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# Protocol for a Systematic Review: Recovery Schools for Improving Well-Being among Students in Recovery from Substance Use Disorders: A Systematic Review

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## **BACKGROUND**

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### ***Youth Substance Use Disorders***

Substance use disorders (SUDs) among youth are a major public health problem. In the United States, for example, the incidence of SUDs increases steadily after age 12 and peaks among youth ages 18-23 (White, Evans, Ali, Abrahams, & King, 2009). Although not every youth who experiments with alcohol or illicit drugs is diagnosed with a SUD, approximately 7-9% of 12-24 year olds in the United States were admitted for public SUD treatment in 2013 (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016). The true prevalence of SUDs among youth in the United States is likely higher than 7-9%, however, given that many youth receive treatment in private or in non-specialty settings (Laudet, Harris, Kimball, Winters, & Moberg, 2014), and other youth may never receive treatment for their substance use problems (SAMHSA, 2015). Data available on substance use patterns and treatment availability in other nations also suggests that there are significant numbers of youth worldwide in need of some form of substance use treatment and/or aftercare, although this research is primarily limited to developed nations. For example, in Australia, adolescents aged 10-19 years old comprised approximately 12% of all treatment admissions from 2012-2013 (Australian Institute of Health and Welfare, Canberra, 2014). Similarly, the European Council estimated that across surveyed countries, youth constituted anywhere from 16% (Italy) to 65% (Czech Republic) of the overall substance use treatment population (Council of Europe, Pompidou Group, 2006). And, in 2011, approximately 28,000 adolescents were newly admitted to outpatient treatment across Europe (European Monitoring Centre for Drugs and Drug Addiction, 2013).

Substance use problems can have numerous detrimental consequences on the academic, social, and general well-being of youth. This might include negative effects on school or work performance, legal problems, and substance use tolerance and progression (American Psychiatric Association [APA], 2013). Prior research has documented the multiple negative effects from prolonged and heavy substance use, including diminished memory and cognitive abilities, reduced grades, a decreased likelihood of finishing high school or attending post-secondary education, problems attaining or keeping employment, higher rates of more acute and chronic health conditions than those without a history of use, poverty, and family and social problems (Brown & Tapert, 2004; Homel, Thompson, & Leadbeater, 2014; Larm, Hodgins, Larsson, Samuelson, & Tengström, 2008; Leslie et al., 2016; Lisdahl, Wright, Kirchner-Medina, Maple, & Shollen, 2014; Menasco & Blair, 2014; Newcomb & Bentler, 1988; Patrick, Schulenberg, & O'Malley, 2016; Silins et al., 2014; Squeglia, Jacobus, & Tapert, 2009; Thoma et al., 2011). Given the numerous negative effects associated with heavy substance use among youth, it is important to understand what programs and interventions might be effective in assisting youth with SUDs.

## **Youth Development, Problematic Substance Use, and Substance Use Disorders**

The period of adolescence “is characterized by more biological, psychological, and social role changes than any other stage of life except infancy” (Holmbeck, Devine, Wasserman, Schellinger, & Tuminello, 2012, p. 431). These changes begin in adolescence and continue into emerging adulthood and involve pubertal and cognitive development, and identity, relationship, and achievement transitions (Shulenberg & Maggs, 2001). Generally, the period of adolescence lasts from ages 10-19, although the World Health Organization’s term “young people” includes individuals between 10-24 years of age (World Health Organization, 2016).

Adolescent neurodevelopment has been described as a biologically critical period of heightened vulnerability to experimentation and habitual use of substances (Chambers, Taylor, & Potenza, 2003). For example, due to neurodevelopmental processes, adolescents are more prone to impulsive behaviors, risk taking, and drug and reward seeking compared to adults, all behaviors that are linked to substance use (Chambers et al., 2003; Simon & Moghaddam, 2014). Indeed, animal studies of neural processing have demonstrated that adolescent and adult brains respond differently to rewards, with activity in adolescents’ brain regions of learning and habit formation potentially predisposing them to form problematic substance use habits (Sturman & Modhaddam, 2012). This area of research has also demonstrated that adolescents consume larger quantities of alcohol than adults, a behavior that continues into adulthood, suggesting that drinking habits begun early in life, i.e., during adolescence, may worsen relative to habits begun during adulthood and extend for longer periods of time (Serlin & Torregrossa, 2015).

In addition to neurodevelopmental findings, research has demonstrated that adolescents develop expectancies about potential benefits or risks of substance use (Shulenberg & Maggs, 2001), which vary depending on their social networks and settings and affect when and how they decide to use substances. The social context is especially important as adolescents undergo relationship changes with parents by seeking to differentiate themselves as autonomous individuals and youth create relationships with peers that become more influential. Youth also tend to overestimate the prevalence of drinking in their social environment, with college students viewing drinking as highly normative; youth may also experience increased sociability and report better bonding with peers as a result of drinking (Shulenberg & Maggs, 2001). Social influence has also been consistently identified to be especially important in relapse situations among recovering adolescents (Ramo, Prince, Roesch, & Brown, 2012).

In addition, specific changes related to this developmental period have been identified as risk factors for more problematic substance use (e.g., early maturation, affiliation with deviant peers, and conflicts with parents; Weisz & Hawley, 2002). Adolescent development processes as well as the presence of these additional factors are both risk factors for problematic use, setting this population apart from adults and thus, treatments and aftercare supports should take developmental issues into account (Deas, Riggs, Langenbucher,

Goldman, & Brown, 2000; Weisz & Hawley, 2002). In support of this contention, addiction literature has documented different relapse precipitants for adolescents than for adults, with adolescents more likely to relapse under social pressure and also exhibiting greater complexity in relapse patterns (Ramo & Brown, 2008). Adolescents often use multiple substances and may use a broader array of substances than adults (Deas et al., 2000).

Although not all experimentation with substances leads to problematic use, problematic use can transition to a substance use disorder (SUD), i.e., “a maladaptive pattern of substance use leading to clinically significant impairment or distress” (American Psychiatric Association, 1994). Substance abuse and dependence were originally diagnosed separately with substance abuse considered an early phase and dependence the more severe manifestation; however, the Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V) modified the definition of an SUD to combine abuse and dependence into one category with different levels (American Psychiatric Association, 2013). An SUD is manifested in multiple ways, including substance use that repeatedly impacts school or work performance or contributes to legal problems. Individuals with an SUD demonstrate an increasing need for more of the substance to achieve the same effect (i.e., tolerance) and taking the substance for longer or in larger doses and experience unsuccessful attempts to quit using the substance. Thus, recovery from an SUD is a process involving many factors, the hallmark of which is reduction or complete abstinence of use. Recovery also refers to overall healthy functioning and has been defined as “voluntarily sustained control over substance use, which maximises health and wellbeing and participation in the rights, roles and responsibilities of society” (UK Drug Policy Commission, 2012).

