RECOVERY HIGH SCHOOLS AS CONTINUING CARE FOR ADOLESCENTS

DESCRIPTION, PRELIMINARY OUTCOMES, & COSTS

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ACKNOWLEDGEMENTS

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ADOLESCENT TREATMENT IN THE US

• 1.3 million youths needed treatment in 2013
• 122,000 received treatment at a specialty facility (about 9.1 percent of the youths who needed treatment)
• This left about 1.2 million who needed treatment for a substance use problem but did not receive it at a specialty facility.

SOURCE: NSDUH, 2014
TREATMENT SUCCESS

- Treatment does consistently yield reduced use, especially evaluated vs. usual care or wait list (Tripodi et al., 2010; Lipsey et al.)
- 35% to 75% of all teens use (relapse) after leaving treatment (Tomlinson, Brown & Abrantes, 2004)
- 47% of all students returning to (non-recovery) high schools resumed full blown drug use (Winters et al., 2000)
- Chronic disease requires continuing care (McLellan et al., 2000, 2005)
“Recovery high schools...allow adolescents newly in recovery to be surrounded by a peer group supportive of recovery efforts and attitudes. Recovery schools can serve as an adjunct to formal substance abuse treatment, with students often referred by treatment providers and enrolled in concurrent treatment for other mental health problems.”

RECOVERY HIGH SCHOOL DEFINITIONAL COMPONENTS

A. Primary purpose is to educate students in recovery from substance use or co-occurring disorders.

B. Meet state requirements for awarding a secondary school diploma, i.e. school offers credits leading to a state-recognized high school diploma, and student is not just getting tutored or completing work from another school while there.

SOURCE: Association of Recovery Schools, 2013
C. Intent that all students enrolled be in recovery and working a program of recovery from substance use or co-occurring disorders as determined by the student and the School;

D. Available to any student in recovery who meets state or district eligibility requirements for attendance, i.e., students do not have to go through a particular treatment program to enroll, and the school is not simply the academic component of a primary or extended-care treatment facility or therapeutic boarding school.

SOURCE: Association of Recovery Schools, 2013
Facilities for 9 RHS participants:

- 3 churches
- 3 office complexes
- 2 community centers
- 1 school building
Admission requirements:
• Sobriety Duration (none to at least 30 days)
• Recovery (Contemplation through active recovery)
• Treatment history (none required through some—undefined—prior treatment program)
• Voluntary through coerced

Frameworks of Recovery:
• Most include daily group plus available one on one counseling.
• All utilize some variant of Twelve Step/Minnesota Model, some also incorporate harm reduction, CBT, etc.
• Generally eclectic orientations
• All have counselor/therapist involved, some contracted/outsourced to treatment programs
• Counseling staff credentials vary (most have licensed A&D counselors, LPCs, LMFTs, and/or social workers).
78% report substance abuse treatment history
  • 54% Inpatient/Residential
  • 55% Outpatient

49% report mental health treatment history
  • 23% Inpatient/Residential
  • 25% Outpatient

48% report they are currently receiving counseling or treatment outside of school (18% for AOD, 16% MH, 22% both)
• Most share school staff with other schools/programs
  • Embedded programs usually use parent organization’s staff/classes
• Individualized, self-paced learning, often tutorial in nature
• Some schools use externally created curriculum aligned with state standards
  • Classes often blend grade levels and sometimes subject material
• Strive to:
  • transition students to regular high schools (n=3)
  • to graduate students (n=9), or
  • either transition or graduate, depending on student need (n=5)
• Typically no set limit on length of stay
FINDINGS:
R21 STUDENT SURVEY (N=321)

• Average 19 students per school (range 2-46)
• Student tenure: mean 232 days (just over 7.5 months), range 0-1440 days (4 yrs)
• Gender: 54% Male, 46% Female
• Parents/Guardians: 54% two-parent family in home
• Educational Attainment: 55% have at least one parents with college degree
• Demographics vary by school/community

