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# A systematic review of recovery high schools and collegiate recovery programs for building recovery capital among adolescents and emerging adults

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**Introduction:** Educational settings represent a prime opportunity for reaching adolescents and young adults (ages 12–27) experiencing substance use disorders (SUD). Recovery high schools (RHSs) were established to help adolescents in recovery finish their education while maintaining alcohol and other drug (AOD) abstinence and collegiate recovery programs (CRPs) were implemented for college and university students. With the continued proliferation of these programs, this review synthesizes the empirical literature on the impact of both types of educational recovery supports for youth.

**Method:** This review's methodology was based on a previous Campbell review on the same topic from 2017. We searched five public databases (May 2024), used PRISMA 2020 reporting guidelines, and followed Campbell Collaboration guidelines including Synthesis Without Meta-Analysis. Eligible studies focused on adolescent/emerging adult participants in RHSs or CRPs. Any outcome broadly related to SUD recovery was eligible. We included quantitative or mixed methods studies and allowed for cost-benefit/cost-effectiveness designs. Data from eligible studies were extracted in duplicate and assessed for quality (Quality Assessment Tool for Quantitative Studies) by four review team members. Two cost-benefit/cost-effectiveness studies included in the CRP review were rated for quality using a separate tool appropriate for these designs by a single reviewer.

**Results:** We identified 37 manuscripts representing 25 unique studies focused on RHS (K = 7: N = 14,209) or CRPs (K = 18: N = 2,795). In the RHS studies, participants were predominantly White (41%) and females represented 29% of the sample. No studies met the criteria for low risk of bias. In the CRP studies, participants were predominately white (89%) and had slightly less female than male participants (45%). 11 of the 16 studies that did not use cost-benefit analysis were rated as high risk of bias. The quality rating of the two studies using cost-benefit designs indicated that both studies had fairly rigorous approaches.

**Discussion:** This research base suggests that students who participate in RHSs and CRPs may demonstrate reductions in AOD use, and improvements in social and academic outcomes, although given the existing research designs, statements about the incremental public health utility of investing in these programs relative to other approaches of equal intensity or duration cannot be made with confidence.

## KEYWORDS

collegiate recovery communities, collegiate recovery programs, recovery capital for adolescents model, recovery high school, systematic review

# 1 Introduction

In 2019, over 70,000 youth enrolled in publicly funded substance use disorder (SUD) treatment in the United States, and an additional 1.9 million needed treatment but did not receive it (1, 2). More effective engagement of youth in seeking treatment for alcohol and other drug (AOD) use and sustained recovery support would have major public health benefits. Educational settings represent a prime opportunity for reaching adolescents and young adults experiencing heavy or problematic substance use including those with an SUD, given they spend the majority of their time in such settings. Although these educational environments present an opportunity to identify and support youth in need of treatment and recovery services, they also pose barriers due to the availability of substances on campuses and the social influence of peer groups who use substances (3, 4). In response to this need, recovery high schools (RHSs) were established to help adolescents in or seeking SUD recovery finish their high school education while maintaining alcohol and other drug abstinence (5) and collegiate recovery programs (CRPs) were implemented for college and university students (6, 7). It has now been a decade since federal offices formally recognized RHSs and CRPs as important supports for youth recovery (8).

These education-based recovery support services emerged in the 1970s to support students in their recovery while also helping them achieve their academic goals (7). Recovery high schools vary in size and structure, with enrollment typically ranging from 2 to 115 students (9), and exist as both independent schools and programs embedded within another school (10). They often offer much of what a traditional high school environment offers: classes, coursework, and a high school diploma. Yet, they also offer recovery-focused programming such as recovery group check-ins, individual counseling or links to mental health supports, opportunities for volunteer community services, and ensure regular connection/check-ins with parents or guardians (7). Collegiate recovery programs (CRP) also range in size and structure, with typical student enrollment ranging from 10 to 50 students (4, 11). They do not directly offer coursework or a college diploma but instead operate on college campuses and support students in recovery pursuing university degrees. They offer recovery supports such as sober housing/dormitories, recovery specific meeting spaces/congregational areas, AOD-free social events, group recovery meetings, and scholarships and/or work-study opportunities (12, 13). Some CRPs are membership driven where a period of abstinence is required to become an official member, while others have a more open membership policy. Whereas recovery high schools are professionally led, CRPs can be peer-driven, with a limited professional staff (10, 11, 14, 15). The underlying philosophy of both CRPs and RHSs is that by surrounding young people with others seeking recovery or those farther along in recovery (e.g., advanced students, staff) they will form new, pro-recovery social network connections that will reduce engagement with pro-substance use peers and serve to reinforce substance use disorder recovery (5).

Recovery capital refers to the resources necessary to initiate and sustain recovery (16–18). This construct provides an ecological

framework that outlines different types of resources at different levels: human, financial, social, and community recovery capital. Both RHSs and CRPs are positioned as sources of community recovery capital, or as resources and supports located in the local community which are recovery supportive settings and can link their participants to an assortment of recovery supportive activities and peers. They are posited to support recovery through several different mechanisms and to address a multitude of related outcomes. A previously published recovery capital-oriented logic model of CRPs (13) described how CRPs could address personal, social, and community-level barriers of students in collegiate environments to support accrual of recovery capital through a variety of programming options. RHSs can also offer a similar way of building recovery capital. For example, in an RHS, a student can work towards completing their coursework for a high school diploma, building their skillset and motivation (human or personal recovery capital). Identifying with similar age peers, making pro-recovery peer connections, and seeing recovery modeled in others can help to build new relationships and help satisfy recovery-specific developmental needs related to esteem and belonging (19, 20), as well as boost their social recovery capital. Being in an environment with trusted adults who understand the unique needs of students in recovery, and may be in recovery themselves, can offer another facet of social recovery capital. RHSs may also serve as a bridge to broader community services, for example, to help link students to services that address basic needs (e.g., food pantries, stable housing).

Though no single model for RHSs or CRPs exists, education-based recovery support services have continued to grow in recent years, with over 40 recovery high schools currently in operation (21), and over 100 CRPs in development or operation in the United States (22). This review aims to synthesize the existing empirical literature on the impact of both types of educational recovery supports for youth and provide areas for future research direction.

## 1.1 Aim

A previous Campbell systematic review demonstrated a growth in the empirical literature on RHSs and CRPs within recent years and indicated potential for programming to result in a variety of positive outcomes for their participants (6). Yet, that review had a narrow focus on comparative research study designs and was published in 2018 (with a search from 2017); given these programs have been increasingly implemented across the United States and even globally, there was a need to return to the literature and synthesize any updates since that review.

## 2 Methods

This review was based on the methods used in a previously published Campbell review conducted by the first author [Hennessy et al. (23)], but given time constraints, we were unable



to preregister a new protocol. We used the PRISMA reporting guidelines (24) to report all aspects of the review, including the study inclusion/exclusion process and followed Campbell Collaboration best practice guidelines for systematic reviews (25, 26). Throughout the manuscript and tables, we use standard review convention (27) to refer to the number of studies (K) and to the number of participants (N).

## 2.1 Inclusion criteria

**Participants, Intervention, and Comparator.** Eligible studies focused on adolescent and emerging adult participants engaged in recovery high schools (RHSs) for high school students in AOD use recovery or collegiate recovery programs/collegiate recovery communities (CRCs/CRPs) for college students in AOD use recovery. Studies needed to directly identify the program as an RHS or CRP for students in recovery. There were no eligibility restrictions for the comparison groups, provided one was present.

### 2.1.1 Inclusion criteria: outcomes

If a study focused on and reported quantifiable participant outcomes related to SUD recovery, it was deemed eligible. Studies that only focused on the organizational functioning of RHS/CRPs were not eligible. Any outcome broadly related to AOD use recovery was eligible for inclusion. We anticipated for example, outcomes related to substance use (e.g., abstinence, quantity, frequency), academics (e.g., grades/grade point average), criminal history/behavior (e.g., interaction with the criminal justice system), and broader indicators of quality of life and recovery capital.

### 2.1.2 Inclusion criteria: study design, setting, and timing

We included quantitative or mixed methods studies and allowed for cost benefit or cost effectiveness study designs. Given the difficulty of randomizing participants to these programs, we anticipated primarily quasi-experimental designs and few randomized controlled trials. Single group designed studies were also eligible. Studies that were solely qualitative in nature were not eligible. There were no restrictions on the study setting or timing (e.g., cross-sectional and longitudinal studies were both included as were studies from any timepoint).

## 2.2 Search

A systematic search of the literature (from inception until 5/9/2023), using the search terms “collegiate recovery”, “recovery school”, “recovery high school”, “recovery hous\*”, “university-based recovery center”, or “university based recovery center” in combination with substance use terms (see [Supplementary Material](#)), identified 786 records across five publicly available databases (i.e., PubMed, EMBASE, CINAHL, CENTRAL, and PsycInfo). A title/abstract screen removed 482 duplicate records

and 260 ineligible reports, leaving 44 for full-text review. 11 additional articles were identified through reference list searching of previous reviews and eligible articles and assessed for inclusion. In May of 2024, we completed an updated search, which resulted in 82 records, 36 of which were duplicates. The remaining 46 titles and abstracts were screened and 33 were excluded. The full-text review of 10 articles resulted in 3 more articles being excluded, for a final addition of 7 new articles to the original search. See [Figure 1](#) for the PRISMA flow diagram created using the Shiny app developed by Haddaway and colleagues (28). In the original search, only a single screener completed the screening due to resource constraints, but in the updated search, two screeners independently completed both the title/abstract and full-text screening through the Covidence platform and compared discrepancies. Screeners had 100% agreement for including/excluding studies: the only areas of disagreement were for the reason for excluding a study as only a single item could be selected as a reason for exclusion.

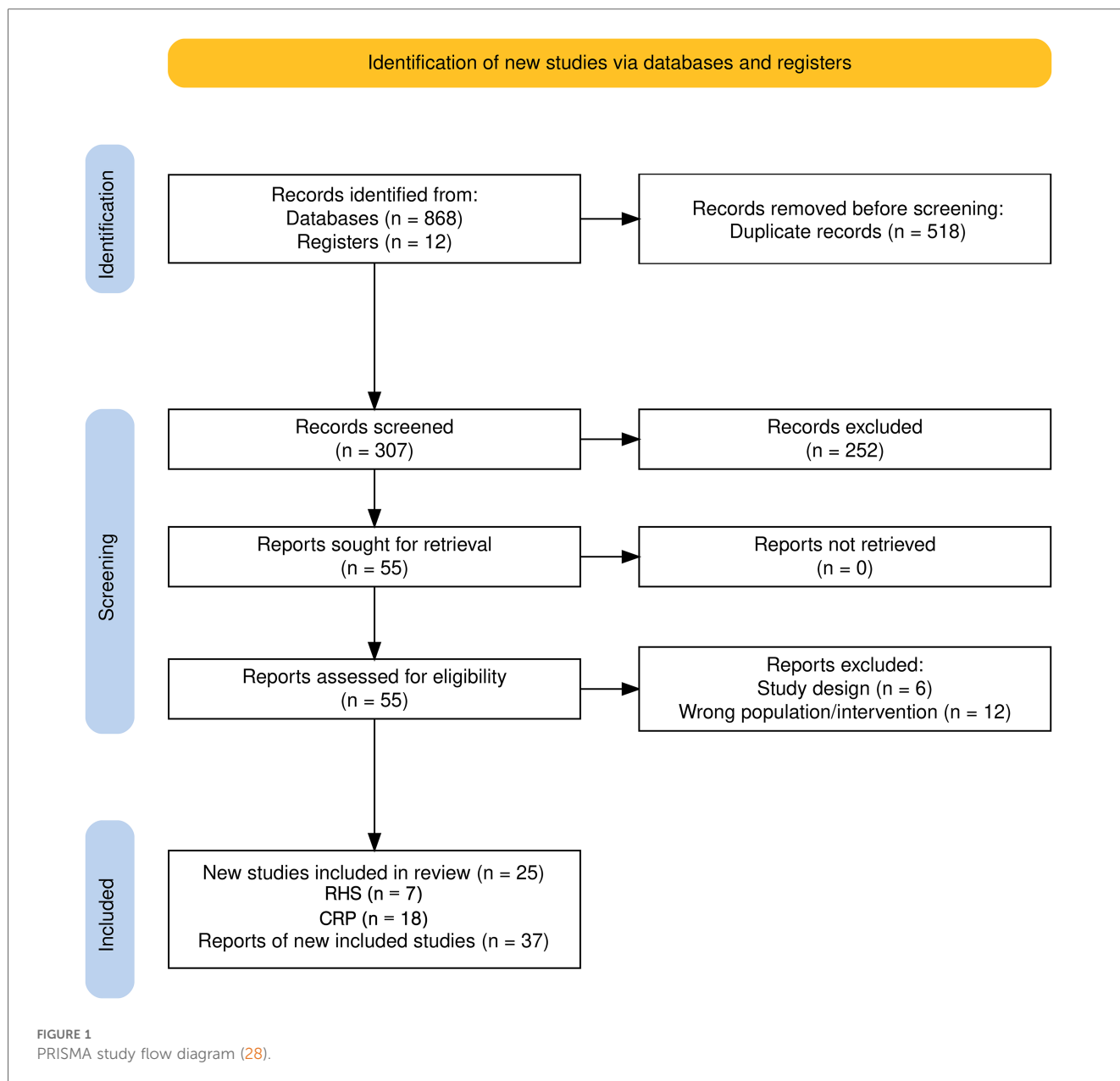
## 2.3 Data extraction

Data from eligible studies were extracted in duplicate by four members of the review team (EH, JO, MK, SG) using an instrument developed for this purpose in the Research Electronic Data Capture (REDCap) electronic data capture tools hosted at Massachusetts General Hospital (29). The coding form included categories for characteristics at the study level (study design, retention rate, demographic characteristics of participants), group level (intervention and comparator characteristics), and outcome level (type of outcome, measurement of outcome, author-reported statistical results of outcome measure). Coding discrepancies were resolved by discussion. Studies where the first author was an author on this review were coded by alternate review team members.