### **Approaches for Addressing Youth in Recovery from Substance Use Disorders**

Given the biological, psychological, and social developmental changes in adolescence, it is important to attend to distinct developmental issues of adolescence when focusing on adolescents in recovery (Weisz & Hawley, 2002). Thus, for youth diagnosed with an SUD there are a variety of adolescent-specific treatment options available, which fall within a spectrum of varying intensity from early intervention, such as screening, brief intervention, and referral to treatment (SBIRT: Bien, Miller, & Tonigan, 1993; Madras et al., 2009) to intensive inpatient treatment (American Society of Addiction Medicine [ASAM], 2013). However, SUDs are often experienced as chronic conditions; thus, multiple treatment episodes and ongoing recovery supports after treatment are often necessary to assist with the recovery process (Brown, D'Amico, McCarthy, & Tapert, 2001; Ramo, Prince, Roesch, & Brown, 2012; White et al., 2004). Indeed, research has demonstrated that youth seeking SUD treatment do not always engage in or successfully complete that treatment (Kaminer, Bureson, Burke, & Litt, 2014; Pugatch, Knight, McGuinness, Sherritt, & Levy, 2014; Winters, Stinchfield, Latimer, & Lee, 2007). Lack of engagement in treatment is due to a variety of factors including denial about the extent of the problem, motivation, emotional reasons, life stressors, financial or insurance barriers, peer influence and social norms, and access and availability of substances combined with triggers to use (Gonzales, Anglin, Beattie, Ong, &

Glik, 2012; Wisdom, Cavaleri, Gogel, & Nacht, 2011), and has been linked to community factors such as median family income (Jones, Heflinger, & Saunders, 2007). Among youth who successfully complete substance use treatment programs, 45-70% return to substance use within months of treatment discharge (Anderson et al., 2007; Brown, et al., 2001; Ramo et al., 2012; White et al., 2004).

Perhaps the greatest risk of relapse for youth in recovery is during the late adolescent and emerging adulthood years (Anderson, Ramo, Cummins, & Brown, 2010); thus, youth with an SUD require developmentally appropriate, sustained, and multi-pronged intervention and follow-up support (Gonzales et al., 2012). To this end, research has demonstrated the importance of structured continuing care supports after treatment for youth in recovery from substance use. These continuing care supports can include, for instance, a dedicated case manager, home visits, meetings with caregivers, or other environmental supports for the youth and their family (Godley, Godley, Dennis, Funk, Passetti, & Petry, 2014; Stanger, Ryan, Scherer, Norton, & Budney, 2015; Tanner-Smith, Wilson, & Lipsey, 2013). Indeed, youth who engage in recovery supports posttreatment have the greatest likelihood of abstinence from substance use (Brown et al., 2001; Hennessy & Fisher, 2015). Engagement in substance-free peer environments is one recovery support system that shows particular promise, and has been linked to reduced substance use and increased psychosocial functioning among youth (Anderson, Ramo, Schulte, Cummins, & Brown, 2008; Nelson, Henderson, & Lackey, 2015; Terrion, 2012).

### **The Importance of Schools in the Recovery Process**

Success and engagement at school and in postsecondary education are critical to healthy youth development. For youth in recovery from SUDs, school attendance, engagement, and achievement build human capital by motivating personal growth, creating new opportunities and social networks, and increasing life satisfaction and meaning (Keane, 2011; Terrion, 2012; 2014). Upon discharge from formal substance use treatment settings, schools become one of the most important social environments in the lives of youth with SUDs. Healthy school peer environments can enable youth to replace substance use behaviors and norms with healthy activities and prosocial, sober peers.

Unfortunately, however, some of the most significant risk factors for substance use are embedded within school environments, including perceived peer use, association with substance-using peers, alcohol or drug availability, and academic challenges (Derzon, 2007; Mason, Mennis, Linker, Bares, & Zaharakis, 2014; Svensson, 2000; Wambeam, Canen, Linkenbach, & Otto, 2014). Indeed, in a nationwide survey of high school students in the United States, approximately 26% of respondents were offered, sold, or given an illicit drug on school property (CDC, 2011). This trend is especially problematic for youth in recovery from SUDs: for example, in a study of recovering youth, almost all adolescents who returned to their old school after treatment reported being offered drugs on their first day back in high school (Spear & Skala, 1995). College students suffer similar environmental risks,

particularly given the high rates of, and social norms that approve of alcohol consumption on campus. For example, a study of seven universities in Great Britain demonstrated that approximately 70% of enrolled students reported heavy drinking at least once during the previous two weeks. Across five New Zealand universities, 37% of student respondents reported at least one binge drinking episode during the previous week and approximately 68% scored in the hazardous drinking range on the Alcohol Use Disorders Identification Test consumption scale (Kypri, Paschall, Langley, Baxter, Cashell-Smith, & Bourdeau, 2009). In the United States, 35-39% of college students reported binge drinking (i.e., five or more drinks in one sitting) at least once in the past month (Monitoring the Future, 2013; SAMHSA, 2013) and research has documented a rapid escalation in alcohol consumption during the first two years of college in the United States (Shulenberg & Maggs, 2001). Indeed, approximately one-half of substance use treatment admissions for college students in the United States were for alcohol use (Center for Behavioral Health Statistics and Quality, 2012). In addition, a recent review highlighted that approximately 20% of college students in the United States use drugs on a monthly basis and that 5% reported daily use (Dennhardt & Murphy, 2013). One study of recovering college students found that the majority of students were addicted to multiple substances while only a few students were solely addicted to alcohol (Cleveland, Harris, Baker, Herbert, & Dean, 2007). Given the prevalence of binge drinking and substance use among this population as well as the social acceptability of alcohol consumption during the college years, it is no surprise that the college environment has been described as “abstinence hostile” for youth in recovery (Cleveland et al., 2007).

### ***Recovery Schools as Interventions to Improve Students’ Well-Being***

Given the many social and environmental challenges faced by youth in recovery from substance use, recovery-specific institutional supports are increasingly being linked to educational settings. The two primary types of education-based continuing care supports for youth in recovery are recovery high schools (RHS) and collegiate recovery communities or programs (CRC): both settings will be referred to under the broad umbrella term of “recovery schools” for this review. Federal offices in the United States have recently recognized these two educational programs as viable supports for youth after they complete formal substance use treatment programs (National Institute on Drug Abuse [NIDA], 2014; Office on National Drug Control and Policy [ONDCP], 2014).

**Recovery High Schools.** The RHS model addresses academic advancement and recovery maintenance among adolescents that have completed treatment for a SUD and are still seeking to complete their high school education (Finch & Frieden, 2014). First instituted in 1979, RHSs are now located in multiple cities across the United States and are typically small, with school size on average around 30-40 students (Ruben, 2002; White & Finch, 2006). According to the Association of Recovery Schools (ARS), a national United States-based non-profit organization that supports the creation, improvement, and maintenance of RHSs, there are currently 36 recovery high schools in operation in the United States (ARS,

2016), although there have been as many as 84 operating over the past 30 years (Finch, Karakos, & Hennessy, 2016). Depending on the location and policies of the educational system in which it is embedded, an RHS may be free of charge for students or provide scholarships for tuition (Finch et al., 2016). Although the ARS has recently developed accreditation standards and begun to review RHSs under these standards, RHSs are implemented using a variety of models and share a set of common characteristics (Moberg, Finch, & Krupp, 2014). The RHS's primary purpose is to educate youth in recovery from substance use or co-occurring disorders (ARS, 2013). Thus, RHSs have two primary foci: (1) an educational focus, which includes meeting state requirements for awarding a secondary school diploma; (2) a recovery focus that ensures that all students enrolled at the school are in recovery for substance use or co-occurring disorders and that they work toward maintaining recovery while enrolled. Finally, RHSs should be available to any student who is in recovery and who would meet state or district eligibility for attendance.

