one voice at a time. *Journal of Addictions Nursing.* 27(2):120–126.
- Bureau of Justice Statistics, Mumola CJ, Varberg JC. 2004. Drug use and dependence, state and federal prisoners, 2004. Washington (DC): Bureau of Justice Statistics, Publication: NCJ 213530. Retrieved November, 2017 from: <http://www.bjs.gov/index.cfm?ty=pbdetail&iid=778>.
- Cadet JL, Bisagno V, Milroy CM. 2014. Neuropathology of substance use disorders. *Acta Neuropathol.* 127(1):91.
- Center for Behavioral Health Statistics and Quality. 2015. Behavioral health trends in the United States: results from the 2014 National

- Survey on Drug Use and Health (HHS Publication No. SMA 15-4927, NSDUH Series H-50). <http://www.samhsa.gov/data/>
- Chandler RK, Fletcher BW, Volkow ND. 2009. Treating drug abuse and addiction in the criminal justice system: improving public health and safety. *JAMA*. 301(2):183.
- Clark HW. 2017. Health reform and the substance use disorder treatment system: a time of change. *J Psychoactive Drugs*. 49(2):91–94.
- Cloud W, Granfield R. 2008. Conceptualizing recovery capital: expansion of a theoretical construct. *Subst Use Misuse*. 43(12-13):1971–1986.
- Corrigan P, Schomerus G, Shuman V, Kraus D, Perlick D, Harnish A, Kulesza M, Kane-Willis K, Qin S, Smelson D. 2017. Developing a research agenda for understanding the stigma of addictions Part I: lessons from the Mental Health Stigma Literature. *Am J Addict*. 26(1):59–66.
- Davidson L, White W. 2007. The concept of recovery as an organizing principle for integrating mental health and addiction services. *J Behav Health Serv Res*. 34(2):109–120.
- Dennis ML, Foss MA, Scott CK. 2007. An eight-year perspective on the relationship between the duration of abstinence and other aspects of recovery. *Eval Rev*. 31(6):585–612.
- Dennis M, Scott CK. 2007. Managing addiction as a chronic condition. *ASCP*. 4(1):45.
- Department of Health and Human Services (HHS). 2003. Achieving the promise: transforming mental health care in America. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Department of Health and Human Services (HHS). (2016). Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health. Washington, DC: HHS Office of the Surgeon General.
- DiClemente CC, Norwood AEQ, Gregory WH, Travaglini L, Graydon MM, Corno CM. 2016. Consumer-centered, collaborative, and comprehensive care: the core essentials of recovery-oriented system of care. *J Addict Nurs*. 27(2):94–100. <https://doi.org/10.1097/JAN.0000000000000120>
- Donovan DM, Ingalsbe MH, Benbow J, Daley DC. 2013. 12-Step interventions and mutual support programs for substance use disorders: an overview. *Soc Work Public Health*. 28(3-4):313–332.
- Evans AC, Jr, Achara-Abrahams I, Lamb R, White WL. 2012. Ethnic-specific support systems as a method for sustaining long-term addiction recovery. *J Groups Addict Recovery*. 7(2-4):171–188.
- Evans A, Lamb R, White W. 2013. The community as patient: recovery-focused community mobilization in Philadelphia, PA (USA), 2005–2012. *Alcohol Treat Q*. 31(4):450–465.
- Florence CS. 2016. The economic burden of prescription opioid overdose, abuse, and dependence in the United States, 2013. *Med Care*. 54(10):901–906.
- Gagne C, White W, Anthony WA. 2007. Recovery: a common vision for the fields of mental health and addictions. *Psychiatr Rehabil J*. 31(1):32.
- Granfield R, Cloud W. 2001. Social capital and natural recovery. *Expanding addiction: critical essays*, 196.
- Harwood H. 2000. Updating estimates of the economic costs of alcohol abuse in the U.S.: estimates, update methods and data. Report prepared by the Lewin Group for the National Institute on Alcohol Abuse and Alcoholism.