IMAGE SOURCE: http://www.archwayacademy.net/
Recovery High Schools: Innovative Schools Supporting Recovery from Substance Abuse

Emily A. Hennessy
Emily E. Tanner-Smith

Annual Research & Policy Conference on Child, Adolescent, and Young Adult Behavioral Health
March 24, 2015
Adolescent Substance Use Treatment in the US, 2012

Number of Adolescent Substance Abuse Treatment Episodes

- Inpatient Detox: 3,390.06
- Res Rehab: 16,888.68
- Intensive OP: 16,783.92
- Non-Intensive OP: 82,999.25

Source: 2012 Treatment Episode Dataset
School-Based Recovery Supports

• Therapeutic boarding schools with a recovery emphasis
• Alcohol & drug treatment center schools
• Non-traditional schools with targeted substance abuse programming
  – Alternative schools
  – Charter schools
  – Contract schools
  – Home schools
  – Virtual/online schools
  – Area learning centers
• Traditional secondary schools
• Recovery high schools
Recovery High Schools

- Primary purpose is to educate students in recovery from substance use or co-occurring disorders.
- Meet state requirements for awarding a secondary school diploma.
- Intended for all students enrolled to be in recovery and working a program of recovery from substance use or co-occurring disorders.
- Available to any student in recovery who meets state or district eligibility requirements for attendance.
Recovery High School Activities

• Recovery support/continuing care
  – Daily group
  – Therapeutic community
  – Peer support
  – Individual counseling
  – Outside meetings
  – Relapse prevention

• Academic
  – Curriculum
  – Enrichment
  – Experiential and community service learning

• Family
  – Family support
  – Parent monitoring

• Peers
  – New peer groups in school
Prior Research

- Several studies found continuing care approaches to be effective in promoting abstinence following substance use treatment (Godley et al., 2010; Kelly, 2013).
- Few rigorous evaluation studies have examined the effects of RHSs, as a form of continuing care, on academic and/or behavioral outcomes.
- Moberg & Finch’s (2007) descriptive study of 317 students attending 17 RHSs reported promising results for substance use and academic outcomes.
Study Aims

• Are recovery high schools (RHSs) effective in preventing relapse from substance use for students in recovery from substance use disorders?
  – Alcohol, marijuana, other substance use

• Are RHSs effective in improving academic outcomes for students in recovery from substance use disorders?
  – Grade point average, truancy, standardized achievement scores, drop-out
Methods – Research Design

- Quasi-experimental research design - compare students who voluntarily enroll (or not) in RHS after substance use treatment
- Students and parents recruited from substance use treatment facilities and RHSs in Minnesota, Wisconsin and Texas

<table>
<thead>
<tr>
<th>Recruit from:</th>
<th>Baseline</th>
<th>School Type</th>
<th>3 Months</th>
<th>School Type</th>
<th>6 Months</th>
<th>School Type</th>
<th>12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Settings</td>
<td>O₀</td>
<td>Non-RHS</td>
<td>O₃</td>
<td>Non-RHS</td>
<td>O₆</td>
<td>Non-RHS</td>
<td>O₁₂</td>
</tr>
<tr>
<td>RHS (recruitment added)</td>
<td>O₀</td>
<td>RHS</td>
<td>O₃</td>
<td>RHS</td>
<td>O₆</td>
<td>RHS</td>
<td>O₁₂</td>
</tr>
</tbody>
</table>
## Methods – Sample (through Jan 2015)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>3-M</th>
<th>6-M</th>
<th>12-M</th>
<th>Total Interviews to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Youth Interviews</strong></td>
<td>237</td>
<td>190</td>
<td>159</td>
<td>123</td>
<td>709</td>
</tr>
<tr>
<td></td>
<td>(85%)</td>
<td>(83%)</td>
<td>(77%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Parent Interviews</strong></td>
<td>247</td>
<td>207</td>
<td>171</td>
<td>142</td>
<td>767</td>
</tr>
<tr>
<td></td>
<td>(90%)</td>
<td>(89%)</td>
<td>(86%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Interviews</strong></td>
<td>484</td>
<td>397</td>
<td>330</td>
<td>265</td>
<td>1,476</td>
</tr>
</tbody>
</table>
Methods – Outcome Measures