Academics are a primary focus in RHSs, however, the schools also incorporate recovery-specific elements into the day, such as a daily group check-in, community service, and individual counseling sessions. Schools employ administrative and teaching staff, but vary in their employment of counseling staff. For example, some schools have dedicated counselors located daily at the school, while others employ mental health staff to visit the school on a regular basis for individual meetings with students (Finch, Moberg, & Krupp, 2014). Most schools have admission criteria that require some SUD treatment and/or minimum length of sobriety and a desire to remain abstinent; however, if a school is part of the public school system, they are unable to mandate previous treatment for enrolling students and instead rely on interviews with youth to determine their interest in maintaining sobriety and contributing to the sober culture (Finch & Wegman, 2012). In addition, RHSs encourage parent involvement in their students' learning experience through the creation of parent support groups (Finch et al., 2014) and some schools mandate this practice via regular parent-teacher meetings. These criteria, along with structured and supervised learning, foster a recovery-supportive culture where students and staff attend to academic development and recovery maintenance. Thus, the characteristics that distinguish RHSs from traditional high schools include attention to maintenance of a positive, sober peer culture and explicit therapeutic support (Tanner-Smith et al., 2014). Because peer substance use is highly predictive of one's own substance use (Lewis & Mobley, 2010), the RHS sober peer environment is especially important to the RHS model.

Descriptive research has demonstrated that students in RHSs do feel supported by peers in the RHS setting (Karakos, 2014), and that RHSs may be effective in promoting the health and well-being of students. For example, one evaluation of three recovery high schools in Massachusetts found that the majority of students remained enrolled in the school for the year during the study and maintained A or B grades while also remaining abstinent or only enduring 1-2 relapse episodes during this year (Kochanek, 2008). Interviews with youth also demonstrated psychosocial benefits to remaining in the RHS. Another descriptive pre-post

study of 17 RHSs found that students enrolled in these schools had reduced substance use and improved mental health functioning at follow-up (Moberg & Finch, 2007).

**Collegiate Recovery Communities or Programs.** As a result of the substance use environment on college campuses, CRCs have been instituted with college/university support or via grassroots student organizations on at least 75 college campuses to provide college students with recovery supports and a social environment that encourages abstinence (Bugbee, Caldeira, Soong, Vincent, & Arria, 2016; Harris, Kimball, Casiraghi, & Maison, 2014). Recent data suggests that as many as 600 students are members of CRCs in the United States every academic year (Laudet et al., 2014). Given that students are typically members of CRCs for a relatively short amount of time (i.e., their duration in college), there is a likely possibility that many college enrolled youth in recovery spend time in these communities; thus, the number of unique student members is likely much higher than 600.

Similar to RHSs, CRCs are typically small communities and range in size from 5-80 students (Cleveland et al., 2007). The CRC model focuses heavily on providing environmental sober supports and settings and incorporates recovery-related supports such as seminars, 12-Step meetings and counseling, recreational activities and social events, life-skills training, educational supports and peer and family support, as well as linkages to community supports and services (Bugbee et al., 2016; Harris, Baker, Kimball, & Shumway, 2008; Laudet et al., 2014). Some CRCs also require that members sign a behavioral and sobriety contract that may be implemented and enforced by a peer governance system (Bugbee et al., 2016). Similar to RHSs, some CRCs also have admission criteria for their community programs. For example, one CRC at a large public university requires that members have been in recovery for one year, continue to pursue their education, and are willing to attend at least one on-campus 12-Step meeting each week (Cleveland et al., 2007). Other CRCs may require that student members have previously received treatment for addiction.

CRCs differ from RHSs, however, in that although they offer educational supports, they do not usually offer separate academic classes for students in recovery. They primarily provide recovery support services including offering group meetings and individual counseling services, providing dedicated space for students in recovery to meet, organizing sober events and community service activities, and educating the broader community in an effort to reduce stigma around addiction (Association of Recovery in Higher Education [ARHE], 2015; Cleveland et al., 2007; Harris et al., 2014; Perron et al., 2011). They also may offer scholarships toward university fees and provide substance-free, supervised dormitories (Cleveland et al., 2007; Harris et al., 2014), although presence of a sober dormitory does not in itself constitute a CRC (Bugbee et al., 2016).

The primary aim of the CRC is to improve abstinence rates and prevent relapse so that students can remain enrolled and succeed at secondary education (Harris et al., 2014): indeed, preliminary descriptive research demonstrates evidence of this success (Cleveland et al., 2007). For example, the relapse rate among CRC members across one academic semester

was only 4.4%. In addition, the majority of CRC members in this study had solid academic records while enrolled at the university and many maintained working part/full time jobs. And, in a nationwide survey of students enrolled in 29 different CRCs, approximately only 5% of students who considered themselves in recovery from addiction had used a substance in the past month (Laudet, Harris, Kimball, Winters, & Moberg, 2016).

### ***Theory of Change***

RHSs and CRCs seek to build upon the social connectedness contained within the educational environment (Finch & Frieden, 2014). The recovery school model draws heavily on the notion of social capital, or the social support, connections, and access to resources available through social networks, as one of the strongest factors influencing educational and recovery outcomes (Coleman, 1988; Granfield & Cloud, 2004; Meier, 1999). Connectedness between youth, family, peers, school, and community generates social capital and can potentially translate into academic achievement for youth (Meier, 1999).

RHSs support the recovery and academic achievement of students by fostering connectedness and social capital in a setting that addresses issues related to addiction and recovery with dedicated attention to healthy adolescent growth and development. They provide a safe environment for youth in recovery to practice the skills learned in treatment, use structured activities so that youth learn how to engage with their own emotional state and physiological responses they previously avoided through substance use, and use the sober community to model positive behaviors of peers and mentors (Finch & Frieden, 2014). The primary elements through which this underlying theory of change is operationalized are: build a richer base of peer and family connection, social support, and accountability; minimize contact with negative peers to increase school engagement and reduce relapse risk; provide students the opportunity to meet peers in recovery and to incorporate skills learned in treatment; quickly respond to problematic behaviors or symptoms of a co-occurring disorder due to the small school environment and specialized school staff; promote contact with positive peers and adults outside school by requiring participation in support groups after school; and support graduation from high school by providing an accredited curriculum taught by licensed teachers (Tanner-Smith et al., 2014).