## 2.4 Quality assessment

As suggested by previous reviewers to address quality assessment of non-RCTs (30, 31), we used the Quality Assessment Tool for Quantitative Studies by the Effective Public Health Practice Project [EPHPP (32)], for all studies aside from the cost-effectiveness/cost-benefit studies (32). Four reviewers (EH, JO, MK, SG) assessed for risk of bias independently and in duplicate and came to a consensus on the component ratings before a global assessment (Strong, Moderate, Weak) was decided. The Risk-of-bias VISualization (ROBVIS) online tool was used to visualize and present the quality assessment results from the EPHPP tool (33).

For the two cost-effectiveness/cost-benefit studies included in the CRP review, a single reviewer (EH) used a separate tool appropriate for these designs to rate their quality (34), which has 16 items and uses a weighted grading scheme, resulting in a score for each study of up to 100. In this tool, the question about



sub-group analysis (weight of 1) was deemed not applicable for either study so the resulting scale range is up to 99.

## 2.5 Synthesis

We used Synthesis Without Meta-analysis (SWiM) to guide our reporting of the outcomes (35). Given the likely diversity of the included studies and the small evidence base, the review team decided *a priori* that a descriptive synthesis would be undertaken, highlighting areas for future primary studies and meta-analyses to examine. All extracted data were tabularized and summarized in tables to aid in the descriptive synthesis of findings. We grouped the outcomes into the following seven broad categories of outcomes we established *a priori* and

reported all identified outcomes in these categories in the text and/or tables: (1) Academic; (2) Crime/Criminal Involvement; (3) Employment; (4) Recovery Capital (validated measures); (5) Social network change; (6) Substance use; (7) Other psychosocial outcome. After coding the included studies, we returned to the “Other psychosocial outcome” grouping for each intervention (RHS and CRP) and created a further sub-coding of categories based on emerging categories. Drug craving/urges and length of time in recovery were both recategorized from “other psychosocial outcome” to the (6) Substance use category for ease of interpretation. We added new categories of (8) Mental or Physical Health (9), Life Satisfaction/Flourishing (10), Cost benefit, and (11) Metrics of Participation (CRPs only) to replace the broader “other” outcomes category. We considered metrics of participation important to gather as these can be considered an

intermediate or enabling outcome. By attending programming, participants are positioned to gain the resources and social support necessary to achieve longer-term outcomes. Although the ultimate goals of CRPs include long-term impacts like remission and graduation, participation metrics recognize that the process of engaging the community is itself an important achievement. This aligns with theories of change that value process-oriented outcomes alongside impact-oriented ones (36).

Given the diversity of types of outcomes and ways these were measured, we did not standardize the coded quantitative outcomes into any given metric but instead reported these outcomes as they had been reported in the primary studies using the text and/or table entries provided by the authors.

## 3 Results

We identified 37 manuscripts representing 25 unique studies that focus on RHS ( $K = 7$ :  $N = 14,209$  including a national sample from a pooled dataset of adolescents who have undergone SUD treatment, or  $N = 1,242$  without that sample included) or CRPs ( $K = 18$ :  $N = 2,795$ ). An overall summary of key characteristics of these studies is in Table 1 (RHS) and Table 2 (CRP). Notably, there were no RCTs of either type of educational recovery support, so the strongest study designs identified are comparative studies that attempt to equate groups through matching or cost-benefit analysis studies.

### 3.1 Description of recovery high school studies

#### 3.1.1 Types of research designs

Of the seven RHS studies, there were two comparative studies: (1) a dissertation by Adam Knotts in 2017 (39) and (2) another study from Finch and colleagues in 2017 [Finch and colleagues (40)] was the main publication with a series of additional manuscripts focused on different subsets of the population or research questions, including a publication led by Weimer utilizing cost-benefit analysis (41–45).<sup>1</sup> There was also one cross-sectional mixed methods study that explored differences between RHS and non-RHS groups (48), three cross-sectional single-group studies of just RHS students (38, 46, 47), and one longitudinal single-group study of RHS students (37).

#### 3.1.2 Study characteristics

Study samples ranged in size from just six persons up to 13,261. Tanner-Smith and colleagues published multiple studies

comparing their sample of RHS attendees with a previously-collected national comparison sample of US adolescents receiving treatment for AOD use treatment, but who attended mainstream high school (44). This inclusion inflated the sample demographics across several categories to be more nationally representative. Including this sample, participants were predominantly White (41%), with Hispanic (28%), Black (14%), and Native American (3%) participants represented at rates generally consistent with the national United States demographics. Females represented only 29% of the overall participant sample. Without this national sample, participants were predominately White (78%; range, 71%–90%), with only 7% Hispanic and <1% Black participants included. Studies also had about equal female and male participants overall ( $M = 48\%$  female;  $M$  range, 29%–57%). The average age was 17.3 years ( $M$  range, 13–21).

#### 3.1.3 Study quality

Overall, there were three studies of moderate and four of high risk of bias; no studies met the criteria for low risk of bias (See Figures 2, 3). Blinding of participants to the research question and of data collection by the outcome assessor were most likely to have the lowest risk of bias ratings, at primarily moderate. Regarding the potential for selection bias, individuals who were selected to participate were rated as either somewhat or very likely to be representative of the target population, but only a single study reported the percentage of individuals who agreed to participate after selection (46). In terms of appropriately addressing the potential confounders defined by the EPHPP tool, the studies were split between low risk of bias ( $k = 3$ ) or high risk of bias ( $k = 4$ ). Those rated as high risk of bias did not measure potential confounders, or if they did, did not include them in their analytic approach to examining outcomes. For example, of the list of eight common confounders (race, sex/gender, marital status/family, age, income/class, education, health status, and pre-intervention score on outcome), only 3 studies controlled for race and/or sex/gender, only 2 studies controlled for age and pre-baseline scores on outcomes (e.g., AOD use), and only a single study controlled for SES, education, or health status of participants.

### 3.2 Recovery high school student outcomes

#### 3.2.1 Overview

Six of the seven studies examined some aspect of substance use (e.g., frequency, abstinence), with all but one (38) using primarily self-report. Four studies examined academic outcomes, with only two using official school records (38, 39). Two studies examined involvement with the criminal justice system via self-reported delinquency (42) or legal issues (46). Two studies examined social networks, with one focusing on conflict and perceptions of social support (43) and the other focusing on the alcohol and drug use behaviors of social groups within their networks (48). Two studies

<sup>1</sup>Other publications that were identified and linked to this study because they published on a portion of the data or focused on aspects of the study design but were not coded for this review include: (70, 71).

TABLE 1 Characteristics of recovery high school program studies ( $K = 7$ ).

Study	Citation	N	Sample	Study design	Exp. N	Comp. N	Follow-Ups	Retention	Sex	Age	Race/ethnicity	Primary substance	Primary substance of focus
1	Hensel & Wilburn (37)	6	Adolescents in substance use recovery attending a recovery high school in Indiana (from larger sample of 40)	Single-group prospective; longitudinal			Daily (Jan.-Feb. 2022)	81.2% (147/180 EMAs)	57.3% Female 43.7% Male	NR	White = 71%	NR	NR
2	Giles (38)	375	Students (13 to 21 years) enrolled at the William J. Ostiguy Recovery High School in Boston, Northshore Recovery High school in Beverly, and Independence Academy in Brockton between September 2011 and January 2022	Single-group retrospective; cross-sectional					37.87% Female 62.13% Male	M = 16.98	White = 83.47% Black = 7.2% Asian = 0.53% Hispanic = 6.4%	Alcohol, alcohol and other drugs, cannabis, crack cocaine, cocaine, heroin, opioids, multi-substance	Alcohol (measured at intake; $N = 126$ , 33.60% of sample); Marijuana ( $N = 109$ , 29.07%); Heroin, Prescription Opiate Misuse, Prescription Opiate Misuse ( $N = 77$ , 20.53%); Cocaine, Crack ( $N = 27$ , 7.20%); Benzodiazepines ( $N = 20$ , 5.33%); Other ( $N = 16$ , 4.27%)
3	Knotts (39)	57	RHS: Students enrolled at Hope Academy (IN) between Fall 2010 and Spring 2015. Comparator: Matched comparison group of peers not in SUD recovery from the NWEA norms data	QED; longitudinal	43	43			49.1% Female 50.9% Male	NR	White = 82.5% Black = 3.5% Hispanic = 1.8%	Any	NR
4	Finch et al. (40)	194	High-school adolescent with a history of alcohol and substance use; recently discharged from an intensive treatment program for substance use disorder and enrolled in high school. Recruited upon discharge from 10 substance use treatment facilities in MN, WI, or TX. Compared by RHS (28 + days) vs. non-RHS status.	QED; longitudinal	134	60	3-mo., 6-mo., 12-mo.	78% (6-mo.)	49.49% Female 50.51% Male	M = 16.41 (SD = 1.01)	White = 85.57% Black = 7.22% Other = 7.21%	Any	
	Tanner-Smith et al. (41)	194		QED; longitudinal	134	60	3-month, 6-month, 12-month	78%	49.49% Female 50.51% Male	M = 16.41 (SD = 1.01)	White = 85.57% Black = 7.22%	Any	At baseline: 19 days of alcohol use, 55 days of marijuana use, and 30 days of other substance use in the past 90 days
	Tanner-Smith et al. (42)	260		QED; longitudinal	143	117	3-month, 6-month, 12-month	81% (6 m) and 71% (12 m)	NR	M = 16.07 (SD = 1.03)	White = 82.69% Black = 10.38% Hispanic = 11.5%	Any	NR

(Continued)



TABLE 1 Continued

Study	Citation	N	Sample	Study design	Exp. N	Comp. N	Follow-Ups	Retention	Sex	Age	Race/ethnicity	Primary substance	Primary substance of focus
	Glaude et al. (43)	246		Cross-sectional	121	125			48.37% Female 51.63% Male	M = 16.34 (SD = 1.06)	White = 74% Black = 3.7% Asian = 2.0% Native American = 1.6% Hispanic = 6.1%	Any	NR
	Tanner-Smith et al. (44)	13,261	(1) and (2): High-school adolescent with a history of alcohol and substance use; recently discharged from an intensive treatment program for substance use disorder and enrolled in high school. Recruited upon discharge from 10 substance use treatment facilities in MN, WI, or TX. (3) a national comparison sample of U.S. adolescents receiving SUD treatment	QED; longitudinal	171	(2) 123 (3) 12,967			(1) 51.46% male (2) 59.84% male (3) 73.23% male	Age 13–14 (1) 2.92% (2) 9.84% (3) 15.28% Age 15–16 (1) 42.69% (2) 48.36% (3) 58.22% Age 17–18 (1) 54.39% (2) 41.80% (3) 26.49%	(1) White = 85.96% African American = 4.09% Hispanic = 5.26% Other = 4.68% (2) White = 77.24% African American = 4.88% Hispanic = 12.2% Other = 5.69% (3) White = 37% African American = 15.07% Hispanic = 29.95% Other = 18.48%	Any	
	Weimer et al. (45)	260		Cost effectiveness	143	117	3-month, 6-month, 12-month	80.6% (6-month); 71.4% (12-month)	45% Female 55% Male	M = 16.3 (SD = 1.09)	White = 82%	Any	NR
5	Lanham & Tirado (46)	72	179 students who graduated from the Serenity High School, a public school located in the McKinney Independent School District in Texas, between 2000 and 2010.	Single-group retrospective; cross-sectional					58.3% Female 41.7% Male	M = 21.4 (SD = 2.5)	White = 90.3%	Any	NR
6	Moberg & Finch (47)	321	Students in 17 recovery high schools [California (3), Colorado (1), Minnesota (8), Pennsylvania (1), Tennessee (1), Texas (3)] that fit ARS guidelines and had been operating for at least two years.	Single-group retrospective; cross-sectional					46% Female 54% Male	Not Reported	White = 78% Black = 3% Asian = 3% Native American = 4% Hispanic = 7%	Any	NR

(Continued)

TABLE 1 Continued

Study	Citation	N	Sample	Study design	Exp. N	Comp. N	Follow-Ups	Retention	Sex	Age	Race/ethnicity	Primary substance	Primary substance of focus
7	Hennessy et al. (48)	28	Youth ages 12–19 attending a RHS or other treatment/recovery support service for AOD, or having seen a provider for AOD. Compared RHS vs. non-RHS student status.	Mixed methods; cross-sectional	20	8			28.57% Female 71.43% Male	M = 17.32 (SD = 1.33)	White = 82.15%	Alcohol and other drugs	NR
Sum		14209		3 Longitudinal; 4 Cross-sectional					29% Female	17.3 years (k = 4)	41% White (K = 7) 28% Hispanic (K = 4) 14% African American (K = 4) 3% Native American (K = 2) <1% Asian (K = 3)		
Adj. Sum <sup>a</sup>		1,242							48% Female		78% White 7% Hispanic <1% African American		

<sup>a</sup>Without national comparison sample. K = Number of studies.

examined mental (but not physical) health outcomes, and a single study examined life satisfaction/flourishing. A single study examined work status (full vs. part-time) and number of hours worked. No studies examined measures of Recovery Capital.

3.2.2 Comparative studies

This section details the adolescent outcomes among the studies of RHSs with the most rigorous study design in this sample, two comparative studies of RHS, one of which includes a cost-benefit analysis driven from the findings of the researchers’ quasi-experimental study. In addition to having the most rigorous study design, they had the lowest risk of bias (moderate) compared to the majority of other studies. The other study designs and their associated outcomes are reported in full in Table 3.

One dissertation study conducted by Knotts (39) enrolled 57 students from an Illinois RHS, Hope Academy (2010–2017) and matched 43 of these students with a nationally representative virtual comparison group of students from the 2015 Northwest Evaluation Association’s Measure of Academic Progress normative data. Matching was conducted to ensure that students were from similar schools (percentage of students receiving free/reduced-price lunches and school location) and that there was a match for each RHS student on gender, ethnicity, subject area, starting score, grade level, and testing timeframe. When examining these academic outcomes using paired *t*-tests, RHS students displayed similar levels of academic growth when compared to the virtual comparison group (*t*-stat = +0.849; *p* = 0.397), including on reading (+0.201, *p* = 0.278), mathematics (+0.019, *p* = 0.914), and language (−0.005, *p* = 0.977). Substance use was only assessed among RHS students as the virtual comparison group did not have this assessment. The RHS students were administered the Global Assessment of Individual Needs-Short Screen (GAIN-SS) every eight to twelve weeks. This resulted in 141 instances of the GAIN-SS in the RHS sample: in 49 of these, the student had returned to use, while in the remaining 92 instances, they had not returned to substance use.