- Harwood H, Fountain D, Livermore G. 1998. The economic costs of alcohol and drug abuse in the U.S., 1992. Report prepared for the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism, NIH, DHHS. Rockville MD: NIH, NIH Publication No. 98-4327.
- Hibbert LJ, Best DW. 2011. Assessing recovery and functioning in former problem drinkers at different stages of their recovery journeys: recovery and functioning in former problem drinkers. *Drug Alcohol Rev*. 30(1):12–20. <https://doi.org/10.1111/j.1465-3362.2010.00190.x>
- Hoge MA, Stuart GW, Morris J, Flaherty MT, Paris M, Goplerud E. 2013. Mental health and addiction workforce development: federal leadership is needed to address the growing crisis. *Health Affairs*. 32(11):2005–2012.
- Humphreys K. 2015. An overdose antidote goes mainstream. *Health Aff*. 34(10):1624–1627.
- Humphreys K, Tucker JA. 2002. Toward more responsive and effective intervention systems for alcohol-related problems. *Addiction*. 97(2):126–132.
- Jason LA, Mericle AA, Polcin DL, White WL. 2012. A primer on recovery residences in the United States. Retrieved from NARR.org.
- Jason LA, Olson BD, Ferrari JR, Lo Sasso AT. 2006. Communal housing settings enhance substance abuse recovery. *Am J Public Health*. 91:1727–1729.
- Jordan N, Grissom G, Alonzo G, Dietzen L, Sangsland S. 2008. Economic benefit of chemical dependency treatment to employers. *J Subst Abuse Treat*. 34(3):311–319. <https://doi.org/10.1016/j.jsat.2007.05.001>
- Kaplan L. 2008. The role of recovery support services in recovery-oriented systems of care: DHHS publication no. (SMA) 08-4315. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.
- Kelly JF. 2017. Is Alcoholics Anonymous religious, spiritual, neither? Findings from 25 years of mechanisms of behavior change research. *Addiction*. 112(6):929–936.
- Kelly JF, Bergman B, Hoepfner BB, Vilsaint C, White WL. 2017. Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug Alcohol Depen*. 181:162–169. <https://doi.org/10.1016/j.drugalcdep.2017.09.028>
- Kelly JF, Hoepfner B, Stout RL, Pagano M. 2012. Determining the relative importance of the mechanisms of behavior change within Alcoholics Anonymous: A multiple mediator analysis. *Addiction*. 107(2):289–299.
- Kelly JF, White WL, editors. 2010. *Addiction recovery management: theory, research and practice*. New York, NY: Springer Science & Business Media.
- Kennedy-Stewart S. 2016. So what's all this talk of the CARA bill? *MedSurg Nursing*. 25(6):S16.
- Kidd SA, George L, O'Connell M, Sylvestre J, Kirkpatrick H, Browne G, Oduyungbo AO, Davidson L. 2011. Recovery-oriented service provision and clinical outcomes in assertive community treatment. *Psychiatr Rehabil J*. 34(3):194.
- Kumpfer KL. 2002. Prevention of alcohol and drug abuse: what works? In Haack ML, Adger HA, editors. *Strategic plan for interdisciplinary faculty development; arming the Nation's Health Professional Workforce for a new approach to substance use disorders*. Providence (RI): Association for Medical Education and Research in Substance Abuse (AMERSA); p. 263–271.
- Laudet AB, Humphreys K. 2013. Promoting recovery in an evolving policy context: What do we know and what do we need to know about recovery support services? *J Subst Abuse Treat*. 45(1):126–133.
- Laudet A, Harris K, Kimball T, Winters KC, Moberg P. 2014. Collegiate recovery communities programs: what do we know and what do we need to know? *J Soc Work Pract Addict*. 14(1):84–100.
- Luoma JB, Kulesza M, Hayes SC, Kohlenberg B, Larimer M. 2014. Stigma predicts residential treatment length for substance use disorder. *Am J Drug Alcohol Abuse*. 40(3):206–212.
- Lyons T, Lurigio AJ. 2010. The role of recovery capital in the community reentry of prisoners with substance use disorders. *J Offender Rehabil*. 49(7):445–455.