Similar to RHSs, CRCs also support students' academic goals through fostering a positive, sober peer environment that provides companionship as well as emotional and recovery social support (Harris et al., 2014). Youth in recovery who choose to enroll in postsecondary education have additional tasks that can challenge their recovery. For example, unlike youth attending high school, youth in college are tasked with finding their own network of social support and developing healthy peer relationships, moving away from home and learning to live outside of their caregiver's supervision, and setting and attaining educational and career goals (Harris et al., 2008). For youth in recovery, these tasks must be undertaken with the added pressure of finding a sober peer environment that supports abstinence, a difficult task in an abstinence-hostile environment. Thus, through their available programming and

dedicated on-campus recovery support, CRCs seek to create an internal community of recovery support, advocate for sobriety among the larger community, and support students as they transition to young adulthood. CRCs are vital environmental supports for youth in recovery wishing to attend postsecondary education: indeed, in a recent survey of students in 29 CRCs across the United States, one-third of respondents stated they would not have chosen to attend higher education without a campus recovery support system (Laudet et al., 2016).

Although RHSs and CRCs operate along a similar theory of change in relation to sober peer support and community, they have different operating models and structures based on how they seek to intervene with youth and due to their placement in particular educational systems. For example, RHSs operate as both the formal school and recovery support system and there may be less of a clearer distinction between the classroom as an academic versus recovery space. As part of the educational system, RHSs are also able to award their students secondary diplomas when they graduate. Alternatively, CRCs are operated on a college campus but are primarily separate from academic classroom spaces, offering additional supports outside of the academic structure. Youth in CRCs may choose to discontinue their participation in the CRC activities but still remain enrolled at the college, while youth at RHSs need to remain sober for continued enrollment at the school. Relapse situations in RHSs are typically treated on a case-by-case basis, but if the youth continues to use substances without indicating motivation to change, they are eventually referred to another school setting to preserve the sober environment of the RHS. Given the close proximity of students and teachers and small school size of RHSs, there is also closer monitoring of youth behavior at the RHS, compared to CRCs, which are housed on larger campuses.

### **Factors That Affect Youth Experience of Recovery Schools**

Multiple, interacting factors may affect whether participants enroll in or join a recovery school and once participating, will determine how the recovery school setting affects subsequent substance use and other behavioral outcomes. Most often studied are individual-level factors such as demographic and socioeconomic characteristics.

Gender and age have distinguished different pathways of youth recovery involvement and outcomes (Stevens, Estrada, Murphy, McKnight, & Tims, 2004; Wellman, Contreras, Dugas, O'Loughlin, & O'Loughlin, 2014). For example, male college students have higher annual prevalence rates of use of marijuana and most other drugs than female college students (Dennhardt & Murphy, 2013). There are also differences between males and females on mental health comorbidity and level of juvenile justice involvement (Stevens et al., 2004), which may interact with level of substance use and/or level of care received for that use (Oser, Karakos, & Hennessy, 2016). Mental health, specifically diagnoses of mental illness comorbidities, has also been studied in this population and found important to outcomes (Hersh, Curry, & Yaminer, 2014; Yu, Buka, Fitzmaurice, & McCormick, 2006). For example, one review of comorbid depression and adolescent treatment outcomes indicated mixed

results depending on study characteristics and concluded that there is not a simple way to categorize the relationship between depression and substance use outcomes (Hersh et al., 2014).

Finally, evidence suggests that tangible resources affect recovery, possibly through either restricting or enhancing access to supportive social networks and other established recovery supports (Granfield & Cloud, 1999; Pesetski, 2015; Terrion, 2012); thus, measures of socioeconomic status are important indicators of potential inequity among this population.

### ***Why it is Important to do the Review***

To our knowledge, no reviews of CRCs exist in the literature. Further, there is only one systematic review to date that has included findings from RHSs (Fisher, 2014). That systematic review identified a range of adolescent-specific continuing care supports, however, and did not solely focus on RHSs. In addition, although four studies of RHSs were identified in the review, the author had limited resources with which to conduct the review and a meta-analysis was not attempted. Since that review was completed, we are aware of at least three additional primary studies that would be potentially eligible for a review of RHSs, as well as multiple studies of CRCs that have never been reviewed or synthesized.

Other reviews on adolescent treatment and recovery have compared the effectiveness of different adolescent outpatient treatments (Tanner-Smith et al., 2013; Waldron & Turner, 2008), reviewed adolescent participation in 12-Step programs (Kelly & Myers, 2007; Sussman, 2010) and the role of social support in collegiate recovery programs (Smock, Baker, Harris, & D'Sauza, 2011), and explored the relationship between 12-Step attendance and adolescent substance use outcomes posttreatment (Hennessy & Fisher, 2015). Although these reviews have highlighted the importance of treatment and support programs for youth with SUDs, they have not focused explicitly on examining the potential effectiveness of recovery schools. Thus, there is a need to understand the effects of education-based interventions in light of our understanding of other youth recovery supports especially given the recent enthusiasm for their implementation (NIDA, 2014; ONDCP, 2014; White, 2009) and recovery school funding mechanisms in some U.S. states (Finch et al., 2016).

Finally, based on resources located from U.S.-based national networks and recent documents outlining the recovery school movement (ARHE, 2016; Laudet et al., 2014; White & Finch, 2006), we anticipate that the majority of the programs will be located in the United States. We are aware of at least one potential recovery school program in China (Lin, Lu, & Wu, 2017). However, we are not aware of other attempts to locate recovery school program literature on an international scale. An extensive systematic search would enable knowledge around whether, and if so, where such programs are in operation worldwide. Substance use disorders among youth are problematic in every nation, and many countries have instituted treatment and recovery resources specific to adolescents and young adults. Thus, this review could highlight gaps in recovery supports and potential solutions for addressing youth recovery moving forward.

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## **OBJECTIVES**

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Recovery school programs in the United States are now operated with a substantial infrastructure and both private and government funding are made available for these supports (Finch et al., 2016; Moberg & Finch, 2007; Oser et al., 2016). Globally, there is also increasing attention to building more comprehensive, developmentally-appropriate continuing care supports to break the cycle of relapse and return to treatment many youth experience (Daddow & Broome, 2010; Sussman, 2010; White, Kelly, & Roth, 2012). Given the limited education and public health resources, and continued implementation of new recovery school programs (ARS, 2016; White & Finch, 2006), it would seem timely for a review of this nature, even if currently there is a somewhat limited incidence of these education-based programs compared to, for example, youth treatment programs.

Thus, the objectives of the review are to summarize and synthesize the available research evidence on the effects of recovery schools for improving academic success and social and emotional well-being among high-school and college students who are in recovery from substance use. The specific research questions guiding the review are:

1. What effect does recovery school attendance (versus attending a non-recovery or traditional school setting) have on academic outcomes for students in recovery from substance use? Specifically (by program type):
  - a. For recovery high schools: what are the effects on measures of academic achievement, high school completion, and college enrollment?
  - b. For collegiate recovery programs: what are the effects on measures of academic achievement and college completion?
2. What effect does recovery school attendance have on substance use outcomes for students in recovery from substance use? Specifically, what are the effects on alcohol, marijuana, cocaine, or other substance use?
3. Do the effects of recovery schools on students' outcomes vary according to the race/ethnicity, gender, or socioeconomic status of the students?
4. Do the effects of recovery schools on students' outcomes vary according to existing mental health comorbidity status or juvenile justice involvement of the students?