In the only other comparative study of RHS students, 294 youth in recovery were recruited from RHS and treatment centers from 2011 to 2016 (40–45). Their school enrollment choice (after treatment, if enrolled from a treatment center) was collected, and they were followed for one year. Matching was conducted to equate the non-RHS and the RHS youth for the analysis. Of the analyzed sample of 260 youth, RHS students reported less substance use than non-RHS students at the 6-month (*b* = − 0.58, 95% CI [− 1.21, 0.04], Incidence Rate Ratio [IRR] = .56, *d* = 0.19) and 12-month follow-ups [*b* = −0.50, 95% CI (− 0.98, −0.02), IRR = .60, *d* = 0.21]. Students who attended RHS reported substance use rates approximately 0.60 times lower than non-RHS students. At the 12-month follow-up, the number of days predicted by the negative binomial models for use of substances in the past 90 days was 13.86 for RHS students vs. 25.67 for non-RHS students. RHS students reported less frequent

TABLE 2 Characteristics of collegiate recovery program studies ( $K = 18$ ).

Study	Citation	N	Sample	Study design	Follow-ups/ retention	Sex	Age	Race/ ethnicity	Primary substance of focus
1	Ashford et al. (49)	54	Undergraduate and graduate students participating in the UNT Psychology Sona System who were also in recovery. Comparison between those “actively” engaged in CRP ( $n = 14$ ) vs. not engaged ( $n = 40$ ).	Single-group retrospective; cross-sectional	NA	64.3% Female 28.6% Male	$M = 27$	NR	NR
2	Brown et al. (50)	88	Self-reported alumni of CRPs at institutions of higher education in the United States	Single-group retrospective; cross-sectional	NA	44.3% Female 54.5% Male	$M = 30.13$ ( $SD = 6.89$ )	White = 96.6% Black = 1.1% Asian = 1.1% Native American = 1.1% Hispanic = 3.4%	Alcohol (21.6%); Opiates (23.9%); Cocaine (4.5%); Amphetamines (2.3%); Marijuana (5.7%); Multiple (33%); Other (9.1%)
3	Castedo de Martell et al. (51)		Secondary data from 2 national surveys of CRPs at the programmatic level (mean budget: 54 CRPs and mean membership size: 20 CRPs). Average relapse rates were drawn from a 2012 survey of 29 CRPs across 19 US states. 20 schools provided sufficient information to estimate annual CRP budget. Mean membership size estimated from 2017 CRP survey.	Cost effectiveness	NA	NA	NR	NR	NA
4	Gerber et al. (52)		Costs derived from previous work by De Martell (2019). Utilizing her findings of the average CRP budget, the costs were \$191,389. The mean room and board cost of \$9,488 was used. National average alumni giving was determined for the US: an average of \$3,896 was given by alumni to their alma maters. Nationally, 32% of alumni give to their respective alma maters, but individuals volunteering in college gave closer to 79%.	Cost effectiveness	NA	NA	NR	NR	NA
5	Hennessy et al. (48)	861	Students enrolled in CRPs; secondary data analysis from 5 CRPs who provided data operating across the US within four-year large, public schools	Single-group retrospective; longitudinal	Varied	44% Female 56% Male	$M = 27$ ( $SD = 8$ )	White = 89.0% Black = 2.66% Asian = 3.39% Hispanic = 0.48%	Varied
	Nichols et al. (53)	861		Single-group retrospective; cross-sectional		44.2% Female 56% Male	$M = 26.99$ ( $SD = 7.6$ )	White = 88.9% Black = 3.0% Asian = 0.5% Native American = 0.3% Hispanic = 3.8%	Only reported in 188/861 cases: Alcohol (47.3%) Marijuana (11.2%) Opiates (23.9%) Hallucinogens (1.6%) Stimulants (11.2%) Other (4.8%)
6	Smith et al. (54)	185	Students from 28 CRPs nationwide	Single-group prospective; longitudinal		45.4% Female 54.6% Male	$M = 29.09$ ( $SD = 9.42$ )	NR	Alcohol as their primary substance of choice (38.4%)
	Smith et al. (55)	334	CRP students at 4-year universities and community colleges in the US and Ontario, Canada.	Single-group prospective; longitudinal	59%	51% Female 31% Male	$M = 29.48$ ( $SD = 9.62$ )	White = 84.0% Black = 6.0% Asian = 2.7% Native American = 1.5% Hispanic = 5.1%	Nearly all with polysubstance use history: alcohol (93%) and cannabis (93%) most commonly used Majority identified alcohol (40%), opioids (22%), or cannabis (14%) as primary substance of choice

(Continued)

TABLE 2 Continued

Study	Citation	N	Sample	Study design	Follow-ups/retention	Sex	Age	Race/ethnicity	Primary substance of focus
	Vest et al. (56)	435	Students from 51 CRPs across the US and Ontario, Canada from 4 cohorts (Fall 2020, Spring 2021, Fall 2021, and Spring 2022). Part of the National Longitudinal Collegiate Recovery Study.	Single-group prospective; cross-sectional		53.6% Female 28.4% Male	$M = 27.65$ ( $SD = 6.61$ )	White = 81.7%	NR
7	Smith (57)	16	Current members of the KSU CRP (CYAAR) atlarge Georgia university	Single-group retrospective; cross-sectional		NR	NR	NR	NR
8	Botzet et al. (58)	83	Current students ( $n = 46$ ) and alumni ( $n = 37$ ) of StepUP recovery program: provided (a) drug and alcohol-free living, (b) weekly 1-on-1 and group meetings to discuss recovery and school-related issues, (c) individual abstinence contracts, and (d) drug-free social activities.	Other; longitudinal	7 months (NR)	35% Female 65% Male	$M = 22.5$	White = 97.6%	NR
9	Cleveland et al. (4)	82	Student members of the TTU CRC between March 2004 and February 2005	Single-group retrospective; cross-sectional		38% Female 62% Male	$M = 23.2$ ( $SD = 6.2$ )	White = 95.0%	Non-Alcohol Drug dependence ( $n = 47$ ; Score: $M = 1.44$ , $SD = 0.43$ ). Alcohol dependence ( $n = 27$ ; Score: $M = 1.00$ , $SD = 0.48$ ). Multiple Substance Use: 4 indicated alcohol as both their 1st and 2nd drug of choice. Eating Disorders: Several participants identified eating disorder as primary addiction.
10	Cleveland & Harris (59)	55	Student members of a CRP supported by a large public university in the southwestern US between 2004 and 2005 (60 recruited – 5 excluded from analysis).	Single-group prospective; longitudinal	(1) Baseline; (2) End-of-day daily diaries, max 33 days (92%)	29% Female 71% Male	$M = 22.6$ ( $SD = 5.7$ )	White = 98% Black = 0% Asian = 0% Native American = 1.8% Hispanic = 0%	Primary Addictions: 18% alcohol only ( $N = 10$ ), 31% nonalcohol drug only ( $N = 17$ ), 49% nonalcohol drug with alcohol ( $N = 27$ ), 5% marijuana ( $N = 3$ ), 2% food ( $N = 1$ )
	Wiebe et al. (60)	55				30.77% Female 69.23% Male			
	Knapp et al. (61)	50	50 members of a twelve-step CRC located in a southwestern U.S. public university, ages 18–29 and full-time students. Original sample was 55 but 5 were excluded for age or non-SUD recovery status.	Single-group prospective	Daily diaries for 3 weeks	29% Female 71% Male	$M = 21.42$	White = 98%	Alcohol was 1st/2nd drug of choice for 52% ( $n = 26$ ); marijuana for 50% ( $n = 25$ ), stimulants for 40% ( $n = 20$ ), opiates for 26% ( $n = 13$ ), and club drugs or hallucinogens for 32% ( $n = 16$ )
11	Laudet et al. (11)	486	CRP-enrolled students from 29 different CRPs in 2013	Single-group retrospective; cross-sectional		42.8% Female 57.2% Male	$M = 26.2$ ( $SD = 8.19$ )	White = 91.3% Black = 1.9% Asian = 1.0% Native American = 1.0% Hispanic = 5.0%	Alcoholism (38.9%), Drug addiction (52.6%), behavioral addictions (7.1%), “other” addictions(1.3%); 41.2% indicated alcohol as primary substance, 0.2% indicated sedatives (e.g., barbiturates), 3.3% indicated tranquilizers or anti-anxiety drugs, 11.1% indicated pain relievers (e.g., Codeine), 6.9% indicated stimulants (e.g., uppers), 10.0% indicated marijuana, 11.7% indicated cocaine or crack, 2.0% indicated hallucinogens (e.g., Ecstasy), 0.2% indicated inhalants or solvents (e.g., amyl nitrate), 11.9% indicated heroin, and 1.5% indicated performance enhancing drugs (e.g., steroids, HGH).

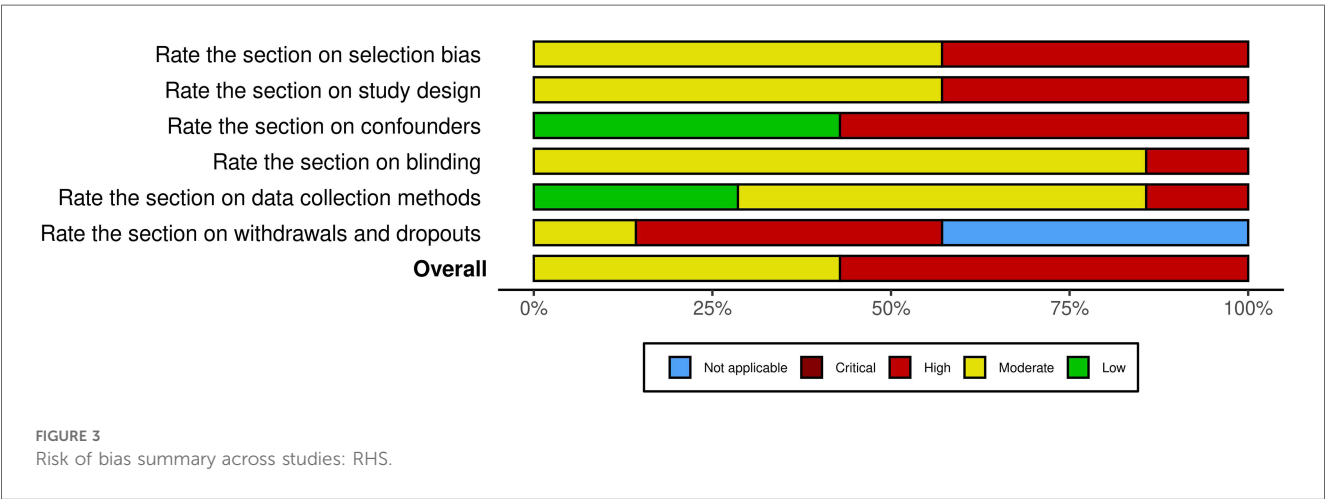
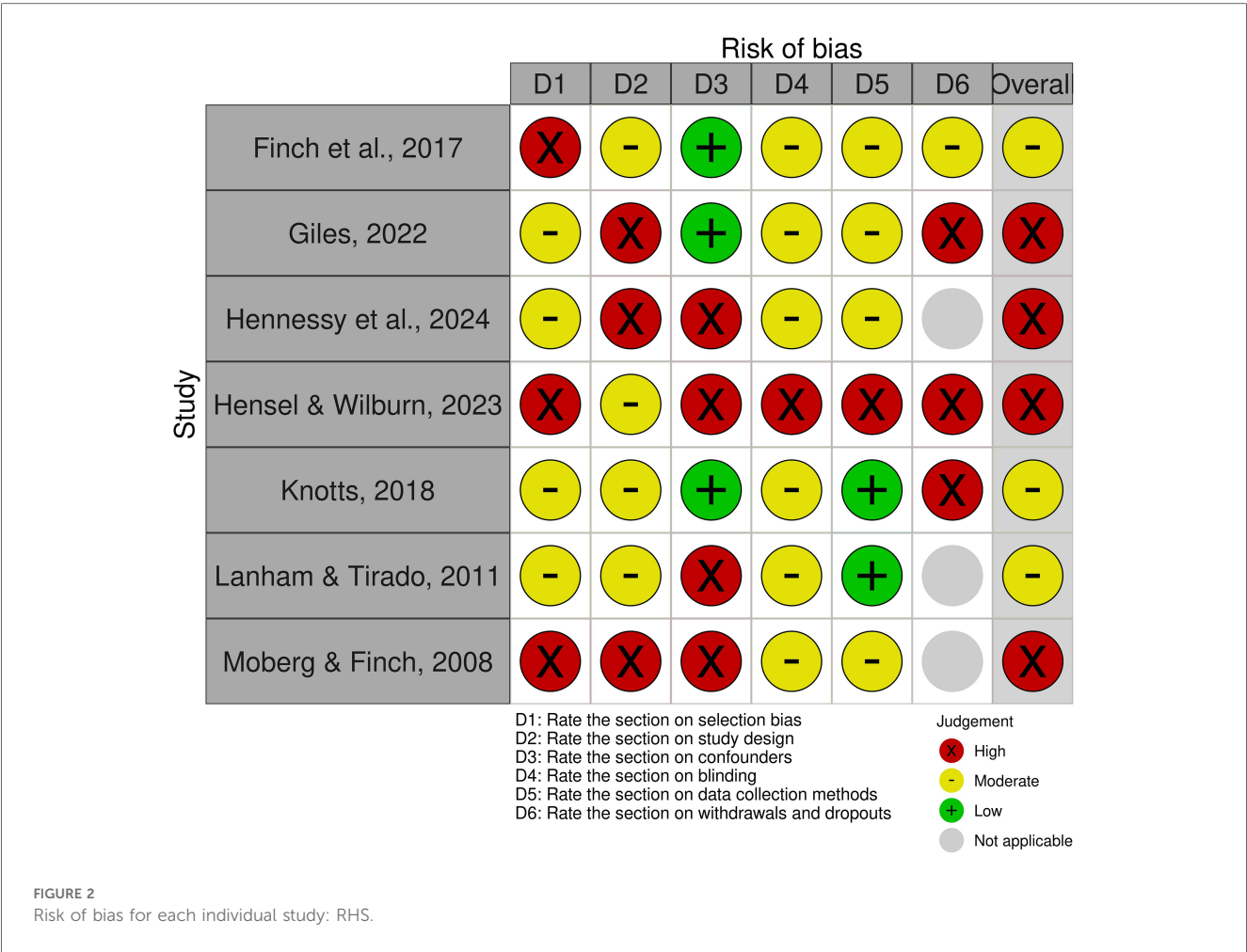
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TABLE 2 Continued

