



2018

FINDINGS FROM THE
**ADOLESCENT KENTUCKY
TREATMENT OUTCOME STUDY
(AKTOS)**

EXECUTIVE SUMMARY

This report summarizes substance abuse treatment outcomes for the Adolescent Kentucky Treatment Outcome Study (AKTOS). The goal of AKTOS is to examine client satisfaction and outcomes for specific targeted factors including: (1) substance use including severity of substance use, (2) mental health, (3) school attendance and performance, and employment, (4) caregiver and living situation, (5) involvement with the justice system, and (6) recovery support.

This report describes the sample of adolescents in two main ways: (1) providing characteristics of the 318 adolescents who completed an intake interview in FY 2015 and FY 2016, and (2) the presentation of outcomes for a subsample of 122 youth who completed an intake interview in FY 2015 and FY 2016 and a 12-month follow-up telephone interview in FY 2016 and FY

2017. Of the adolescents who agreed to be contacted and were eligible for the follow-up survey (n = 137), the CDAR research team completed follow-up surveys with 122 individuals—a follow-up rate of 89.1%.

CLIENT SATISFACTION WITH TREATMENT EXPERIENCE

Results show that adolescent clients were satisfied with the treatment services they received. The majority of clients (65.6%) gave a highly positive rating between 8 and 10 of their satisfaction with the treatment program, with 1 representing the worst treatment and 10 representing the best treatment. The vast majority of clients understood their rights as clients of substance abuse treatment, believed they were treated with respect, understood what staff expected of them, understood their treatment plan, felt better about themselves as a result of their

treatment, and believed they had received the services they needed to help them get better.

SUBSTANCE USE

At follow-up, there were significant reductions in use of any illegal drugs from intake (93.4%) to follow-up (42.1%). Specifically, there were significant reductions in use of marijuana, synthetic drugs, opioids/opiates, Central Nervous System (CNS) depressants, stimulants, and alcohol. Furthermore, at intake, 36.1% met criteria for no substance use disorder (SUD), while at follow-up, the majority (82.8%) met criteria for no SUD.

MENTAL HEALTH

Adolescents' self-reported mental health problems were significantly reduced at follow-up. Specifically, the percent of adolescents who had a score indicating clinically significant attention problems, a score

Five core components of the AKTOS evidence based assessment



**SUBSTANCE
USE**



**MENTAL
HEALTH**



**SCHOOL
ATTENDANCE AND
PERFORMANCE**



**JUSTICE SYSTEM
INVOLVEMENT**



**ADVERSE CHILDHOOD
EXPERIENCES AND
VICTIMIZATION**

Two supplemental components of the AKTOS evidence based assessment



CAREGIVER INVOLVEMENT

indicating clinically significant internalizing problems, and a score indicating clinically significant externalizing problems decreased significantly from intake to follow-up. The percent of youth who reported suicide ideation and/or attempts decreased from 22.5% at intake to 8.3% at follow-up. The proportion of youth who reported any type of disordered eating decreased significantly.

SCHOOL ATTENDANCE AND PERFORMANCE

Youth's academic performance improved while the number of individuals with school disciplinary action decreased from intake to follow-up. Among adolescents who were enrolled in school at intake and follow-up, the mean Grade Point Average (GPA) increased significantly from 2.1 at intake to 2.7 at follow-up. Self-reported school absences in the past 3 months decreased significantly from intake (13.4) to follow-up (6.7). The percent of youth enrolled in school in the past 3 months who reported

missing any school because they were in detention, under suspension, or expulsion decreased significantly from 62.0% at intake to 12.7% at follow-up.

Because 18 is the typical age at which individuals graduate from high school, education status at follow-up was examined for the 40 individuals who were 18 years old or older at follow-up. Less than half of individuals who were at least 18 years old at follow-up ($n = 50$) had obtained a high school diploma or GED (30.0%), and 55.0% were enrolled in secondary school. A small percent (15.0%) of individuals were not enrolled in school and had less than a high school diploma or GED (i.e., dropout). The existence of this small percentage of dropouts in the follow-up sample suggests a need for far more intensive school-based programs to retain and successfully intervene with at-risk youth. At follow-up, the majority of individuals (72.2%) who had less than a high school diploma or GED reported they were unemployed and



RECOVERY SUPPORTS

half of individuals with a high school diploma or GED were unemployed.

LIVING SITUATION

The majority of youth reported their primary caregiver(s) was their biological parent(s) at intake (68.9%) and follow-up (63.9%). About a quarter of individuals reported their caregiver was other family (including kinship foster care and adoptive parents). At intake and follow-up, adolescents rated their primary caregiver's involvement in their lives as high, on average, with a significant but slight increase over time. With regard to their living situation in the past 12 months, significantly fewer individuals reported they had lived in an institutional facility (e.g., juvenile detention, residential treatment, group home) at follow-up (18.2%) than at intake (33.1%). Further, there was a significant decrease from intake to follow-up in the percent of youth who reported independent living, including living with peers, on their own, or on the streets.

JUSTICE SYSTEM INVOLVEMENT

For the most part, youth’s involvement with the justice system decreased from intake to follow-up. The percent of youth who reported being arrested and charged with any type of offense and the number of youth who were under supervision of the justice system decreased significantly; however, the percent of youth who reported they were in juvenile detention or incarcerated remained unchanged.

RECOVERY SUPPORTS

Attendance at mutual help recovery meetings is not a major source of recovery support for adolescents in the AKTOS sample. Nonetheless, the average number of people

youth said they could count on for recovery support increased from intake to follow-up, as did youth’s rating of their overall satisfaction with the level of recovery support in their lives.

Overall, results from this outcome evaluation study provide evidence that publicly-funded substance abuse treatment for adolescents facilitated positive changes for the vast majority of clients in a variety of areas including decreased substance use, decreased severity of substance use disorders, decreased mental health problems, improved school performance and decreased disciplinary issues at school, and a decrease in supervision by the justice system. Results also suggest clients appreciate their experiences in the community mental health

center (CMHC) substance abuse treatment programs. Investment in treatment for today’s substance using adolescents may translate into not only avoidance of substantial health care, mental health care, public benefit, and criminal justice system costs, but may also lead to gains in education, employment, health, and other less tangible qualities (e.g., social capabilities, parenting, quality of life) of adolescents who grow into tomorrow’s adults.

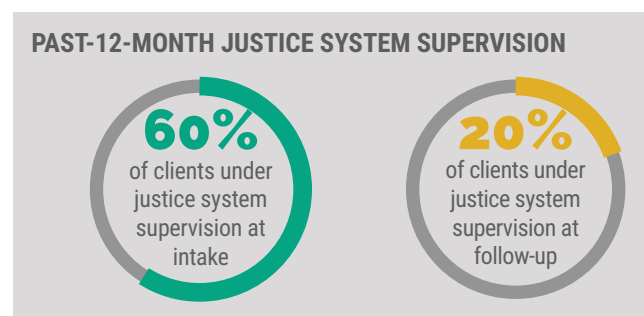
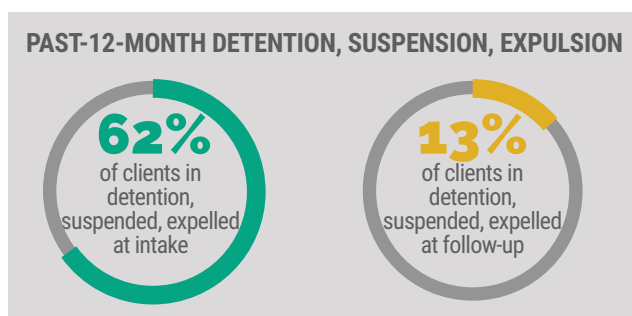
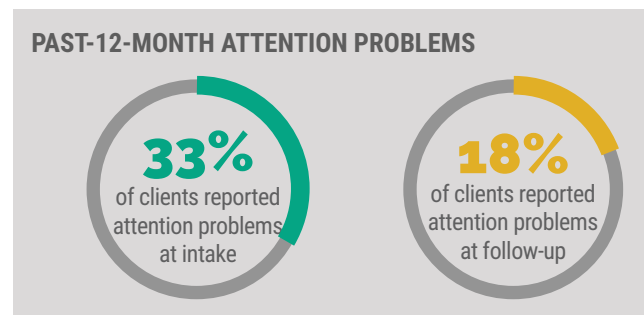


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PROJECT ACKNOWLEDGMENTS

PRESENTED BY:

Kentucky Department for Behavioral Health,
Developmental and Intellectual Disabilities,
Division of Behavioral Health
275 E. Main Street, 4W-F, Frankfort, KY 40621
(502) 564-4527
<http://dbhdid.ky.gov/kdbhdid>

WENDY MORRIS

Commissioner

KOLEEN SLUSHER

Director
Division of Behavioral Health

MAGGIE SCHROEDER

Branch Manager
Substance Abuse Treatment and Recovery Services Branch

MICHELLE KILGORE

Adolescent Substance Abuse and Co-Occurring Program
Administrator

REPORT PREPARED BY:

UNIVERSITY OF KENTUCKY CENTER ON DRUG & ALCOHOL RESEARCH

Behavioral Health Outcome Studies
333 Waller Avenue, Suite 480
Lexington, KY 40504

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INTRODUCTION

Kentucky's Community Mental Health Centers (CMHC) provide substance abuse treatment (including outpatient, intensive outpatient, residential, and case management) to adolescents (ages 12 - 17 years old). The Commonwealth of Kentucky funds substance abuse treatment programs using both federal block grants and state general fund dollars. To measure treatment effectiveness, the Division of Behavioral Health within the Department for Behavioral Health, Developmental and Intellectual Disabilities (DBHDID) funds the Adolescent Kentucky Treatment Outcome Study (AKTOS).

The goal of AKTOS is to provide a biannual outcome evaluation for the DBHDID in partnership with the Behavioral Health Outcome Studies team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR).

This report presents the results of the outcome evaluation in ten sections:

Section 1: Overview and Description of Adolescent Clients in Substance Abuse Treatment in Kentucky. This section briefly describes publicly-funded substance abuse treatment in Kentucky and the Adolescent Kentucky Treatment Outcome Study (AKTOS) including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who participated in publicly-funded substance abuse treatment in Kentucky's Community Mental Health Centers in FY 2015 and 2016 as well as clients who completed a 12-month follow-up interview.

Section 2: Client Satisfaction with Substance Abuse Treatment Programs. This section describes two aspects of client satisfaction: (1) overall client satisfaction, and (2) client ratings of program experiences.

Section 3: Substance Use. This section examines substance use changes from the period before entering treatment (i.e., pre-program) to the 12-month follow-up (i.e., 12 months after they entered treatment). Analysis is organized by presenting the percent of individuals who reported use of any illegal drugs or alcohol, and then the percent of individuals who reported using illegal drugs, alcohol, and tobacco at intake and follow-up. In addition to examining the overall use of illegal drugs, several specific categories of illegal drugs were examined including: (a) marijuana, (b) synthetic drugs [i.e., bath salts, synthetic marijuana], (c) opioids [i.e., prescription opiates, methadone, and buprenorphine], (d) heroin, (e) central nervous system (CNS) depressants [i.e., tranquilizers, benzodiazepines, sedatives, and barbiturates], (f) stimulants/cocaine [i.e., cocaine, methamphetamine, Ecstasy, MDMA, Adderall, and Ritalin], and (g) other illegal drugs not mentioned above [i.e., hallucinogens and inhalants]. Analysis is presented in detail for adolescents who were not in a controlled environment for the entire period of 12 months and/or 30 days before entering treatment or the follow-up interview. Additionally, the average number of months individuals reported using each substance are presented for those individuals who reported any use at each period (i.e., intake and follow-up).

Section 4: Mental Health. This section examines change from pre-program to 12-month follow-up on seven mental health measures: (1) attention problems, (2) internalizing problems, (3) externalizing problems, (4) suicidality, (5) disordered eating, (6) stress and coping, and (7) emotion regulation. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

Section 5: Education and Employment. This section examines changes in education and employment from pre-program to 12-month follow-up. Specifically, this section presents data on: (1) enrollment in school, (2) grade point average, (3) school absences for any reason and specifically for disciplinary reasons, (4) detention, suspension, and expulsion, (5) education status for individuals 18 years old and older at follow-up, and (6) employment status among those who were attending school and among those who were not attending school.

Section 6: Caregiver Involvement and Living Situation. This section of target factors examines the adolescent's perception of their primary caregiver's involvement in their life and the adolescent's living situation in two periods: pre-program and 12-month follow-up. Specifically, clients were asked about: (1) their primary caregiver, (2) their primary caregiver's involvement in their life, and (3) the types of residences they had lived in the past 12 months (i.e., parents' home, other relatives' home, foster care, institutional facility, on their own).

Section 7: Justice System Involvement. This section describes change in client involvement with the justice system during the 12-month period before entering treatment and during the 12-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) the number of times arrested, (3) types of criminal offenses (status offenses vs. public offenses), (4) any detention or incarceration; (5) the number of nights in detention or incarceration; and (6) supervision by the justice system.

Section 8: Recovery Supports. This section focuses on three main changes from pre-program to 12-month follow-up in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) the number of people the participant said they could count on for recovery support, and (3) satisfaction with their recovery support.

Section 9: Associations of Factors with Substance Use Severity at Follow-Up. This section presents multivariate associations of targeted factors at intake with substance use severity at 12-month follow-up.

Section 10: Summary and Conclusions. This section presents, summarizes, and discusses the implications of the major findings from the AKTOS Follow-Up 2018 Report.

SECTION 1

OVERVIEW AND DESCRIPTION OF AKTOS CLIENTS

This section briefly describes publicly-funded substance abuse treatment in Kentucky and the Adolescent Kentucky Treatment Outcome Study (AKTOS) including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who participated in publicly-funded substance abuse treatment in Kentucky's Community Mental Health Centers in FY 2015 and 2016 as well as clients who completed a 12-month follow-up interview.

Publicly Funded Substance Abuse Treatment for Adolescents

Adolescence is a critical period of vulnerability to substance use. The neurodevelopment of the brain renders the adolescent brain more vulnerable to addiction than the adult brain.¹ Furthermore, the effects of substance use are more damaging to adolescents' brains than to adults' brains in many ways, and in some cases may have long-lasting effects.^{2,3,4,5} In addition, early use of alcohol and drugs is a robust predictor of substance use disorders in adulthood.⁶ Thus, early and effective treatment for substance abuse among adolescents is a high priority public health problem.

Kentucky's sociocultural context includes some of the highest rates in the United States for drug overdose fatalities among 12- to 25-year old individuals, smoking, teen births, major depressive episode, and obesity in 10- to 17-year-old individuals, along with the fourth highest proportion of adolescents on disability in the US.^{7,8,9} Kentucky was ranked as the 12th lowest state in the percent of children (ages 3 – 17) with a mental/behavioral condition who received treatment or counseling (47.9%).¹⁰ In 2016 Kentucky ranked 42nd in the U.S. for health rankings, in which states are ranked across 34 measures of behaviors, community and environment, policy, clinical care, and outcomes.¹¹ Kentucky also ranks

¹ Volkow, N., & Li, T.K. (2004). Drug addiction: The neurobiology of behavior gone awry. *Neuroscience*, 5, 963-970.

² Clark, D., Thatcher, D., & Tapert, S. (2008). Alcohol, psychological dysregulation, and adolescent brain development. *Alcohol Clinical and Experimental Research*, 32(3), 375-385.

³ Crews, F., He, J., & Hodge, C. (2007). Adolescent cortical development: A critical period of vulnerability for addiction. *Pharmacology, Biochemistry and Behavior*, 86(2), 189-199.