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## METHODOLOGY

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### *Criteria for including and excluding studies*

#### *Types of study designs*

The proposed review will include studies that use an experimental or quasi-experimental design. For the primary analysis, eligible studies must compare outcomes for students enrolled in recovery school programs with students enrolled in one or more comparison condition that does not involve a recovery school program. To be eligible, study designs must meet at least one of the following criteria:

- i. **Randomized controlled trial:** Participants are randomly assigned to intervention and comparison conditions. Individual and cluster level randomization is acceptable.
- ii. **Quasi-randomized controlled trial:** Participants are assigned to intervention and comparison conditions via a quasi-random procedure, such as birth date or student record number.
- iii. **Quasi-experimental controlled trial with individual level matching:** Participants in the intervention and comparison conditions are allocated to conditions via a non-random process, but participants are individually matched on at least one measure of substance use and on three student demographic characteristics (age, race/ethnicity, gender).
- iv. **Quasi-experimental controlled trial with pretest-adjusted outcomes:** Participants in the intervention and comparison condition are formed via a non-random process, but the study authors adjusted for pretest differences between groups (e.g., as pretest-adjusted posttest means, regression coefficients from models that adjust for pretest). For those outcomes on which pretest data are not applicable (e.g., high-school graduation), adjustment must be done for a close proxy of a pretest.
- v. **Quasi-experimental controlled trial with pretest data:** Participants in the intervention and comparison condition are formed via a non-random process, but pretest data are available for each outcome. Pretest data must be reported in a form that permits assessment of the initial equivalence of the intervention and control groups on those variables via calculation of an effect size. For those outcomes on which pretest data are not applicable (e.g., high-school graduation), data for a close proxy of a pretest must be available.

### *Types of participants*

Eligible student populations will include students enrolled part-time or full-time in secondary (high school) or postsecondary (college or university) educational institutions. All ages of students are eligible for inclusion provided they are enrolled in an educational institution, but most secondary and postsecondary students are expected to be ages 14-25. Studies that include students who are not enrolled in educational institutions at the time of the intervention will not be eligible for inclusion.

Eligible student populations must be comprised of students who are in recovery from substance use. The definition for “in recovery” is broad, and encompasses any student with a history of using substances who is motivated or interested in reducing their substance use or maintaining abstinence from substance use. Students who were mandated to a program because of behaviors related to substance use or actual problematic use are also considered eligible populations. Due to inconsistent reporting in primary studies, students in recovery are not required to have a formal substance use disorder diagnosis (e.g., substance abuse or substance dependence diagnosis based on DSM criteria).

To be as inclusive as possible, no other eligibility restrictions will be placed on the eligible participant populations. Students in recovery who are enrolled in educational institutions in any country will be eligible for inclusion.

### *Types of interventions*

The proposed review will include any recovery school program that is designed to support the academic success of students who are in recovery from substance use. Recovery schools are broadly defined as educational institutions, or programs at educational institutions, that are developed specifically for students in recovery and address recovery needs in addition to academic development. Eligible recovery school programs can be at the secondary (Recovery High Schools [RHS]) or postsecondary level (College Recovery Communities [CRC]) and should meet the standards detailed by the Association of Recovery Schools (2013) or by the Association of Recovery in Higher Education (2015) as outlined below. Both sets of guidelines provided by the two organizations are broad enough to include schools and programs of varying designs, yet stringent enough to exclude treatment-based programs to ensure the review’s focus on academic recovery supports. Although Recovery High Schools must meet the broad standards detailed by the ARS to be considered eligible for the review, these programs do not need to be officially accredited by ARS to be included in the review because the accreditation process is fairly new, may be costly for some locations, has not been widely implemented at this time, and is currently only available in the United States (ARS, 2016). Given the different models of recovery high schools and collegiate recovery communities, eligibility criteria differ by program type.

*Recovery High Schools* must meet the inclusion criteria described below to be eligible for inclusion in the review:

- i. Eligible recovery high school programs must have as their primary mission to provide education to youth in recovery from substance use or co-occurring disorders.
- ii. Eligible recovery high school programs must have an explicit goal of providing academic or educational instruction to high school students. The program must meet state requirements for awarding a secondary diploma. GED-awarding programs are also eligible. The program also must have direct contact with one or more students, and provide educational instruction via face-to-face, online, telephone, or video communication.
- iii. Eligible recovery high school programs must have an explicit goal of providing a high school environment oriented around recovery from substance use or co-occurring disorders and must require previous treatment and/or commitment to sobriety. Recovery school programs could include any of the following recovery support elements: individual, group, or parent counselling services; links to mutual aid support groups and/or requirement to attend additional continuing care support.
- iv. Eligible recovery high school programs must be available to any student in recovery from substance use or co-occurring disorders who meets state or district eligibility requirements for attendance.

*Collegiate Recovery Communities* must meet the inclusion criteria described below to be eligible for inclusion in the review:

- i. Eligible collegiate recovery communities must have an explicit goal of providing recovery support services and be focused on encouraging abstinence from use of substances.
- ii. Eligible collegiate recovery communities must be located in a postsecondary educational setting. The program must have direct contact with one or more students, and provide supports via face-to-face, online, telephone, or video communication.
- iii. Eligible collegiate recovery communities must have an explicit goal of providing a collegiate environment oriented around recovery from substance use. This goal could be met through any of the following or a combination of the following activities for youth in recovery: have a dedicated space for students in recovery to meet and support each other; offer group mutual aid meetings; offer individual counseling services with trained, specialized staff. They may also

provide substance-free housing for recovering youth, organize sober events and community service activities, and educate the broader community in an effort to reduce stigma around addiction and generate a sober social culture. Single recovery supports, for example, a stand-alone 12-Step meeting that meets on campus but separate from any sustained CRC program model would not be considered an eligible program. However, if, as part of a broader CRC effort, the campus has a 12-Step meeting that includes students and non-students, the overall CRC program is still eligible. In this example, only the outcomes for students would be considered eligible outcomes to include in the review.

*Comparison Condition.* Eligible comparison conditions must include traditional educational programs or services that do not explicitly have a substance use recovery focus. A school specifically designed for students with mental health diagnoses who do not have a substance use disorder would also be an eligible comparison condition.

### *Types of settings*

Studies may be conducted in any country. Eligible settings for intervention delivery are educational settings for youth in recovery and are described in detail in the section of this protocol discussing intervention eligibility criteria (above). If the location of the educational program is in a substance use treatment center, then the program is not eligible for inclusion in this review. The rationale for this exclusion criterion is that educational programs delivered in formal substance use treatment settings prioritize treatment services over academics and may involve more intensive treatment services, and thus do not qualify as a posttreatment or continuing care recovery support environment.