Study	Citation	N	Sample	Study design	Follow-ups/ retention	Sex	Age	Race/ ethnicity	Primary substance of focus
	Laudet et al. (62)		CRP-enrolled students from 29 different CRPs in 2013	Single-group retrospective; cross-sectional		NR	NR	NR	NR
12	Patterson et al. (63)	40	Students involved in CRC, defined as “participating in recovery programming or meetings at least 2/week.” Participants used CRC average of 8.40 h/week (SD = 11.23).	Single-group retrospective; cross-sectional		57.5% Female 42.5% Male	M = 22.45 (SD = 4.22)	White = 72.5% Black = 2.5% Asian = 7.5% Native American = 2.5% Hispanic = 15.0%	Recovery from alcohol/substance use (52.5%), mental health disorders (30%), sex/pornography (22.5%), self harm (10%) 15% identified as in recovery from two addictions.
13	Wattick et al. (64)	13	Students enrolled in CRP at West Virginia University in 2018; focus on culinary and nutrition component	Single-group retrospective; cross-sectional		61.5% Female 38.5% Male	NR	White = 76.9%	NR
14	Odefemi-Azzan (65)	222	Students from an ethnically diverse university in the southeast who applied to the CRP (2007–2017)	Single-group retrospective; cross-sectional		37.1% Female 62.9% Male	M = 24	White = 96.3% Black = 1.2%	NR
15	Bennett et al. (66)	78	Students who received 6 months of treatment at the New Jersey Collegiate Substance Abuse Program	Single-group prospective; longitudinal	6 months (70.51)	48.7% Female 51.3% Male	M = 22.12 (SD = 3.71)	NR	Alcohol (41.9%); Alcohol/drug combinations (37.8%)
16	Tuliao et al. (67)	162	At least 18 years old, enrolled in CRP for a SUD from 43 colleges universities with a CRP	Single-group retrospective; cross-sectional		44% Female 56% Male	M = 27.01 (SD = 7.49)	White = 83.0% Black = 2.0% Asian = 3.0% Hispanic = 1.0%	NR
17	Herold (68)	31	18 years or older, a student at a college or university, and actively participating in at least 1 element or service of CRP at least 1/week. CRP must be ARHE member	Qualitative/Mixed methods; cross-sectional		64.5% Female 35.5% Male	NR	White = 71.0% Black = 3.2% Asian = 3.2% Native American = 3.2% Hispanic = 19.4%	Alcohol (87.1%), Opiates (16.1%), Benzodiazepines (9.7%), cocaine or crack-cocaine (22.7%), methamphetamine (25.8%), other stimulants (9.7%), hallucinogens or psychedelics (25.8%), f synthetic or “club’ drugs (12.9%), ecstasy/MDMA (16.1%), marijuana (54.8%)
18	Hamner (69)	89	Enrolled college students affiliated with ARHE and/or SAFE Project	Single-group retrospective; cross-sectional		43.2% Female 46.6% Male	M = 30.45 (SD = 10.43)	White = 78.4% Hispanic = 10.2%	NR
Summary		2795		12 cross-sectional; 4 longitudinal		45% Female (k = 15)	26.28 years (k = 13)	White = 89% (k = 13) Black = 2.73% (k = 10) Asian = 2.68% (k = 9) Native American = 0.09% (k = 7) Hispanic = 5.04% (k = 9)	

ARHE, Association of Recovery in Higher Education; NR, not reported; SAFE, stop the addiction fatality epidemic; K, number of studies.



delinquent behavior while intoxicated and fewer days of substance use relative to students attending non-RHSs. Urinalysis was used to examine abstinence from THC (cannabis): 68% of RHS students vs. 37% of comparison students were abstinent. In the cost-benefit analysis from 260 students in this sample (45), the mean net benefits ranged from \$16.1 thousand to \$51.9 thousand per participant, indicating a large cost savings by implementing the RHS for youth struggling with substance use; benefit-to-cost ratios ranged from 3.0 to 7.2. In addition, RHS students' high school graduation rates were 21–25 percentage points higher than comparison students.

TABLE 3 Recovery high school study outcomes by study quality: academic, cost-benefit, crime/criminal Involvement, Employment, life satisfaction, mental/physical health, social network change, substance Use (K = 7).

A. (academic, cost-benefit, crime/criminal involvement, employment, life satisfaction)									
Study	Study design	N	Retention	Risk of bias rating	Key findings				
					Academic	Cost benefit results	Crime/criminal involvement	Employment	Life satisfaction
Finch et al. (40)	QED; longitudinal			Moderate					
Glaude et al. (43)	QED (Cross-sectional outcomes only)	246							<p>RHS: higher life satisfaction  <math>[F(1,242) = 7.626, p &lt; 0.001, \eta^2 = .071]</math>            RHS: M = 3.71            non-RHS: M = 3.35</p> <p>Males: M = 3.60,            SD = 0.68; range = 1.50, 5.0.            Females: M = 3.45,            SD = 0.64; range = 1.83, 4.67.            ANOVA: sex differences were not significant.</p>
Tanner-Smith et al. (44)	QED; longitudinal								
Tanner-Smith et al. (41)	QED; longitudinal	194	78%						
Tanner-Smith et al. (42)	QED; longitudinal	260	81% (6 m) and 71% (12 m)				<p>6 mo.:            No difference between RHS and non-RHS: illegal activity days (<math>b = -0.43</math>, 95% CI <math>[-0.91, 0.05]</math> and lower intoxicated illegal activity [<math>b = -1.10</math>, 95% CI <math>(-1.89, -0.29)</math>, IRR = 0.34, <math>d = 0.37]</math>            12 mo.:            No difference between RHS and non-RHS: illegal activity days (<math>b = -0.17</math>, 95% CI <math>[-0.62, 0.28]</math>. and lower intoxicated illegal activity [<math>b = -0.87</math>, 95% CI <math>(-1.57, -0.18)</math>, IRR = 0.42, <math>d = 0.27]</math>.</p>		

(Continued)

TABLE 3 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, life satisfaction)									
Study	Study design	N	Retention	Risk of bias rating	Key findings				
					Academic	Cost benefit results	Crime/criminal involvement	Employment	Life satisfaction
Weimer et al. (45)	Cost effectiveness	260	80.6% (6-mo.); 71.4% (12-mo.)		RHS: graduated at higher rates (53.8%) compared to non-RHS (34.2%). Entire analytic sample ( $n = 260$ ) assuming all students with missing data did not graduate: estimated adjusted impact of RHS = 13.6 percentage points ( $B = .136$ ; $SE = .077$ ). Cases for which graduation status was known and student old enough to graduate ( $n = 164$ ): estimated impact of RHS = 23.9 percentage points ( $SE = 0.088$ ). Excluded Texas cases ( $n = 153$ ): estimated impact of RHS = 19.1 ( $SE = 0.08$ ). Excludes unknown and Texas cases: estimated RHS impact = 26.8 percent ( $SE = 0.085$ ).	Mean net benefits ranged from \$16.1 thousand to \$51.9 thousand per participant; benefit-to-cost ratios ranged from 3.0 to 7.2.			
Hensel & Wilburn (37)	Single-group prospective; longitudinal	6	81.2% (147/180 EMAs)	Weak					
Giles (38)	Single-group retrospective; cross-sectional	375		Weak	<10% of students had an unsuccessful academic outcome, 1.07% left school because they moved out of the area. 52% transitioned to their sending school in good standing with the MA-RHS, 28.27% graduated HS, 9.87% earned their HiSET. Other students moved, went to treatment, withdrew, or entered the criminal justice system.				

(Continued)



TABLE 3 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, life satisfaction)									
Study	Study design	N	Retention	Risk of bias rating	Key findings				
					Academic	Cost benefit results	Crime/criminal involvement	Employment	Life satisfaction
Knotts (39)	QED; longitudinal	57		Moderate	RHS: similar levels of academic growth compared to a nationally-representative matched Virtual Comparison Group (t-stat = + 0.849; $p = 0.397$ ). Average growth of RHS outpaced VCG in reading (+0.201, $p = 0.278$ ) and mathematics (+0.019, $p = 0.914$ ), but not language (−0.005, $p = 0.977$ ). 49 cases where a student relapsed: average growth outpaced the VCG in reading (+0.443, $p = 0.299$ ) and math (+0.574, $p = 0.084$ ), but not language (−0.146, $p = 0.623$ ). 92 cases where the student did not relapse: average growth outpaced VCG in reading (+0.087, $p = 0.634$ ) and language (+0.087, $p = 0.631$ ), but not math (−0.214, $p = 0.280$ ).				
Lanham & Tirado (46)	Single-group retrospective; cross-sectional	72		Moderate	65 (90%) had some college Six (9%) earned bachelor's or master's degrees, 7 (10%) earned 2-year associate's degree		9 (20%) of nonabstinent respondents: currently facing criminal charges or sentencing 4 (9%) were in a controlled environment in last 30 days. Abstinent respondent: 1 facing criminal charges/sentencing (completed survey from prison)  ASI composite score: Legal Status (M = 0.119 SD = 0.226).	Majority worked at least part time. Number of work days in last 30 days (M = 20.4, SD = 2.4; range = 1, 30)	
Moberg & Finch (47)	Single-group retrospective; cross-sectional	321		Weak					
Hennessy et al. (48)	Mixed methods; cross-sectional	28		Weak					

Bold indicates a “parent” study of a series of linked studies. HiSet, High School Equivalency Diploma.

TABLE 3 Continued

B. (mental/physical health, social network change, substance Use)							
Study	Study design	N	Retention	Risk of bias rating	Key findings		
					Mental/physical health	Social network change	Substance use
Finch et al. (40)	QED; longitudinal			Moderate			6-months: RHSs: more likely to be abstinent from all AODs (b = 1.47, 95% CI [0.11, 2.69], OR=4.36, 95% CI [1.19, 15.98]). RHS predicted probability of abstinence (.58) vs. non-RHS (.30) RHS: fewer days of marijuana use (adjusted regression model [b = -14.38, 95% CI (-27.70, -1.06)]): RHS Mean = 8.84, SD = 22.94 Non-RHS Mean = 25.82, SD = 34.90  RHS fewer days of alcohol use than non-RHS (adjusted model for propensity score, baseline scores, referral sites [b = -2.07, 95% CI (-6.56, 2.41), d = -0.23]: RHS Mean = 2.01, SD = 6.82 Non-RHS Mean = 5.43, SD = 12.33  RHS less frequent use of other substances (adjusted regression model [b = -6.77, 95% CI (-14.80, 1.27), d = -0.45]): RHS Mean = 3.18, SD = 11.66 Non-RHS Mean = 7.08, SD = 20.67
Glaude et al. (43)	QED (Cross-sectional outcomes only)	246				No difference in perceptions of social support based on RHS/non-RHS, [ANOVA: F (2,242) = 2.457, p = 0.169]. Males: higher perceptions of social support (M = 8.26, SD = 1.09; range = 3.0–9.0). Females: lower perception of social support (M = 8.01, SD = 1.18; range = 3.0, 9.0)	
Tanner-Smith et al. (44)	QED; longitudinal						
Tanner-Smith et al. (41)	QED; longitudinal	194	78%		6 mo.: students in both conditions reported less MH symptoms than at baseline. Adjusting for baseline MH and propensity scores: no differences in odds of MH symptoms at follow-up for RHS vs. non-RHS.  RHS: lower rates than non-RHS of anti-social personality disorder (9 vs. 18%), hypomanic episodes (8 vs. 10%), suicide risk (14 vs. 19%). RHS: higher levels of symptomatology than non-RHS on major depression (49 vs. 42%), GAD (44 vs. 37%), OCD (7 vs. 3%), panic disorder (25 vs. 23%), and PTSD (26 vs. 10%).		