- MacMaster SA. 2004. Harm reduction: a new perspective on substance abuse services. *Soc Work*. 49(3):356–363.
- Marshall B, Milloy MJ, Wood E, Montaner J, Kerr T. 2011. Reduction in overdose mortality after the opening of North America's first medically supervised safer injecting facility: a retrospective population-based study. *The Lancet*. 377(9775):1429–1437.
- McKay JR. 2017. Making the hard work of recovery more attractive for those with substance use disorders: making recovery more attractive. *Addiction*. 112(5): 751–757. <https://doi.org/10.1111/add.13502>
- McQuaid RJ, Malik A, Moussouni K, Baydack N, Stargardt M, Morrissy M. 2017. Life in recovery from addiction in Canada. Ottawa (ON): Canadian Centre on Substance Use and Addiction.

- Muller AE, Skurtveit S, Clausen T. 2016. Many correlates of poor quality of life among substance users entering treatment are not addiction-specific. *Health Qual Life Outcomes*. 14(1):39.
- National Drug Intelligence Center. 2011. National drug threat assessment. Washington (DC): United States Department of Justice. www.justice.gov/archive/ndic/pubs44/44849/44849p.pdf
- NIDA. 2012 Dec 1. Principles of drug addiction treatment: a research-based guide. 3rd ed. <https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition> on 2017, November 17.
- Polcin DL. 2001. Sober living houses: potential roles in substance abuse services and suggestions for research. *Subst Use Misuse*. 36(3): 301–311.
- Polcin DL, Korcha RA, Bond J, Galloway G. 2010. Sober living houses for alcohol and drug dependence: 18-month outcomes. *Journal of Substance Abuse Treatment*. 38(4):356–365.
- Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. 2009. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*. 373(9682):2223–2233
- Rudd RA, Seth P, David F, Scholl L. 2016. Increases in drug and opioid-involved overdose deaths — United States, 2010–2015. *Morbidity and Mortality Weekly Report*, 65, 1445–1452. <http://dx.doi.org/10.15585/mmwr.mm650501e1>.
- Sacks, J. J., Gonzales, K. R., Bouchery, E. E., Tomedi, L. E., & Brewer, R. D. 2015. 2010 National and State Costs of Excessive Alcohol Consumption. *American Journal of Preventive Medicine*, 49(5), e73–e79. <https://doi.org/10.1016/j.amepre.2015.05.031>
- Sheedy CK, Whitter M. 2009. Guiding principles and elements of recovery oriented systems of care: what do we know from the research? HHS publication no. (SMA) 09-4439. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.
- Sheedy CK, Whitter M. 2013. Guiding principles and elements of recovery-oriented systems of care: what do we know from the research? *J Drug Addict Educ Eradication*. 9(4):225.
- Simoneau H, Kamgang E, Tremblay J, Bertrand K, Brochu S, Fleury MJ. 2017. Efficacy of extensive intervention models for substance use disorders: a systematic review. *Drug and Alcohol Review*. 37 Suppl 1:S246–S262.
- Stinchcomb J. 2010. Drug courts: conceptual foundation, empirical findings, and policy implications. *Drugs Educ Prev Policy*. 17(2): 148–167.
- Substance Abuse and Mental Health Services Administration. 2011. SAMHSA's working definition of recovery. <https://store.samhsa.gov/system/files/pep12-recdef.pdf>
- Taylor P. 2009. Recovery community organizations. In Fisher GL, Roget NA, editors. *Encyclopedia of substance abuse prevention, treatment, & recovery*. Thousand Oaks (CA): SAGE Publications Ltd; p. 765.
- Timko C, Below M, Schultz NR, Brief D, Cucciare MA. 2015. Patient and program factors that bridge the detoxification-treatment gap: a structured evidence review. *J Subst Abuse Treat*. 52:31–39.
- Transforming Youth Recovery. 2017. Higher education grant programs. <http://www.transformingyouthrecovery.org/higher-education-grant-programs/>.