### *Types of outcome measures (primary)*

The primary outcomes eligible for this review are divided into two broad domains, with further subdivisions for constructs within each of these domains. Each construct within a larger outcome domain will be coded and analysed separately in the review. Studies that meet all other eligibility criteria will be eligible for the review even if they do not measure one of the primary outcome domains: these studies will be included in the narrative portion of the review but not included in any of the meta-analyses.

*Academic performance domain.* The academic performance domain includes outcomes that assess students' academic achievement and performance in school. Eligible constructs within this domain include standardized achievement test scores (e.g., ACT, SAT, state assessments), grade-point average (GPA), high-school completion, college enrollment, and college completion. College enrolment and completion outcomes can be at any type of secondary educational establishment including two- and four-year institutions and technical colleges. Given differences in credit value across institutions, the number of credits earned toward a high school or college diploma are not considered eligible outcomes.

*Substance use domain.* The substance use domain includes outcomes that assess students' consumption of alcohol and other substances. Positive and negative outcomes are both eligible: e.g., proportion abstinent and number of days of use are both eligible substance use outcomes but would be analysed separately. Eligible constructs in this domain include alcohol, marijuana, cocaine, heroin, stimulant, and other substance use (i.e., general measures that collapse across different types of substances). In addition, official DSM diagnoses including an abuse, dependence, or substance use disorder diagnosis, are eligible constructs within this domain. Diagnosis outcomes are likely to come from the following scales, but diagnostic outcomes are not limited to these scales as long as the scale is a standardized and validated metric: the Adolescent Diagnostic Interview (ADI; Winters, Stinchfield, Fulkerson, & Henly, 1993), Diagnostic Interview Schedule for Children (DISC; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000), or the Mini Structured Interview for Diagnosis (MINI-SCID; Sheehan, Janavs, Baker, Harnett- Sheehan, Knapp, & Sheehan, 1999).

Tobacco use (and its respective DSM diagnoses) and caffeine intake will not be eligible constructs in this domain, and will be excluded from the review.

#### *Types of outcome measures (secondary)*

There is one domain of secondary outcomes eligible for this review, divided into subdivisions for unique construct within this domain. Studies that meet all other eligibility criteria will be eligible for the review even if they do not measure one of the secondary outcome constructs.

*Substance use related problems domain.* The substance use related problems domain includes outcomes that assess students' problems related to the consumption of alcohol and/or use of other substances. Eligible constructs in this domain include the following problems due to alcohol or substance use: arrests, DUI/DWI (e.g., motor vehicle problems), health consequences, peer and family relationship problems, risky sexual behaviour, school or work problems, and mixed negative consequences as measured by a scale (e.g., Rutgers Alcohol Problem Index [RAPI] score; White & Labouvie, 1989). Substance use related problems are likely to be measured by a variety of assessment tools, including the following: Personal Experiences Inventory (PEI; Winters & Henly, 1989), Problem Oriented Screening Instrument for Teenagers (POSIT; Rahdert, 1991), and the RAPI (White & Labouvie, 1989). Substance use related problem outcomes are not limited to these scales.

If the effects of tobacco and caffeine use on these outcomes are reported separately, they will not be eligible in this domain and will be excluded from the review.

#### *Duration of follow-up*

There are no eligibility criteria based on duration of follow-up. All follow-up periods of eligible studies will be considered. During the analysis, studies with similar follow-up

periods may be grouped together if there is a great degree of diversity in follow-up duration across studies (described below in more detail).

### *Other Eligibility Criteria*

*Language of Publication.* Studies may be published in any language.

*Date of Publication.* Studies must be reported in 1978 or later, given that the first collegiate recovery program was developed in 1977 (White & Finch, 2006) and the first recovery high school was developed in 1979 (Finch, 2015, personal communication; Ruben, June 22, 2000).

*Form of Publication.* To be as comprehensive as possible, studies may be reported in any form or type of publication, including but not limited to journal articles, books, book chapters, theses and dissertations, technical reports, conference papers, and other unpublished but disseminated formats.

### **Description of methods used in primary research**

Given the potential difficulty in randomizing students to certain types of high schools or colleges, most studies included in this review are expected to use a quasi-experimental study design. In addition, given the uniqueness of recovery high schools in particular, it might also be difficult to find appropriate comparison schools for matching. Thus, we anticipate that most included studies will control for certain participant characteristics in the analysis rather than engage in a matching procedure at the school level.

For example, one of the earliest evaluation studies, a potentially eligible study for *recovery high schools* is from the Phoenix School (Emrich & Green, 1981). Using a quasi-experimental study design, the authors used a matched sample of non-Phoenix students ( $n = 11$ ) and Phoenix students ( $n = 11$ ) to evaluate the effectiveness of the Phoenix School, a recovery high school, on the following relevant outcomes: GPA, school attendance, and substance use. Substance use was reported as both a continuous frequency and binary abstinence measure by substance (e.g., beer, wine, marijuana, hashish, cocaine). A single number of a drug prevalence index, generated from a Rasch model, was also reported. Overall, the authors concluded that there was no significant difference in substance use between the two groups.

In contrast, although providing valuable information about the characteristics of students in CRCs in the United States, the following recent study by Laudet and colleagues (Laudet, Harris, Kimball, Winters, & Moberg, 2015) would not be considered eligible for this review, based on its study design. In this study, the authors reported on 429 college students enrolled in 29 different CRCs. This sample represents about 81% of students in enrolled in United States' CRCs at the time of the study. The authors used a survey that included questions addressing students' sociodemographic characteristics, mental health, substance use involvement, severity of drug and alcohol dependence, behavioural addictions (e.g.,

eating disorders, internet addiction), perceived harm of substance use, perceived benefit of recovery, utilization of recovery support services, and physical health. The study design did not allow for an assessment of outcomes prior to engagement in the CRC and there was no use of a non-CRC comparison group. Thus, this cross-sectional descriptive study would not be considered an eligible study for this review, despite its usefulness in understanding important characteristics of students enrolled in CRCs in the United States.

### ***Search strategy***

The search strategy will use electronic databases, hand searches of journals, and grey literature sources to identify all potentially eligible published and unpublished studies. Leading authors and experts in the field of youth addiction and recovery will also be contacted for additional studies via email. The bibliographies of relevant reviews and included studies will be used to identify additional references for review. We will conduct forward citation searching using the website Google Scholar as this database produces similar results to other search engines (e.g., Web of Science; Tanner-Smith & Polanin, 2015) and is also more likely to locate existing grey literature.

Two independent reviewers will first independently screen studies' titles and abstracts. Disagreements between reviewers will be resolved by consensus. Potentially eligible studies will then be retrieved in full text and these full texts will be reviewed for eligibility, again using two independent reviewers. Disagreements between reviewers will again be resolved via discussion and consensus. If we cannot determine eligibility due to missing information in a report, we will contact study authors for this information. The completed review will include a table of studies excluded at the full text level of screening and provide rationale for each exclusion decision. We will also publish a PRISMA flow chart to report the screening process and results (Moher et al., 2015).