• **Substance Use** (Timeline FollowBack; Sobell & Sobell, 1992)
  – Days used alcohol (past 90)
  – Days used marijuana (past 90)
  – Days used other drugs (past 90)

• **Academics** (Student reports)
  – English/reading grades (mostly F’s [0] to mostly A’s [4])
  – Math grades (mostly F’s [0] to mostly A’s [4])
  – Truancy in past 90 days (never [0] to past month [4])
Methods – Analytic Strategies

- Propensity scores used to balance RHS and non-RHS students on a range of baseline characteristics:
  - Used to control for potential confounding and address lack of randomization to groups.
  - Propensity scores were estimated using a large set of baseline covariates expected to predict the selection mechanism and/or any of the outcomes.
  - Covariate selection guided by our prior meta-analytic work on adolescent substance use.
  - Unmatched participants \( (n = 50) \) were pruned from the analytic sample due to non-equivalence.
Methods – Analytic Strategies

• Multiple imputation \( (m = 20) \) to handle missing data
• Average treatment effects of RHS attendance (at 3-months) on 6-month outcomes
• Multilevel linear regression models with school-level random effects used to estimate program effects on outcomes
### Baseline Characteristics of Matched Sample (n = 108)

<table>
<thead>
<tr>
<th>RHS (n = 56) ; Non-RHS (n = 52)</th>
<th>Baseline Substance Use</th>
<th>MH Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>16.5 (1.0)</td>
<td>Generalized anxiety disorder 60%</td>
</tr>
<tr>
<td>Male</td>
<td>60%</td>
<td>Major depression disorder 76%</td>
</tr>
<tr>
<td>White</td>
<td>89%</td>
<td>Panic disorder 28%</td>
</tr>
<tr>
<td>African-American</td>
<td>1%</td>
<td>Post-traumatic stress disorder 31%</td>
</tr>
<tr>
<td>Other race</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>MH Treatment History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient/residential</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Outpatient</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>SU Treatment History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient/residential</td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>Outpatient</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>AA/NA</td>
<td>68%</td>
<td></td>
</tr>
<tr>
<td>Baseline Substance Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days used alcohol</td>
<td>19.8 (24.1)</td>
<td></td>
</tr>
<tr>
<td>Days used marijuana</td>
<td>58.7 (33.3)</td>
<td></td>
</tr>
<tr>
<td>Days used other drugs</td>
<td>28.1 (32.6)</td>
<td></td>
</tr>
<tr>
<td>Baseline Academics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English grades</td>
<td>2.7 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Math grades</td>
<td>2.3 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Truancy</td>
<td>2.2 (1.4)</td>
<td></td>
</tr>
</tbody>
</table>
School Location at 3 months (Non-RHS, N = 52)
Preliminary 6-Month Outcomes

- 5 fewer days of use: Cohen's d = 0.16
- 10 fewer days of use: Cohen's d = 0.32
- 4 fewer days of use: Cohen's d = 0.20

Effect sizes favoring the RHS (Right Hand Side) for alcohol, marijuana, other drugs.
Preliminary 6-Month Outcomes

Cohen’s d Effect Size

Increase of 0.34 points
Increase of 0.38 points

-1.2 -0.7 -0.2 0.3 0.8
Favors Non-RHS Favors RHS

Math
English
Truancy
Conclusions

• RHSs are important options in the continuum of recovery support, particularly for students with co-occurring disorders, severe substance use disorders, and/or high need for services and support.
• Preliminary results suggest RHS programs can be successful in supporting young people in recovery.
Conclusions