- Tsemberis S, Kent D, Respress C. 2012. Housing stability and recovery among chronically homeless persons with co-occurring disorders in Washington, DC. *Am J Pub Health*. 102(1):13–16.
- Turning Point, Easternhealth, & South Pacific Private. 2015 May. The Australian life in recovery survey. www.turningpoint.org.au/site/DefaultSite/filesystem/documents/Life%20In%20Recovery%20Survey.pdf.
- United Nations Office on Drugs and Crime. 2018. World drug report 2018. United Nations publication, Sales No. E.18.XI.9.
- Van Wormer K, Davis DR. 2016. *Addiction treatment*. Boston (MA): Cengage Learning.
- Walker MA. 2009. Program characteristics and the length of time clients are in substance abuse treatment. *J Behav Health Serv Res*. 36(3):330–343.
- Walmsley R. 2016. World prison population list, 11th ed. Institute for Criminal Policy Research. London: Birkbeck, University of London.
- Walmsley R. 2017. World female imprisonment list, 4th ed. Institute for Criminal Policy Research. London: Birkbeck, University of London.
- Weisner C, Matzger H. 2003. Missed opportunities in address drinking behavior in medical and mental health services. *Alcoholism: Clinical and Experimental Research*. 27(7):1132–1114.
- Wen H, Hockenberry J, Cummings J. 2017. The effect of Medicaid expansion on crime reduction: evidence from HIFA-waiver expansions. *J Public Econ*. 154:67–94.
- Werb D, Kamarulzaman A, Meacham MC, Rafful C, Fischer B, Strathdee SA, Wood E. 2016. The effectiveness of compulsory drug treatment: a systematic review. *Int J Drug Policy*. 28:1–9.
- White W. 2007. The new recovery advocacy movement in America. *Addiction*. 102(5):696–703.
- White W. 2008. Recovery management and recovery-oriented systems of care: scientific rationale and promising practices. Pittsburgh (PA): Northeast Addiction Technology Transfer Center, Great Lakes Addiction Technology Transfer Center, Philadelphia Department of Behavioral Health & Mental Retardation Services.
- White W. 2009. Peer-based addiction recovery support: History, theory, practice and scientific evaluation. Philadelphia (PA): Great Lakes Addiction Technology Transfer Center, Philadelphia Department of Behavioral Health & Mental Retardation Services.
- White WL. 2009. The mobilization of community resources to support long-term addiction recovery. *J Subst Abuse Treatment*. 36(2): 146–158.
- White WL, Kelly JF. 2010. Recovery management: what if we really believed that addiction was a chronic disorder? In *Addiction recovery management*. New York (NY): Humana Press; p. 67–84.
- White WL, Kelly JF, Roth JD. 2012. New addiction-recovery support institutions: mobilizing support beyond professional addiction treatment and recovery mutual aid. *J Groups Addict Recovery*. 7(2-4): 297–317.
- White WL, Kurtz E. 2008. Linking addiction treatment & communities of recovery: a primer for addiction counselors and recovery coaches. Pittsburgh (PA): Northeast ATTC, the Addiction Technology Transfer Center Network.
- White W, Weingartner R, Levine R, Evans A, Lamb R. 2013. Recovery prevalence and health profile of people in recovery: results of a southeastern Pennsylvania survey on the resolution of alcohol and other drug problems. *J Psychoactive Drugs*. 45(4):287–296.
- World Health Organization. 2018. Global status report on alcohol and health 2018. Geneva (Switzerland): World Health Organization; License: CC BY-NC-SA 3.0 IGO.
- Wynn L, Erdman J, Foster A, Trussell J. 2007. Harm reduction or women's rights? Debating access to emergency contraceptive pills in Canada and the United States. *Stud Fam Plann*. 38(4):253–267.
- Zadoretzky C, McKnight C, Bramson H, Des Jarlais D, Phillips M, Hammer M, Cala ME. 2017. The New York 911 Good Samaritan Law and opioid overdose prevention among people who inject drugs. *World Med Health Pol*. 9:318–340.