### ***Electronic Databases***

As addiction and recovery supports such as recovery schools span multiple disciplines, education, social science, and public health electronic databases will be searched. Search terms will vary by database, but will generally include three blocks of terms and appropriate Boolean or proximity operators, if allowed: blocks will include terms that address (1) intervention; (2) population; (3) outcomes. The following are electronic databases (hosts) we plan to search:

- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cochrane Database of Abstracts of Reviews of Effects (DARE)
- Education Resources Information Center (ERIC, via ProQuest)
- Education Database (via ProQuest)
- International Bibliography of the Social Sciences (IBSS, via ProQuest)
- PsycINFO (via ProQuest)
- PsycARTICLES (via Proquest)

- PubMed
- Social Services Abstracts (via Proquest)
- Sociological Abstracts (via Proquest)
- Web of Science

*Search Terms.* The search terms and strategy for PsycINFO via ProQuest are as follows (to be modified for other databases):

(TI,AB("recovery high school" OR RHS OR "recovery school" OR "sober school" OR "sober high school" OR "collegiate recovery communities" OR "collegiate recovery community" OR CRC OR "collegiate recovery program\*" OR CRP OR "college recovery community" OR "college recovery program" OR "campus recovery program" OR "campus recovery community" OR "recovery community" OR (school NEAR recovery))) AND (alcohol OR drink\* OR substance OR drug OR marijuana OR cannabis OR cocaine OR amphetamine OR heroin OR inhalant OR opioid OR opiate OR "substance use disorder" OR "substance abuse" OR "drug abuse" OR addiction) AND (student\* OR youth OR adolescen\* OR teen OR teens OR teenager OR teenagers OR "young adult" OR "young adults" OR "emerging adult" OR undergraduate OR undergraduates)

#### *Journal Hand Searches*

As suggested in the C2 Literature Search guide (Hammerstrøm, Wade, & Jørgensen, 2010), journal hand searches will be conducted in the most current issues of journals where a large number of included studies have been found.

#### *Grey Literature sources, including Theses and Dissertations*

- Alcohol Studies Database: [http://www2.scc.rutgers.edu/alcohol\\_studies/alcohol/](http://www2.scc.rutgers.edu/alcohol_studies/alcohol/)
- Association of Recovery in Higher Education (ARHE), also includes the Annual Collegiate Recovery Conference materials for past 3 years:  
<http://collegiaterecovery.org>
- Association of Recovery Schools (ARS) website: <https://recoveryschools.org>
- Drug & Alcohol Findings Project: <http://findings.org.uk/index.php?s=eb>
- International Clinical Trials Registry: <http://apps.who.int/trialsearch/>
- NIAAA Website: <https://www.niaaa.nih.gov>
- NIH RePORTER: <https://projectreporter.nih.gov/reporter.cfm>
- ProQuest Dissertations and Theses Global (now includes *Index to Theses in Great Britain and Ireland*)
- SafetyLit: <http://www.safetylit.org/index.htm>
- SAMHSA website: <http://www.samhsa.gov>
- Theses Canada: <http://www.bac-lac.gc.ca/eng/services/theses/Pages/theses-canada.aspx>

### ***Criteria for determination of independent findings***

Prior to initiating the quantitative synthesis (described in more detail below), all reports of unique studies will be reviewed to ensure that articles reporting on the same study will be appropriately linked so that only unique study samples are included in each analysis. To ensure independence and appropriate combination of outcome constructs, syntheses will initially be split into categories based on similar follow-up durations (e.g., less than 6 months, 6 months or greater, or 1 year or more). However, within-study effect size dependency based on similar outcome constructs within domains will be handled differently depending on how many studies are eligible for the review. This is because some meta-analytic methods and inferences (e.g., robust variance estimation) are only appropriate in cases with enough power, which is ensured by a larger sample size at the study level: although there are no strict guidelines on the exact number of studies appropriate for robust variance estimation, the cut-off chosen is based on recommendation from previous simulation studies (e.g., see Tanner-Smith & Tipton, 2014 for a summary).

*If there are a small number of studies ( $k < 10$ ):* In the event that studies report multiple outcomes within the same construct category (e.g., two measures of academic achievement, two measures of alcohol use), for each construct category in a domain only one outcome per study will be included in the synthesis for that construct. The most similar outcomes will be chosen for synthesis within a category.

*If there are a larger number of studies ( $k \geq 10$ ):* In the event that studies report multiple outcomes within the same construct category (e.g., two measures of academic achievement, two measures of alcohol use), we will use robust variance estimation to handle these statistical dependencies in the synthesis (Hedges, Tipton, & Johnson, 2010; Tanner-Smith & Tipton, 2014; Tipton, 2013).

### ***Details of study coding categories***

All studies will be independently double-coded by two reviewers, using a piloted codebook (see Appendix A for a draft codebook). Coding disagreements will be resolved via discussion and consensus. If data needed to calculate an effect size are missing from a report, we will contact the primary study authors for this information.

The primary categories for coding are as follows: participant demographics (e.g., age, DSM diagnoses for mental health and substance use, gender, grade level, race/ethnicity, socioeconomic status); intervention setting (e.g., country, academic level of focus, urbanicity); intervention components and curriculum delivery (e.g., community service, parent involvement, online coursework, in-person lessons); study characteristics (e.g., attrition, duration of follow-up, study design, participant dose, sample N); outcome construct (e.g., type, description of measure); outcome results (e.g., timing at measurement, baseline and follow-up mean and standard deviation).

The risk of bias in included studies will be assessed using Cochrane risk of bias tools for randomized studies (Higgins & Green, 2011) and non-randomized studies (Sterne et al., 2016). The Cochrane risk of bias tool for non-randomized studies, ROBINS-I, requires that at the protocol stage of the review, two sets of items are determined: reviewers must list (1) confounding areas that they expect will be relevant to all or most studies in the review and (2) co-interventions that could be different between intervention groups with the potential to differentially impact outcomes. For this review, we anticipate the following confounding factors: prior substance use, prior academic achievement, mental health comorbidities, and readiness to change. We also anticipate the following co-interventions as potentially different between groups: self-help attendance (e.g., 12-Step programs) and other substance use counseling services (e.g., outpatient treatment).

### ***Statistical procedures and conventions***

*Effect Sizes.* Outcomes in included studies will likely be reported as continuous measures using a variety of scales (e.g., numeric grades or test scores, frequency or quantity of use); thus, the standardized mean difference (SMD) will be the primary effect size metric used to quantify study findings. Effect sizes will be coded so that the direction of the outcome remains the same across different scales. All continuous outcomes will also be adjusted for small samples (Hedges' *g*).

In the event that binary outcomes are reported (e.g., abstinence of use, truancy), an odds ratio effect size metric will be used to quantify study findings. We assume that any binary outcome measures will reflect different underlying constructs than continuous measures (i.e., abstinence from substance use represents a different underlying construct than frequency or quantity of substance use). Therefore, all quantitative syntheses will pool the Hedges' *g* and odds ratio effect sizes separately.