• Preliminary results should be interpreted cautiously –
  – Small sample sizes (low power to detect effects)
  – Remember, comparison is between RHS and all other types of schools- large number of alternative school attendance

• Final analyses will –
  – include a larger and more diverse sample
  – focus on a broader range of outcomes with longer follow-up duration
Acknowledgements

- This work was supported by Grant Number R01DA029785-01A1 from the National Institute on Drug Abuse. The contents of this presentation are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.
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Project Website:
http://my.vanderbilt.edu/recoveryhighschools
Covariates Used in Propensity Score Model

- Student demographics (age, race, gender)
- Parent education
- Family history of alcohol/substance use, treatment history
- Baseline substance use (alcohol, marijuana, other drugs)
- Baseline academics (English grades, math grades, truancy)
- Knowledge of RHS prior to treatment, interest in attending RHS
- Perceived academic abilities, time spent on homework, teacher/student support of recovery
- Mental health diagnoses (DSM-IV)
- Substance use disorder diagnoses (DSM-IV)
- Substance approving peers (PEI/PSUT)
- Negative attitudes toward school (BASC)
- Life satisfaction index (GAIN-Q3)
- Spiritual social support (GAIN-Q3)
- Risk behavior screener (GAIN-Q3)
- Youth happiness with parent (YHPS)
- Services received prior to treatment (AOD services, mental health services)
Cost-Benefit Analysis of Recovery High Schools

D. Paul Moberg
David Weimer
Stephanie Lindsley

28th Annual Research & Policy Conference on Child, Adolescent, and Young Adult Behavioral Health,
Tampa, Florida
March 24, 2015
Outline

• What is Cost-Benefit Analysis (CBA)
• How are we applying CBA to our Recovery High School (RHS) research?
• What benefits are anticipated?
• What costs are included?
• How will we assess them?
• Pilot study results
Hi, I donated $20 last year. Can you tell me exactly how many Children I've saved?
What is Cost-Benefit Analysis (CBA)?

• CBA is a protocol for systematically assessing alternative public policies in terms of their efficiency
  – Assess efficiency in terms of net benefits
  – Choose policies that would maximize net benefits

• CBA is comprehensive
  – It seeks to include all valued impacts
  – It gives “standing” to everyone in society

• CBA is prospective
  – What net benefits would result if a policy were adopted (including continuation or replication of existing program)
Costs and Benefits in CBA

- **Benefits** are monetized sum of valued impacts
  - Real estimated benefits (e.g., future earnings)
  - Willingness to pay (for intangibles) to obtain or avoid the impacts

- **Costs** are the sum of the values of real resources (e.g., labor, ) and opportunity costs to implement the program or policy.
To Conduct CBA...

- Identify all relevant impacts
- Monetize full range of impacts
  - Sometimes at market prices
  - More often with “shadow prices” that take account of distortions, especially missing markets
- Discount for time
- Conduct sensitivity analysis to take account of uncertainties in estimation and valuation using Monte Carlo Analysis (Weimer and Vining 2009)
- Report predicted distribution of net benefits
Applying CBA to our Recovery High School (RHS) research

Goal:

Estimate the “return on investment” and the net benefits of recovery high school attendance compared to other school settings among adolescents post-treatment.

Need to comprehensively identify and measure impacts—costs and benefits!

Data:

Student & parent interviews; site visits to schools and treatment programs
What Benefits are Anticipated?

• Primary impacts (assessed in the evaluation):
  • Reduced substance use and related problems
  • Improved mental health/reduced conduct disorder
  • Academic achievement

• Secondary impacts: Student achievement and sobriety ->
  • HS graduation
  • Reduced delinquency and criminality
  • Higher earnings
  • Reduced societal costs for treatment, incarceration etc.

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What costs are included?