(Continued)

TABLE 3 Continued

B. (mental/physical health, social network change, substance Use)							
Study	Study design	N	Retention	Risk of bias rating	Key findings		
					Mental/physical health	Social network change	Substance use
Tanner-Smith et al. (42)	QED; longitudinal	260	81% (6 m) 71% (12 m)				RHS: less AOD use than non-RHS students at 6-mo. [ $b = -0.58$ , 95% CI ( $-1.21, 0.04$ ), IRR = .56, $d = 0.19$ ] and 12-mo. [ $b = -0.50$ , 95% CI ( $-0.98, -0.02$ ), IRR = .60, $d = 0.21$ ]. RHS: AOD rates 0.60 times smaller than non-RHS students. 12-mo., predicted number of AOD use days in past 90: RHS: 13.86 Non-RHS: 25.67 NPSS moderated effect of RHS on AOD use outcomes, with RHSs providing minimal beneficial effects for those students endorsing maladaptive problem solving styles. NSPS styles moderated effect of RHS on AOD use at 6-mo. [ $b$ RHS $\times$ NPS = 2.22, 95% CI (0.70, 3.75), IRR = 9.23].
Weimer et al. (45)	Cost effectiveness	260	80.6% (6-mo.) 71.4% (12-mo.)				<b>12-mo. abstinence:</b> RHS: 54.7% past 3-mo. Non-RHS: 25.6% past 3-mo. <b>12-mo. alcohol use days:</b> RHS: $M = 11.5$ , $SD = 28.4$ Non-RHS: $M = 21.8$ , $SD = 39.8$ <b>12-mo. marijuana use days:</b> RHS: $M = 43.3$ , $SD = 76.7$ Non-RHS: $M = 119.4$ , $SD = 130.7$ Urinalysis confirmed THC (cannabis) abstinence for 68% of RHS vs. 37% of non-RHS. <b>12-mo. other drug use days:</b> RHS: $M = 16.5$ , $SD = 37$ Non-RHS: $M = 21.3$ , $SD = 54.4$
Hensel & Wilburn (37)	Single-group prospective; longitudinal	6	81.2% (147/180 EMAs)	Weak			6% of urge days involved drug-use (4/48; NS sample size for additional analysis) Greater daily emotional pain increased odds of drug urges ( $OR=3.75$ ) and associated with higher urge intensity ( $OR=2.92$ ); Higher positive mood associated with urge to use ( $OR=1.36$ ), urge frequency ( $OR=1.17$ ), and urge intensity ( $OR=1.18$ ); More somatic symptoms associated with greater odds of drug urges ( $OR=1.26$ ) and greater odds of urge frequency during the day ( $OR=1.10$ ); Greater daily emotional pain associated with higher within-day urge frequency ( $OR=2.42$ );

(Continued)

TABLE 3 Continued

B. (mental/physical health, social network change, substance Use)							
Study	Study design	N	Retention	Risk of bias rating	Key findings		
					Mental/physical health	Social network change	Substance use
Giles (38)	Single-group retrospective; cross-sectional	375		Weak			At discharge: 29.87% not using any AOD. 54.13% reduced use to 1/month. 16% engaged in heavy use or used some substance almost daily.
Knotts (39)	QED; longitudinal	57		Moderate			Of 141 total testing periods, in 49 of the cases the student relapsed (remaining 92 cases did not)
Lanham & Tirado (46)	Single-group retrospective; cross-sectional	72		Moderate			<p>28 (39%) past 30-day abstinence.  3 (4%) nonproblem use.  Abstinent or consumed alcohol but no illicit drugs in last 30 days: 43 (60%).  Among drinkers: 9.2 drinking days in previous 30 (SD = 7.02).  Cannabis most used drug (<math>n = 23</math>), followed by sedatives/hypnotics tranquilizers (<math>n = 8</math>), opiates analgesics (<math>n = 6</math>), cocaine (<math>n = 4</math>), amphetamines (<math>n = 3</math>), heroin (<math>n = 2</math>), hallucinogens (<math>n = 2</math>), barbiturates (<math>n = 1</math>)</p> <p>ASI composite scores:  Alcohol Use (<math>M = 0.07</math>, <math>SD = 0.094</math>)  Drug Use (<math>M = 0.08</math>, <math>SD = 0.115</math>)</p>

(Continued)



TABLE 3 Continued

B. (mental/physical health, social network change, substance Use)							
Study	Study design	N	Retention	Risk of bias rating	Key findings		
					Mental/physical health	Social network change	Substance use
Moberg & Finch (47)	Single-group retrospective; cross-sectional	321		Weak	Retrospective report ( $n = 291$ ): bothered by any nervous, mental or psychological problem reduced from 69% to 33%. Feel very trapped, lonely, sad, blue, depressed or hopeless about the future (Before:73, Now: 31; $p < .001$ ). No energy, losing interest in work, school, friends, sex or other things you cared about? (Before: 60, Now: 20; $p < .001$ ). Thought about ending your life or committing suicide (Before: 53, Now: 16; $p < .001$ ) Felt very anxious, nervous, tense, fearful, scared, panicked (Before: 68, Now: 44; $p < .001$ ) Trembling, heart racing, restless. (Before: 60, Now: 40; $p < .001$ ) Very distressed, upset when reminded of the past (Before: 65, Now: 55; $p = .003$ ) Hard time expressing feelings, even to people you cared about. (Before: 83, Now: 49; $p < .001$ ) Hard time paying attention at school, work or home (Before: 86, Now: 63; $p < .001$ ) Unable to stay in a seat or where you were supposed to be (Before: 71, Now: 41; $p < .001$ ) Bothered by any nervous, mental or psychological problems? (Before: 69, Now: 33; $p < .001$ ) Disturbed by memories of things from the past that you did, saw or happened to you? (Before: 76, Now: 55; $p < .001$ )		Retrospective report ( $n = 291$ ): weekly AOD use decreased from 90% in the 12 months before admission, to 7% since admission ( $p < .001$ ). Retrospective report ( $n = 174$ students in school at least 90 days): 28.5 days abstinent (SD = 36.8) in the 90 days before entering RHS and 266.1 days abstinent (SD = 258.8) since entering RHS ( $p < .001$ ). <b>Alcohol days (<math>p &lt; .001</math>):</b> Before: M = 33.6 (SD = 35.4) After: M = 3.5 (SD = 11.2) <b>Drank <math>\geq 5</math> drinks at a time (<math>p &lt; .001</math>):</b> Before: M = 31.3 (SD 34.2) After: M = 3.0 (SD = 11.1) <b>Cannabis days (<math>p &lt; .001</math>):</b> Before: M = 47.2 (SD = 40.0) After: M = 3.1 (SD = 12.3) <b>Other drugs days (<math>p &lt; .001</math>):</b> Before: M = 30.9 (SD = 37.3) After: M = 2.8 (SD = 10.5) <b>Smoked cigarettes, last 30 days (<math>p &lt; .001</math>):</b> 91% at follow-up (67% daily)  Limited to when they started school (not necessarily past 90 days): <b>Percent abstinent from AOD (<math>p &lt; .001</math>):</b> Before: 20; After: 56 <b>Percent abstinent from alcohol (<math>p &lt; .001</math>):</b> Before: 24; After: 62 <b>Percent abstinent from cannabis (<math>p &lt; .001</math>):</b> Before: 30; After: 71 <b>Percent abstinent from other drugs (<math>p &lt; .001</math>):</b> Before: 40; After: 74 <b>Percent days abstinent (<math>p &lt; .001</math>):</b> Before: 32; After: 82

(Continued)

TABLE 3 Continued

B. (mental/physical health, social network change, substance Use)							
Study	Study design	N	Retention	Risk of bias rating	Key findings		
					Mental/physical health	Social network change	Substance use
Hennessey et al. (48)	Mixed methods; cross-sectional	28		Weak		NETWORK CHARACTERISTICS <b>Average degree of conflict</b> RHSs: 5.26 (SD = 3.72) Non-RHS: 5.50 (SD = 3.78) Total sample: 5.33 (SD = 3.67) <b>Heavy alcohol use ratio</b> RHS: 0.20 (SD = 0.33) Non-RHS: 0.18 (SD = 0.10) Total sample: 0.19 (SD = 0.29) <b>Casual alcohol use ratio</b> RHS: 0.28 (SD = 0.19) Non-RHS: 0.47 (SD = 0.17) Total sample: 0.33 (SD = 0.20) <b>No alcohol use ratio</b> RHS: 0.21 (SD = 0.17) non-RHS: 0.09 (SD = 0.13) Total sample: 0.18 (SD = 0.17) <b>Recovering from alcohol use ratio</b> RHS: 0.19 (SD = 0.18) non-RHS: 0.07 (SD = 0.08) Total sample: 0.16 (SD = 0.16) <b>Heavy drug use ratio</b> RHS: 0.30 (SD = 0.35) non-RHS: 0.24 (SD = 0.16). Total sample: 0.28 (SD = 0.30) <b>Casual drug use ratio</b> RHS: 0.19 (SD = 0.17) non-RHS: 0.23 (SD = 0.14) Total sample: 0.20 (SD = 0.16) <b>No drug use ratio</b> RHS: 0.19 (SD = 0.15) non-RHS: 0.26 (SD = 0.14) Total sample: 0.21 (SD = 0.15) <b>Recovering from drug use ratio</b> RHS: 0.17 (SD = 0.17) non-RHS: 0.03 (SD = 0.07) Total sample: 0.13 (SD = 0.16)	

Bold indicates a “parent” study of a series of linked studies.  
AOD, alcohol and other drug; Mo., Month; NPSS, negative problem-solving styles.

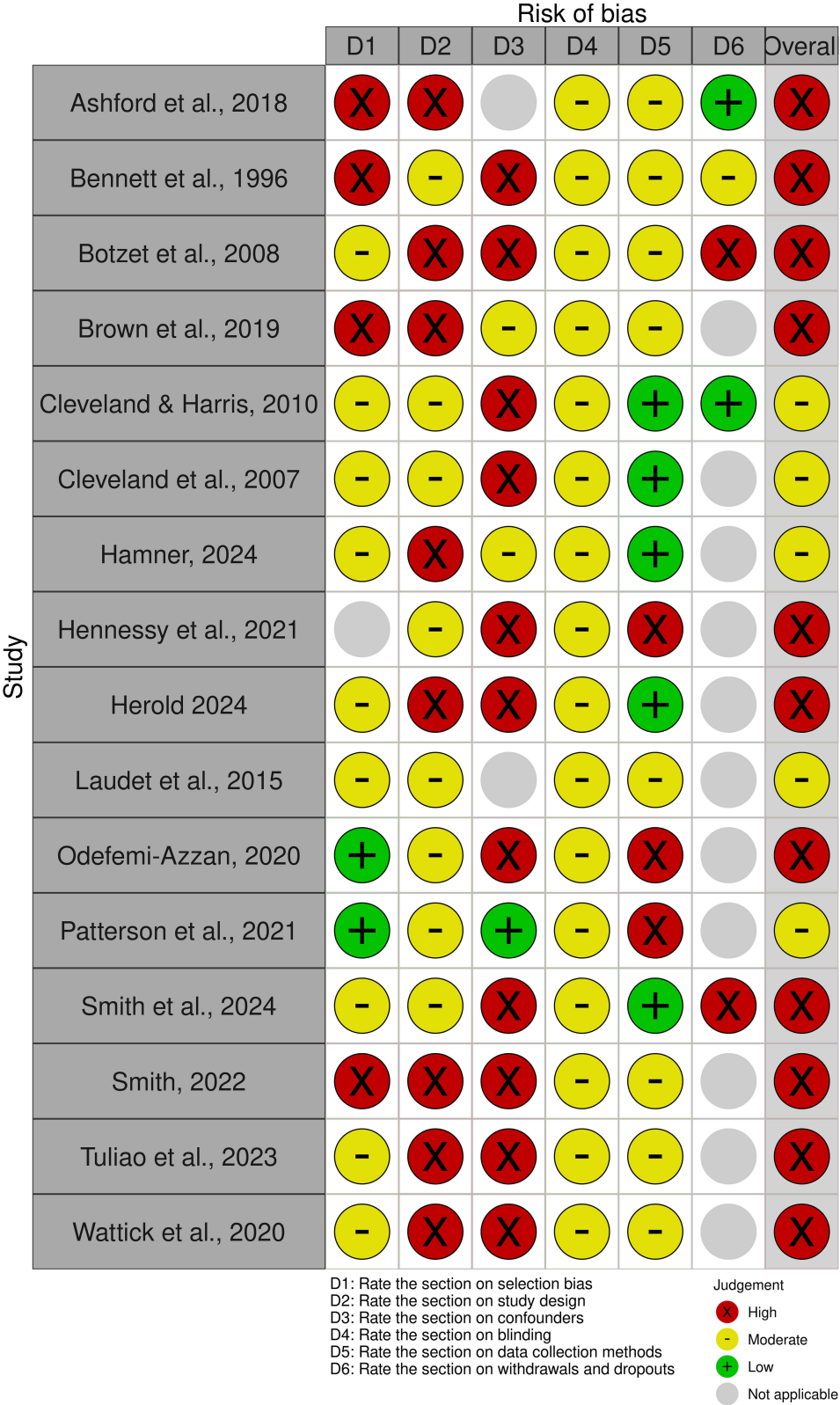


FIGURE 4  
Risk of bias for each individual study (K = 16): CRP.

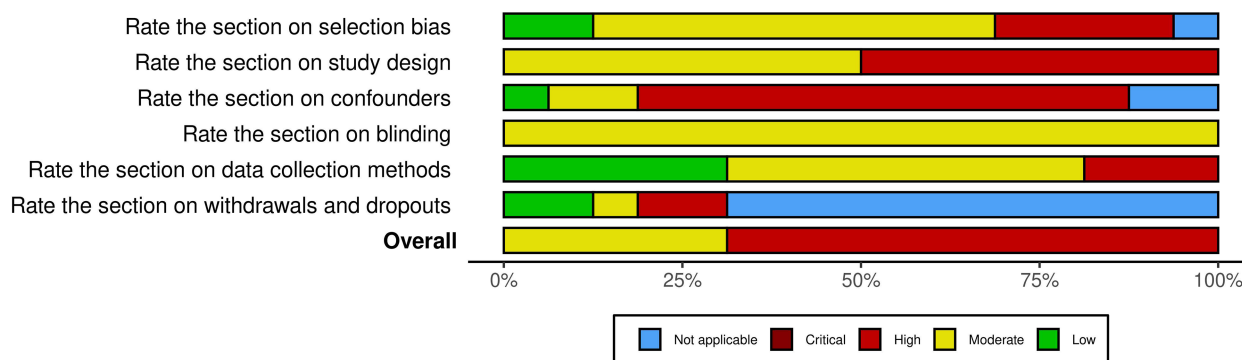


FIGURE 5  
Risk of bias summary across studies ( $K = 16$ ): CRP.

### 3.3 Description of collegiate recovery program studies

Of the 18 CRP studies, there were two cost-benefit (51, 52) and 16 single-group studies, the majority of which were cross-sectional (75%).

#### 3.3.1 Study characteristics

The demographic characteristics for the 17 studies that were not cost-benefit studies indicate a high degree of heterogeneity across the included studies. Study samples ranged in size from 13 to 861 participants, although the largest sample size was from a secondary data analysis that synthesized data across five CRPs (13). Participants were predominately white (89%; range, 71%–98%). Studies had slightly less female than male participants overall ( $M = 45\%$  female;  $M$  range, 29%–66%). The average age was 26.28 years ( $M$  range, 22–30).

#### 3.3.2 Study quality

Overall, the 16 studies that did not use cost-benefit analysis had variable quality (See Figures 4, 5). The majority were rated as high risk of bias ( $k = 11$ ), primarily due to selection bias, study design, and the way confounders were addressed. All studies were rated as moderate due to their approach to blinding of participants to the research question and of the outcome assessors to the condition of the participants. A subset of five studies were rated as low risk of bias in data collection methods, with a further eight studies at moderate risk of bias as many used validated and reliable scales or a combination of these with measures developed for their study purposes.