To minimize any potential bias in the meta-analysis results introduced by effect size outliers, effect sizes three or more standard deviations from the mean will be Winsorized prior to pooling (Lipsey & Wilson, 2001).

*Model.* Given the expected diversity of populations and settings, meta-analyses will be conducted using random-effects inverse variance weights and 95% Confidence Intervals will be reported. All meta-analyses will be conducted and reported separately for RCTs and non-RCTs. Analyses will also be separated by intervention (*intervention 1, RHS* versus the comparison and *intervention 2, CRC* versus the comparison) and by outcome domain (*academic outcomes, substance use outcomes, and substance use problems outcomes*). Analyses will be further separated by outcome construct if there are enough unique constructs reported for separate syntheses. For example, if enough studies report both frequency and quantity of substance use, then separate analyses will be used: if not, then these outcome constructs will be pooled together for one standardized and continuous measure of substance use outcomes. Forest plots will be used to display the results.

*Assessment of Heterogeneity and Moderator Analysis.* Heterogeneity will be assessed and reported using the  $\chi^2$  statistic and its corresponding p value,  $I^2$ , and  $\tau^2$ . If there is existing heterogeneity and there are enough studies to explore its source (defined here as at least 10 studies), we will use mixed-effect meta-regression models to conduct moderator analyses. Proposed moderators include the following: (1) proportion of males; (2) mean age of sample; (3) proportion of students with mental health comorbidities; (4) proportion of students with juvenile justice involvement; (5) student socioeconomic status; (6) and student race/ethnicity. These effect size moderators have been established in prior research as potentially important factors in the role of youth recovery from substance use and were addressed in the background to this review.

*Sensitivity Analyses.* Appropriate assessments, such as the contour enhanced funnel plot (Palmer, Peters, Sutton, & Moreno, 2008), Egger's regression test (Egger, Smith, Schneider, & Minder, 1997), and trim and fill (Duval & Tweedie, 2000), will be used to evaluate the potential of publication, or small study, bias.

Sensitivity analyses using two potential moderators of study quality will also be used to assess the robustness of review findings. These will include the following: (1) level of within-study attrition and (2) whether or not a standardized assessment tool was used to measure outcomes. Finally, we will conduct additional sensitivity analysis that removes any Winsorized effect sizes from the meta-analysis, to assess whether this method for handling outliers may have substantively altered the review findings.

#### *Data Management and Software*

We will use the following software throughout the review process: FileMaker Pro (literature screening and data extraction), Microsoft Excel, Microsoft Word, and Stata (synthesis, generation of figures including forest plots).

#### ***Treatment of qualitative research***

We do not plan to include qualitative research in this review.

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## **ROLES AND RESPONSIBILITIES**

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- Content: Finch, Hennessy, Tanner-Smith

Andrew J. Finch, has been a co-PI on two NIDA-funded projects (an R21 and an R01) studying recovery high schools. He is a co-founder of the Association of Recovery Schools. Among his published works are *Starting a Recovery School* and *Approaches to Substance Abuse and Addiction in Educational Communities: A Guide to Practices that Support*

*Recovery in Adolescents and Young Adults*, on which he was a co-editor. For nine years, Dr. Finch worked for Community High School in Nashville, one of the early schools for teens recovering from alcohol and other drug addictions and a school he helped design. Emily Hennessy is a doctoral candidate at Vanderbilt University and is an expert in adolescent health promotion. Since 2012, she has been working on Dr. Finch's R01-funded evaluation of recovery high schools and her dissertation focuses on factors related to adolescent recovery. Emily Tanner-Smith has also been working on the R01-funded recovery high schools evaluation project and is an expert in adolescent substance use.

- Systematic review methods: Hennessy, Potter, Sathe, Tanner-Smith

Emily Hennessy, the lead reviewer, has authored 7 systematic reviews and meta-analyses. She is a systematic review specialist for the International Initiative for Impact Evaluation (3ie) and a graduate student reviewer for the Methods Coordinating Group of the Campbell Collaboration. Emily Tanner-Smith has authored 17 systematic reviews and meta-analyses (including two Campbell Systematic Reviews) and formerly served as Editor for the Methods Coordinating Group of the Campbell Collaboration. Nila Sathe has been an author on more than 20 systematic reviews addressing pediatric health. She helps to direct evidence synthesis efforts for Vanderbilt Medical Center's Agency for Healthcare Research and Quality (AHRQ)-funded Evidence-based Practice Center. She is adept in the use of systematic review methods and serves as an associate editor for AHRQ systematic reviews and participates in methods workgroups. Shannon Potter is a co-author on four systematic reviews and one technical brief. She has contributed significantly to literature screening, data extraction, and appraisal of evidence on several systematic reviews of medical and psychosocial interventions, including one large review of interventions for disruptive behavior in children and adolescents.

- Statistical analysis: Hennessy, Tanner-Smith

Emily Hennessy has a graduate minor in quantitative methods and has authored multiple meta-analyses. Emily Tanner-Smith is an expert in research synthesis methods and is currently a statistical editor for the journal *Systematic Reviews*. She is also an elected member of the Society for Research Synthesis Methodology.

- Information retrieval: Hennessy, Potter, Sathe

In addition to the information provided above regarding systematic review expertise, Nila Sathe is the Lead Co-Convener for the Campbell Collaboration Information Retrieval Methods Workgroup. Shannon Potter is a trained medical librarian with expertise in literature searching and retrieval.

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## **SOURCES OF SUPPORT**

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This review will be supported with a grant from the Campbell Collaboration.

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## **DECLARATIONS OF INTEREST**

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Three of the authors of this review (AJF, EAH, ETS) are involved in one ongoing primary study examining the effects of recovery high schools. If that study is deemed eligible for inclusion in the review, external and independent data collectors will be used to extract all data from that study. This will be reported transparently in the completed review.

The authors of this review have no other conflicts of interest to declare.

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## **PRELIMINARY TIMEFRAME**

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| <i>Milestone</i>             | <i>Date</i>                            |
|------------------------------|--|
| Title Registration           | Submitted with proposal                |
| Project Start Date           | June 1, 2016                           |
| Protocol Submission          | July 20, 2016                          |
| Literature Search            | August – September 2016                |
| Abstract Screening           | September – October 2016               |
| Literature Retrieval         | September – October 2016               |
| Eligibility Screening        | September – January 2017               |
| Data Extraction/Coding       | January 2017 – February 2017           |
| Data Analysis                | February 2017-March 2017               |
| Prepare Final Review         | March 2017                             |
| Submit Final Review          | March 31, 2017                         |
| Prepare and Submit Revisions | May 31, 2017 and thereafter, as needed |

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## **PLANS FOR UPDATING THE REVIEW**

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The lead reviewer anticipates updating the review on a five-year cycle, pending continued research on the topic.

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## AUTHOR DECLARATION

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By completing this form, you accept responsibility for preparing, maintaining and updating the review in accordance with Campbell Collaboration policy. The Campbell Collaboration will provide as much support as possible to assist with the preparation of the review.

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