- Real resources used
  - Teacher, parent, administrator time
  - Materials; space; curriculum
  - Counseling/support/therapeutic/treatment costs
  - Transportation time and cost
- Incremental cost relative to comparison group experience (academics plus therapeutics for RHS)
Assessing Benefits

Relevant Shadow Prices

• Direct valuation
  – Social cost of drug abuse: harm to user; treatment system costs; potential harm to others (e.g., DUI)
  – Productivity gain from high school completion: present value of increased earnings over working life

• Vertical linkage
  – Student achievement->productivity gain
  – Reductions in drug abuse->reductions in property crime

• Horizontal linkage
  – Higher productivity->reductions in crime & improved family economic condition
Example: Estimating the Value of an Additional High School Graduation

• Begin with estimates made by the Washington State Institute for Public Policy (WSIPP)

• Convert to current year dollars: http://www.bls.gov/data/inflation_calculator.htm

• Use estimates of external benefits (e.g. reduced crime, better fertility choices) from increased earnings

• Discount back to average current year in program

• Apply resulting shadow price to increased number of graduations
Analysis to account for uncertainty

• Monte Carlo simulation:
  • Assume distributions for all uncertain parameters
  • Calculate net benefits with random draws of all uncertain parameters
  • Repeat process to generate many estimates of net benefits
  • Display and analyze distribution of predicted net benefits
Pilot Study Results

Establishing the Theoretical Framework for Cost-Benefit Analysis of Recovery High Schools
PA 881

Bo McCready, Holden Weisman, Brian Quinn, Tae Wook Ahn, Yu-Chieh Chen, and Marlon Mundt

ABSTRACT
Prepared for Dr. Paul Moberg of the University of Wisconsin Population Health Institute and Dr. David Weimer of the La Follette School of Public Affairs.
Pilot CBA Study Methods

• Five areas of impact examined:
  – Educational Attainment
  – Mental Health Outcomes
  – Delinquency and Crime Reduction
  – Treatment and Correctional system costs
  – Budgetary and administrative marginal costs

• Used proxy values for these variables
Summary of Pilot CBA Estimates

• Most likely benefits:
  – $188,000 across student lifetime
  – Range $36,000 to $342,000, S.D. $53,000

• Cautions:
  – Crude estimation without experimental data
  – Co-linearity of outcomes
  – Fails to consider equity of access

Translating Research for Policy and Practice
Pilot CBA Results

Figure 1: Histogram of Net Benefits from Monte Carlo Simulation
Table 7: Point estimates of impacts and expected net benefits

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Subfield</th>
<th>Point Estimate of Cost/Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Attainment</td>
<td>NPV of high school graduation</td>
<td>$372,000</td>
</tr>
<tr>
<td></td>
<td>Increased chance of graduation</td>
<td>0.48</td>
</tr>
<tr>
<td>Mental Health Services</td>
<td>Expected reduction in mental health service costs</td>
<td>$700</td>
</tr>
<tr>
<td>Delinquency and Crime Outcomes</td>
<td>Expected crime reduction benefits</td>
<td>$103,000</td>
</tr>
<tr>
<td>Administrative Marginal Costs</td>
<td>Additional cost of educating a recovery high school student</td>
<td>$64,000</td>
</tr>
<tr>
<td></td>
<td>New facilities cost/student</td>
<td>$3,600</td>
</tr>
<tr>
<td>Marginal Excess Tax Burden</td>
<td>Expected METB</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>Additional burden</td>
<td>$26,364</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>$193,000</td>
</tr>
</tbody>
</table>

(Source: Authors)

Translating Research for Policy and Practice
Conclusion

• Pilot data and analysis are very promising of favorable cost-benefit.

• Applying CBA to the data currently being collected via student, parent and staff interviews is expected to impart a practical understanding of the value of recovery schools to education and treatment systems.

• The limitations of data and the accuracy of monetization are such that conclusions reached from these analyses must be presented as suggestive and assumption-laden, but none the less useful guides for policy analysis.

*Translating Research for Policy and Practice*
Acknowledgement

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Thank You
References


References (cont.)


See also: