

Impacts of Substance Use Disorder Treatment Enhancements for Youth

An Evaluation of Washington’s Substance Abuse Treatment Enhancement and Dissemination (SAT-ED) Program

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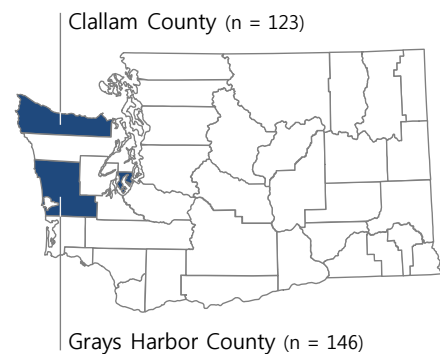
THE SUBSTANCE ABUSE TREATMENT ENHANCEMENT AND DISSEMINATION (SAT-ED) program provides enhanced treatment and recovery services for youth (ages 12 to 18) with a diagnosed substance use disorder (SUD).¹ Funded by the federal Substance Abuse and Mental Health Services Administration (SAMHSA), this program aims to ensure that youth in outpatient SUD treatment receive standardized assessments (Global Appraisal of Individual Needs; GAIN), evidence-based treatment (Adolescent Community Reinforcement Approach; A-CRA), and recovery support services (Recovery Support Services – Adolescent Substance Abuse; RSS-ASA).

Two community-based treatment sites (located in Clallam and Grays Harbor counties) participated in direct service enhancements through the SAT-ED program between January 2013 and July 2016. This report describes youth participants and the services they received, and changes in key outcomes after entering the program. Outcomes based on GAIN assessment data (e.g., substance use) are self-reported, and are available only for SAT-ED program participants. Outcomes based on administrative data (e.g., juvenile justice) are compared between SAT-ED program participants and a statistically matched comparison group of youth in publicly funded outpatient SUD treatment.

Key Findings

- SAT-ED participants reported decreased substance use, increased confidence about resisting relapse, and improved school outcomes 6 months after entering the program. Data were unavailable to determine whether these changes were driven by specific enhancements under the SAT-ED program.
- Participants had higher rates of treatment completion than a matched comparison group of similar youth entering SUD treatment.
- Participants showed promising improvements in several key outcomes relative to a matched comparison group, but due to small sample sizes, most program effects were not statistically significant. Promising findings included decreased juvenile justice involvement and increased employment rates.

FIGURE 1
SAT-ED Sites
Total Enrollment = 269



¹Washington’s SAT-ED program is sometimes referred to as the Washington Recovery Youth Services (WA-RYS) program.

CONTEXT

Substance Abuse Treatment Enhancement and Dissemination

The Washington State Department of Social and Health Services' (DSHS) Division of Behavioral Health and Recovery (DBHR) received \$3 million in federal funding over a four-year period from the U.S. Department of Health and Human Services' Substance Abuse and Mental Health Services Administration (SAMHSA) for the SAT-ED program.² These funds provided support to strengthen youth substance use disorder (SUD) treatment services at both the system and local provider levels. At the system level, grant activities included infrastructure development such as financial mapping and workforce development. This evaluation report focuses on grant activities at the local provider level.

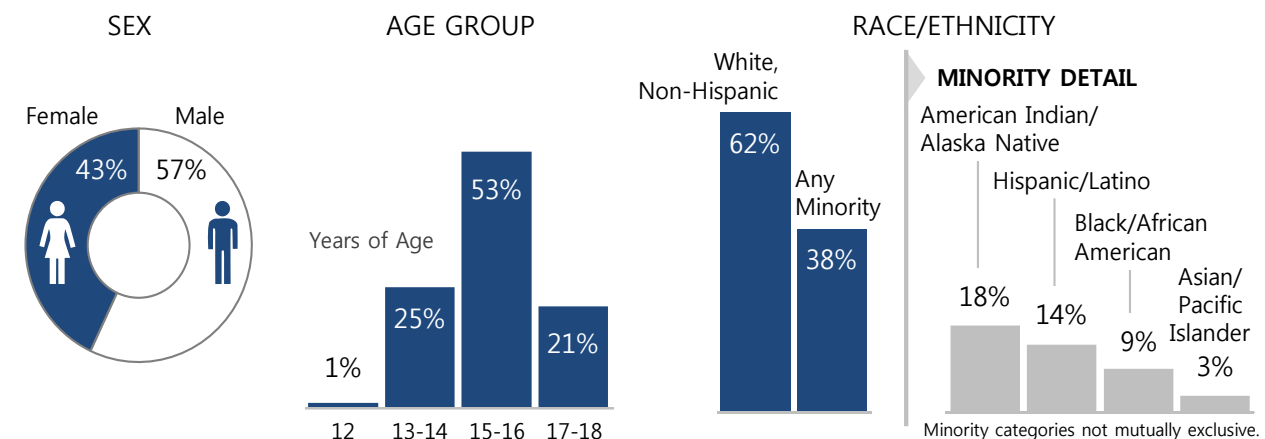
Under the SAT-ED grant, two community-based substance use disorder treatment facilities (True Star in Clallam County and True North in Grays Harbor County) implemented three treatment enhancements for youth in outpatient SUD services. Specifically, SAT-ED youth served by these agencies were (1) assessed regularly with a standardized assessment tool, the Global Appraisal of Individual Needs (GAIN); (2) treated using an evidence-based treatment, the Adolescent Community Reinforcement Approach (A-CRA); and (3) provided recovery support services using a model now established as a promising practice (Recovery Support Services – Adolescent Substance Abuse; RSS-ASA).

Youth enrolled in the SAT-ED program from January 2013 through November 2015, with all clients exiting the program by July 2016. In total, 269 youth received enhanced treatment services through the SAT-ED program, 123 at True Star in Clallam County and 146 at True North in Grays Harbor County. On average, participants remained in the program for 10 months. The participants were 57 percent male and 43 percent female. Participants ranged in age from 12 to 18 years old, with just over half (53 percent) falling into the 15 to 16 year age group. Sixty-two percent of participants identified as non-Hispanic white, and 38 percent as minorities. The two SAT-ED sites were located in non-urban counties along the Washington coast where a high proportion of youth are non-Hispanic white (approximately 70 percent), so the SAT-ED participant characteristics represent a higher proportion of minority youth served by the program than reside in those locations overall. In addition, 9 percent of SAT-ED youth identified as LGBTQ. These statistics are consistent with the grant program's goal of enhancing access to services for adolescent populations vulnerable to health disparities.

FIGURE 2.

Demographics

SAT-ED PARTICIPANTS, Total = 269



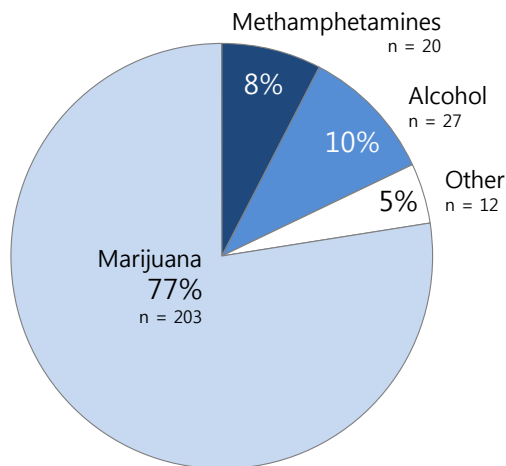
SOURCE: DSHS Integrated Client Databases.

² The original grant period was three years. A no-cost extension added a fourth year.

FIGURE 3.

Primary Substance

SAT-ED PARTICIPANTS with available data, Total = 262



SOURCE: DSHS Integrated Client Databases.

Three-quarters (77 percent) of SAT-ED participants reported marijuana as their primary substance upon treatment intake, and the typical participant started using between the ages of 10 and 14. About half (50 percent) of SAT-ED youth had a co-occurring mental health treatment need, based on having at least one mental health diagnosis, prescription, or service in administrative service records in the 24 months prior to entering the SAT-ED program.

Nearly half (46 percent) of SAT-ED participants were referred to treatment through the legal system (court/probation/diversion) and roughly one-third (35 percent) were referred by schools. A range of other referral sources included self/family, other behavioral health providers, and child welfare case workers.³ Among youth entering the SAT-ED program, recent criminal charges (35 percent in the 12 months prior to intake), and school suspensions/expulsions (45 percent in the 12 months prior to intake) were common.

Global Appraisal of Individual Needs (GAIN)

SAT-ED grant funds supported the training and certification of clinical staff to conduct Global Appraisal of Individual Needs (GAIN; Dennis, White, Titus, and Unsicker, 2008) assessments. Developed by Chestnut Health Systems, GAIN is a standardized bio-psychosocial assessment tool which asks SUD clients to report on substance use, risk behaviors, mental and emotional health, environment and living situation, school and work, and a multitude of other topics. SAT-ED youth were administered the GAIN-I, a comprehensive intake assessment, at program entry and the GAIN-M90, a follow-up assessment tool, six months later. Automated summaries of GAIN data are intended to assist with treatment planning. A secondary purpose of the GAIN assessment is for program monitoring and evaluation. Part one of this evaluation will present changes in self-reported GAIN outcomes between intake and 6-month follow-up for SAT-ED youth with assessment data available at both time points.

Adolescent Community Reinforcement Approach (A-CRA)

Youth in SAT-ED were provided treatment following the Adolescent Community Reinforcement Approach (A-CRA), an intervention that aims to replace substance use and its triggers with pro-social activities, and foster new behaviors and social skills that support recovery (Smith and Meyers 2006; Smith, Lundy, and Gianini 2007). A-CRA is designated by SAMHSA as an evidence-based practice for youth in SUD treatment, and by the Washington State Institute for Public Policy (WSIPP) and the University of Washington's Evidence-Based Practice Institute (EBPI) as a research-based practice.⁴

A-CRA treatment services were delivered to participants throughout the SAT-ED program, but complete electronic records for A-CRA services were only recorded from January 2013 through June 2015 to support clinician training and certification. Here we report on the typical "package" of A-CRA

³ For some SAT-ED youth, TARGET treatment intake data indicate more than one referral source.

⁴ In 2012, the Washington State legislature directed the Washington State Institute for Public Policy (WSIPP) and the University of Washington's Evidence-Based Practice Institute (EBPI) to create an inventory of "evidence-based", "research-based", and "promising practices" for children in the areas of behavioral health, child welfare, and juvenile justice services (WSIPP 2016). The "evidence-based" designation signifies the strongest level of evidence of effectiveness.

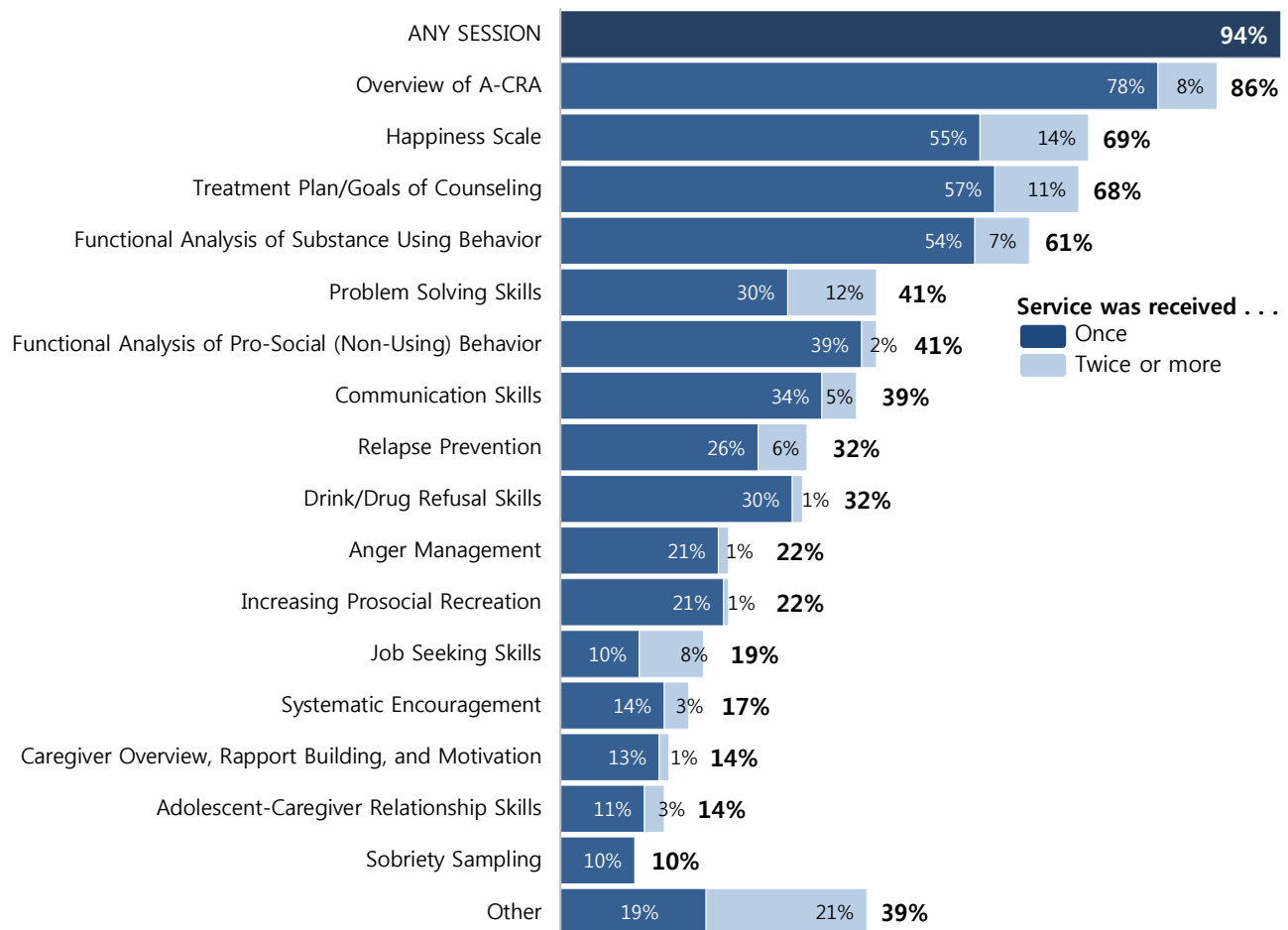
treatment services youth received during their time in SAT-ED, for the subset of SAT-ED youth discharged from the program by June 2015. Overall, 94 percent of SAT-ED participants who discharged by June 2015 received at least one A-CRA treatment session during the program.

On average, youth received five A-CRA sessions during their time in treatment, which lasted an average of 43 minutes apiece. One-quarter of SAT-ED youth had parents or other caregivers participate in their A-CRA treatment (via a parent/caregiver-only session or joint parent/caregiver-youth session). Each A-CRA session included one or more A-CRA treatment elements. The most frequent A-CRA treatment elements were Overview of A-CRA; Happiness Scale; Treatment Plan/Goals of Counseling; and Functional Analysis of Substance Using Behavior.

FIGURE 4.

Adolescent Community Reinforcement Approach (A-CRA) Services, Both Sites

Services Received by SAT-ED Participants Discharged by June 2015*, Total = 155



SOURCE: EBTx, Chestnut Health Systems' electronic data system for A-CRA treatment records.

NOTES: Bars may not sum to overall percentages due to rounding. Other A-CRA services include Case Management, Couples Relationship Therapy, Crisis Management, Homework complete only, Medication Adherence and Monitoring, Urinalysis result only. *Complete A-CRA service data not available past June 2015.

Recovery Support Services (RSS)

SAMHSA defines recovery support services as “nonclinical services that assist individuals and families working toward recovery from substance use conditions” (SAMHSA 2010: 1). Because they are not currently Medicaid-funded in Washington State, recovery support services are unavailable to most youth receiving publicly funded SUD treatment. The SAT-ED grant funded program participants to receive Recovery Support Services for Adolescent Substance Abuse (RSS-ASA; DBHR 2013), a model of recovery support services for youth, adapted from the adult model used in the successful Access to Recovery Program (Krupski et al. 2009; Wickizer, Mancuso, Campbell & Lucenko 2009). RSS-ASA is designated by the Washington State Institute for Public Policy and the University of Washington’s Evidence-Based Practice Institute as a promising practice (WSIPP 2016).

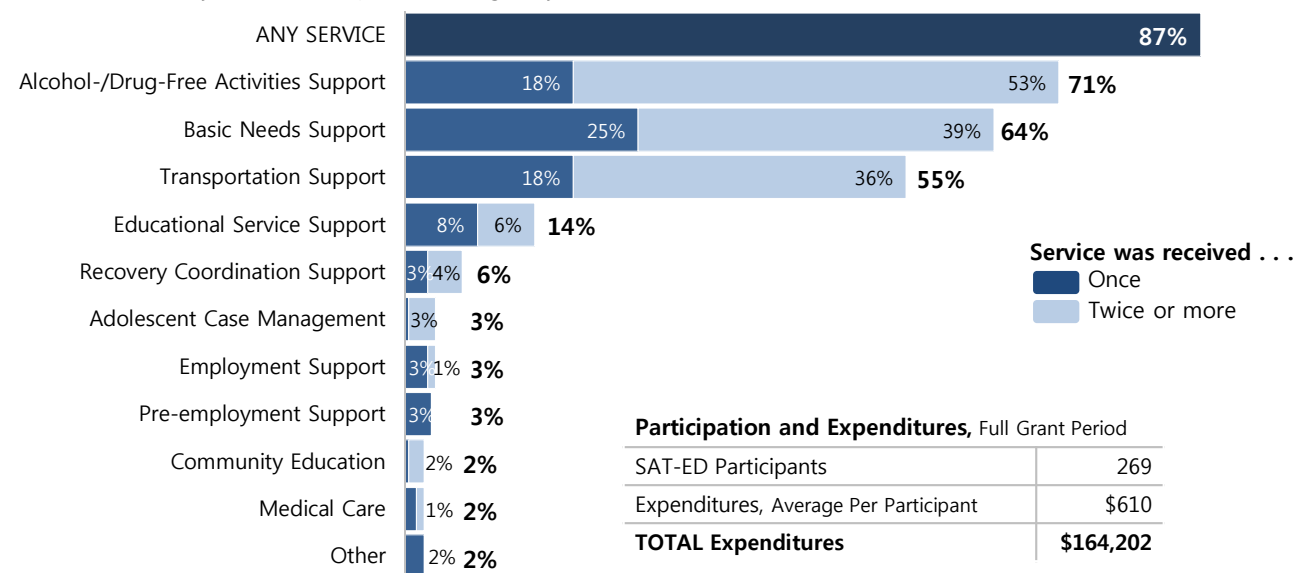
RSS-ASA comprises two major components. First, a recovery care coordinator oversees a youth’s recovery process, maintaining regular contact with the youth and family during and after clinical treatment services, assessing the youth’s needed supports, developing an individualized recovery plan, and facilitating the execution of this plan. Second, funding is provided for individualized recovery support services, such as bus passes to get to treatment or registration fees to participate on a youth sports team.⁵ Expenditures for RSS for all 269 SAT-ED clients over the full grant period totaled \$164,202, or an average of \$610 per client.

The chart below shows the use of RSS through the SAT-ED program. The chart is restricted to SAT-ED youth discharged by March 2016 for whom complete RSS data is available. Most SAT-ED participants (87 percent) received at least one RSS during their time in the program. The most common types of RSS were Alcohol- and Drug-Free Activities Support (e.g., youth sports team or music lessons), Basic Needs Support (e.g., food or clothing), and Transportation Support (e.g., bus passes or gas vouchers).

FIGURE 5.

Recovery Support Services

Services Received by SAT-ED Participants Discharged by March 2016*, Total = 240



NOTES: Bars may not sum to overall percentages due to rounding. Other includes: Outreach Services, Brief Intervention, Brief Therapy-Individual, Family Support, Vision Care. *Complete RSS records not available past March 2016.

SOURCE: DSHS Integrated Client Databases.

⁵ Participating agencies also conducted group recovery support services, such as “activity nights.” In this report, recovery support services refer to individualized recovery support services under the RSS-ASA model.

Part I. Self-Reported Outcomes

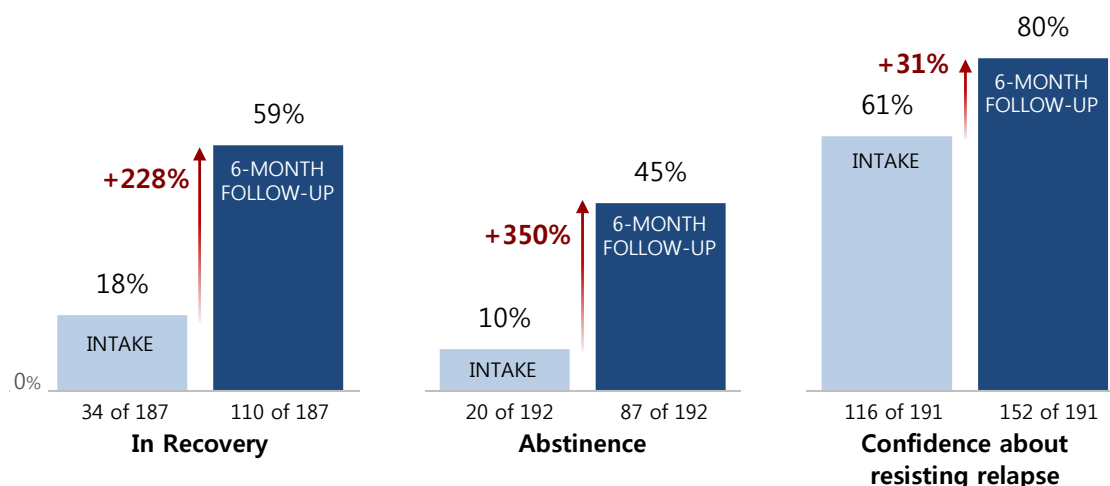
Part one of this report presents self-reported recovery status, substance use, and school outcomes for a subset of SAT-ED participants with Global Appraisal of Individual Needs (GAIN) assessment data at intake and at 6-month follow-up (n = 192). These measures were not available for a comparison group and should not be interpreted as program net impacts. The changes observed could be larger than, smaller than, or similar to changes for other youth receiving publicly funded outpatient SUD services in Washington State. Part two of the report examines changes in administrative data outcomes for the SAT-ED study population, a subset of SAT-ED participants statistically matched to a comparison group.

The GAIN assessment data show that youth receiving enhanced SUD treatment through the SAT-ED program made measurable progress toward recovery. More than half of participants (59 percent) were considered “in recovery” at 6-month follow-up, meaning they were housed in the community, abstinent, and without substance use problems in the month prior to assessment. Nearly half of SAT-ED youth (45 percent) abstained from substance use in the 90 days preceding the 6-month assessment, more than a four-fold increase from intake (10 percent). Youth also reported high rates of confidence (80 percent) about resisting relapse at the 6-month follow-up, up from 61 percent at intake.

FIGURE 6.

Self-Reported Recovery Outcomes

SAT-ED clients with GAIN assessment data at intake and 6-month follow-up, Total = 192



SOURCE: Global Appraisal of Individual Needs (GAIN) assessment data.

NOTE: Fewer than 192 responses for some measures due to missing item-level data.

In Recovery – Housed in community, abstinent, and no substance use problems in the past month.

Abstinence – No drug or alcohol use in the past 90 days.

Confidence About Resisting Relapse – Client believes he/she could avoid using alcohol or drugs at home, at school/work, with friends, and when around others using alcohol or drugs.

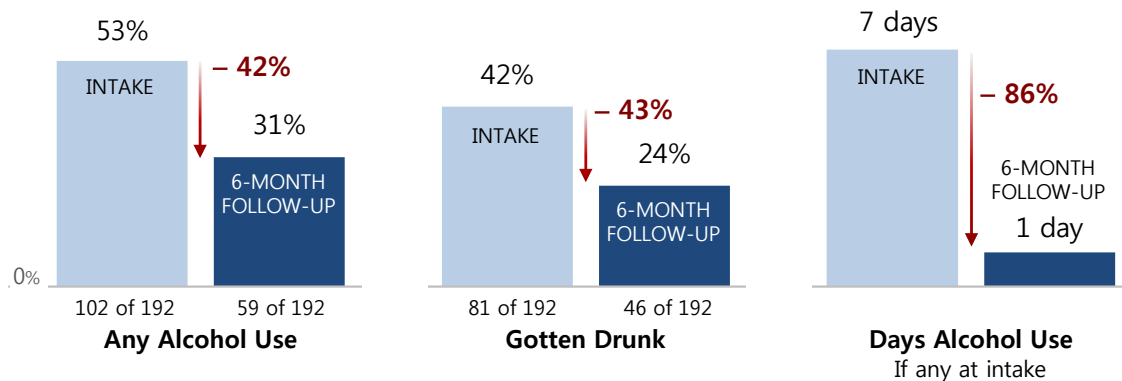
In addition to overall progress toward recovery, youth reported less frequent use of specific substances at the 6-month follow-up assessment, compared to the assessment at intake. The proportion of clients who reported drinking declined from one-half (53 percent) to one-third (31 percent). Similar decreases were seen in getting drunk (42 percent to 24 percent), and in the average days of alcohol use, if any at intake (7 days to 1 day), in the 90 days prior to assessment.

Marijuana use declined between intake and 6-month follow-up. The majority of SAT-ED youth (85 percent) reported using marijuana at intake, consistent with marijuana being the most frequent primary substance according to SUD treatment records. The rate of self-reported marijuana use dropped from 85 to 49 percent by 6 months. In parallel, youth who reported using marijuana at intake reduced their average days of use, from 33 days at intake (roughly one-third of the 90-day period preceding assessment) to 14 days at 6-month follow-up.

FIGURE 7.

Self-Reported Alcohol Use, Past 90 Days

SAT-ED clients with GAIN assessment data at intake and 6-month follow-up, Total = 192



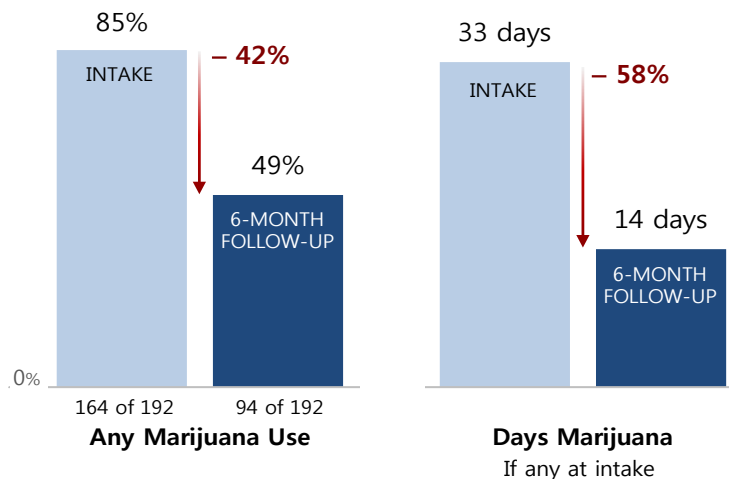
SOURCE: Global Appraisal of Individual Needs (GAIN) assessment data.

▶ **Any Alcohol Use** – Any alcohol use in the past 90 days.
Gotten Drunk – Gotten drunk or had 5 or more drinks in the past 90 days.
Days Alcohol Use – Average number of alcohol use days in the past 90 days.

FIGURE 8.

Self-Reported Marijuana Use, Past 90 Days

SAT-ED clients with GAIN assessment data at intake and 6-month follow-up, Total = 192



SOURCE: Global Appraisal of Individual Needs (GAIN) assessment data.

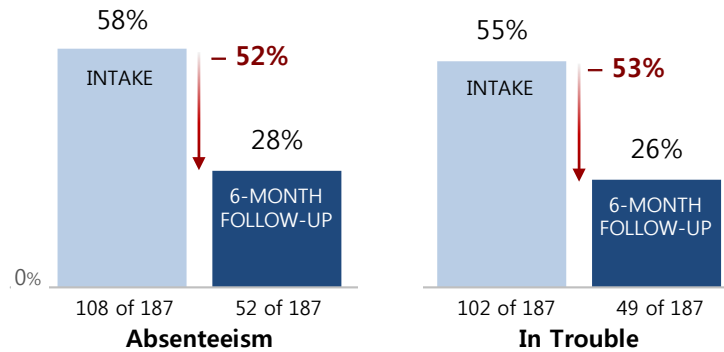
▶ **Any Marijuana Use** – Any marijuana use in the past 90 days.
Days Marijuana Use – Average number of marijuana use days in the past 90 days.

School absenteeism and the rate of getting in trouble at school declined by approximately half between intake and 6 months. In the 90 days prior to intake, 58 percent of youth reported five or more absences; this rate dropped to 28 percent at 6-month follow-up. In the 90 days prior to intake, 55 percent of youth reported getting in trouble at school, getting suspended, or getting expelled; this rate dropped to 26 percent at 6-month follow-up.

FIGURE 9.

Self-Reported School Outcomes, Past 90 Days

SAT-ED clients with GAIN assessment data at intake and 6-month follow-up, Total = 192



SOURCE: Global Appraisal of Individual Needs (GAIN) assessment data.

NOTE: Fewer than 192 responses for some measures due to missing item-level data.

▶ **Absenteeism** – Five or more days absent from school/training in the past 90 days.
In Trouble – Youth got in trouble at school/training, got suspended, or got expelled in the past 90 days.

The changes in self-reported outcomes in GAIN assessment data were relatively consistent across sex, age, and race/ethnicity groups (Table 1 presents tests for differences in changes over time, across groups). While there were noteworthy baseline differences in some of the measures – for example, male and minority youth were more likely to report getting in trouble in school in the 90 days before intake, and older youth were more likely to report getting drunk – the changes were similar across groups. Youth with and without co-occurring mental health disorders (COD) experienced similar changes over time, but results suggest that some outcomes for COD youth still lagged behind their peers at 6-month follow-up (e.g., lower rates of recovery, higher rates of school absenteeism and getting in trouble at school). SAT-ED youth served by the two sites also experienced similar changes in outcomes, with the exception of school absenteeism. Youth served by True Star in Clallam County started with higher absenteeism rates and had larger declines than their peers at True North in Grays Harbor County ($p < .05$). At 6 months after intake, absenteeism rates were the same at both sites.

Youth who received more recovery support services experienced larger increases in abstinence ($p < .1$), larger increases in confidence about resisting relapse ($p < .05$), and larger decreases in school absences ($p < .05$). At 6-month follow-up, participants provided 10 or more RSS reported lower rates of alcohol use (16 percent compared to 39 percent), getting drunk (10 percent compared to 30 percent), and marijuana use (40 percent compared to 52 percent) relative to participants provided 9 or fewer RSS during the program. It is important to note that these higher RSS utilizers, who represent 40 percent of youth with both GAIN and RSS data available, also began services with somewhat lower rates of substance use than their peers, but that the gap widened over the course of treatment.

TABLE 1.

Selected Self-Reported Outcomes from GAIN Assessment Data, by Subgroup

	N	In Recovery		Abstinence		Confidence about resisting relapse		Any Alcohol	
		INTAKE	6 MOS	INTAKE	6 MOS	INTAKE	6 MOS	INTAKE	6 MOS
All SAT-ED Clients with GAIN Data	192	18%	59%	10%	45%	61%	80%	53%	31%
Sex									
Male	106	17%	56%	9%	43%	62%	82%	56%	32%
Female	82	21%	63%	13%	48%	57%	76%	49%	28%
Age Group									
12-14	55	15%	58%	4%	42%	56%	73%	46%	31%
15-16	101	16%	58%	12%	48%	60%	84%	56%	30%
17-18	32	32%	65%	19%	44%	65%	74%	53%	31%
Race/Ethnicity									
Non-Hispanic White	118	18%	56%	8%	46%	59%	76%	55%	30%
Any Minority	70	19%	65%	14%	44%	61%	84%	49%	31%
Co-Occurring Disorders									
Yes - Mental Health Tx Need	92	19%	54%	14%	45%	56%	78%	50%	30%
No	96	18%	64%	7%	46%	64%	80%	55%	30%
Program Site									
True North, Grays Harbor County	97	19%	58%	9%	41%	58%	76%	56%	34%
True Star, Clallam County	95	17%	60%	12%	49%	63%	83%	51%	27%
Recovery Support Services Volume									
Low (0-9)	101	20%	60%	10%	40%	65%	78%	55%	39%
High (10+)	70	19%	62%	11%	57%*	54%	84%**	47%	16%

	N	Got Drunk		Any Marijuana		Absenteeism		In Trouble at School	
		INTAKE	6 MOS	INTAKE	6 MOS	INTAKE	6 MOS	INTAKE	6 MOS
All SAT-ED Clients with GAIN Data	192	42%	24%	85%	49%	58%	28%	55%	26%
Sex									
Male	106	46%	26%	88%	52%	57%	24%	61%	30%
Female	82	38%	20%	82%	45%	61%	33%	48%	23%
Age Group									
12-14	55	33%	24%	95%	55%	78%	35%	80%	53%
15-16	101	46%	23%	84%	45%	48%	26%**	46%	20%
17-18	32	50%	25%	72%	53%*	55%	23%	41%	3%
Race/Ethnicity									
Non-Hispanic White	118	45%	25%	86%	50%	57%	24%	52%	25%
Any Minority	70	39%	20%	83%	47%	62%	34%	61%	30%
Co-Occurring Disorders									
Yes – Mental Health Tx Need	92	41%	22%	83%	50%	60%	31%	55%	29%
No	96	44%	25%	88%	48%	57%	24%	55%	25%
Program Site									
True North, Grays Harbor County	97	47%	27%	88%	51%	47%	28%	54%	28%
True Star, Clallam County	95	37%	21%	83%	47%	69%	27%**	55%	24%
Recovery Support Services Volume									
Low (0-9)	101	47%	30%	87%	52%	48%	27%	55%	24%
High (10+)	70	33%	10%	81%	40%	69%	27%**	48%	25%

NOTE: The table indicates where the magnitude of changes differ significantly from that of the reference category, defined as the first category within each subgroup list (**p<math><.01</math>; **p<math><.05</math>; *p<math><.1</math>). For example, the reference category for recovery support services volume is "low (0-9)," and the increase in abstinence over time was greater for youth with a "high (10+)" dosage of recovery support services relative to this reference group. Note that recovery support services expenditures at the individual level were not available.

SOURCE: Global Appraisal of Individual Needs (GAIN) assessment data and DSHS Integrated Client Databases.

Part II. Impact Evaluation

To evaluate the impact of SAT-ED, we constructed a statistically matched comparison group and examined how treatment episode measures and outcomes among SAT-ED clients receiving enhanced SUD services differed from those of similar youth in outpatient SUD treatment services receiving “treatment as usual.” Outcomes were measured over a 12 month follow-up period derived from administrative data sources, including TARGET (chemical dependency treatment services) and the DSHS Research and Data Analysis Division’s (RDA’s) Integrated Client Databases (Mancuso 2014).

The study sample (n=149) included all youth who enrolled in SAT-ED between January 2013 and March 2015, whose program enrollment record could be linked with an intake record for publicly funded SUD treatment services, and who were enrolled in medical assistance (Medicaid or SCHIP) for at least one month during the 12-month period both preceding and following intake.

Propensity score matching was used to select a statistically matched comparison group (n=149) of youth who began an episode of publicly funded outpatient SUD treatment services in the same time period, and who were similar to SAT-ED participants in terms of baseline demographics, medical assistance enrollment, substance use disorder treatment needs, behavioral and health risk indicators, family and living situation, social service use, juvenile justice involvement, prior employment, and geographic characteristics (see appendix and technical notes for additional details).

The matched groups were used for analysis of both treatment episode measures (e.g., engagement) as well as several outcome categories including: SUD treatment utilization, juvenile justice involvement, emergency department visits, and employment. The SUD treatment episode measures are defined during the treatment episode; there is no parallel measure in the 12-month baseline period. For all other measures, we used a difference-in-difference (DID) approach, also known as an untreated control group design with pre-test and post-test (Shadish et al., 2002). This approach compares the change in outcomes between the pre- and post-periods for persons who receive enhanced treatment services, relative to the change observed for the “treatment as usual” or comparison group.

What is a Difference-in-Difference (DID)?

Calculating the difference-in-difference between SAT-ED and non-SAT-ED clients' change in rates of alcohol- and drug-related charges between the 12-month pre-period and the 12-month post-period:

- Change in rates of alcohol- and drug-related charges for SAT-ED clients:
21.5% in pre-period and 10.1% in post-period = – 11.4%
- Change in rates of alcohol- and drug-related charges for non-SAT-ED clients:
20.8% in pre-period and 16.8% in post-period = –4.0%
- Difference-in-difference:
(– 11.4%) – (–4.0%) = –7.4%

The decrease in rates of alcohol- and drug-related charges was 7.4 percentage points larger for SAT-ED clients compared to that of non-SAT-ED clients.

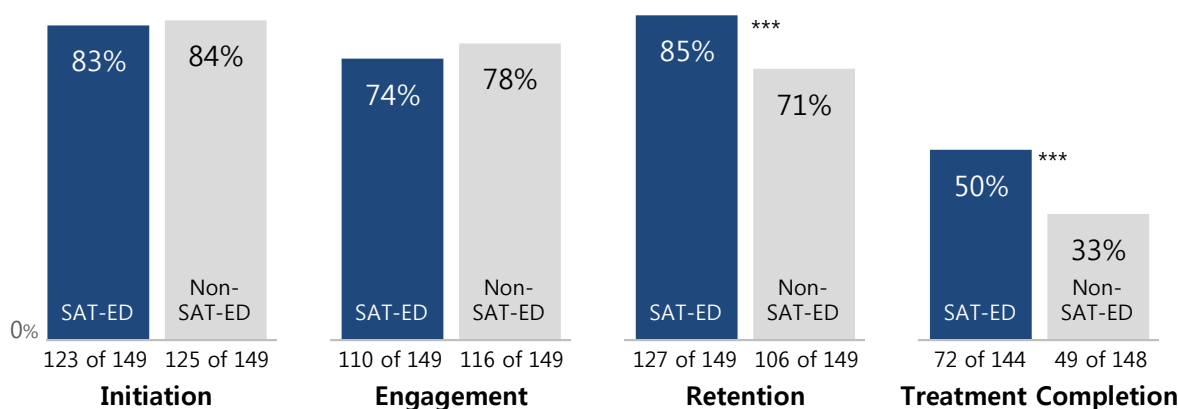
Substance Use Disorder Treatment Episode Measures

Substance use disorder treatment episode measures include the Washington Circle and related performance measures (Garnick et al 2009): initiation, engagement, retention, and treatment completion. These metrics aim to capture the quality of care after intake, and may be associated with positive treatment outcomes, such as reduced substance use (Garnick et al. 2012).

Results show that SAT-ED youth fared no better than the matched comparison group on measures of initiation and engagement, but have significantly higher rates of retention (85 percent compared to 71 percent; $p < .01$) and treatment completion (50 percent compared to 33 percent; $p < .01$). These findings indicate that SAT-ED youth were more likely to remain in treatment until successful completion, relative to peers receiving treatment as usual.

FIGURE 10.

Treatment Episode Measures



***Difference is statistically significant at $p = < .01$.

SOURCE: DSHS, Division of Behavioral Health and Recovery, Treatment and Assessment Report Generation Tool (TARGET) data system.

NOTE: Due to data lag, a handful of treatment completion outcomes are unknown. Although the resulting sample sizes are not identical across groups, the balance on baseline measures remains strong (nearly the same as in the full groups).

- Initiation** – Client received at least one additional outpatient SUD treatment service within 14 days after intake.
- Engagement** – Client received at least two additional outpatient SUD treatment services within 30 days after initiation.
- Retention** – Client received at least one outpatient treatment service every 30 days for the first 90 days after intake
OR was discharged as completing treatment within 90 days of intake
OR was transferred to a residential treatment facility within 90 days of intake.
- Treatment Completion** – Client was discharged as completing treatment.

Substance Use Disorder Treatment Utilization

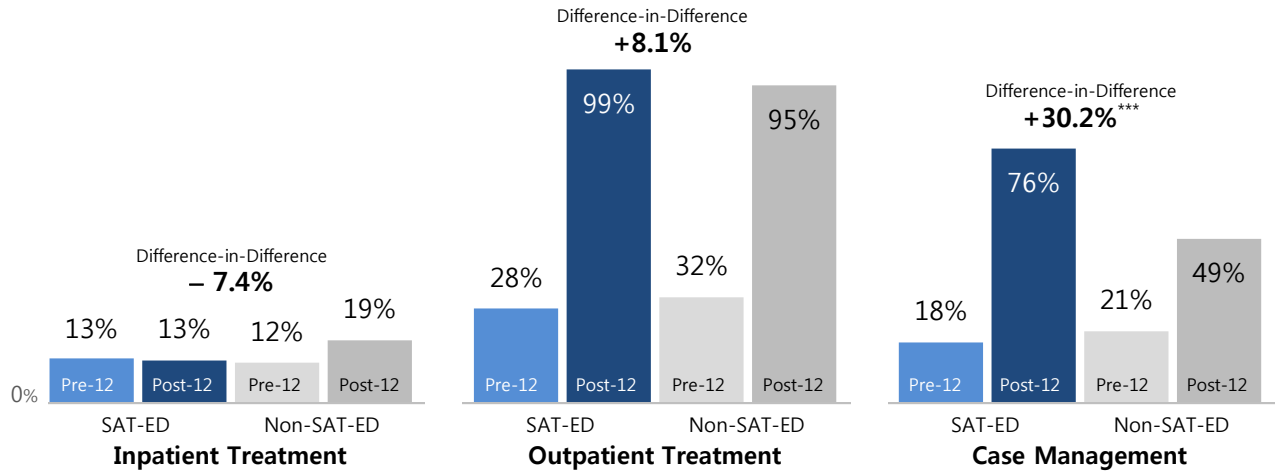
Results relating to the types of substance use disorder treatment utilization also reflect positive impacts of the SAT-ED treatment enhancements. The proportion of SAT-ED participants who used inpatient SUD treatment services remained stable across time: 13 percent in both the 12-month pre- and post-periods. In contrast, the rate of inpatient SUD treatment rose in the matched comparison group, from 12 percent in the pre-period, to 19 percent in the post-period. Although the difference-in-difference estimate suggests a beneficial effect of treatment (-7.4 percentage points), it is not statistically significant.

Nearly all of the SAT-ED participants and matched comparison group members received outpatient SUD treatment services in the 12-month period following intake, with a slightly higher rate among SAT-ED participants (99 percent compared to 95 percent). The difference-in-difference estimate (+8.1 percentage points) is positive but not statistically significant.

Over the 12-month follow-up period, SAT-ED participants experienced higher rates of SUD case management than their matched peers (76 percent compared to 49 percent), resulting in a large and statistically significant difference-in-difference (+30.2 percentage points; $p < .01$). This result is consistent with the recovery support services model used within the SAT-ED program, in which a recovery care coordinator works closely with each youth to develop and implement an individualized recovery plan.

FIGURE 11.

Treatment Utilization



***Difference-in-difference is statistically significant at $p = < .01$.

SOURCE: DSHS Integrated Client Databases.

Inpatient Treatment – Any inpatient substance use disorder treatment services in the 12-month period.
Outpatient Treatment – Any outpatient substance use disorder treatment services in the 12-month period.
Case Management – Any substance use disorder case management activities in the 12-month period.

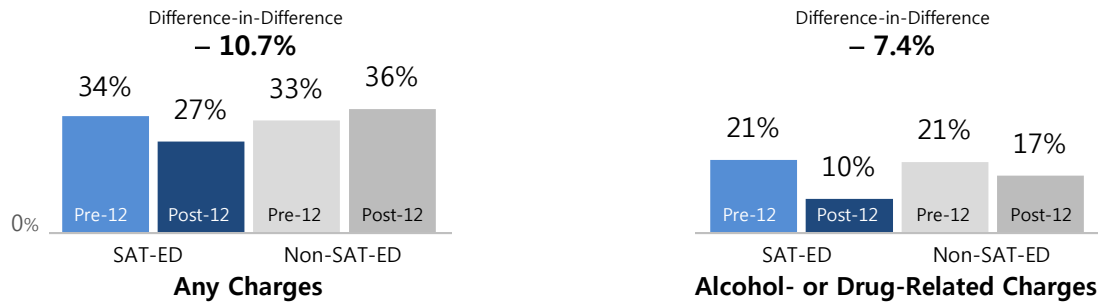
Juvenile Justice

Juvenile justice outcomes examined in this evaluation include charges for all types of offenses, and charges specifically for alcohol- and drug-related offenses. Alcohol- and drug-related charges include offenses such as driving under the influence (DUI) or being a minor intoxicated in public or a minor in possession (MIP) of drugs or alcohol. In addition to alcohol- or drug- related charges, the broader measure of any charges includes shoplifting, property crimes, and others.

Although SAT-ED participants and comparison group members were charged with offenses at similar rates in the 12-month pre-period (34 percent compared to 33 percent), the rates diverged in the 12-month post period, with the rate for SAT-ED participants rate decreasing (to 27 percent) and the comparison group rate increasing (to 36 percent). The estimated decrease in charges among SAT-ED participants, relative to the control group, was -10.7 percentage points (not statistically significant). SAT-ED participants also had a larger decline in alcohol- and drug-related charges, relative to the matched comparison group (-7.4 percentage points; not statistically significant).

FIGURE 12.

Juvenile Charges



NOTE: DID estimates shown are not statistically significant.
SOURCE: DSHS Integrated Client Databases.

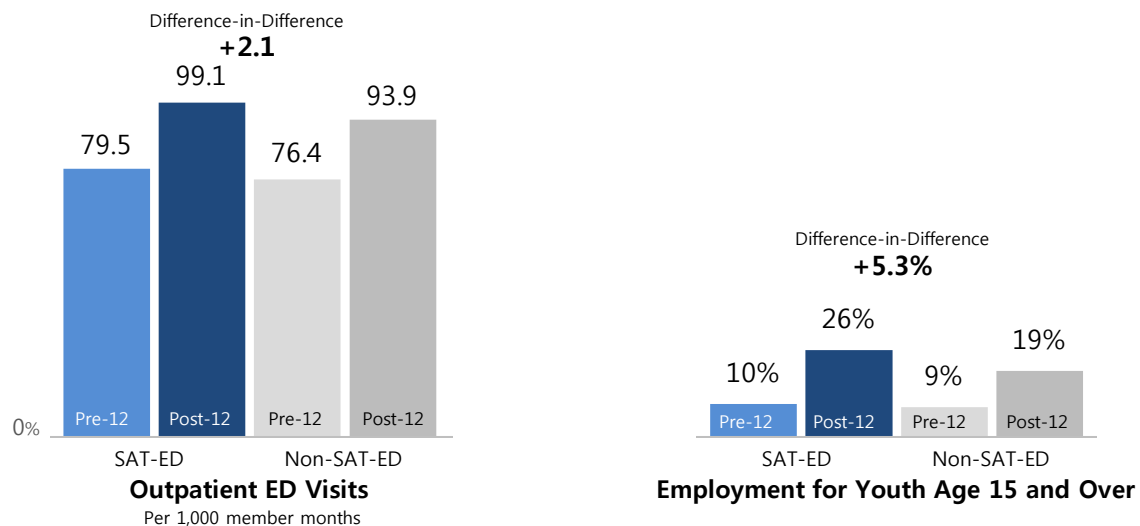
Any Charges – Charged with an offense in the 12-month period.
Alcohol- or Drug-Related Charges – Charged with an offense related to alcohol or drugs in the 12-month period.

Other Outcomes

This study also examined changes in emergency department utilization and employment outcomes. SAT-ED participants fared no better than the matched comparison group on rates of outpatient emergency department use. The difference-in-difference estimate shows very small increases for both groups, moving both from slightly below one visit per 12 months of Medicaid enrollment to slightly above one visit per 12 months of enrollment (+2.1 ED visit per 1,000 member months; not statistically significant). Employment rates were examined for a subset of the study population who was age 15 or older at intake, which included three-quarters of study participants (76 percent) in both the SAT-ED and matched comparison groups. Consistent with youth working more as they grow older, both groups increased employment rates between the pre- and post-periods. The increase was greater in the SAT-ED group (+5.3 percentage points; not statistically significant).

FIGURE 13

Other Outcomes



NOTE: DID estimates shown are not statistically significant.
SOURCE: DSHS Integrated Client Databases.

Outpatient ED Visit – Number of emergency department (ED) visits per 1,000 months enrolled in Medicaid or SCHIP.
Employment for Youth Age 15 and Over – Ever employed (full-time or part-time) in the 12-month period.

Discussion

This study describes the enhanced substance use disorder treatment services youth received by SAT-ED program participants, and the outcomes for youth who enrolled. Results show promising findings for the SAT-ED program.

First, SAT-ED program participants reported substantial improvements between intake and 6-month follow-up on several measures of a standardized assessment tool (GAIN). **The proportion of youth “in recovery” more than tripled between intake and 6-month follow-up, and the proportion abstaining from alcohol and drugs more than quadrupled.** Use of both alcohol and marijuana declined substantially. Many fewer youth reported frequent school absences and getting in trouble at school 6 months after enrolling in SAT-ED than at intake. These measures were not available for a comparison group, so it is unknown whether the changes for SAT-ED youth were of similar magnitude to those experienced by other youth in publicly funded SUD treatment in Washington State. However, findings do indicate that SAT-ED treatment led to improved recovery outcomes for youth.

Second, **SAT-ED youth were significantly more likely to receive case management services, and had significantly higher rates of treatment completion relative to the matched comparison group.** While not outcomes in and of themselves, these treatment factors may be associated with more positive long-term recovery outcomes.

Third, SAT-ED youth showed promising improvements in several key outcomes, measured through administrative data, relative to a statistically matched comparison group. **Due to the small number of youth in this study, most findings were not statistically significant, but nevertheless suggest positive effects of the SAT-ED program.** Between the pre- and post-periods (12 months before and after intake), **SAT-ED participants received more outpatient SUD treatment and less inpatient SUD treatment** relative to the matched comparison group. **SAT-ED participants experienced larger decreases in juvenile justice involvement** relative to the matched comparison group, as measured by legal charges filed over a 12-month period for any type of offense, as well as charges specifically for alcohol- or drug-related offenses. Employment rates increased more for SAT-ED youth relative to the matched comparison group, with one-quarter of SAT-ED participants 15 and over working full- or part-time within the 12 months after enrollment.

There were three important limitations to this study. First, the small sample size reduced the study's statistical power and limited its ability to demonstrate statistically significant program effects. The findings are promising, and build upon previous research on the evidence-based program enhancements, but alone do not meet the standard threshold for evidence of program effectiveness. A future study providing treatment enhancements to a larger number of program participants could better assess program effects. Second, administrative data on educational outcomes were unavailable. Given the promising improvements in self-reported school outcomes, future studies should consider the feasibility of incorporating educational outcomes from administrative data.

Lastly, because the three treatment enhancements were bundled together, the study is unable to determine which was most strongly associated with the promising findings, or if the combination is responsible. Subgroup analyses of self-reported outcomes from the GAIN suggest that youth who received more recovery services made greater progress to recovery than others. The current study cannot distinguish between two alternative explanations for these findings: (1) the dosage-response explanation, i.e. that a higher dosage of RSS leads to stronger recovery outcomes; or (2) that youth with less intense needs or more motivation, likely to experience stronger recovery outcomes with or without RSS, accessed more RSS through the SAT-ED program. To more conclusively determine the net impact of recovery support services on youth SUD treatment outcomes, a pilot program would need to provide a group of youth with SUD “treatment as usual” except for the addition of recovery support services.

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APPENDIX

Baseline Measures

Baseline characteristics of the 149 SAT-ED clients in the study population, and of the matched comparison group are shown in Table 2. Note that the 149 SAT-ED clients in the SAT-ED treatment group in this study represent a subset of the 269 total youth who received SUD treatment services through the SAT-ED program. The selected 149 are those clients in publicly funded SUD treatment services with sufficient data both in the pre-period (12 months before intake) and the post-period (12 months following intake) to enable matching to comparison group clients and measuring outcomes one year later. Additional details on the selection of the study population and construction of the matched comparison group can be found in the technical notes.

TABLE 2.

Baseline Measures for SAT-ED Participants and Non-SAT-ED Comparison Group

	Study Population	
	SAT-ED n = 149	Non-SAT-ED n = 149
Demographics		
Average Age	15.5	15.5
Sex		
Male	52%	52%
Female	48%	48%
Race/Ethnicity		
Non-Hispanic white	60%	60%
Any minority	40%	40%
Minority Group Categories not mutually exclusive		
American Indian or Alaska Native	23%	19%
Black or African American	11%	12%
Hispanic or Latino	11%	11%
Asian or Pacific Islander	2%	5%
Primary language in home is English	99%	100%
Year of Index Month		
2013	44%	40%
2014	40%	46%
2015	15%	15%
Substance Use Disorder, Current Treatment Episode		
Referral Sources Categories not mutually exclusive or exhaustive		
Court/probation/diversion	44%	43%
School/education	38%	40%
Self/family	9%	10%
Primary Substance		
Marijuana	79%	80%
Alcohol	9%	8%
Methamphetamines	9%	7%
Other	3%	5%
Substance Use Prior to Intake		
Used alcohol to intoxication, 30 days prior to intake	14%	11%
Used marijuana more than 12 times, 30 days prior to intake	17%	21%

	Study Population	
	SAT-ED n = 149	Non-SAT-ED n = 149
Behavioral Health History		
Previous SUD Treatment Episode, Ever	36%	40%
Receipt of SUD Treatment, 12 months before index month		
Outpatient Treatment	28%	32%
Inpatient treatment	13%	12%
Case management	18%	21%
Detox	1%	2%
Days of SUD Treatment, 12 months before index month		
Outpatient treatment	7.6	7.7
Inpatient treatment	7.5	8.5
Case management	0.8	0.8
Behavioral Health Treatment Needs, 24 months before index month		
Substance use disorder treatment need	53%	51%
Mental health treatment need	58%	60%
DBHR Mental Health Services, 12 months before index month	29%	30%
Mental Health Crisis Services, 12 months before index month	15%	17%
Family and Living Situation		
Foster care, Ever in lifetime	28%	28%
Foster care, 12 months before index month	9%	10%
Family/household member has drug/alcohol problem, at intake	56%	56%
Housing instability/homelessness, 12 months before index month	13%	11%
Ran away from home, 12 months before intake	26%	28%
Health Care Indicators, 12 months before index month		
Medical assistance enrollment months	10.9	10.7
Outpatient emergency department visits per 1,000 MM	79.5	76.4
Outpatient emergency department visits per 1,000 MM with alcohol- or drug-related diagnosis	5.7	4.7
Other Baseline Indicators, 12 months before index month		
Employment (part-time or full-time)	8%	7%
School Suspension or Expulsion, 12 months before intake	44%	46%
Social Service Use		
Basic Food	68%	64%
TANF	17%	15%
Child welfare	39%	40%
Criminal Justice Involvement		
Any juvenile justice (arrests, charges, convictions, Juvenile Rehabilitation)	38%	38%
Any charges	34%	33%
Any alcohol or drug-related charges	21%	21%
County-Level Indicators		
High-Density Urban County	0%	0%
Students Eligible for Free/Reduced-Price Lunches	58%	55%
Alcohol Use in Past 30 Days, 10 th graders	26%	24%
Marijuana Use in Past 30 Days, 10 th graders	19%	21%

NOTE: All differences shown had absolute standardized mean difference (ASMD) less than .2, indicating acceptable balance, with the exception of three county-level indicators. The ASMD is not a suitable measure of balance for these indicators because of the minimal variation in the denominator when the treatment group contains only two counties.

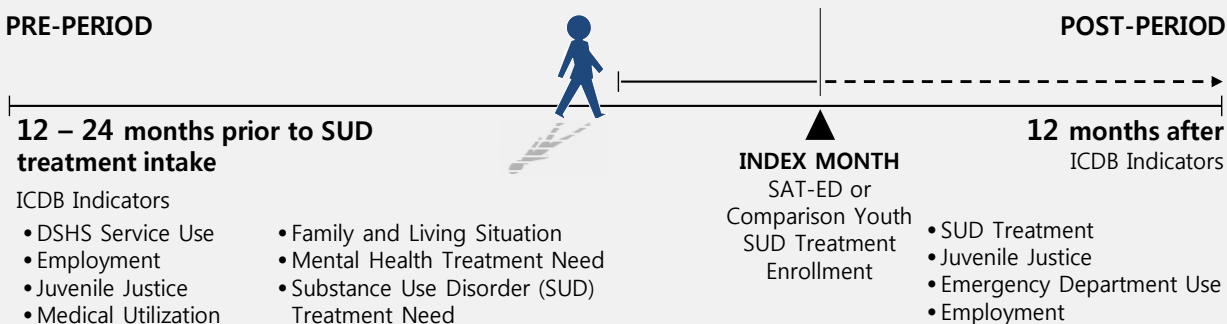
TECHNICAL NOTES

STUDY POPULATION AND TIME PERIOD

The study population for the impact evaluation was comprised of youth age 12 to 18 who entered publicly funded outpatient substance use disorder treatment services between January 2013 and March 2015. The index month for each client was the month of intake to treatment. Baseline characteristics were measured over the 12 to 24 months prior to the index month, and outcomes were measured over a 12-month follow-up period. All study participants were required have at least one month of Medicaid or SCHIP enrollment during the pre- and post-period.

PRE-PERIOD

POST-PERIOD



- **SAT-ED treatment group** (n = 149): The SAT-ED treatment group was comprised of youth who enrolled in the SAT-ED program between January 2013 and March 2015 at True Star in Clallam county or True North in Grays Harbor county. The index month was assigned as the month of intake in linked publicly funded outpatient SUD treatment records in TARGET administrative data system. Treatment group members were required to have at least one month of Medicaid or SCHIP enrollment during the pre- and post-period (required to adequately measure pre-period matching variables and outcome variables). Fifty-six SAT-ED clients were dropped from the treatment group due to either not meeting the Medicaid enrollment requirement or having a private payer at SUD treatment intake.
- **Comparison group sampling frame** (n = 3,121 person months): The comparison group sampling frame included youth (12-18) who entered publicly funded outpatient SUD treatment services between January 2013 and March 2015. Youth in the sampling frame were required to live in counties not designated as high-density urban (this excluded youth in Clark, King, Kitsap, Pierce, Snohomish, Spokane, and Thurston counties, who lived in contexts not comparable to youth in Clallam and Grays Harbor counties). Youth were required to have at least one month of Medicaid/SCHIP enrollment during the pre- and post-period. Additionally, any youth who received SUD treatment services at any time during the grant period at the two participating provider agencies were excluded from the comparison group. (Note that the comparison group sampling frame includes multiple records for each person. Each index month meeting study criteria for inclusion was treated as a single record.)

COMPARISON GROUP SELECTION

To select the comparison group, we identified youth SUD treatment clients from the sampling frame described above who were similar to SAT-ED participants with respect to baseline characteristics, who did not participate in the SAT-ED program.

We used a statistical technique known as propensity score matching to estimate the probability of SAT-ED enrollment using logistic regression models, using baseline measures as predictors. The propensity scores obtained from these models were used to create matched comparison groups using 1:1 nearest neighbor matching, with exact matching on sex and age group. (We did test the possible use of 1:5 matching to boost statistical power; results were similar.)

To test for balance in baseline characteristics after matching, we calculated the absolute standardized mean difference (ASMD) for each baseline measure included in the propensity score models. Achieving a standardized mean difference of .2 or less is generally considered an indication of acceptable balance (Cohen 1992). All of our baseline measures fell below this threshold, with the exception of three county-level indicators. The ASMD is not a suitable measure of balance for these indicators because of the minimal variation in the denominator in this context where the treatment group contains only two counties.

County-level variables differ no more than three percentage points between the groups, and robustness tests that control for these small residual imbalances yielded very similar results. Unadjusted difference-in-difference (DID) estimates are reported in the body of this report.

DATA SOURCES AND MEASURES

The SAT-ED program collected several types of data for clinical purposes, performance monitoring, and/or to fulfill federal reporting requirements.

- **EBTx.** This web-based data system run by Chestnut Health Systems was used by clinical staff to track the details of A-CRA treatment sessions with SAT-ED participants. EBTx data were used to support A-CRA training and certification. Data are summarized in report section, "Adolescent Community Reinforcement Approach (A-CRA)."
- **GAIN-ABS.** This web-based data system run by Chestnut Health Systems was used by clinical staff to record assessment data from the Global Appraisal of Individual Needs (GAIN). It includes youth self-reports on a range of topics including recent substance use; mental health; environment and living situation; and school, work and financial status. GAIN data were used for clinical purposes and program monitoring. Selected items are summarized in report section, "Part I. Self-Reported Outcomes."
- **Government Performance and Results Act Services Accountability Improvement System Client Outcome Measures for Discretionary Programs (GPRA/SAIS).** SAT-ED staff were required to collect these federally-mandated client interviews at enrollment, 6-month follow-up, and discharge. Questionnaire items included demographic questions and items regarding substance use, housing status, social connectedness, criminal justice involvement, education and employment. GPRA data were used for program monitoring, and for tracking program enrollment and discharge.

Administrative data come from the DSHS Integrated Client Databases (ICDB), a longitudinal, integrated set of client databases containing nearly 20 years of detailed services, history, costs and outcomes (Mancuso, 2014).

Demographics

- We used the DSHS Integrated Client Databases (ICDB) for information on county of residence, age, sex, race, and ethnicity. Primary language and index month came from the DBHR's electronic data system that stores information on substance use disorder treatment services, the Treatment and Assessment Report Generation Tool (TARGET).

Substance Use Disorder Treatment

- Information on the current treatment episode of SUD treatment, including referral sources, primary substance, and substance use prior to intake, came from DBHR's TARGET data system.

Behavioral Health History

- TARGET was also the source of information on whether a client had any previous publicly funded SUD treatment in Washington State. Pre-period receipt of any mental health treatment in the 12 months before index was identified from the ICDB. Behavioral health treatment need measures were constructed from data elements in the ICDB.
- Substance use disorder treatment need was flagged when a youth had at least one substance-related diagnosis, procedure, prescription, treatment, or arrest in the 24 months prior to intake.
- Mental health treatment need was flagged when a youth had at least one mental health diagnosis, prescription or service recorded in administrative data in the 24 months prior to intake.

Family and Living Situation

- Foster care and housing instability/homelessness measures came from the ICDB. Foster care information was derived from the Children's Administration FamLink data system. Homelessness/housing instability was identified through living arrangement status reported to DSHS caseworkers and recorded in ACES, CIS and/or the Homeless Management Information System (HMIS).
- The flag for whether a family/household member has a drug or alcohol problem at intake, and whether a youth ran away from home in the 12 months before intake, were self-reported on the SUD treatment intake record in TARGET.

Health Care Indicators

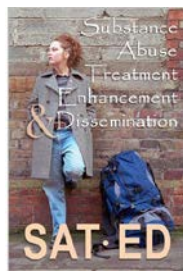
- Medical eligibility and emergency department visits were based on information in the DSHS' ICDB, originally integrated from ProviderOne (the electronic data system maintained by Washington's Health Care Authority). Emergency department use was identified from ProviderOne medical claims and encounters for Medicaid/SCHIP clients.

Other Baseline Measures

- Other baseline measures are from the ICDB, with the exception of school suspension or expulsion in the 12 months before intake, which is from the youth's SUD treatment intake record in TARGET.
- Employment status (part-time or full-time) derived from data were obtained from the Washington State Employment Security Department. Individuals were considered employed if they had at least one quarter of non-zero earnings during the period.
- Basic Food and TANF cash assistance histories were derived from Economic Services Administration records (ACES) and child welfare service utilization was derived from Children's Administration records (FamLink).
- Criminal justice involvement was derived from Washington State Patrol (WSP) arrest records, charges recorded in the WSIPP Criminal History Database, and Juvenile Rehabilitation records. Alcohol- and drug-related charges include offenses such as driving under the influence (DUI), minor in possession (MIP) of drugs or alcohol, or minor intoxicated in public. The broader measure of any charges additionally includes shoplifting, property crimes, and others.

County-Level Indicators

- The two SAT-ED counties (Clallam, Grays Harbor) are compared to counties of residence, as recorded in the ICDB, for other youth entering publicly funded SUD treatment services outside of high-density urban counties over the same time period.
- The proportion of students eligible for free/reduced-price lunches is a five-year rate, averaging data from 2012 through 2016 from the Office of the Superintendent of Public Instruction. Rates represent students eligible for free- or reduced-price lunches per 100 public school students enrolled.
- The rates of alcohol and marijuana use in the past 30 days were reported by 10th grade respondents to the 2014 Healthy Youth Survey, a biennial school-based survey that asks public school students to report on health behaviors and health risk and protective factors. The survey is sponsored by the Department of Health, the Office of Superintendent of Public Instruction, the Department of Social and Health Services, the Department of Commerce, and the Liquor and Cannabis Board.



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