The quality rating of the two studies using cost-benefit designs indicated that overall both studies had fairly rigorous approaches (See Table 4). The study by Castedo de Martell and colleagues (51) achieved a score of 92. Factors influencing this score were a lack of adjusting for longitudinal outcomes and not discounting benefits over time. The study by Gerber and colleagues (52) achieved a score of 70, primarily due to poor reporting of various aspects of the approach, including a lack of specifying and justifying the modeling approach, using

insufficiently or overly optimistic assumptions (e.g., rates of volunteerism) and relying heavily on the earlier cost work by Castedo de Martell (51) without sufficient rationale for several indicators.

### 3.4 Collegiate recovery program student outcomes

#### 3.4.1 Overview

Nine studies examined substance use outcomes and all used self-report assessments. Five additional studies did not examine substance use directly but instead inquired about length of time in recovery or substance craving (15, 49, 59, 64, 69). Seven studies examined academic outcomes, with the majority focused on GPA (4, 13, 15, 49, 55, 57, 62, 65). Five studies assessed various metrics related to CRP participation, including duration of participation, perceived helpfulness or program benefits, engagement in recovery-related activities, and whether the CRP was the primary pathway to recovery (50, 54, 55, 58, 62, 67). Five studies examined mental and/or physical health outcomes, with the majority assessing the history of such problems not limited to the resolution of problems during the participant's time in the CRP (11, 53, 58–60, 66). Two studies examined stress among participants related to their current experience in the CRP (54, 58), and another study examined “good health and the absence of depression symptoms” as part of their CRP culinary programming component (64). Four studies (49, 50, 54–56, 65, 69) examined recovery capital using either the 50-item Assessment of Recovery Capital (72) or its 10-item version, the BARC (73). Five studies (49, 50, 54–56, 64, 68) examined life satisfaction by measuring self-reported quality of life ( $k = 3$ ), personal growth ( $k = 1$ ), resilience ( $k = 1$ ), and/or flourishing ( $k = 1$ ). Four studies examined aspects of social networks: (i) social network change (58), (ii) whether the CRP plays an important role in their social life (55), and (iii) in-group nominations (63). Two additional reports from the same study examined whether and where (CRC setting or not) a participant talked with others about their recovery and how this related to

TABLE 4 Results of the grading assessment of the quality of the CRP cost-effectiveness studies (K = 2).

Criteria	Weight	Castedo de Martell et al. (51)		Gerber et al. (52)	
		Coding	Weighted score	Coding	Weighted score
1. Was the study objective presented in a clear, specific, and measurable manner?	7	1	7	1	7
2. Were the perspective of the analysis (societal, third-party payer, etc.) and reasons for its selection stated?	4	1	4	1	4
3. Were variable estimates used in the analysis from the best available source (i.e., Randomized Control Trial—Best, Expert Opinion—Worst)?	8	1	8	1	8
4. If estimates came from a subgroup analysis, were the groups prespecified at the beginning of the study?	1	NA		NA	
5. Was uncertainty handled by: (1) statistical analysis to address random events; (2) sensitivity analysis to cover a range of assumptions?	9	1	9	1	9
6. Was incremental analysis performed between alternatives for resources and costs?	6	1	6	0	0
7. Was the methodology for data abstraction (including value health states and other benefits) stated?	5	1	5	1	5
8. Did the analytic horizon allow time for all relevant and important outcomes? Were benefits and costs that went beyond 1 year discounted (3%–5%) and justification given for the discount rate?	7	0	0	1	7
9. Was the measurement of costs appropriate and the methodology for the estimation of quantities and unit costs clearly described?	8	1	8	0	0
10. Were the primary outcome measure(s) for the economic evaluation clearly stated and were the major short term, long term and negative outcomes included?	6	1	6	1	6
11. Were the health outcomes measures/scales valid and reliable? If previously tested valid and reliable measures were not available, was justification given for the measures/scales used?	7	1	7	1	7
12. Were the economic model (including structure), study methods and analysis, and the components of the numerator and denominator displayed in a clear transparent manner?	8	1	8	0	0
13. Were the choice of economic model, main assumptions and limitations of the study stated and justified?	7	1	7	0	0
14. Did the author(s) explicitly discuss direction and magnitude of potential biases?	6	1	6	1	6
15. Were the conclusions/recommendations of the study justified and based on the study results?	8	1	8	1	8
16. Was there a statement disclosing the source of funding for the study?	3	1	3	1	3
<b>Summary Scores</b>			<b>92</b>		<b>70</b>

1 = Yes. 0 = No. NA = Not applicable.

their craving (59), as well as whether stress and negative affect changed who CRC students connected with (family, sponsor, CRC peers) and how frequently (61). Two studies examined employment by collecting whether participants worked during the semester and examining hours worked (4, 56). A single study focused on criminal involvement and examined self-reported “legal severity” (66) and another study analyzed several recovery outcomes by comparing them across student incarceration history (56).

### 3.4.2 Cost-benefit studies

This section focuses on the student outcomes among the two studies of CRPs that utilized cost-benefit analyses (51, 52). The other 16 studies, study designs, and their associated outcomes are reported in Table 5.

In one cost-benefit analysis of CRPs (51, 74), the authors used secondary data from two national surveys of CRPs at the programmatic level to model CRP-related variables. The mean budget was modeled from 54 CRPs and the mean membership size from 20 CRPs, while the average relapse rates were used from a 2012 survey of 29 CRPs across 19 US states. Model

results indicated that the cost of operating a CRP in the base case is \$97,586.24 less than the cost of treatment as usual and adds just over 25 Quality-Adjusted Life Years. The incremental cost-effectiveness ratio for the societal model in the base case is -\$3,872.75, suggesting a cost savings of \$3,872.75 per Quality-Adjusted Life Years gained when implementing a CRP.

In another cost-benefit analysis of CRPs (52), several sources of existing data were used. Utilizing Castedo De Martell’s 2019 findings of the average CRP budget [from the thesis underlying the 2022 publication covered above (74)], the CRP costs for this study were set at \$191,389. The mean room and board cost to educate students of \$9,488 was used as a cost to the university. The national average alumni giving amounts in the United States was determined using alumni giving amounts and volunteering to the college. An underlying assumption was that CRP students might be more willing to give due to the strong tradition of giving back as part of CRP membership while students at the university. A CRP size of 14 members was used in the calculations and a 90% graduation rate was used. These calculations resulted in a societal cost-benefit ratio of 1.94 and an institutional cost-benefit ratio of 1.38. The societal Incident Rate

TABLE 5 Study outcomes by study quality: collegiate recovery program engagement and satisfaction, substance use, recovery capital, social connectedness, employment/education, criminal justice involvement, quality of life and well-being (K = 19).

A. (academic, cost-benefit, crime/criminal involvement, employment, recovery capital)									
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings				
					Academic	Cost-benefit	Crime/criminal involvement	Employment	Recovery capital
Ashford et al. (49)	Single-group retrospective; cross-sectional	54		Weak	All students in recovery ( $n = 54$ ): GPA = 3.482 (SD = 0.446) Students in recovery and CRP members: GPA = 3.686 (SD = 0.338)				Correlations between total ARC scores and CRP scholarship assistance services ( $r_s = .557$ , $p = .039$ )
Bennett et al. (66)	Single-group prospective; longitudinal	78	70.51	Weak			ASI Legal Severity Baseline ( $M = 0.04$ , $SD = 0.12$ ) 6 Months ( $M = 0.02$ , $SD = 0.06$ ); $F = 3.81$ ( $n = 55$ )		
Brown et al. (50)	Single-group retrospective; cross-sectional	88		Weak					Recovery capital $M = 45.90$ ( $SD = 4.21$ ) Scores not significantly different among gender $\chi^2$ (28) = 21.57, $p = .801$ , race $\chi^2$ (42) = 34.91, $p = .772$ , ethnicity $\chi^2$ (14) = 13.83, $p = .462$ , education level $\chi^2$ (14) = 21.33, $p = .093$ , or income level $\chi^2$ (42) = 50.33, $p = .177$ . ARC scores positively correlated with human flourishing scale (FS-8 scores) ( $r = .670$ , $p < .001$ ), and scores from all domains of the WHOQOL BREF (DOM1, $r = .371$ , $p < .001$ ; DOM2, $r = .741$ , $p < .001$ ; DOM3, $r = .606$ , $p < .001$ ; DOM4, $r = .470$ , $p < .001$ ).
Botzet et al. (58)	Other; longitudinal	83		Weak					
Castedo de Martell et al. (51)	Cost effectiveness			92		The cost of operating a CRP in the base case is \$97,586.24 less than the cost of TAU and adds just over 25 QALYs. The ICER for the societal model in the base case is -\$3,872.75, or a cost savings of \$3,872.75 per QALY gained when implementing a CRP.			

(Continued)

TABLE 5 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, recovery capital)									
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings				
					Academic	Cost-benefit	Crime/criminal involvement	Employment	Recovery capital
Cleveland et al. (4)	Single-group retrospective; cross-sectional	82		Moderate	22.5% GPA higher than 3.75 52.5% GPA of 3.25 or better			Half of CRC members also work during the semester: 7.4% work >40 h/week, 27.2% work 20 h/week, 14.8% work 10 h per week	
Cleveland & Harris (59)	Single-group prospective; longitudinal	60		Moderate					
Wiebe et al. (60)	Single-group prospective; longitudinal	55	92						
Knapp et al. (61)	Single-group prospective; longitudinal	50	87						
Gerber et al. (52)	Cost effectiveness			70		Societal CB ratios = 1.94 Institutional CB ratio = 1.38 Societal IRRs = 249% Institutional IRR = 77% The benefits of a CRP significantly outweigh the costs			
Hamner (69)	Single-group retrospective; cross-sectional	89		Moderate					Recovery capital M = 52.31 (SD = 5.973) Time in Recovery accounted for 9% of the variance explained in Recovery Capital: people with less time in recovery scored lower in than those with more time. Relational Transparency accounted for 8.6% of the variance in Recovery Capital: the higher they scored their mentor on Relational Transparency, the higher they scored their own Recovery Capital (b = 0.293) Those below the median for Time in Recovery had lower Recovery Capital (M = 50.49) than those above the median [M = 54.02; t (87) = -2.90, p = .005].

(Continued)



TABLE 5 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, recovery capital)									
					Key findings				
Study	Study design	N	Retention	Study quality rating risk of bias	Academic	Cost-benefit	Crime/criminal involvement	Employment	Recovery capital
Herold (68)	Qualitative/Mixed methods; cross-sectional	31		Weak					
Hennessy et al. (15)	Single-group retrospective; longitudinal	861	Varied	Weak	Site 1 (n = 196) improved GPA across two consecutive college semesters [SMG = 0.54, 95% CI (0.25, 0.83)]. Two separate cohorts of students at site 3 (n = 24 in each) reported improvements in GPA from pre-to post-recovery: SMG = 0.97 [95% CI (0.46, 1.48)] and SMG = 0.31 [95% CI (0.02, 0.60)]. Site 4 (n = 139) reported slight reductions in GPA between entry into the CRP and the follow-up period, but this effect was not significantly different from zero [SMG = -0.04, 95% CI (-0.71, 0.63)].				
Nichols et al. (53)	Single-group retrospective; cross-sectional	861							
Laudet et al. (11)	Single-group retrospective; cross-sectional	486		Moderate					
Laudet et al. (62)	Single-group retrospective; cross-sectional	486			Current GPA M = 3.22 (SD = .062).				

(Continued)

TABLE 5 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, recovery capital)									
					Key findings				
Study	Study design	N	Retention	Study quality rating risk of bias	Academic	Cost-benefit	Crime/criminal involvement	Employment	Recovery capital
Odefemi-Azzan (65)	Single-group retrospective; cross-sectional	222		Weak	26 students were alumni—no MH 92 students were alumni—at least 1 diagnosis 12 students were non-active—at least 1 diagnosis Of alumni with no MH, 100% graduated Having an additional mental health disorder is associated with lower graduation rates. 100% of female CRP students—graduated 25.4% of male CRP students—graduated Female students had higher graduation rates than male students ( $p < .001$ , $df = 1$ ).				
Patterson et al. (63)	Single-group retrospective; cross-sectional	40		Moderate					
Smith et al. (55)	Single-group prospective; longitudinal	334	59	Weak	CRP helps them academically ( $M = 71.86$ , $SD = 29.10$ )				BARC-10 Baseline ( $M = 52.66$ , $SD = 7.25$ ) Follow-up 1 ( $M = 52.26$ , $SD = 6.32$ ) Follow-up 2 ( $M = 51.67$ , $SD = 7.35$ )  Accounting for the effects of age, race/ethnicity, gender, cohort, and time in recovery, pairwise comparisons indicated that recovery capital at baseline was higher than recovery capital at follow-up 1 ( $Mdiff = 1.72$ , $p < .001$ , $n = 92$ ) and follow-up 2 ( $Mdiff = 2.21$ , $p = .025$ , $n = 63$ ).

(Continued)

TABLE 5 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, recovery capital)									
					Key findings				
Study	Study design	N	Retention	Study quality rating risk of bias	Academic	Cost-benefit	Crime/criminal involvement	Employment	Recovery capital
Smith et al. (54)	Single-group prospective; longitudinal	185							Recovery capital (M = 53.27, SD = 6.73, range = 29–60). MANOVAs: students who were abstinent from their primary substance had higher recovery capital [Pillai's Trace = 0.37, F(10, 159) = 99.23, $p < 0.001$ , $\eta^2 = 0.367$ ] than those who were not abstinent. Number of hours engaged in recovery-related activities was positively associated with recovery capital scores ( $\beta = 0.21$ , $p = 0.006$ , $R^2 = 0.04$ ).
Vest et al. (56)	Single-group prospective; cross-sectional	435			GPA: Formerly incarcerated students (M = 3.5, SD = 0.52) Non-LS involved students (M = 3.46, SD = 0.48) non-incarcerated LS-involved students (M = 3.4, SD = 0.58).  No significant differences in GPA between groups (F = 1.51, $p = 0.222$ ).			Hours worked: Formerly incarcerated students (M = 25.74, SD = 16.71) Non-incarcerated LS-involved students (M = 16.70, SD = 16.43) non-LS involved students (M = 14.30, SD = 15.27)  Significant difference of hours worked between formally incarcerated students and non-LS involved students and between formally incarcerated students and non-incarcerated LS-involved students (F = 7.48, $p = .009$ ).	Recovery capital: Formerly incarcerated students (M = 54.47, SD = 6.17) non-incarcerated LS-involved students (M = 54.29, SD = 5.67) non-LS involved students (M = 51.06, SD = 6.76)  No significant differences in recovery capital between groups (F = 2.58, $p = 0.077$ ).

(Continued)

TABLE 5 Continued

A. (academic, cost-benefit, crime/criminal involvement, employment, recovery capital)									
					Key findings				
Study	Study design	N	Retention	Study quality rating risk of bias	Academic	Cost-benefit	Crime/criminal involvement	Employment	Recovery capital
Smith (57)	Single-group retrospective; cross-sectional	16		Weak	GPA increased from M = 2.40 (SD = 1.01) prior to entering the CYAAR program to 3.48 (SD = .33), a mean GPA growth of 1.08 (SD = 1.06). GPA increased with length of membership. Of participants with only one semester of membership (n = 5, 31.25%), GPA prior to CYAAR M = 2.84, and the current GPA M = 3.22 (13.38% increase). Participants with 5 or more semesters (n = 6, 37.5%), GPA of M = 1.69 upon entry and current GPA of M = 3.62 (114.2% increase).				
Tuliao et al. (67)	Single-group retrospective; cross-sectional	162		Weak					
Wattick et al. (64)	Single-group retrospective; cross-sectional	13		Weak					

Bold indicates a “parent” study of a series of linked studies.

TABLE 5

B. (social networks, substance Use, mental/physical health, CRP involvement)								
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings			
					Social networks	Substance use	Mental/physical Health	CRP involvement
Ashford et al. (49)	Single-group retrospective; cross-sectional	54		Weak		All students in recovery ( $n = 54$ ): 3.93 years in recovery ( $SD = 2.604$ ) Students in recovery and CRP members: 3.69 years in recovery ( $SD = 2.869$ )	Correlations between WHOQOL-BREF psychological domain and CRP scholarship assistance services ( $rs = .612, p = .020$ ).	
Bennett et al. (66)	Single-group prospective; longitudinal	78	70.51	Weak		74.5% of participants who completed follow-up were abstinent at 6-months (assuming those who did not complete follow-up returned to use, then abstinence rate = 52.6%) In 90 days prior to 6-month assessment, users remained substance-free $M = 79.80$ days ( $SD = 18.10$ days, $n = 10$ of 14 relapsers with complete data; range 30–90 days substance free in last 3 months). ASI alcohol severity ( $n = 55$ ) Baseline ( $M = 0.29, SD = 0.22$ ) 6 Months ( $M = 0.12, SD = 0.12$ ); $F = 44.66, p < 0.001$ ASI drug severity ( $n = 55$ ) Baseline ( $M = 0.08, SD = 0.09$ ) 6 Months ( $M = 0.03, SD = 0.05$ ); $F = 16.17, p < 0.001$	ASI medical severity ( $n = 55$ ) Baseline ( $M = 0.18, SD = 0.25$ ) 6 Months ( $M = 0.21, SD = 0.24$ ); $F = 0.74$ ASI psychiatric severity ( $n = 55$ ) Baseline ( $M = 0.36, SD = 0.21$ ) 6 Months ( $M = 0.22, SD = 0.20$ ); $F = 26.97, p < .0001$ Days of psychological problems in past month ( $n = 55$ ) Baseline ( $M = 13.47, SD = 9.96$ ) 6 Months ( $M = 7.42, SD = 8.59$ ); $F = 15.37, p < .0001$ BDI scores ( $n = 45$ ) Baseline ( $M = 14.60, SD = 9.74$ ) 6 Months ( $M = 10.04, SD = 9.05$ ); $F = 11.64, p < .005$	
Brown et al. (50)	Single-group retrospective; cross-sectional	88		Weak		87.5% ( $n = 86$ ) reported no recurrences of use since graduation-representing a return to use rate of (10.2%). Of those that returned to use ( $n = 9$ ), 3 participants experienced one episode, 3 participants experienced two to four episodes, and 3 participants experienced five or more episodes.	Flourishing scores (FS-8) $M = 49.69$ ( $SD = 6.04$ ). Scores not significantly different among gender $\chi^2 (38) = 29.61, p = .833$ , race $\chi^2 (57) = 31.01, p = .997$ , ethnicity $\chi^2 (19) = 39.916, p = .05$ , education level $\chi^2 (19) = 25.08, p = .158$ , or income level $\chi^2 (57) = 63.81, p = .250$ . FS-8 scores were significantly positively correlated with ARC scores ( $r = .670, p < .001$ ) and all domain scores of the WHO-QOL BREF (DOM1, $r = .359, p = .001$ ; DOM2, $r = .800, p < .001$ ; DOM3, $r = .721, p < .001$ ; DOM4, $r = .454, p < .001$ ).	68.2% felt CRP directly prepared them for professional environment; 80.7% felt program directly prepared them for post-graduation recovery. 89.8% felt program membership was helpful academically. 36.4% reported they would not have attended their institution if the program had not been there. 81.8% maintained alumni contact with the undergraduate CRP.
Botzet et al. (58)	Other; longitudinal	83		Weak	Both student groups $M = 7.2$ and $M = 7.8$ of ten possible support sources. Alumni faced slightly greater rate of relapse-risk in present social and work environments than the current students, (MANOVA [ $F (1,82) = 0.72, p > .05$ and $F (1,82) = 2.32, p > .05$ , respectively]).	9 (11%) used AOD during prior 6 months, 2 (2%) met DSM-IV criteria for current SUD. Current students: 1 reported using AOD, 0 had a current SUD. Current and past endorsed roughly the same number of SUD symptoms. Current used tobacco more often than alumni (76 days and 41 days, respectively, out past 90 days). There were no significant changes across time substance use and recovery variables (no further information provided).	Prospective Sample: Sources of stress increased from first ( $M = 3.9, SD = 2.5$ ) to second assessment ( $M = 4.6, SD = 2.6$ ). Severe physical health problems not frequently reported in current students ( $M = 1.0, SD = 1.1$ ) or alumni ( $M = 1.0, SD = 1.7$ ) at baseline. Physical health declined from first ( $M = 1.1, SD = 1.0$ ) to second assessment ( $M = 0.5, SD = 1.0$ ). Symptoms of prior 6 mo. mental and behavioral health problems showed slight decrease from fall to spring: 1) depression-related problems (mean symptom counts of 2.4 and 1.7, respectively), 2) anxiety problems (1.4 and 1.1, respectively), 4) post-traumatic stress problems (1.5 and 1.1, respectively), and 5) attention-deficit problems (3.5 and 2.9, respectively). Total mental health symptom count decreased (paired sample $t = 2.49, p < .05$ ); when corrected for multiple-comparison error [ $p = .05/\#$ of tests (11) = .005], this difference was no longer significant. Overall sample reported 3.5 (of 10	Self-help group attendance, past 90 days: Current = 30 days Alumni = 17 days. Reports of assets or personal strength were high for both past and current students, with a mean number of seven assets (out of 10).

(Continued)

TABLE 5 Continued

B. (social networks, substance Use, mental/physical health, CRP involvement)								
					Key findings			
Study	Study design	N	Retention	Study quality rating risk of bias	Social networks	Substance use	Mental/physical Health	CRP involvement
							possible) sources of stress in the past 6 mo.: current students (M = 3.9 SD = 2.6) reported more sources of stress than alumni (M = 3.4, SD = 2.5). Symptoms of mental health problems were prevalent: anxiety, depression, post-traumatic stress, and attention-deficit problems the most frequently endorsed MH categories. Current students reported higher symptom counts than alumni students across all mental health problem screens [F (1,82) = 12.70, $p < .001$ ]. Rates for individual MH screens were higher for current students only on gambling [F (1,82) = 8.00, $p < .01$ ], depression [F (1,82) = 6.46, $p < .05$ ], and ADHD [F (1,82) = 21.74, $p < .001$ ].	
Castedo de Martell et al. (51)	Cost effectiveness			92				
Cleveland et al. (4)	Single-group retrospective; cross-sectional	82		Moderate		Fall 2003 to Spring 2006: CRC helped support M = 64 members/semester; 17 relapses. M = 2.8 students relapsing/semester, community has a within-semester relapse rate of 4.4%.		
Cleveland & Harris (59)	Single-group prospective; longitudinal	60		Moderate		Outside-of-center recovery talks on craving: 0.62 (0.25), $t = 2.50^{**}$ At-center recovery talks on craving: 0.012 (0.017), $t = 0.72$	Outside-of-center recovery talks on negative affect: 0.100 (0.35), $t = 2.87^{**}$ At-center recovery talks on negative affect: 0.035 (0.023), $t = 1.55$	
Wiebe et al. (60)	Single-group prospective; longitudinal	55	92				Step work differed across coping styles. Action steps, but not everyday steps, were associated with day-to-day fluctuations in craving when moderated by coping style: among individuals high in Support Seeking, high in Avoidance, or low in Problem Solving. 12-step meeting attendance and received emotional support (daily level), more strongly predicted use of Everyday Steps than Action Steps. Problem solving coping, avoidance coping, and support seeking coping moderated relationship between craving and use of Action Steps. Individuals above the median in Support Seeking and Avoidance were more likely to work the Action Steps on days in when they had craving. Individuals below the median in Problem Solving, were more likely to work the Action steps on days in when they had cravings. These findings were not seen to predict Everyday steps.	

(Continued)

TABLE 5 Continued

B. (social networks, substance Use, mental/physical health, CRP involvement)								
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings			
					Social networks	Substance use	Mental/physical Health	CRP involvement
Knapp et al. (61)	Single-group prospective; longitudinal	50					<p>Odds of family contact were higher on days when they perceived recovery maintenance to be more difficult than usual (OR=1.27, Est. = 0.24, SE = 0.10, CI 95%[0.05, 0.43], <math>p = 0.02</math>. Odds of having contact with sponsors [OR=1.21, CI (−0.02, 0.40)], romantic partners [OR=0.61, CI (−1.15,0.14)], or CRC peers [OR=0.85, CI (−0.42, 0.10)] were not higher on days with higher-than-usual recovery maintenance difficulty. Days when students were in contact with family: length of time spent in contact was higher on days when they perceived recovery maintenance to be more difficult than usual [b = 0.21, SE = 0.05, <math>p = 0.00</math>, 95% CI (0.12, 0.31)]. Recovery maintenance difficulty was not associated with time that students spent with CRC peers inside [b = 0.03, CI (−0.17, 0.23)] nor outside [b = −0.06, CI (−0.15,0.02)] the drop-in center. Days when students were in contact with sponsors and perceived recovery maintenance to be more difficult than usual: odds of having conversations about recovery were higher relative to not having recovery-focused conversations [OR=1.32, Est. = 0.28, SE = 0.14, <math>p = 0.05</math>, 95% CI (0.001, 0.56)]. Day-level association between recovery maintenance difficulty and recovery-focused conversations with CRC peers: on days when students were in contact with CRC peers and perceived recovery maintenance to be more difficult than usual, the odds of having recovery-focused conversations with peers were higher relative to not having recovery-focused conversations [OR=1.27, Est. = 0.24, SE = 0.10, <math>p = 0.02</math>, 95% CI (0.05, 0.44)]. Amount of family contact was higher when students perceived recovery maintenance to be more difficult than usual when including the effects of negative affect and school stress [b = 0.27, CI (0.16, 0.37)]. Recovery maintenance difficulty was not associated with students' odds of having contact with family [OR=1.22, CI (−0.01,0.41)], romantic partners [OR=0.57, CI (−1.27,0.11)], sponsors [OR=1.15, CI(−0.09,0.37)], or CRC peers [OR=0.90, CI(−0.39,0.19)], nor with the amount of daily contact with CRC peers within [b = 0.02, CI(−0.20,0.24)] and outside the CRC [b = −0.04, CI (−0.13,0.05)], after accounting for negative affect and school stress. 92% of students (<math>n = 46</math>) had a 12-step sponsor at some point during the study. These students contacted their sponsors on 40% of days (<math>n = 384</math>) and had recovery-focused conversations on 35.9% of the days on which they had contact with their sponsors (<math>n = 138</math>). Adjusting for campus drop-in center closures, participants stopped by it on 51% of days. When they stopped by, the most frequently reported time spent was 30–60 min (23.1% of days), with the length of time 30 min more on 53.6% of the days they visited. Students spent time with CRC friends outside the center on 74.1% of days (<math>n = 874</math>) on days with contact, the most frequently reported time spent was 4 + hours (56.1% of days). Students were in contact with CRC peers on 80.5% of days (<math>n = 950</math>). On days when they had contact with CRC peers, students had recovery-focused conversations with them on 46.4% of days (<math>n = 440</math>).</p>	

(Continued)

TABLE 5 Continued

B. (social networks, substance Use, mental/physical health, CRP involvement)								
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings			
					Social networks	Substance use	Mental/physical Health	CRP involvement
Gerber et al. (52)	Cost effectiveness			70				
Hamner (69)	Single-group retrospective; cross-sectional	89		Moderate		Time in recovery M = 4.66 (SD = 4.58)		
Herold (68)	Qualitative/Mixed methods; cross-sectional	31		Weak		Drug Avoidance Self-Efficacy: Total increase in score M = 39.13; 70.2% increase from mean total retrospective score.	Quality of Life: Total increase in score M = 56.84; represents 56.4% increase from the mean total retrospective score.	
Hennessy et al. (15)	Single-group retrospective; longitudinal	861	Varied	Weak		Time in Recovery: 7.08% < 6 months; 7.34% 6 months-1 year; 40.93% 1-5 years; 25.74% 5-10 years; 18.92% 10 or more years		
Nichols et al. (53)	Single-group retrospective; cross-sectional	861					History: 129/187 students (69.0%): mental health problems 98/308 students (31.8%): eating disorder 78/169 students (46.2%): other compulsive behavior 245/318 students (77.0%) any mental health treatment 83/188 students (44.1%) anxiety treatment 85/188 students (45.2%) depression treatment	
Laudet et al. (11)	Single-group retrospective; cross-sectional	486		Moderate		5.4% of students AOD use in past month (3.4% used alcohol; 4.5% used drugs). Days since last drank M = 952 days (SD = 962); Days since last used drugs M = 1,053 days (SD = 1,196). Days since last used any drug or drank alcohol (M = 975, SD = 1,073). Restricting analyses to students considering themselves in recovery from AOD use problem (n = 433): 4.8% used AOD in past month (2.3% alcohol, 3.6% drugs).	1 in 6 students reported also being in recovery from a behavioral addiction.  Students had engaged in one of more behavioral addiction in the past 90 days: disordered eating (11.3 days), sex and love (11.7 days), compulsive shopping (8 days), self harm/injury (5.3 days), gambling/gambling addiction (5.1 days), internet addiction (3.1 days), and exercise (2.9 days).  Considered self in recovery from: Eating disorder (15.6%) Sex/love addiction (9.5%) Self harm/injury (10.5%) Gaming/gambling addiction (2.5%) Compulsive shopping (3.1%) Internet addiction (0.6%). Exercise addiction (3.3%) Some 'other' (2.9%)	
Laudet et al. (62)	Single-group retrospective; cross-sectional	486						Duration of CRP participation M = 7 semesters (SD = 2.0): half of students enrolled in CRP when they started at their academic institution. Perceived helpfulness of CRP participation: 28% selected 'extremely helpful, 31% 'quite a bit', 20% 'moderately, 14% 'a little' and 6% 'not at all'.

(Continued)



TABLE 5 Continued

B. (social networks, substance Use, mental/physical health, CRP involvement)								
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings			
					Social networks	Substance use	Mental/physical Health	CRP involvement
Odefemi-Azzan (65)	Single-group retrospective; cross-sectional	222		Weak		Relapse rates and mental health ( $p = 0.004$ , $df = 1$ ) 26 students—no MH diagnosis—none relapsed 115 students—MH diagnosis—25.2% relapsed  33.7% of female students relapsed 0% of male students relapsed Female students relapse more than male students ( $p < .001$ , $df = 1$ ).		
Patterson et al. (63)	Single-group retrospective; cross-sectional	40		Moderate	In-degree was the only variable related to length of sobriety in the model ( $p = 0.002$ ): how many nominations a node (a person) received from other network members was strongly associated with length of sobriety.	Sobriety $M = 16.89$ mo. ( $SD = 18.40$ ; range: 0 to 75 mo.). Students used CRC $M = 8.40$ h/wk ( $SD = 11.23$ ): this was positively related to length of sobriety at the bivariate level. In this model, CRC hours was not related to sobriety length ( $p = 0.318$ ). Increased CRP participation is correlated with higher sobriety rates ( $r^2 = 0.49$ , $p < .05$ )		
Smith et al. (55)	Single-group prospective; longitudinal	334	59	Weak	CRP plays a key role in their social life ( $M = 68.77$ , $SD = 30.03$ ),	8% reported recurrence of AOD use between baseline and first follow-up; 5.1% reported recurrence of AOD use between the first and second follow-ups.  Helps maintain their recovery ( $M = 79.78$ , $SD = 21.66$ )	Quality of life Baseline ( $M = 31.34$ , $SD = 5.26$ ) Follow-up 1 ( $M = 30.89$ , $SD = 5.61$ ) Follow-up 2 ( $M = 30.76$ , $SD = 6.52$ )  Accounting for effects of age, race/ethnicity, gender, cohort, and time in recovery, pairwise comparisons indicated that quality of life at baseline was higher than quality of life at follow-up 1 ( $Mdiff = 0.97$ , $p = .011$ , $n = 93$ ) and follow-up 2 ( $Mdiff = 1.38$ , $p = .035$ , $n = 63$ ).	Engaged in recovery-related activities, hours per week Baseline ( $M = 6.32$ , $SD = 5.83$ ) Follow-up 1 ( $M = 5.81$ , $SD = 5.63$ ) Follow-up 2 ( $M = 5.19$ , $SD = 5.25$ )  Accounting for effects of age, race/ethnicity, gender, cohort, and time in recovery, pairwise comparisons indicated that hours engaged in recovery-related activities at baseline was not different than at the first ( $p < .704$ , $n = 100$ ) or second follow-up ( $p = .054$ , $n = 73$ ).  Helps them grow personally ( $M = 82.70$ , $SD = 21.54$ ).
Smith et al. (54)	Single-group prospective; longitudinal	185				Since onset of COVID-19 pandemic, 15.7% experienced recurrence of AOD use; 51.9% attending fewer recovery meetings.  Students who were abstinent from their primary substance had higher recovery capital [Pillai's Trace = 0.37, $F(10, 159) = 99.23$ , $p < 0.001$ , $\eta^2 = 0.367$ ] than those who were not abstinent	Students abstinent from primary substance had better quality of life [Pillai's Trace = 0.10, $F(8, 166) = 2.23$ , $p = 0.028$ , $\eta^2 = 0.097$ ] than those who were not abstinent.  Overall recovery capital scores were not significantly correlated with COVID-19-related changes in stress levels ( $r = -0.03$ , $p = 0.722$ ).	66.0% endorsed CRPs as a primary pathway to recovery.

(Continued)

TABLE 5 Continued

B. (social networks, substance Use, mental/physical health, CRP involvement)								
Study	Study design	N	Retention	Study quality rating risk of bias	Key findings			
					Social networks	Substance use	Mental/physical Health	CRP involvement
Vest et al. (56)	Single-group prospective; cross-sectional	435				<p>SUD severity: Formerly incarcerated students (M = 10.55, SD = 1.01) Non-incarcerated LS-involved students (M = 10.27, SD = 1.31) Non-LS involved students (M = 9.73, SD = 1.38)</p> <p>Significant difference in SUD severity between non-LS involved students and between non-incarcerated LS and between non-LS involved students and formerly incarcerated students (F = 9.01, <math>p &lt; 0.001</math>).</p> <p>AUD severity: Formerly incarcerated students (M = 9.93, SD = 1.70) Non-incarcerated LS-involved students (M = 9.82, SD = 1.84) Non-LS involved students (M = 9.51, SD = 1.77)</p> <p>No significant differences in AUD severity between groups (F = 0.48, <math>p = 0.617</math>).</p>	<p>Quality of life: Non-incarcerated LS involved students (M = 32.42, SD = 4.69) Formerly incarcerated students (M = 31.73, SD = 5.44) Non-LS involved students (M = 30.25, SD = 5.65).</p> <p>No significant differences in quality of life between groups (F = 1.74, <math>p = 0.177</math>).</p>	
Smith (57)	Single-group retrospective; cross-sectional	16		Weak		<p>Number of times of relapse M = 6.07 (SD =12.72) prior to entering the CYAAR program. No participants relapsed after entering the program. There is a significant difference in mean ranks of the number of relapses before and after entering the program.</p>		
Tuliao et al. (67)	Single-group retrospective; cross-sectional	162		Weak				<p>83% (N = 134) participated in mutual help/12-step program. Negative correlation between mutual help participation and intent to use addiction medicine (<math>r^2 = -0.02</math>, <math>p &gt; .05</math>).</p>
Wattick et al. (64)	Single-group retrospective; cross-sectional	13		Weak		<p>Mean craving score (out of 7) was 1.1.</p>	<p>Resilience score (out of 5) M = 3.4 (SD = 0.91). Higher nutrition and culinary program participation was associated with ratings of good health and the absence of depression symptoms (P = .03 and .04, respectively).</p>	

Bold indicates a “parent” study of a series of linked studies.  
\*\*indicates  $p < .05$ .

Ratio was 249% and the institutional Incident Rate Ratio was 77%. The results indicate that for every dollar the university spends, there will be a return of \$2.26 over the course of ten years. Thus, this study indicated that the benefits of a CRP outweighed the costs, but to what degree a CRP outweighs the costs will depend on the size of the university and the expected CRP student membership.

## 4 Discussion

This systematic review identified 25 unique studies focused on education-based supports for adolescents (RHSs) and emerging adults (CRPs). The combination of a good number of descriptive studies, and a few studies with comparison groups, suggests that students who participate in RHS and CRPs may demonstrate positive outcomes such as reductions in AOD use, and improvements in social and academic outcomes (e.g., grades). Yet, given the lack of randomized controlled designs or even non-randomized comparative prospective research designs, statements about the incremental public health utility of investing in RHSs and/or CRPs relative to some other kind of approach of equal intensity and duration or engagement with services-as-usual, cannot be made with confidence. Similarly, cost-benefit analyses among both types of programs suggest large cost-savings or benefits, which could benefit society overall, but given the lack of comparative prospective investigations, robust estimates of cost-benefit remain unclear. Unlike an RHS, which often requires standalone programming, CRPs represent programming that can be implemented on college and university campuses and potentially integrated with college student health and wellness services. Thus, there seems to be increased potential for their sustainability in these settings given the larger cost savings and potential for synergy with existing structures that these programs represent. Overall, findings suggest possible near-term benefits are likely from RHS and CRP participation. However, much greater research investment is needed to understand more clearly the incremental benefit attributable to these kinds of programs as well for which students in particular, and also to gain greater clarity on the long-term trajectories of youth with SUD histories engaged with such services vs. similar youth who are not engaged with such services.

As might be expected of studies examining recovery supports in education settings, the most commonly measured outcomes for both types of supports were some assessment of substance use and academic outcomes. Surprisingly, given that a key proposed mechanism of both programs is engaging young people in positive social supports and creating recovery-supportive social networks, only a minority of studies examined whether this happened for their participants (5, 13). Capturing social networks can be challenging with limited resources, but it would be an important mechanism for these programs to examine in future research. A few studies also examined mental health outcomes, which epidemiological data has identified as important to understand among individuals experiencing AOD use disorders (75, 76). Only the CRP studies directly examined recovery capital, using a recovery capital measure. This may be due in part to the lack of a

developmentally-appropriate measure of recovery capital despite the identified gap in recovery capital measures (23, 77).

At present, given the study designs of the existing research identified in this review, there is limited evidence identifying RHSs and CRPs as the direct cause of improved outcomes for their participants. There is also limited evidence of longer-term outcomes related to positive development and the growth of recovery capital, such as college graduation, employment and career trajectory after college, and marriage or family life. Furthermore, results from the reviewed studies must be considered alongside their methodological limitations which included high potential for selection bias (often inadequately addressed in analysis), study design (majority of studies did not utilize a comparator group), and the lack of appropriate attention to confounders. There are many important gaps in the literature base that will be important to fill. For example, as it is less feasible to conduct RCT designs with these types of recovery supports, it will be important for researchers to conduct rigorous and longitudinal quasi-experimental studies to determine the effect of RHS and CRPs on AOD use and related outcomes, from which point researchers can work to determine which aspects of these programs are most beneficial, for whom in particular, and why. Providing RHS and CRP programs with funds for a data collection infrastructure that includes dedicated personnel and technical support to engage in ongoing program monitoring will help to establish a sustainable evidence base for these services (12, 13). Overall, substantially more research is needed to begin forming conclusions about the utility of these education-based recovery supports.

In addition to efficacy, RHS and CRPs face additional challenges that warrant investigation. One key issue evident from the studies in this review is that students who utilize these supports are predominately white. Although researchers identify racial disparities in addiction treatment as an ongoing issue (9), RHS often do not reflect the demographic breakdown of their school district (46) or their county. In fact, there are more students of color who receive addiction treatment per capita than attend RHS (78). One possible avenue for future research is to examine, among other factors, the ways in which students are referred and considered for program admission to identify barriers that minoritized individuals face in accessing these services, reason for engaging in services when they do, and strategies for surmounting them. Moreover, it is important for researchers to investigate why, despite the millions of adolescents and young adults with substance use disorder who need treatment, many RHS report one of their main challenges to be enrolling enough students (10). When considering that in 2021, there were an estimated 1.9 million adolescents and 8 million young adults in need of specialized substance use disorder treatment who did not receive it (79), it is important for researchers to work to reconcile the paradox of the adolescent and young adult treatment gap with the enrollment struggles of RHS.

Despite a strong theoretical rationale for the need for education-based recovery supports for young people, research on their effectiveness remains nascent, with only a handful of studies examining these potentially integral supports. Well-conducted comparison studies that examine their underlying logic model are needed to confidently assert that such programs

are worthy of integration into the broader public education system (13, 14). Then, larger-scale studies might be undertaken that examine the specific mechanisms to determine how these resources confer benefit and for which students, in particular.

## 4.1 Limitations

Several limitations to the methodological approaches employed in this review should be mentioned. First, screening from the original search was not conducted in duplicate; however, the updated search included duplicate screening, and there were no exclusion discrepancies during this screening, so the risk of inadvertently excluding eligible studies is minimal. Second, while we identified some grey literature (e.g., conference abstracts and dissertations), our search primarily used electronic databases. Thus, some relevant studies may be missing from this review. Finally, although the majority of studies' risk of bias were assessed in duplicate using two reviewers, only a single reviewer applied the separate cost-benefit tool to assess the risk of bias in the two cost-benefit studies. In the interest of transparency, we provide all coded responses for this tool in Table 4.

## 5 Conclusions

This systematic review highlights the growing interest and evidence supporting education-based recovery supports (RHSs) and collegiate recovery programs (CRPs) for adolescents and young adults, suggesting potential reductions in substance use and improvements in academic and social outcomes. Despite these promising findings, robust causal evidence is limited, particularly regarding effects on long-term outcomes and the development of recovery capital, indicating a need for more rigorous comparative studies with much longer follow-up and better measurement and data collection. Additionally, disparities in enrollment highlight a critical gap in access for students of minoritized identities, emphasizing the importance of investigating barriers to participation and ensuring these programs reflect the demographics of their communities (70, 71).

## Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

## Author contributions

EH: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Supervision,

Visualization, Writing – original draft, Writing – review & editing, Resources, Validation. SG: Formal Analysis, Visualization, Writing – review & editing, Data curation, Investigation, Validation. MK: Formal Analysis, Investigation, Validation, Writing – review & editing. JO: Formal Analysis, Investigation, Validation, Writing – review & editing. DE: Writing – review & editing. JK: Funding acquisition, Resources, Supervision, Writing – review & editing, Conceptualization.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fradm.2025.1522678/full#supplementary-material>

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