⁴ National Center on Addiction and Substance Abuse [CASA]. (2009). *Shoveling up II: The impact of substance abuse on federal, state and local budgets*. New York: The national Center on Addiction and Substance abuse at Columbia University.

⁵ Squeglia, L. M., Jacobus, J., & Tapert, S. F. (2009). The influence of substance use on adolescent brain development. *Clinical EEG Neuroscience*, 40(1), 31-38.

⁶ Grant, B. F., & Dawson, D. A. (1997). Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse*, 9, 103-110.

⁷ Centers for Disease Control and Prevention, National Center for Health Statistics. (2016). National Survey of Children's Health (NSCH) 2011/12. Data query from the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health website. Retrieved March 15, 2018 from www.childhealthdata.org.

⁸ Centers for Disease Control and Prevention. (2016). *Kentucky 2015 and United States 2015 Results, High School Youth Risk Behavior Survey*. Retrieved March 15, 2018 from <https://nccd.cdc.gov/youthonline/app/Results.aspx?LID=KY>.

⁹ Mental Health America. (2015). *Mental Health in America-Youth Data*. Retrieved on March 15, 2018 from <http://www.mentalhealthamerica.net/issues/mental-health-america-youth-data>.

¹⁰ Child and Adolescent Health Measurement Initiative (CAHMI). Data Resource Center for Child and Adolescent Health. 2016 National Survey of Children's Health (NSCH) data query. Retrieved March 15, 2018 from www.childhealthdata.org.

¹¹ United Health Foundation. (2017). *America's health rankings annual report: A call to action for individuals and their communities, 2016*. Minnetonka, MN: United Health Foundation Retrieved on March 15, 2018 from www.americashealthrankings.org

second highest in the nation for children aged 0-17 with 2+ adverse childhood experiences.¹¹ Kentucky also ranks low in financial opportunity, financial well-being, and has a high percentage of children living in poverty (see Figure 1.1).^{12,13} In fact, in 2016, Kentucky ranked as 49th of the states for well-being.

FIGURE 1.1 KENTUCKY CONTEXT



Unfortunately, only a minority of treatment facilities offer specialized care for adolescents.⁴ In the most recent National Survey of Substance Abuse Treatment Services (N-SSATS) Profile of Kentucky treatment facilities in 2016 only 27.3% of the 363 surveyed treatment facilities provided treatment to adolescents.¹⁴ In the 2015 and 2016 National Survey on Drug Use and Health (NSDUH) it was estimated that 2.1% of adolescents in Kentucky needed but did not receive treatment for alcohol use and 2.8% of adolescents in Kentucky needed but did not receive treatment for illicit drug use in the past 12 months.¹⁵

The goal of AKTOS is to provide an annual outcome evaluation of Community Mental Health Centers' substance abuse treatment programs for the Department for Behavioral Health, Developmental and

¹² Gallup Polls. (2018). *State of American well-being: 2017 State Well-being Rankings*. Retrieved on April 12, 2018 from https://assets.americashealthrankings.org/app/uploads/ahrannual17_complete-121817.pdf.

¹³ Centers for Disease Control and Prevention. (2016). *Kentucky 2015 and United States 2015 Results, High School Youth Risk Behavior Survey*. Retrieved March 15, 2018 from <https://nccd.cdc.gov/youthonline/app/Results.aspx?LID=KY>.

¹⁴ Substance Abuse and Mental Health Services Administration (SAMHSA). (2016). *2016 State Profile—United States and Other Jurisdictions National Survey of Substance Abuse Treatment Services (N-SSATS)*. Washington, DC: SAMHSA, Center for Behavioral Health Statistics and Quality. Retrieved on March 19, 2018 from https://www.dasis.samhsa.gov/dasis2/nssats/n2016_st_profiles.pdf.

¹⁵ Substance Abuse and Mental Health Services Administration. (2017). *2015-2016 National Survey on Drug Use and Health: Model-based prevalence estimates (50 states and the District of Columbia), Tables 23-24*. Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services. <https://www.samhsa.gov/data/sites/default/files/NSDUHsaePercents2016/NSDUHsaePercents2016.pdf>

Intellectual Disabilities in partnership with the Behavioral Health Outcome Studies team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR). Specifically, the outcome evaluation examines client satisfaction and outcomes for several targeted factors including: (1) substance use including severity of substance use, (2) mental health, (3) school attendance and performance, and employment, (4) relationship with caregiver and living situation, (5) justice system involvement, and (6) recovery support. Data are self-reported by clients at treatment intake and 12-month follow-up using evidence-based assessments.¹⁶

This report describes the sample of adolescents in two main ways: (1) providing characteristics of the 318 adolescents who completed an intake interview in FY 2015 and FY 2016, and (2) the presentation of outcomes for a subsample of 122 youth who completed an intake interview in FY 2015 and FY 2016 and a 12-month follow-up telephone interview in FY 2016 and FY 2017.

AKTOS includes a face-to-face intake interview conducted by treatment program staff using an evidence-based assessment to measure targeted factors (submitted to UK CDAR from July 1, 2014 through June 30, 2016). In FY 2015 and FY 2016, 318 adolescents completed an intake survey.¹⁷ At the completion of the intake interview, treatment staff informed clients about the opportunity to participate in the AKTOS follow-up telephone interview and asked if they were interested in participating. Almost half of clients (47.8%, n = 152) gave consent to be contacted for the follow-up interview. The follow-up sample was then selected from 146 clients who agreed to be contacted for the follow-up interview and gave the minimum amount of locator information.

Description of Adolescent Clients Who Completed an Intake Interview at Treatment Intake

DEMOGRAPHICS

The majority of clients with an intake survey submitted in FY 2015 and 2016 were male (70.1%), White (78.9%), and were 16 or 17 years old at intake (66.7%). Fewer than one in ten clients reported they were African American/Black (9.1%), 8.2% reported they were multiple races, and 3.8% reported they were Hispanic, or Asian. Clients were, on average, 15.8 years old, ranging from 12 to 17 years old. More than half of clients (54.1%) reported they were referred to treatment by the court (e.g., judge, court designated worker, probation officer), 11.3% reported they were referred to treatment by their school personnel, and 9.1% reported they were referred to treatment by the Department for Community Based Services (DCBS).

¹⁶ Cole, J., Logan, T., Miller, J., & Scrivner, A. (2016). *Evidence base for the Adolescent Kentucky Treatment Outcome Study (AKTOS): Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research, Behavioral Health Outcome Studies.

¹⁷ When a client had more than one intake survey in the two fiscal years included in this report, the survey with the earliest submission date was kept in the data file and the other intake surveys were deleted so that each client was represented once and only once in the data set.

TABLE 1.1. DEMOGRAPHICS FOR ALL AKTOS CLIENTS AT INTAKE

| | (n = 318) |
|--|-----------------------------|
| AGE | 15.8 years (range of 12-17) |
| GENDER | |
| Female | 29.2% |
| Male | 70.1% |
| Transgender | 0.6% |
| RACE | |
| White | 78.9% |
| African American | 9.1% |
| Other race (including Hispanic, Asian) | 3.8% |
| Multiracial | 8.2% |
| REFERRED BY | |
| The court | 54.1% |
| School personnel | 11.3% |
| DCBS | 9.1% |
| Self | 11.6% |
| Other sources | 13.9% |

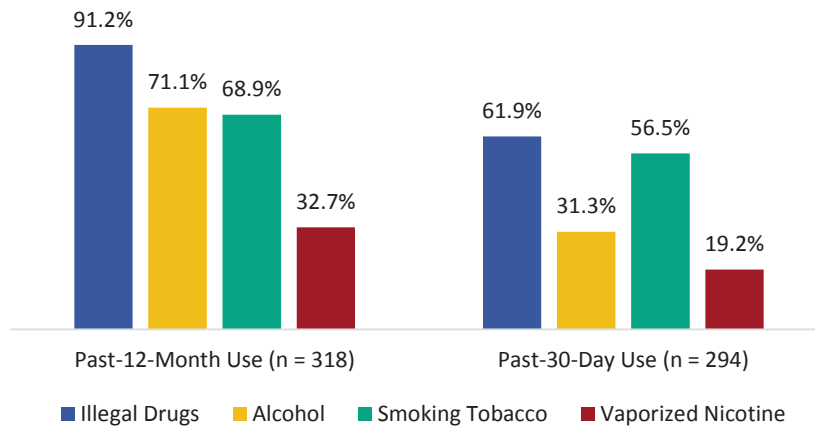
SUBSTANCE USE

The vast majority of adolescents who completed an intake survey (91.2%) reported using illegal drugs, 71.1% reported using alcohol, 68.9% reported smoking tobacco, and 32.7% reported using vaporized nicotine¹⁸ in the 12 months before intake. Because being in a controlled environment decreases opportunities for substance use, adolescents who were in a controlled environment all 30 days before entering treatment (n = 24) are not included in the analysis of substance use in the 30 days before entering treatment. Of the 294 adolescents who were not in a controlled environment all 30 days, 61.9% reported using illegal drugs, 31.3% reported using alcohol, 56.5% reported smoking tobacco, and 19.2% reported using vaporized nicotine in the 30 days before entering treatment.¹⁹

¹⁸ Survey items about using vaporized nicotine were added about halfway through the data collection period. Thus, the number of cases with a non-missing value for vaporized nicotine in the 12-month period is 162.

¹⁹ Survey items about using vaporized nicotine were added about halfway through the data collection period. Thus, the number of cases with a non-missing value for vaporized nicotine in the 30-day period and were not in a controlled environment all 30 days before entering treatment is 151.

FIGURE 1.2. ALCOHOL AND DRUG USE AMONG NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS (N = 318) OR 30 DAYS (N = 294) BEFORE PROGRAM ENTRY

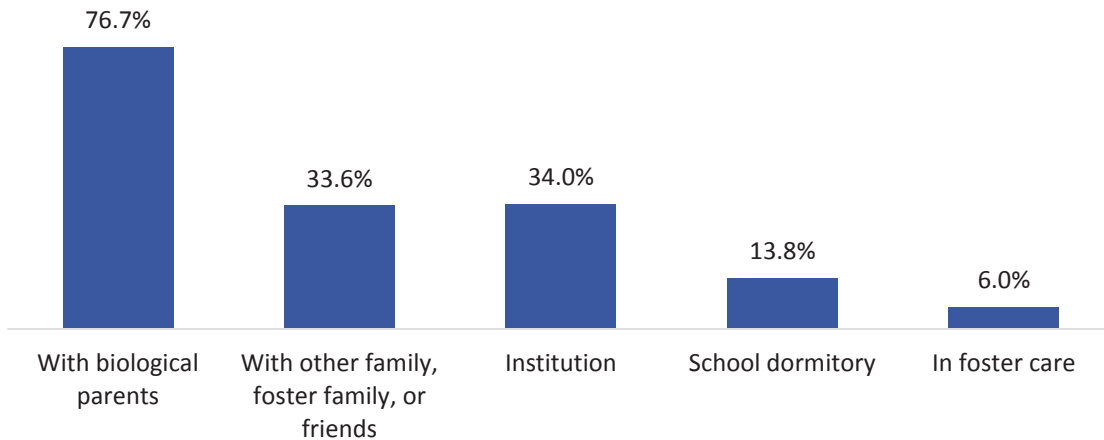


The drug classes reported by the greatest number of adolescents in the 12 months before entering treatment were marijuana (88.7%), synthetic/designer drugs (23.6%; i.e., bath salts, synthetic marijuana), prescription opioids/opiates (22.0%), and tranquilizers/ benzodiazepines/sedatives (20.8%).

CAREGIVER AND LIVING SITUATION

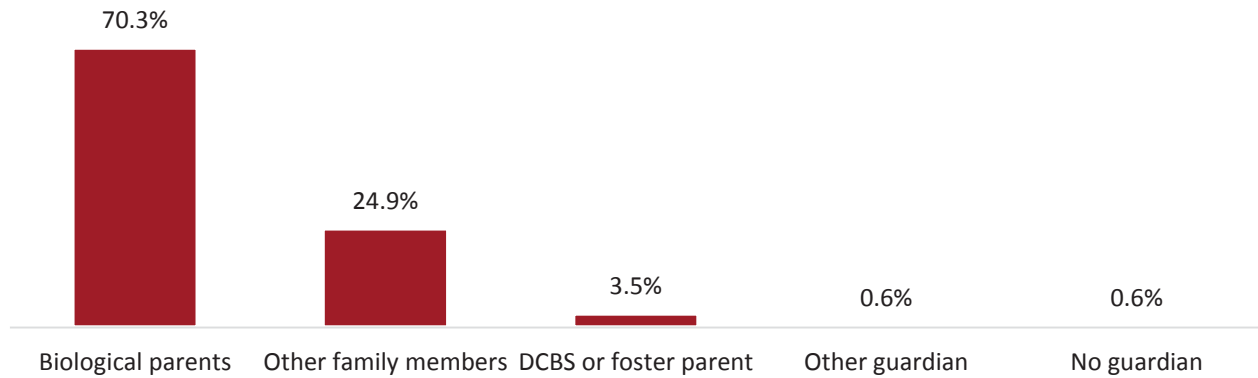
The majority of adolescents reported they lived at home with their biological parents (76.7%). Smaller percentages reported they lived with other family members in the 12 months before intake (33.6%), in an institution (34.0%; e.g., group home, residential treatment, or juvenile detention), independently (13.8%; including on their own, with peer roommates, or in a school dormitory), and in foster care (6.0%; i.e., non-kinship care).

FIGURE 1.3. USUAL LIVING ARRANGEMENT IN THE PAST 12 MONTHS AT INTAKE (N = 318)



The vast majority of adolescents reported their current caregiver was a family member: their biological parents (70.3%), followed by other family members including grandparents, kinship care, adoptive parents (24.9%), foster parent or DCBS (3.5%), and other guardian (0.6%). A small percentage of clients (0.6%) reported they had no caregiver (i.e., emancipated minor).

FIGURE 1.4. CURRENT CAREGIVER AT INTAKE (N = 318)



ADVERSE CHILDHOOD EXPERIENCES

Epidemiological studies have found that individuals who experience chronic childhood adversity have a greater likelihood of abusing alcohol and drugs as well as having other psychiatric disorders.²⁰ Adverse childhood experiences, defined as abuse and household dysfunction, are associated with increased risk of many health, mental health, and social problems in adulthood.²¹ In the Adverse Childhood Experiences Study (ACES), which surveyed over 17,000 adults who were members of a health maintenance organization (HMO), the questionnaire asked about 10 major categories of adverse childhood experiences: (a) three types of abuse (e.g., emotional maltreatment, physical maltreatment, and sexual abuse), (b) two types of neglect (e.g., emotional neglect, physical neglect), and (c) five types of household dysfunction (e.g., parents living separately, witnessing partner violence, victimization of a parent, a household member who abused alcohol or used illegal drugs, a household member with mental illness or had attempted suicide, a household member who was incarcerated).²²

Included in the intake interview were questions about a range of childhood adversities for which previous research has found associations with substance abuse such as child maltreatment and neglect, sexual abuse/assault as well as other types of household dysfunction (e.g., witnessing domestic violence, mental illness, substance abuse, and incarceration of household members) that were included in the Adverse Childhood Experiences (ACE) Study.^{23,24,25}

The average number of categories of adverse childhood experiences adolescents reported was 3.4 (median = 3.0). Only small percentages of male and female adolescents reported 0 of the 10 adverse childhood experiences (see Figure 1.5). Girls reported a higher average number of ACE categories than boys reported (4.6 vs. 3.0; see Figure 1.6).

²⁰ McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2012). Childhood adversities and first onset of psychiatric disorders in a national sample of U.S. adolescents. *Archives of General Psychiatry*, 69(11), 1151-1160.

²¹ Edwards, V. J., Anda, R. F., Dube, S. R., Dong, M., Chapman, D. F., & Felitti, V. J. (2005). The wide-ranging health consequences of adverse childhood experiences. In Kathleen Kendall-Tackett & Sarah Giacomoni (Eds.), *Victimization of children and youth: Patterns of abuse, response strategies*. Kingston, NJ: Civic Research Institute.

²² Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245-258.

²³ Centers for Disease Control and Prevention. (2014). *Prevalence of individual adverse childhood experiences*. Atlanta, GA: National Center for injury Prevention and Control, Division of Violence Prevention.

²⁴ Straus, M. A., & Gelles, R. J. (1990). *Physical violence in American Families: Risk factors and adaptations to violence in 8,145 families*. New Brunswick, NJ: Transaction Press.

²⁵ Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., Sapareto, E., & Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry*, 151, 1132-1136.

FIGURE 1.5. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES AT INTAKE (N = 318)

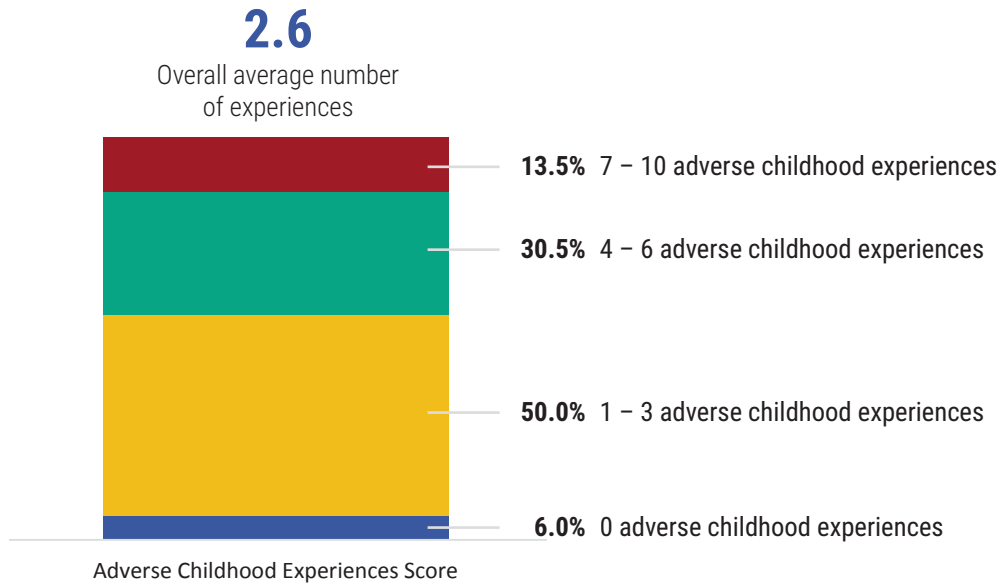
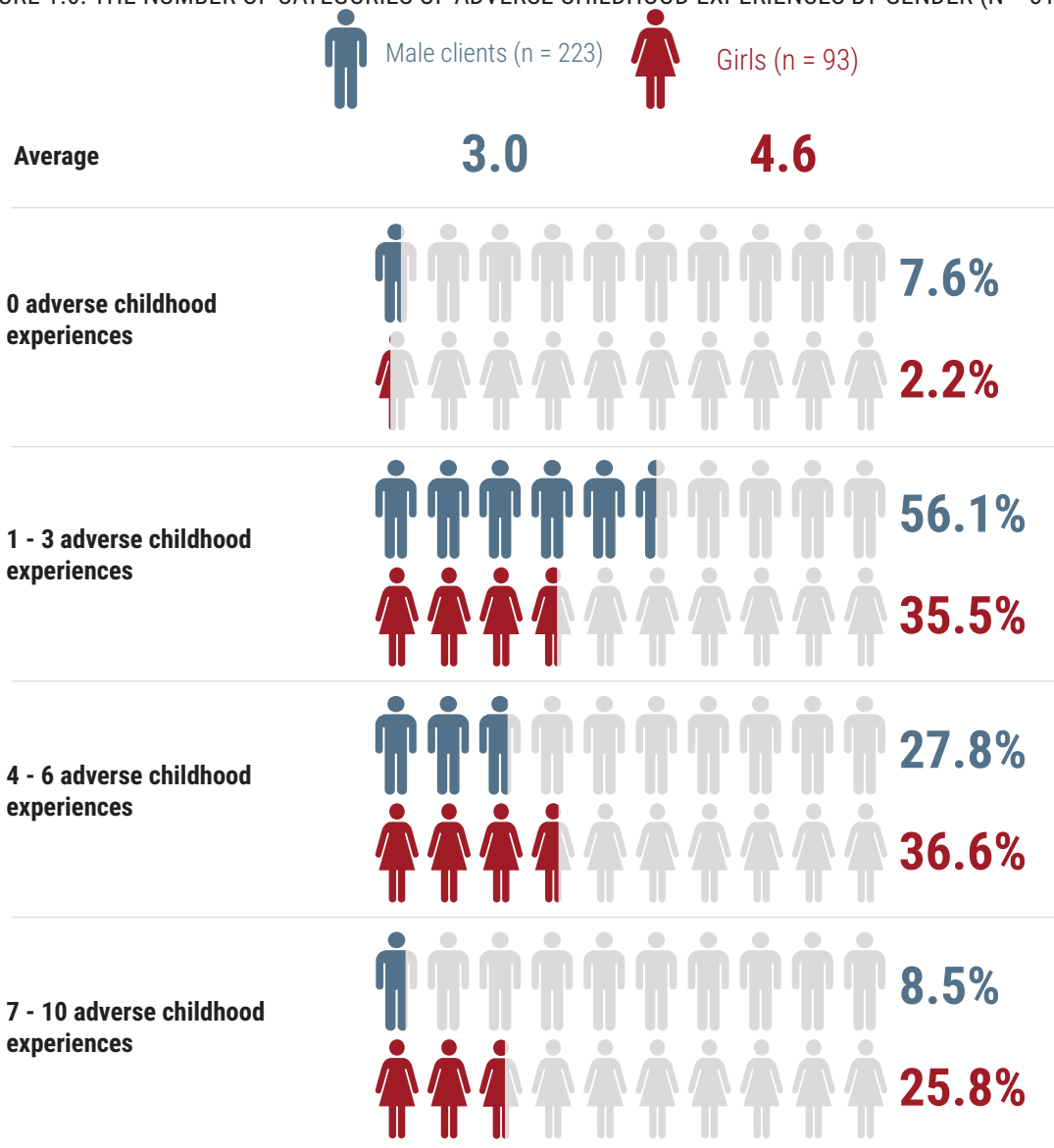
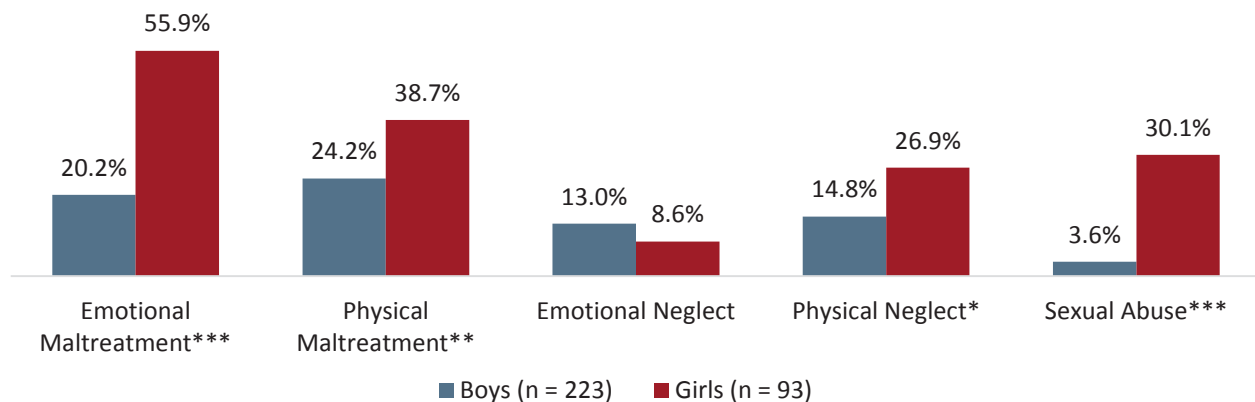


FIGURE 1.6. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES BY GENDER (N = 318)***



Significantly more girls reported ever experiencing all types of maltreatment and abuse²⁶ compared to boys, with the exception of emotional neglect (see Figure 1.7A). Specifically, more than half of girls reported they had experienced emotional maltreatment in their family homes compared to 1 in 5 boys. More than one-third of girls and nearly one-fourth of boys reported they had experienced physical maltreatment. There was no gender difference in the proportion of individuals who reported emotional neglect. More than 1 in 4 girls and 1 in 7 boys reported physical neglect. The most sizable difference in proportion was found for sexual abuse (by any type of perpetrator) with 3 in 10 girls and 1 in 27 boys reporting sexual abuse by an adult in their lifetime. The following percentages of boys and girls reported experiencing any type of maltreatment or abuse depicted in Figure 1.7A: 43.9% of boys and 67.7% of girls.

FIGURE 1.7A. ADVERSE CHILDHOOD EXPERIENCES OF MALTREATMENT AND ABUSE AT INTAKE BY GENDER (n = 316)²⁷



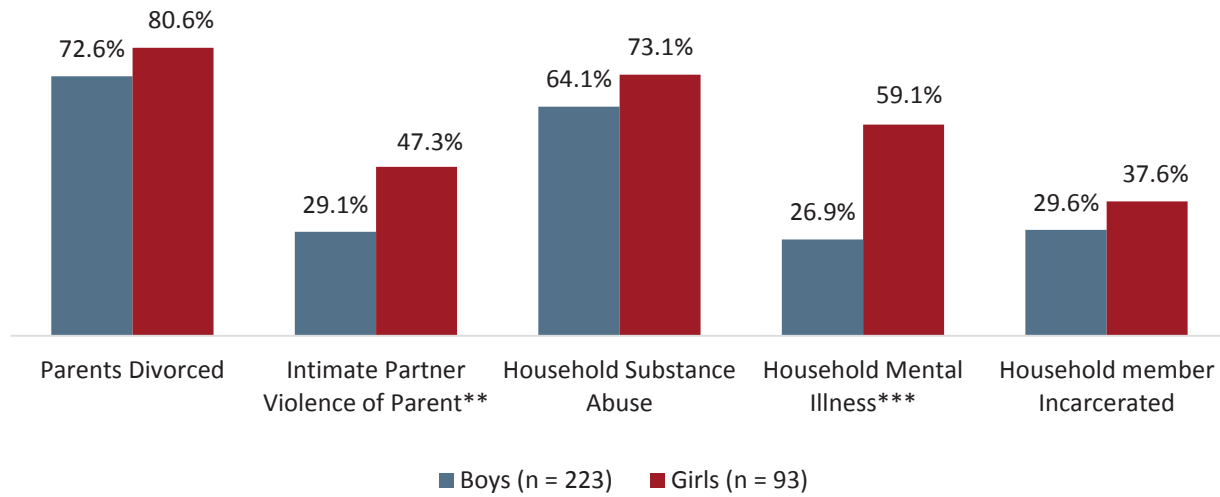
*p < .05, **p < .01, ***p < .001

Most clients reported their parents were divorced or lived separately and that a household member abused alcohol and/or used illegal drugs (see Figure 1.7B). Compared to boys, significantly more girls reported they had witnessed intimate partner violence (IPV) of a parent and a household member had a mental illness (i.e., was seriously depressed, attempted suicide or had a mental illness).

²⁶ The items included here asked about forced sexual touching or acts by an adult (known or not known).

²⁷ Two individuals who reported their gender as transgender were not included in this analysis because two individuals is too few to include as a group in statistical analysis.

FIGURE 1.7B. ADVERSE CHILDHOOD EXPERIENCES OF HOUSEHOLD RISK AT INTAKE BY GENDER (n = 316)²⁸



p < .01, *p < .001.

²⁸ Two individuals who reported their gender as transgender were not included in this analysis because two individuals is too few to include as a group in statistical analysis.

Adverse Childhood Experiences, Substance Use, and Mental Health

A greater number of categories of adverse childhood experiences is associated with greater risk of drug abuse and alcohol abuse, including initiating use in adolescence, as well as smoking tobacco in adolescence. Associations of the ACE score with substance use disorder, substance use, and mental health measures was examined among the 318 youth who completed an intake interview in FY 2015 and FY 2016.

Significant associations were found:²⁹



SEVERITY OF SUBSTANCE USE DISORDER

The number of categories of adverse childhood experiences was significantly different by severity of substance use disorder, even after controlling for gender. Individuals with no substance use disorder (2.8) had significantly fewer categories of adverse childhood experiences compared to individuals with mild SUD (4.1), moderate SUD (4.2), and severe SUD (4.7).



SUBSTANCE USE

The number of categories of adverse childhood experiences was significantly associated with the number of months individuals reported using smoked tobacco products ($r = .194, p < .001$), alcohol ($r = .203, p < .001$), marijuana ($r = .156, p < .01$), opioids/opiates ($r = .275, p < .001$), CNS depressants ($r = .273, p < .001$), stimulants/cocaine ($r = .309, p < .001$), and other illegal drugs ($r = .260, p < .001$) in the 12 months before entering treatment. In other words, individuals who reported more categories of adverse childhood experiences reported more months of using alcohol, marijuana, opioids/opiates, CNS depressants, stimulants/cocaine, and other illegal drugs.



MENTAL HEALTH SYMPTOMS

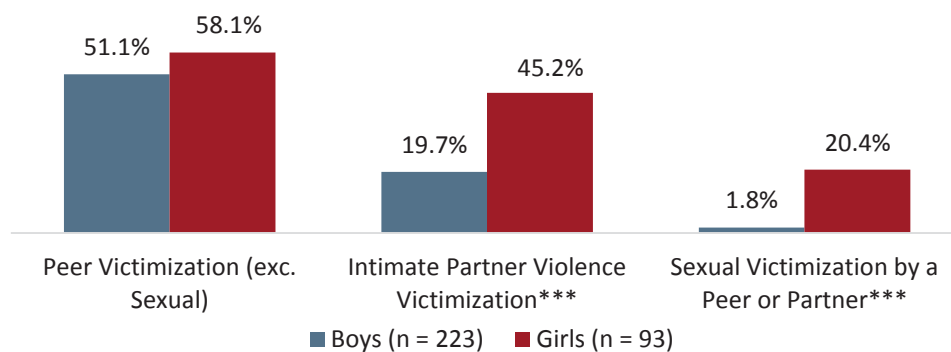
The correlations between the number of categories of adverse childhood experiences and the scores on the Pediatric Symptom Checklist (PSC) attention problem scale ($r = .410, p < .001$), PSC internalizing problems scale ($r = .518, p < .001$), and PSC externalizing problems scale ($r = .319, p < .001$) were statistically significant.

²⁹ Please see details about the mental health symptom measures on pp. 58.

OTHER INTERPERSONAL VICTIMIZATION AND STRESSORS

In addition to the items from the ACE Study, other measures of interpersonal victimization and chronic stressors were taken from the Juvenile Victimization Questionnaire (e.g., peer bullying, intimate partner violence, and sexual abuse by a peer or partner) and from the literature on major childhood stressors (e.g., death of a caregiver, and a sense of abandonment by a parent). About half of boys and a little more than half of girls reported emotional or physical victimization by peers (see Figure 1.8). A little under half of girls reported intimate partner violence compared to about 1 in 5 boys. Significantly more girls than boys reported they had experienced sexual victimization by peers or partners and intimate partner violence.

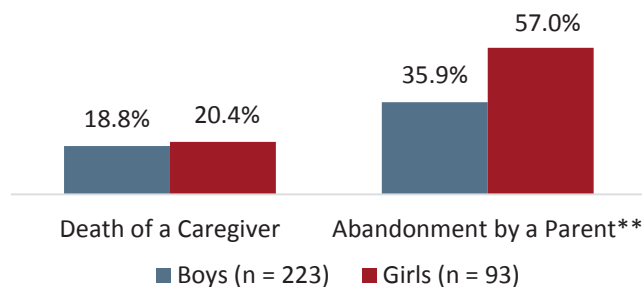
FIGURE 1.8. PEER VICTIMIZATION, INTIMATE PARTNER VIOLENCE, SEXUAL VICTIMIZATION BY PEERS AND OTHER MAJOR CHILDHOOD STRESSORS AT INTAKE BY GENDER (n = 316)³⁰



***p < .001.

Similar percentages of boys and girls reported death of a caregiver (including a parent): about 1 in 5 (see Figure 1.9). Significantly more girls than boys reported they had a sense of parental abandonment, with more than one-half of girls reporting this compared to a little more than one-third of boys.

FIGURE 1.9. OTHER MAJOR CHILDHOOD STRESSORS AT INTAKE BY GENDER (n = 316)³¹



**p < .01.

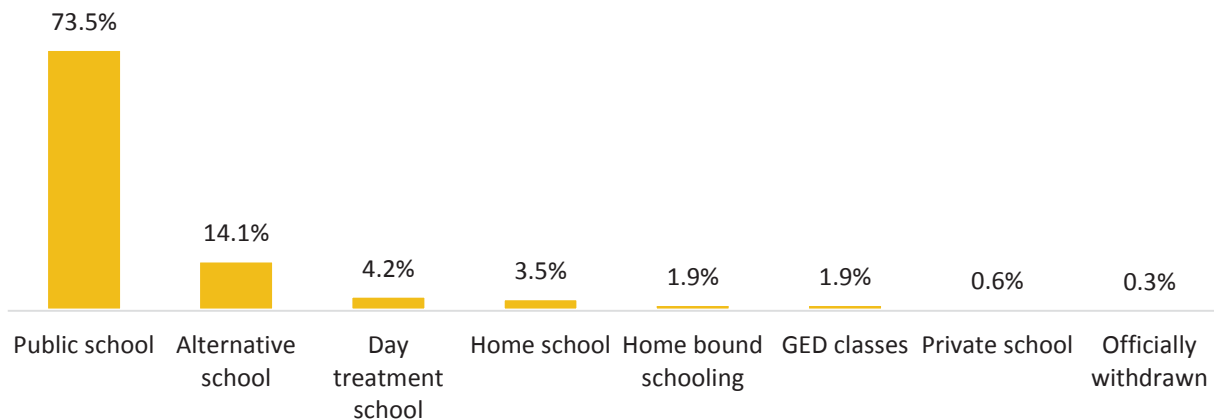
³⁰ Two individuals who reported their gender as transgender were not included in this analysis because two individuals is too few to include as a group in statistical analysis.

³¹ Two individuals who reported their gender as transgender were not included in this analysis because two individuals is too few to include as a group in statistical analysis.

EDUCATION AND EMPLOYMENT

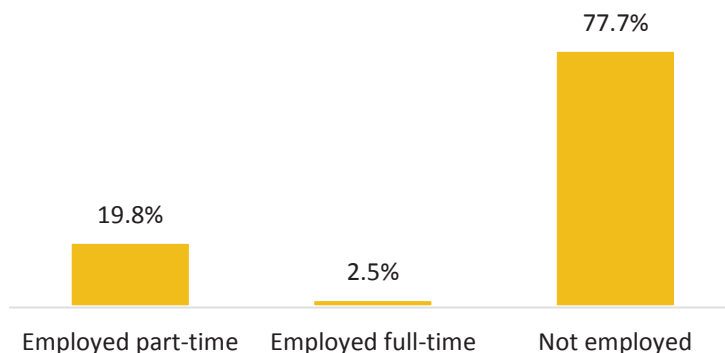
Five individuals (1.6%) reported they had a high school diploma or GED at intake. Among the remaining 313 individuals, almost all (99.7%) were enrolled in school at intake. The majority of clients reported they were attending public school (73.5%; see Figure 1.10). The next most frequently mentioned type of schooling was alternative school (14.1%). Small percentages of clients reported the following types of schooling: day treatment school (4.2%), home school (3.5%), home bound (1.9%), GED classes (1.9%), and private school (0.6%).

FIGURE 1.10. SCHOOL STATUS AT INTAKE (n = 313)³²



A minority of adolescents reported at intake they were currently employed part-time or had occasional or seasonal employment (19.8%), and 2.5% reported they were employed full-time (2.5%; see Figure 1.11). Thus, the majority of youth were not employed at intake (77.7%). Of the five individuals with a high school diploma or GED at intake, 40% (n = 2) were currently employed part-time or full-time and the other three were not employed (not depicted in a Figure).

FIGURE 1.11. EMPLOYMENT STATUS AT INTAKE (N = 318)



³² Five individuals who reported they had a school diploma or GED at intake are not included in this Figure.

JUSTICE SYSTEM INVOLVEMENT

About 2 in 5 adolescents (39.9%) reported they had been arrested and charged with an offense in the 12 months before entering treatment. A little over one-fourth (28.3%) reported they had been incarcerated in the 12 months before entering treatment. Over half of the adolescents reported they were under supervision by the justice system (i.e., court diversion program, probation, drug court).

Description of Adolescents in the Follow-up Sample at Treatment Intake

Follow-up interviews are conducted with a selected sample of clients about 12 months after the intake survey is completed. All adolescents who agree to be contacted for the follow-up interview and have given a minimum amount of locator information, are pulled into the follow-up sample. The follow-up interviews are conducted over the telephone by an interviewer at UK CDAR. Client responses to the follow-up interviews are kept confidential to help facilitate the honest evaluation of client outcomes and satisfaction with program services. There were no direct refusals and a high follow-up rate (89.1%). This means that only 10.9% of individuals included in the sample to be followed up were not successfully contacted.³³

This report describes outcomes for 122 adolescents (ages 12-17 years old) who participated in publicly-funded substance abuse treatment and who completed an intake interview and a follow-up telephone interview about 12 months (average of 324.5 days) after the intake survey was completed. Detailed information about the methods and follow-up efforts can be found in Appendix A.

³³ Clients are not contacted for a variety of reasons including follow-up staff are not able to find a working address or phone number or are unable to contact any friends or family members of the client.

AKTOS 2016 Quality of Data and Locator Efforts

For the 2016 follow-up study, which was conducted two years before the current study, 451 adolescents completed intake surveys and 237 of those youth agreed to be contacted for the follow-up survey. Of these adolescents, 230 cases were included in the follow-up sample.* Of those, 29 clients were not eligible for the follow-up (e.g., in residential treatment, was in a controlled environment, military service) leaving a sample of 201. A total of 181 follow-up surveys were completed for a follow-up rate of 90.0%. Only 10.0% of clients were not contacted.

90.0%
FOLLOW-UP RATE

PHONE CALLS



- 3.3** A total of 748 calls were made to client phone numbers, an average of 3.3 per client.
- 1.4** A total of 328 calls were made to contact phone numbers, an average of 1.4 per client.
- 61%** 6 out of 10 clients had at least one unique contact phone number

MAILINGS



- 1.7** A total of 397 mailings were sent to a client address, an average of 1.7 per client.
- 0.1** A total of 29 mailings were sent to contact addresses, an average of 0.1 per client.
- 11%** A little more than 1 in 10 clients had at least one complete, unique contact address.

ONLINE SEARCH

Client information was verified through external search in cases where (a) client contact information was incomplete; and (b) client contact information was incorrect. Overall, approximately 40.0% of all clients were searched with medium level effort and 24.8% of all clients were searched in-depth.

- 39%** of all clients were searched with light effort (i.e., verification, VINE, Whitepages)
- 40%** of all clients were searched with medium effort (i.e., social media, other public directory databases)
- 25%** of all clients were searched with in-depth effort (i.e., in-depth searching methods)

The seven adolescents who gave consent to be followed up but who were not included in the follow-up sample were excluded because they did not provide phone numbers or addresses in the locator information requested of individuals who agree to be contacted for the follow-up survey.

DEMOGRAPHICS

Of the 122 adolescents who completed a 12-month follow-up interview, 73.0% were male and 27.0% were female (see Table 1.2). The majority of follow-up clients were White (77.0%). A minority were Black/African American (10.7%), 4.9% were Hispanic or Asian, and 7.4% reported they were multiracial. They were an average of 16.0 years old at the time of the intake interview. The majority of adolescents (73.0%) were 16 or 17 years old at intake.

TABLE 1.2 DEMOGRAPHICS FOR AKTOS FOLLOW-UP SAMPLE CLIENTS AT INTAKE

| (n = 122) | |
|--|-----------------------------|
| AGE | 16.0 years (range of 13-17) |
| GENDER | |
| Female | 27.0% |
| Male | 73.0% |
| RACE | |
| White | 77.0% |
| African American | 10.7% |
| Other race (including Hispanic, Asian) | 4.9% |
| Multiracial | 7.4% |

ADVERSE CHILDHOOD EXPERIENCES

Similar to the larger sample of individuals who completed an intake interview, the average number of categories of adverse childhood experiences adolescents in the follow-up sample reported was 3.2 (median = 3.0). Only small percentages of male and female adolescents reported 0 of the 10 adverse childhood experiences (see Figure 1.12). Girls reported a higher average number of ACE categories than boys reported (4.8 vs. 2.6; see Figure 1.13).

FIGURE 1.12. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES AT INTAKE (N = 122)

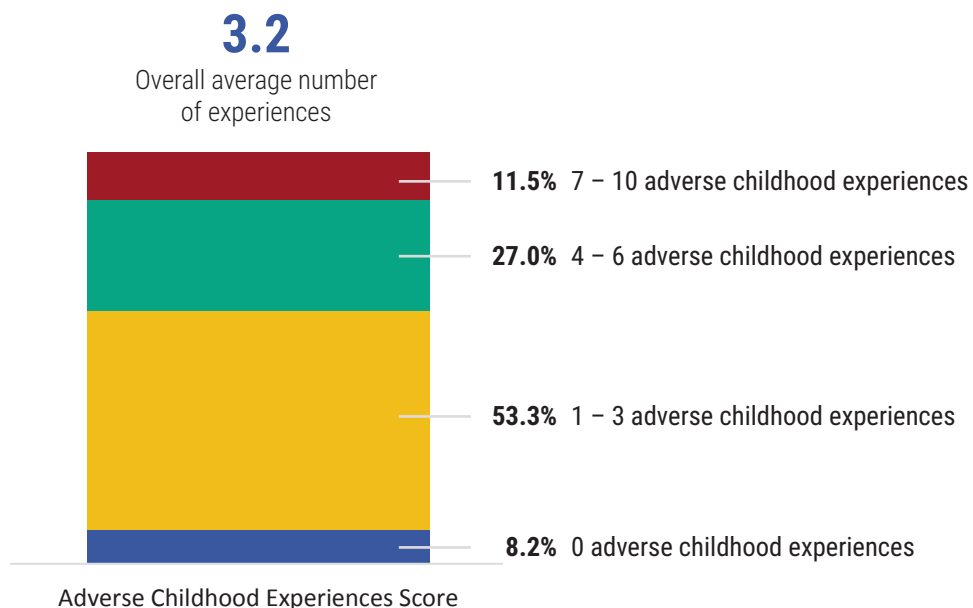
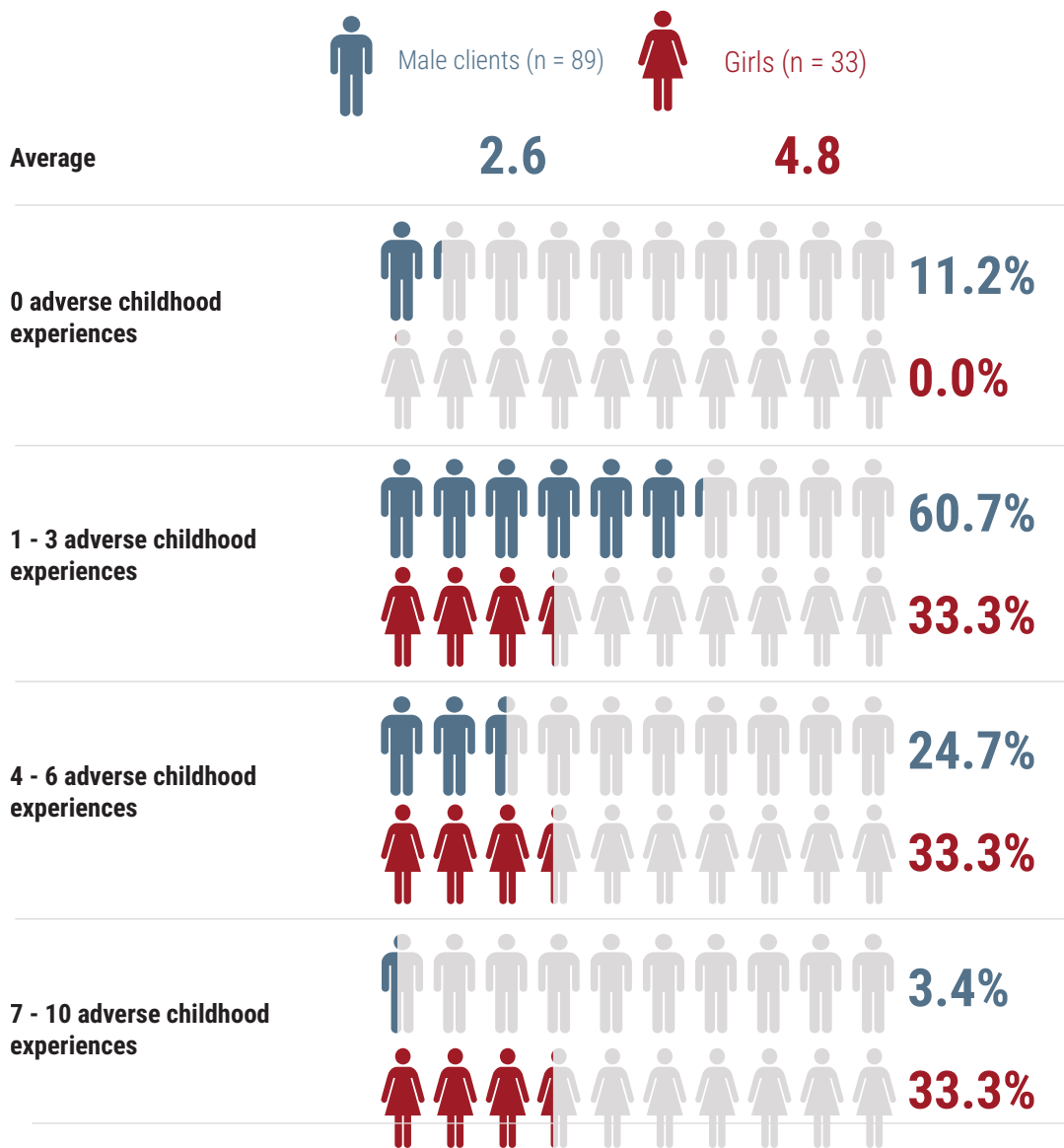


FIGURE 1.13. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES BY GENDER (N = 122)***

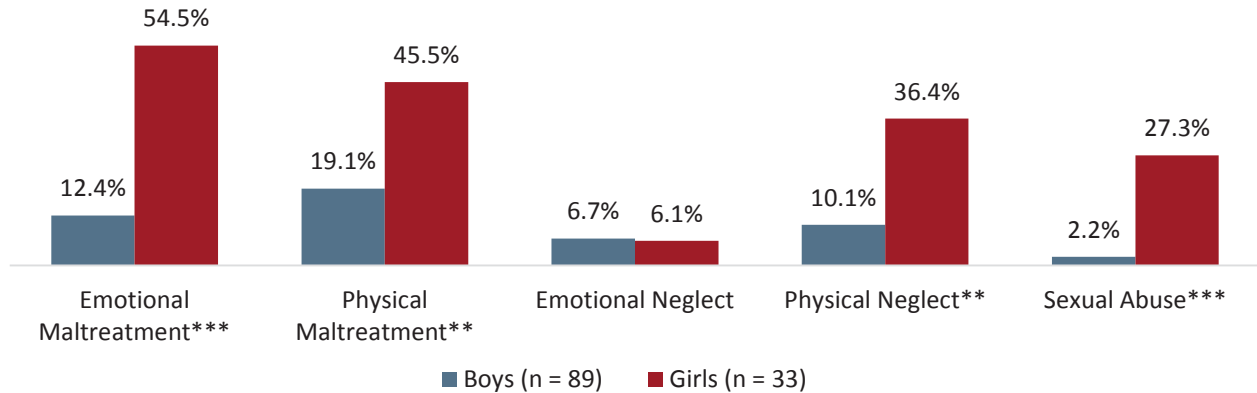


***p < .001.

As with the entire sample of adolescents who completed an intake interview, significant numbers of youth in the follow-up sample reported lifetime experiences of maltreatment and abuse (see Figure 1.14A). One-third of boys (33.7%) and almost two-thirds of girls (63.6%) reported experiencing any of the types of maltreatment/abuse presented in Figure 1.14A. Specifically, significantly more girls reported ever experiencing emotional maltreatment, physical maltreatment, physical neglect, and sexual abuse by any adult³⁴ compared to boys.

³⁴ The items included here asked about forced sexual touching or acts by an adult (known or not known).

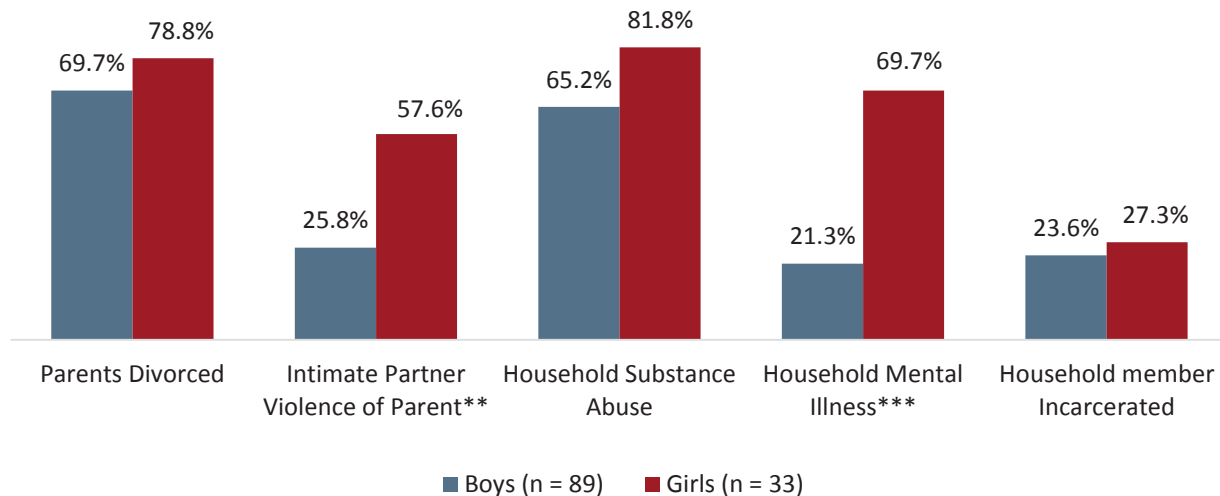
FIGURE 1.14A. ADVERSE CHILDHOOD EXPERIENCES OF MALTREATMENT AND ABUSE AT INTAKE BY GENDER (n = 122)



p < .01, *p < .001

In addition to lifetime maltreatment and abuse, household risk adverse experiences were common in this sample of youth (see Figure 1.14B). The majority of youth reported that their parents were divorced or lived separately and that someone in their household abused alcohol or used illicit drugs. Significantly more girls than boys reported that they had witnessed intimate partner violence victimization of a parent and that a household member had a mental illness. There were no other gender differences in household risks for the follow-up sample.

FIGURE 1.14B. ADVERSE CHILDHOOD EXPERIENCES OF HOUSEHOLD RISK AT INTAKE BY GENDER (n = 122)



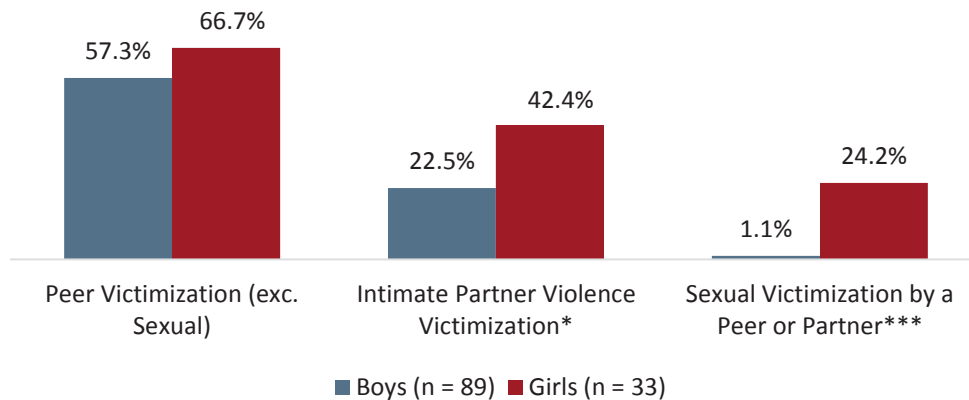
p < .01, *p < .001.

OTHER INTERPERSONAL VICTIMIZATION AND CHRONIC STRESSORS

In addition to the items included in the ACE Study, other measures of victimization and adverse experiences were taken from the Juvenile Victimization Questionnaire (e.g., peer bullying, intimate partner violence, and sexual abuse by a peer or partner) and from the literature on major childhood stressors (e.g., death of a caregiver, and a sense of abandonment by a parent). More than half of boys and two-thirds of girls reported emotional or physical victimization by peers (see Figure 1.15). About

two-fifths of girls reported intimate partner violence compared to about one-fifth of boys. Significantly more girls than boys reported they had experienced sexual victimization by peers or partners and intimate partner violence.

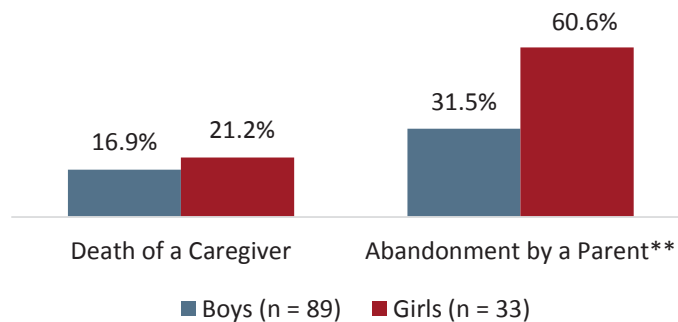
FIGURE 1.15. PEER VICTIMIZATION, INTIMATE PARTNER VIOLENCE, AND SEXUAL VICTIMIZATION BY PEERS AT INTAKE BY GENDER (n = 122)



*p < .05, ***p < .001.

Similar percentages of boys and girls reported death of a caregiver (including a parent). Significantly more girls than boys reported they had a sense of abandonment by a parent (see Figure 1.16).

FIGURE 1.16. OTHER MAJOR CHILDHOOD STRESSORS AT INTAKE BY GENDER (n = 122)



**p < .01.

COMPARISON OF ADOLESCENTS WHO WERE FOLLOWED-UP WITH ADOLESCENTS WHO WERE NOT FOLLOWED-UP

When those with a follow-up interview were compared with those who did not have a follow-up interview on a variety of intake variables, there were few significant differences. Specifically, no differences were found in demographics, employment, caregiver and living situation, and mental health. The only statistically significant differences were that more individuals who had completed a follow-up interview reported they had used CNS depressants, other drugs (hallucinogens and inhalants), and alcohol in the past 12 months when compared to individuals who had not completed a follow-up interview. Also, individuals who completed a follow-up interview reported a higher average number of arrests overall and arrests for status offenses in the 12 months before entering treatment than individuals who had

not completed a follow-up interview. Finally, individuals who completed a follow-up interview reported a higher average number of people they could count on for recovery support than individuals who had not completed a follow-up interview. See Appendix B for detailed comparisons of adolescents who completed a follow-up interview (n = 122) and adolescents who did not complete a follow-up interview (n = 196).

SECTION 2

CLIENT SATISFACTION WITH SUBSTANCE ABUSE TREATMENT PROGRAMS

One of the important outcomes assessed during the follow-up interview is the client's perception of the treatment experience. This section describes two aspects of client satisfaction: (1) overall client satisfaction; and (2) client ratings of program experiences.

Overall Client Satisfaction

A key element in the evaluation of using public funds to address health or social problems is client satisfaction with the services they receive. Higher levels of satisfaction are generally associated with positive treatment outcomes.³⁵ At the beginning of the follow-up survey, interviewers asked participants questions about their satisfaction with the treatment programs where 1 represented the worst experience and 10 represented the best experience. Overall, the majority of clients (65.6%) gave a positive rating between 8 and 10 of their satisfaction with the treatment program (not in a table). The average rating was 7.8.

Client Ratings of Program Experiences

When asked about specific aspects of their treatment program, the vast majority of clients reported they either agreed or strongly agreed with each aspect of the program that was assessed (see Figure 2.1). The vast majority of clients understood their rights as clients of substance abuse treatment, believed they were treated with respect, understood what staff expected of them, understood their treatment plan, felt better about themselves as a result of their treatment, and believed they had received the services they needed to help them get better.

³⁵ Waxman, H.M. (1996). Using outcomes assessment for quality improvement. In L.I. Sederer & B. Dickey (Eds.), *Outcomes assessment in clinical practice*, (pp. 25-33), Boston, Massachusetts: Williams and Wilkins.

FIGURE 2.1. PERCENT OF CLIENTS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE TREATMENT PROGRAM AT FOLLOW-UP (n = 85)³⁶



³⁶ Questions about the treatment experience were changed after the second fiscal year of follow-up data collection had begun. Because more individuals had answered the older version of questions than the updated questions in this dataset we are reporting data for the older items in this report. Answers of don't know/don't remember were treated as missing on these items. Only one client reported "don't know" for some of the items and for one case the interviewer skipped these items in error.

SECTION 3

SUBSTANCE USE

This section describes pre-program compared to 12-month follow-up change in illegal drug, alcohol, and tobacco use for adolescent clients. Past-12-month substance use is examined as well as past-30-day substance use for adolescent clients who were not in a controlled environment all 30 days before entering treatment or the follow-up interview. Results for each substance class are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

This section examines substance use changes which include use of any illegal drugs or alcohol, and then separately for illegal drugs, alcohol, and tobacco at intake and follow-up. In addition to examining the overall use of illegal drugs, several specific categories of illegal drugs were examined separately including: (a) marijuana, (b) synthetic drugs [i.e., bath salts, synthetic marijuana], (c) opioids [i.e., prescription opiates, methadone, and buprenorphine], (d) heroin, (e) central nervous system (CNS) depressants [i.e., tranquilizers, benzodiazepines, sedatives, and barbiturates], (f) stimulants/cocaine [i.e., cocaine, methamphetamine, Ecstasy, MDMA, Adderall, and Ritalin], and (g) other illegal drugs not mentioned above [i.e., hallucinogens and inhalants]. Analysis is presented in detail for AKTOS study participants who were not in a controlled environment for the entire period of 12 months and/or 30 days before entering treatment. Changes in substance use from intake to follow-up are presented in 4 main subsections and organized by type of substance use:

1. **Change in 12-month substance use from intake to follow-up.** Comparisons of the use of substances including ANY illegal drug use, marijuana, synthetic drugs, opioids, heroin, CNS depressants, stimulants, other illegal drug use, alcohol use, and tobacco use 12 months before the client entered the program and any use of these substances during the 12-month follow-up period (n = 121)³⁷ are presented.
2. **Average number of months clients used substances at intake and follow-up.** For those who used each substance class, the average number of months used in the 12 months before treatment intake and during the 12-month follow-up period are reported.
3. **Change in 30-day substance use from intake to follow-up.** In addition to looking at past-12-month substance use, change in any use in the 30 days before program entry and the 30 days before the follow-up interview for any illegal drug use (including marijuana, synthetic drugs, prescription opioids, heroin, CNS depressants, stimulants, and other illegal drugs), alcohol use, and tobacco use (n = 114)³⁸ is also examined. Because some clients were in a controlled environment (e.g., detention center or residential facility) all 30 days before entering treatment (n = 8), changes in drug, alcohol, and tobacco use from intake to follow-up were analyzed only for clients who were not in a controlled environment all 30 days before entering treatment.

³⁷ One individual who reported being in detention all 365 days before entering treatment was excluded from analysis of change in 12-month substance use.

³⁸ Because some clients enter treatment after leaving jail or prison, substance use in the 30 days before entering the program was examined for clients who were not in a controlled environment all 30 days. The assumption for excluding clients who were in a controlled environment all 30 days before entering treatment from the change in past-30-day substance use analysis is that being in a controlled environment inhibits opportunities for alcohol and drug use.

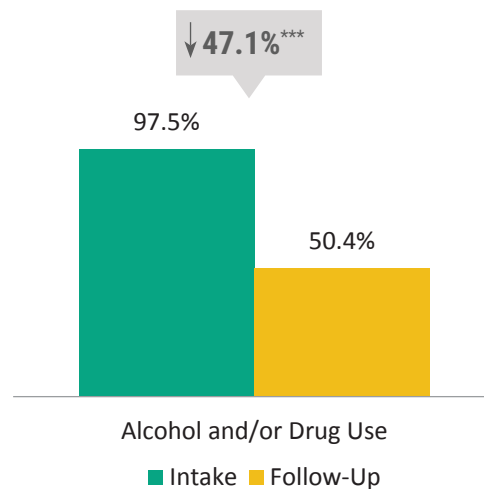
4. **Change in self-reported severity of substance use disorder from intake to follow-up.** Another way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they met the 11 criteria included in the DSM-5 for diagnosing substance use disorder. Under DSM-5 criteria, anyone meeting any two of the 11 criteria during the same 12-month period would receive a diagnosis of substance use disorder, assuming the symptoms were resulting in clinically significant impairments in functioning. The severity of substance use disorder (i.e., none, mild, moderate, or severe) is based on the number of symptom criteria endorsed. The percent of individuals in each of the four categories at intake and follow-up are presented.

Alcohol and/or Drug Use

PAST-12-MONTH ALCOHOL AND/OR DRUG USE

The number of youth who reported using alcohol and/or drugs decreased significantly by 47.1% from intake to follow-up (see Figure 3.1). Nearly all of the youth reported using alcohol and/or drugs in the 12 months before intake, and at follow-up 50.4% reported using alcohol and/or drugs. In other words, a total of 60 youth (49.6%) reported no use of alcohol and/or drugs in the 12-month follow-up period.

FIGURE 3.1. PERCENT OF CLIENTS REPORTING ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (n = 121)

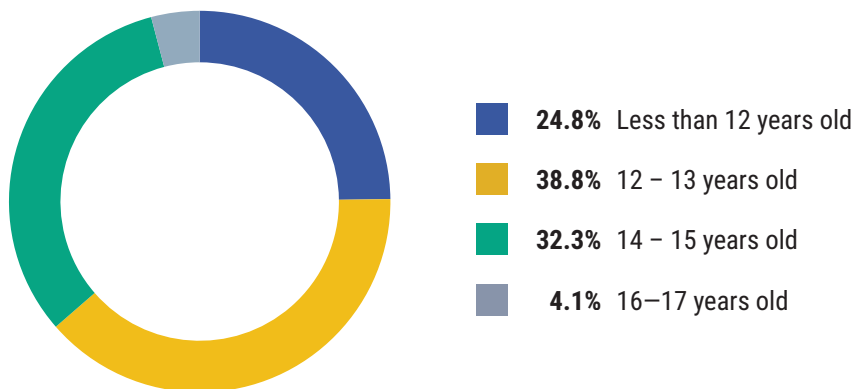


AVERAGE AGE FIRST USED ALCOHOL OR DRUGS

The average age youth initiated alcohol or drug use was 12.7 years old. The majority of youth in the AKTOS follow-up sample (63.6%) were early initiators of substance use (i.e., before the age of 14; see Figure 3.2)).

The majority of youth were early initiators of substance use

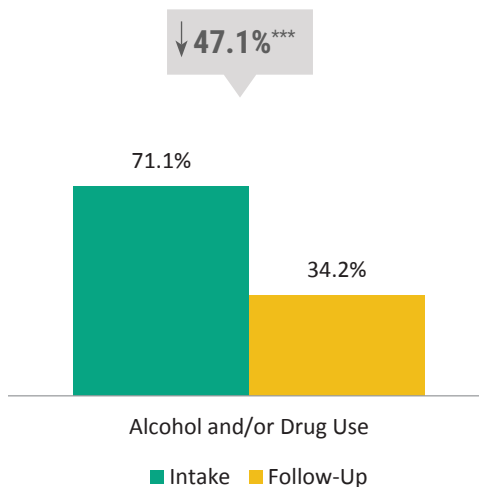
FIGURE 3.2. AVERAGE AGE CLIENT FIRST USED ALCOHOL OR DRUGS (n = 121)³⁹



PAST-30-DAY ALCOHOL AND/OR DRUG USE

The majority of youth reported using alcohol and/or drugs in the 30 days before intake, and at follow-up a little more than one-third (34.2%) reported using alcohol and/or drugs (see Figure 3.3). In other words, a total of 75 youth (65.8% of those who were not in a controlled environment all 30 days) reported not using alcohol and/or drugs in the 30 days before follow-up.

FIGURE 3.3. PERCENT OF CLIENTS REPORTING ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (n = 114)



***p < .001.

Any Illegal Drugs

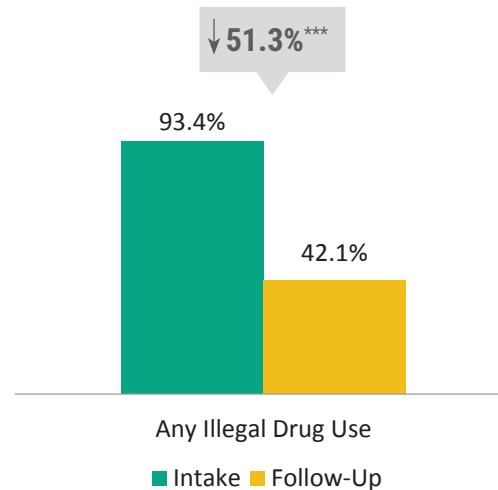
PAST-12-MONTH ILLEGAL DRUG USE

The vast majority of clients (93.4%) reported using illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 42.1% at follow-up (see Figure 3.4).

The number of clients reporting illegal drug use decreased by 51%

³⁹ Age of first use of alcohol and/or drugs was missing for one client.

FIGURE 3.4. PAST-12-MONTH USE OF ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 121)



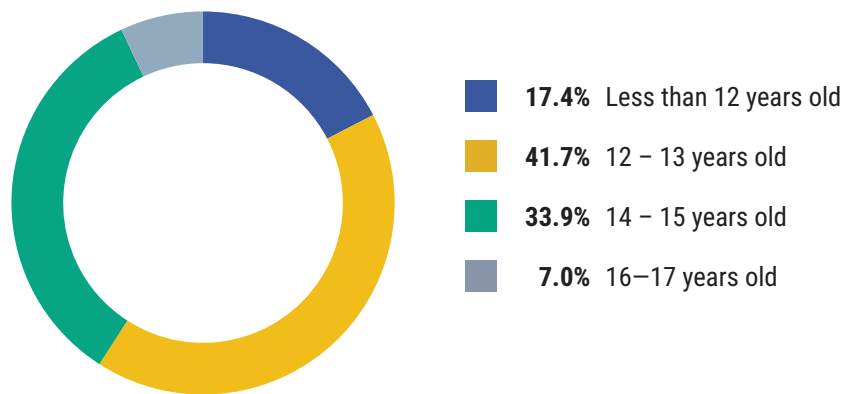
***p < .001

AVERAGE AGE FIRST USED ILLEGAL DRUGS

The 115 adolescents who reported using illegal drugs in the 12 months before intake were, on average, 13.0 years old when they first began using illegal drugs. Figure 3.5 shows the percentage of adolescents who reported first using illegal drugs at different ages.

Youth were on average 13.0 years old when they first used illegal drugs

FIGURE 3.5. AVERAGE AGE FIRST USED ILLEGAL DRUGS (n = 115)

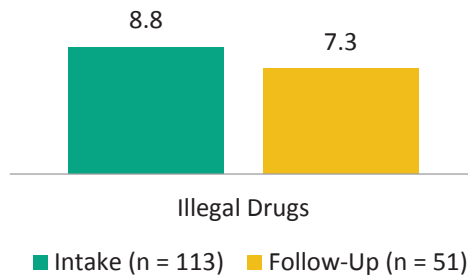


AVERAGE NUMBER OF MONTHS USED ANY ILLEGAL DRUGS

Among the clients who reported using illegal drugs in the 12 months before entering treatment (n = 113), they reported using illegal drugs on average 8.8 months (see Figure 3.6). Among clients who reported using illegal drugs at follow-up (n = 51), they reported using on average 7.3 months.⁴⁰

⁴⁰ Because number of months of illegal drugs was measured separately for each class of substance, the value is a calculation of the maximum number of months clients used any class of substance.

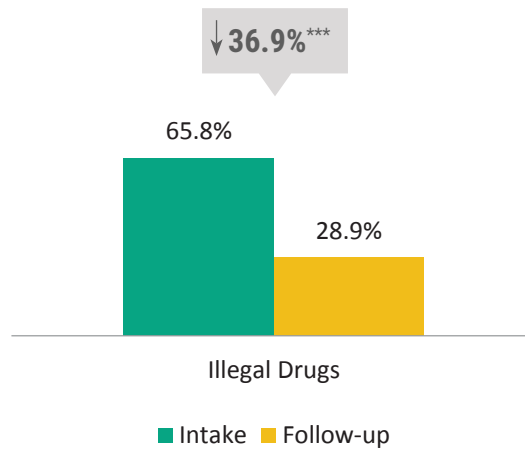
FIGURE 3.6. AMONG CLIENTS WHO USED ANY ILLEGAL DRUGS, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP



PAST-30-DAY ILLEGAL DRUG USE

The majority of clients (65.8%) who were not in a controlled environment all 30 days reported they had used illegal drugs in the 30 days before entering treatment (see Figure 3.7). At follow-up, 28.9% of clients reported they had used illegal drugs in the past 30 days. Examination of use of specific classes of illegal drugs in the following pages shows that most of the reported illegal drug use in the 30 days before follow-up was marijuana.

FIGURE 3.7. PAST-30-DAY USE OF ANY ILLEGAL DRUG AT INTAKE AND FOLLOW-UP (n = 114)



***p < .001

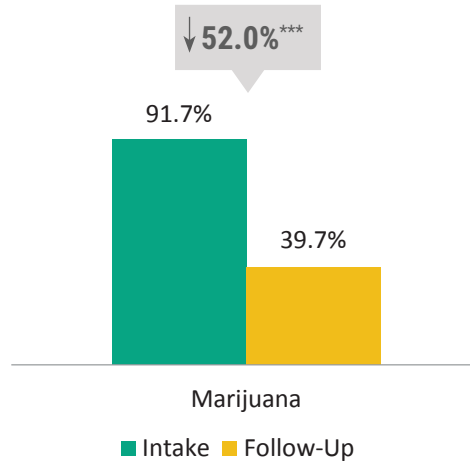
Marijuana

PAST-12-MONTH MARIJUANA USE

The vast majority of clients (91.7%) reported using marijuana in the 12 months before entering treatment, which decreased to 39.7% at follow-up (see Figure 3.8).

The number of clients reporting marijuana use decreased by 52%

FIGURE 3.8. PAST-12-MONTH USE OF MARIJUANA AT INTAKE AND FOLLOW-UP (n = 121)

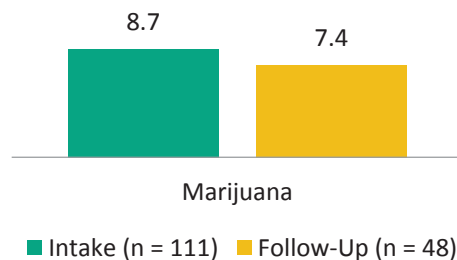


***p < .001

AVERAGE NUMBER OF MONTHS USED MARIJUANA

Among the clients who reported using marijuana in the 12 months before entering treatment (n = 111), they reported using marijuana on average 8.7 months (see Figure 3.9). Among clients who reported using marijuana at follow-up (n = 48), they reported using an average of 7.4 months.

FIGURE 3.9. AMONG ADOLESCENTS WHO USED MARIJUANA, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED MARIJUANA AT INTAKE AND FOLLOW-UP

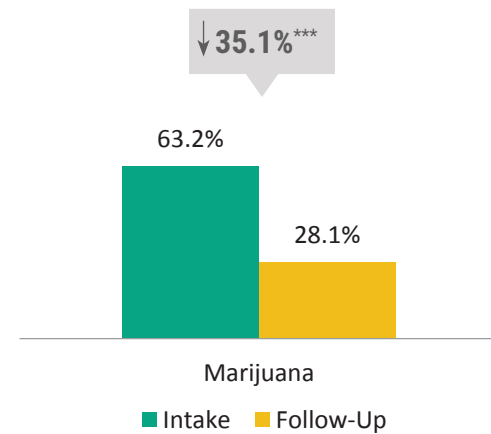


PAST-30-DAY MARIJUANA USE

The number of clients who reported using marijuana decreased from 63.2% at intake to 28.1% at follow-up (see Figure 3.10).

The number of clients who used marijuana in the past 30 days decreased significantly by 35%

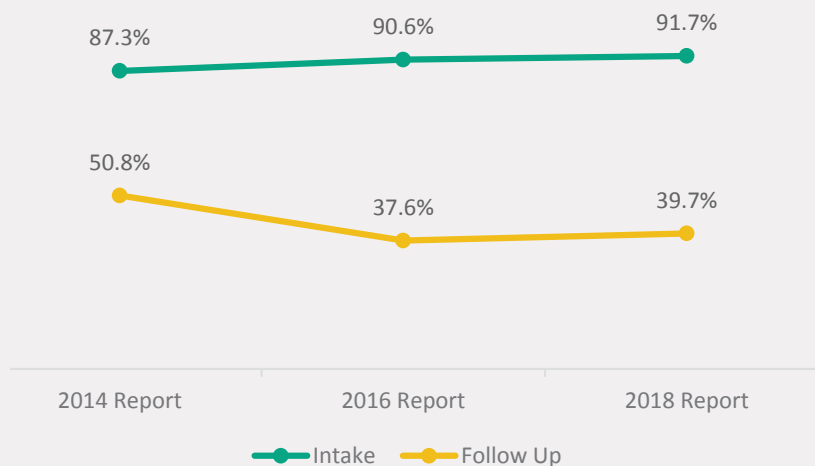
FIGURE 3.10. PAST-30-DAY USE OF MARIJUANA AT INTAKE AND FOLLOW-UP (n = 114)



***p < .001

TREND REPORT: MARIJUANA USE AT INTAKE AND FOLLOW-UP

Adolescents in the follow-up sample report that marijuana is the most commonly used substance. There was a decrease in the percent of adolescents reporting 12-month marijuana use at follow-up in the 2016 report, with a similar percentage in the 2018 report.

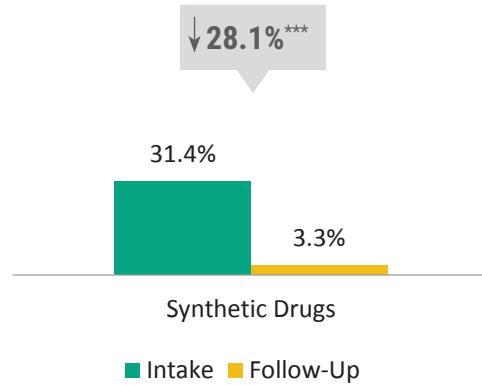


Synthetic Drug Use

PAST-12-MONTH SYNTHETIC DRUG USE

In the 12 months before entering treatment 31.4% of adolescents reported using synthetic drugs such as synthetic marijuana and bath salts. The number of adolescents who reported using synthetic drugs decreased to 3.3% at follow-up (see Figure 3.11).

FIGURE 3.11. PAST-12-MONTH USE OF SYNTHETIC DRUGS AT INTAKE AND FOLLOW-UP (n = 121)

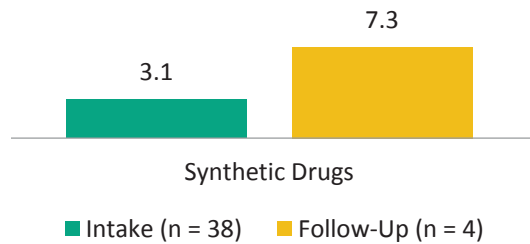


***p < .001

AVERAGE NUMBER OF MONTHS USED SYNTHETIC DRUGS

Among the clients who reported using synthetic drugs in the 12 months before entering treatment (n = 38), they reported using synthetic drugs on average 3.1 months (see Figure 3.12). Among clients who reported using synthetic drugs at follow-up (n = 4), they reported using an average 7.3 months.

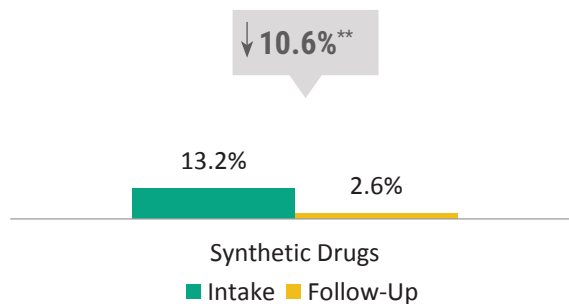
FIGURE 3.12. AMONG ADOLESCENTS WHO USED SYNTHETIC DRUGS, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED SYNTHETIC DRUGS



PAST-30-DAY SYNTHETIC DRUG USE

A minority of clients reported past-30-day use of synthetic drugs, with a significant decrease at follow-up (see Figure 3.13).

FIGURE 3.13. PAST-30-DAY USE OF SYNTHETIC DRUGS AT INTAKE AND FOLLOW-UP (n = 114)



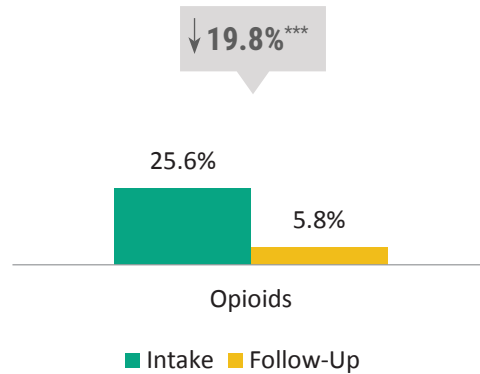
**p < .01

Opioid/Opiate Use

PAST-12-MONTH OPIOID/OPIATE USE

In the 12 months before entering treatment 25.6% of adolescents reported using opioids/opiates⁴¹ other than heroin, including prescription opiates, methadone, and buprenorphine. The number of adolescents who reported using opioids decreased to 5.8% at follow-up (see Figure 3.14).

FIGURE 3.14. PAST-12-MONTH USE OF OPIOIDS AT INTAKE AND FOLLOW-UP (n = 121)

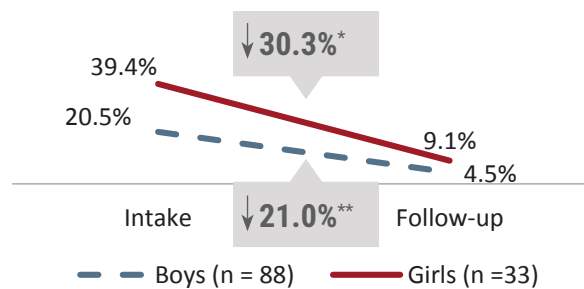


GENDER DIFFERENCES IN PAST-12-MONTH OPIOID/OPIATE USE

Significantly more girls than boys reported using opioids/opiates at intake (see Figure 3.15). By follow-up, there was no difference in opioid/opiate use between boys and girls.

Significantly more girls than boys used opioids/opiates at intake

FIGURE 3.15. GENDER DIFFERENCES IN OPIOID/OPIATE USE AT INTAKE AND FOLLOW-UP (n = 121)^a



a—Significant gender differences at intake; p < .05.
**p < .01, *p < .05

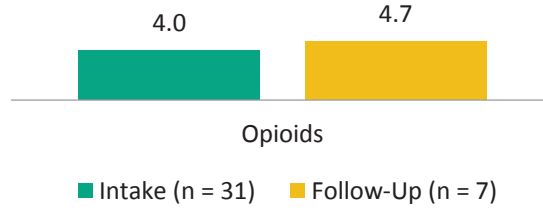
AVERAGE NUMBER OF MONTHS USED OPIOIDS

Among the clients who reported using opioids in the 12 months before entering treatment (n = 31), they reported using opioids on average 4.0 months (see Figure 3.16). Among clients who reported using

⁴¹ For brevity's sake, we will refer to this class of substance including prescription opiates and opioids as opioids.

opioids at follow-up (n = 7), they reported using an average 4.7 months.⁴²

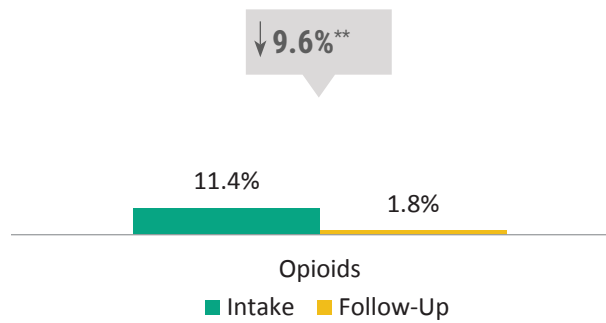
FIGURE 3.16. AMONG ADOLESCENTS WHO USED OPIOIDS, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED OPIOIDS



PAST-30-DAY OPIOID USE

About 1 in 10 adolescents reported past-30-day use of opioids at intake, with a significant decrease to 1.8% at follow-up (see Figure 3.17).

FIGURE 3.17. PAST-30-DAY USE OF OPIOIDS AT INTAKE AND FOLLOW-UP (n = 114)



**p < .01

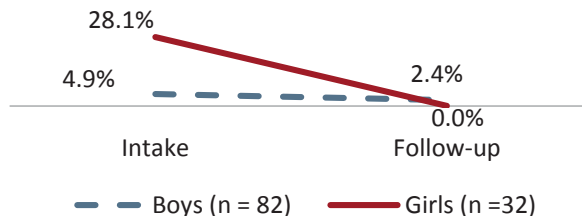
GENDER DIFFERENCES IN PAST-30-DAY OPIOID/OPIATE USE

Significantly more girls than boys reported using opioids/opiates in the past 30 days at intake (see Figure 3.18). By follow-up, there was no difference in opioid/opiate use between boys and girls.

Significantly more girls than boys used opioids/opiates at intake

⁴² Because number of months of prescription opiates, methadone, and buprenorphine were measured separately, the value is a calculation of the maximum number of months clients used any of these specific types of opioids/opiates.

FIGURE 3.18. GENDER DIFFERENCES IN OPIOID/OPIATE USE AT INTAKE AND FOLLOW-UP (n = 114)^{a,b}



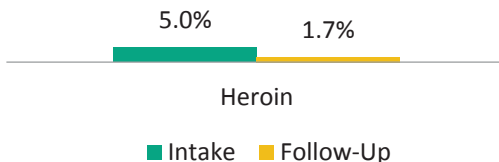
a—Significant gender differences at intake; $p < .001$.
 b—No measure of association could be computed for the crosstabulation for change in opioid use from intake to follow-up for girls because there was a value of 0 for the variable at follow-up.

Heroin Use

PAST-12-MONTH HEROIN USE

In the 12 months before entering treatment, 5.0% of adolescents reported using heroin. The number of adolescents who reported using heroin did not change significantly at follow-up (1.7%; see Figure 3.19).

FIGURE 3.19. PAST-12-MONTH USE OF HEROIN AT INTAKE AND FOLLOW-UP (n = 121)



Because so few adolescents reported using heroin in the 12 months before intake and follow-up, data are not presented in this report on the number of months of heroin use among individuals who used heroin. Only 0.9% of the follow-up sample reported past-30-day use of heroin at intake and no adolescents reported past-30-day use of heroin at follow-up.

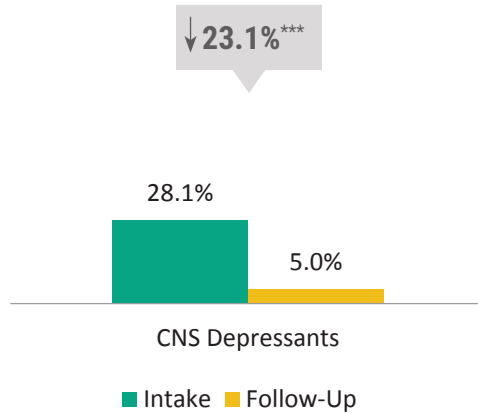
CNS Depressant Use

PAST-12-MONTH CNS DEPRESSANT USE

In the 12 months before entering treatment, 28.1% of adolescents reported using CNS depressants (e.g., tranquilizers, sedatives, benzodiazepines, hypnotics). The number of adolescents who reported using CNS depressants decreased to 5.0% at follow-up (see Figure 3.20).

The number of clients reporting CNS depressant use decreased by 23%

FIGURE 3.20. PAST-12-MONTH USE OF CNS DEPRESSANTS AT INTAKE AND FOLLOW-UP (n = 121)



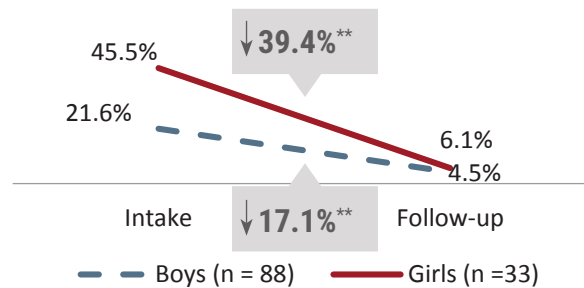
**p < .01

GENDER DIFFERENCES IN PAST-12-MONTH CNS DEPRESSANT USE

Significantly more girls than boys reported using CNS depressants in the past 12 months at intake (see Figure 3.21). By follow-up, there was no difference in CNS depressant use between boys and girls.

Significantly more girls than boys used CNS depressants at intake

FIGURE 3.21. GENDER DIFFERENCES IN CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (n = 114)^a



a—Significant gender differences at intake; p < .01.
**p < .01

AVERAGE NUMBER OF MONTHS USED CNS DEPRESSANTS

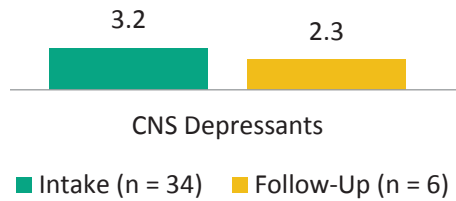
Among the clients who reported using CNS depressants in the 12 months before entering treatment (n = 34), they reported using an average 3.2 months (see Figure 3.22). Among clients who reported using CNS depressants at follow-up (n = 6), they reported using an average 2.3 months.⁴³

“It helped me understand my behavior better and helped me have better control over my behavior, which helped me a lot in school.”

- AKTOS FOLLOW-UP CLIENT

⁴³ Because number of months of CNS depressants were measured separately (e.g., barbiturates, tranquilizers), the value is a calculation of the maximum number of months clients used any of these specific types of CNS depressants.

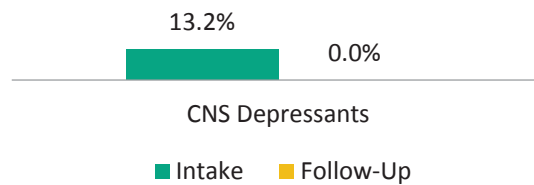
FIGURE 3.22. AMONG ADOLESCENTS WHO USED CNS DEPRESSANTS, THE AVERAGE NUMBER OF MONTHS CLIENTS USED CNS DEPRESSANTS AT INTAKE AND FOLLOW-UP



PAST-30-DAY CNS DEPRESSANT USE

The number of clients who reported using CNS depressants decreased significantly from 13.2% at intake to 0.0% at follow-up (see Figure 3.23).

FIGURE 3.23. PAST-30-DAY USE OF CNS DEPRESSANTS AT INTAKE AND FOLLOW-UP (n = 114)^a

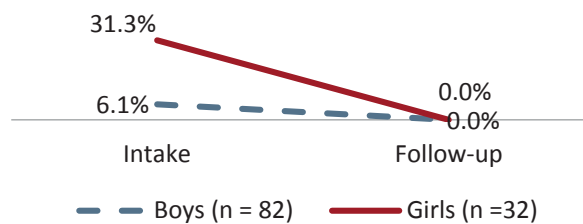


a--No measure of association could be computed for the crosstabulation for change in CNS depressant use from intake to follow-up because there was a value of 0 for the variable at follow-up.

GENDER DIFFERENCES IN PAST-30-DAY CNS DEPRESSANT USE

Significantly more girls than boys reported using CNS depressants in the past 30 days at intake (see Figure 3.24). By follow-up, no adolescents reported past-30-day use of CNS depressants.

FIGURE 3.24. GENDER DIFFERENCES IN CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (n = 114)^{a,b}



a--Significant gender differences at intake; $p < .001$.
 b--No measure of association could be computed for the crosstabulation for change in CNS depressant use from intake to follow-up because there was a value of 0 for the variable at follow-up.

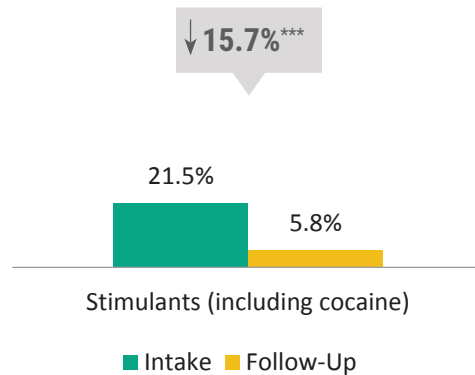
Stimulant Use

PAST-12-MONTH STIMULANT USE

In the 12 months before entering treatment 21.5% of adolescents reported using stimulants (e.g., cocaine, speed, methamphetamine, Ritalin). The number of adolescents who reported using stimulants decreased to 5.8% at follow-up (see Figure 3.25).

The number of clients reporting stimulant use decreased by 16%

FIGURE 3.25. PAST-12-MONTH USE OF STIMULANTS AT INTAKE AND FOLLOW-UP (n = 121)

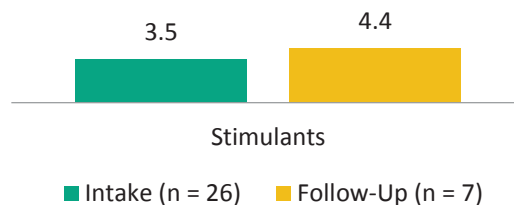


***p < .001.

AVERAGE NUMBER OF MONTHS USED STIMULANTS

Among the clients who reported using stimulants in the 12 months before entering treatment (n = 26), they reported using stimulants on average 3.5 months (see Figure 3.26). Among a small number of clients (n = 7) who reported using stimulants at follow-up, they reported using an average of 4.4 months.

FIGURE 3.26. AMONG ADOLESCENTS WHO USED STIMULANTS, THE AVERAGE NUMBER OF MONTHS CLIENTS USED STIMULANTS AT INTAKE AND FOLLOW-UP

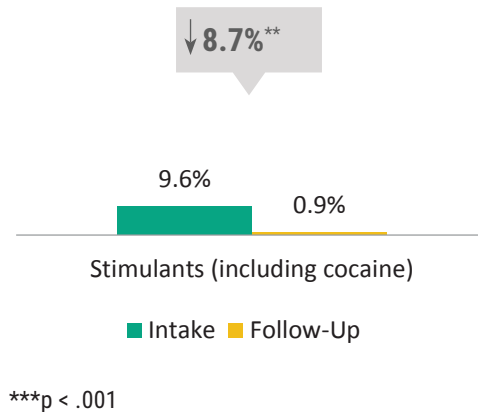


PAST-30-DAY STIMULANT USE

In the 30 days before entering treatment 9.6% of adolescents reported using stimulants (e.g., cocaine, speed, methamphetamine, Ritalin). The number of adolescents who reported using stimulants

decreased to 0.9% at follow-up (see Figure 3.27).

FIGURE 3.27. PAST-12-MONTH USE OF STIMULANTS AT INTAKE AND FOLLOW-UP (n = 121)

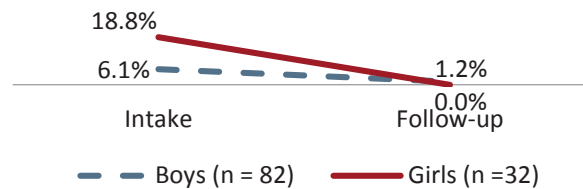


GENDER DIFFERENCES IN PAST-30-DAY STIMULANT USE

Significantly more girls than boys reported using stimulants in the past 30 days at intake (see Figure 3.28). By follow-up, there was no difference in the proportion of boys and girls who reported using stimulants in the past 30 days.

Significantly more girls than boys used stimulants at intake

FIGURE 3.28. GENDER DIFFERENCES IN STIMULANT USE AT INTAKE AND FOLLOW-UP (n = 114)^{a,b}



a—Significant gender differences at intake; $p < .05$.
 b—No measure of association could be computed for the crosstabulation for change in stimulant use from intake to follow-up for girls because there was a value of 0 for the variable at follow-up.

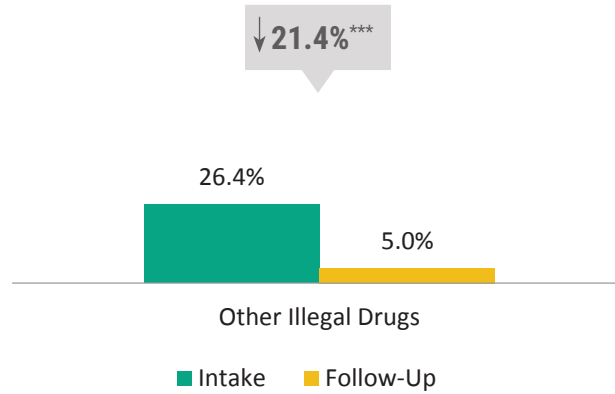
Other Illegal Drug Use

PAST-12-MONTH USE OF OTHER ILLEGAL DRUGS

Use of illegal drugs not included in any of the previous classes of substances (e.g., inhalants and hallucinogens) are presented here. About 1 in 4 adolescents reported using other illegal drugs in the 12 months before entering treatment. The number of adolescents who reported using other illegal drugs decreased to 1 in 20 at follow-up (see Figure 3.29).

The number of clients reporting other illegal drug use decreased by 21%

FIGURE 3.29. PAST-12-MONTH USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (n = 121)

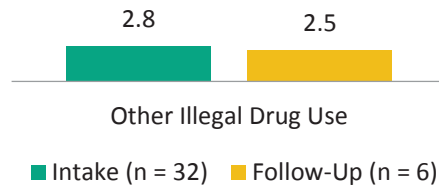


***p < .001.

AVERAGE NUMBER OF MONTHS USED OTHER ILLEGAL DRUGS

Among the clients who reported using other illegal drugs in the 12 months before entering treatment (n = 32), they reported using other illegal drugs on average 2.8 months (see Figure 3.30). Among clients who reported using other illegal drugs at follow-up (n = 6), they reported using an average of 2.5 months.⁴⁴

FIGURE 3.30. AMONG ADOLESCENTS WHO USED OTHER ILLEGAL DRUGS, THE AVERAGE NUMBER OF MONTHS CLIENTS USED OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP

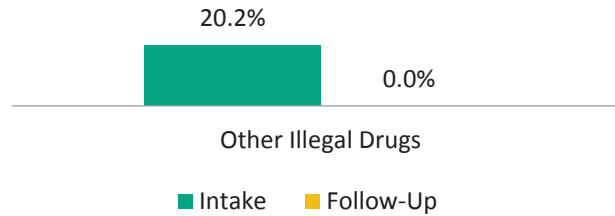


PAST-30-DAY USE OF OTHER ILLEGAL DRUGS

About 1 in 5 adolescents reported using other illegal drugs in the 30 days before entering treatment. At follow-up, no adolescents reported using other illegal drugs (see Figure 3.31).

⁴⁴ Because number of months of other illegal drugs were measured separately (e.g., inhalants and hallucinogens), the value is a calculation of the maximum number of months clients used any of these specific types of other illegal drugs.

FIGURE 3.31. PAST-30-DAY USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (n = 114)



a--No measure of association could be computed for the crosstabulation for change in other illegal drug use from intake to follow-up because there was a value of 0 for the variable at follow-up.

Alcohol Use

There were three measures of alcohol use including: (1) any alcohol use, (2) alcohol use to intoxication, and (3) binge drinking. Binge drinking was defined as having 5 or more alcoholic drinks for males and 4 or more for females in a period of about 2 hours.⁴⁵

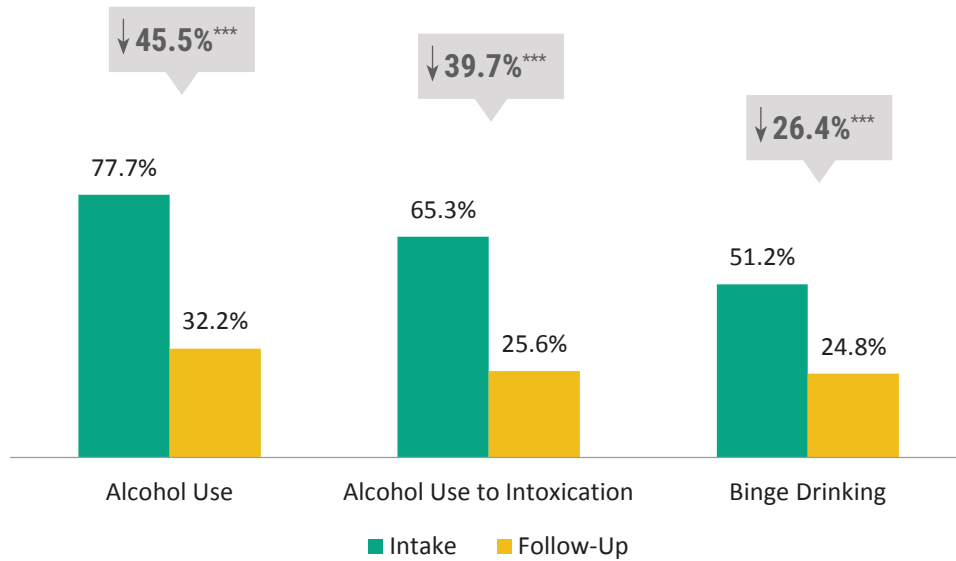
PAST-12-MONTH ALCOHOL USE

A little more than three-fourths of adolescents (77.7%) reported using alcohol in the 12 months before entering treatment while a little less than one-third of adolescents reported alcohol use in the 12 months before follow-up (see Figure 3.32). Overall, for the AKTOS follow-up sample, there was a 45.5% decrease in the number of clients reporting any alcohol use. The majority of adolescents reported using alcohol to intoxication at intake. The number of adolescents who reported using alcohol to intoxication decreased to 25.6% at follow-up. Additionally, there was a significant decrease in the number of clients who reported binge drinking from intake to follow-up.

The number of clients reporting alcohol use decreased by 46%

⁴⁵ National Institute on Alcohol Abuse and Alcoholism [NIAAA]. (2004, Winter). NIAAA council approves definition of binge drinking. *NIAAA Newsletter, Winter 2004* (3). Rockville, MD: Department of Health and Human Services, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism.

FIGURE 3.32. PAST-12-MONTH USE OF ALCOHOL AT INTAKE AND FOLLOW-UP (N = 121)

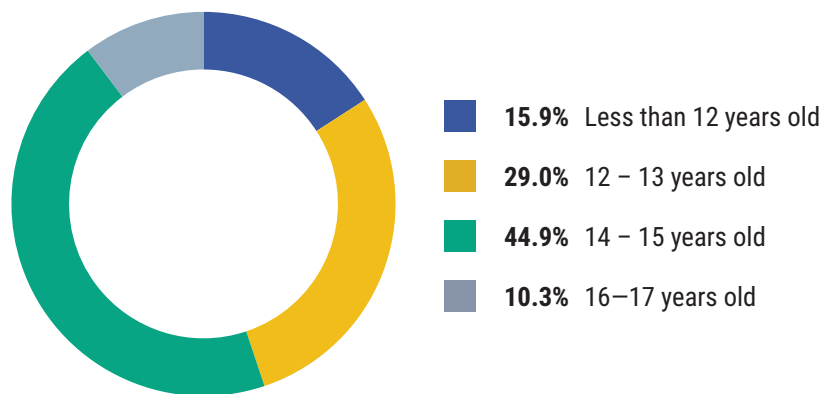


***p < .001

AVERAGE AGE FIRST DRANK ALCOHOL (OTHER THAN A FEW SIPS)

Adolescents who reported using alcohol in the 12 months before intake were asked how old they were when they first had an alcoholic drink (other than a few sips). They were on average 13.4 years old when they had their first alcoholic drink (other than a few sips). Figure 3.33 shows the percentage of adolescents who reported having their first alcohol drink at different ages.

FIGURE 3.33. AVERAGE AGE CLIENT HAD FIRST ALCOHOLIC DRINK (n = 107)⁴⁶

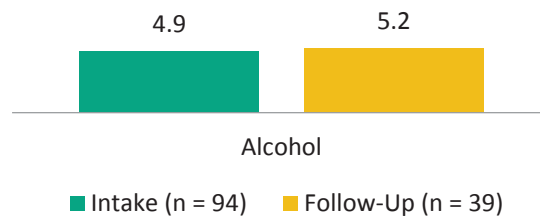


AVERAGE NUMBER OF MONTHS USED ALCOHOL

Figure 3.34 shows the number of months alcohol users reported using alcohol at intake and follow-up. Among the clients who reported using alcohol in the 12 months before entering treatment (n = 94), they reported using alcohol, on average, 4.9 months. Among clients who reported using alcohol in the 12 months before follow-up (n = 39), they reported using, on average, 5.2 months.

⁴⁶ Fifteen individuals reported never using more than a few drinks of alcohol in their lifetime.

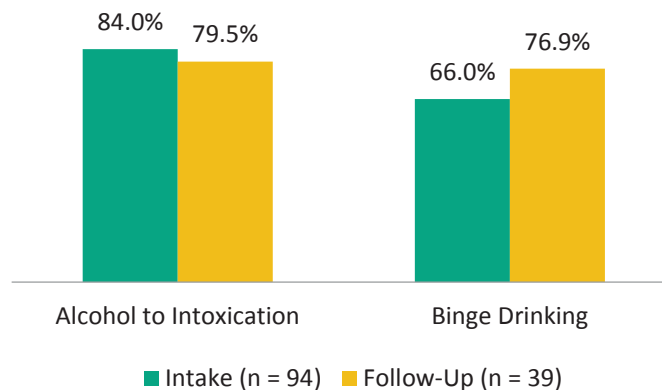
FIGURE 3.34. AMONG ADOLESCENTS WHO USED ALCOHOL, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED ALCOHOL AT INTAKE AND FOLLOW-UP



PAST-12-MONTH ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL

Of the clients who used alcohol in the 12 months before entering treatment (n = 94), 84.0% used alcohol to intoxication in the 12 months before intake and 66.0% binge drank alcohol (see Figure 3.35). Of the clients who used alcohol in the 12 months before follow-up (n = 39), 79.5% of clients reported alcohol use to intoxication and 76.9% binge drank alcohol.

FIGURE 3.35. PAST-12-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



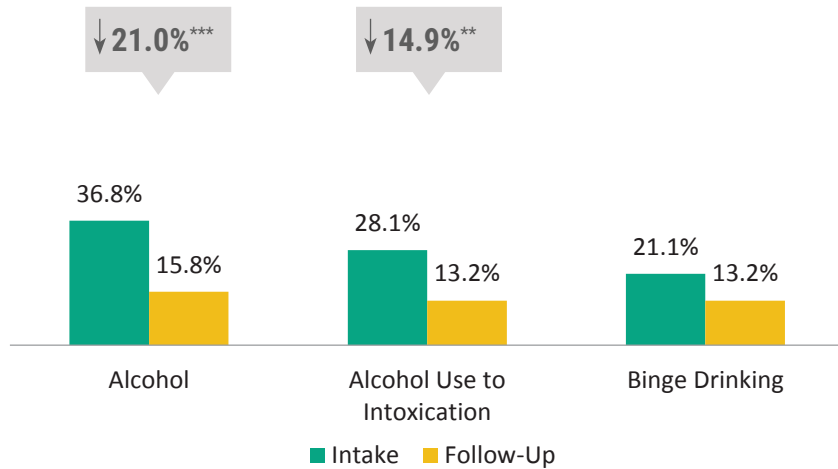
PAST-30-DAY ALCOHOL USE

The number of adolescents who reported using any alcohol and alcohol to intoxication decreased significantly from the 30 days before entering the program to the 30 days before follow-up (see Figure 3.36). The number of adolescents who reported binge drinking alcohol in the 30 day periods did not decrease significantly from intake to follow-up.

"I could talk to them about everything."

- AKTOS FOLLOW-UP CLIENT

FIGURE 3.36. PAST-30-DAY USE OF ALCOHOL AT INTAKE AND FOLLOW-UP (n = 114)



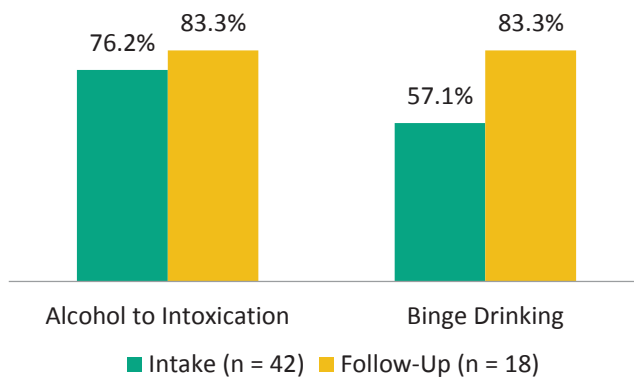
p < .01, *p < .001.

PAST-30-DAY ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL

Of the 42 adolescents who used alcohol in the 30 days before intake, 76.2% used alcohol to intoxication and 57.1% binge drank in the 30 days before intake (see Figure 3.37).

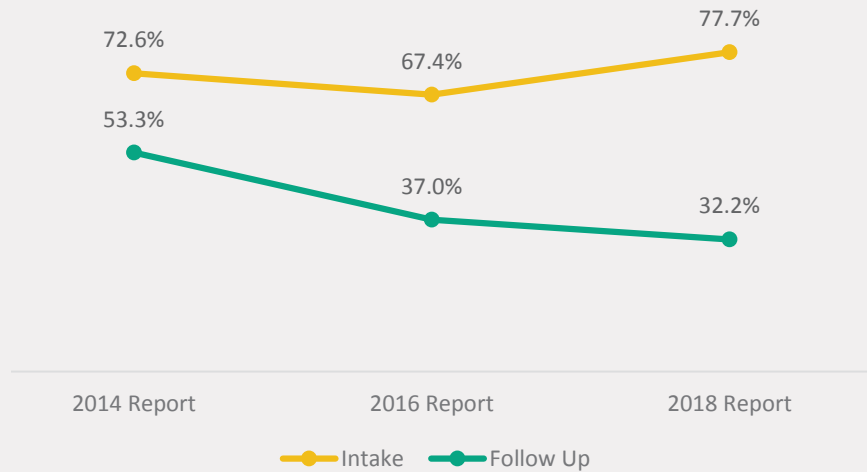
Of the 18 adolescents who reported using alcohol in the 30 days before follow-up, 83.3% reported using alcohol to intoxication and 83.3% reported binge drinking in the 30 days before follow-up.

FIGURE 3.37. PAST-30-DAY USE OF ALCOHOL TO INTOXICATION AND BINGE DRINKING, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



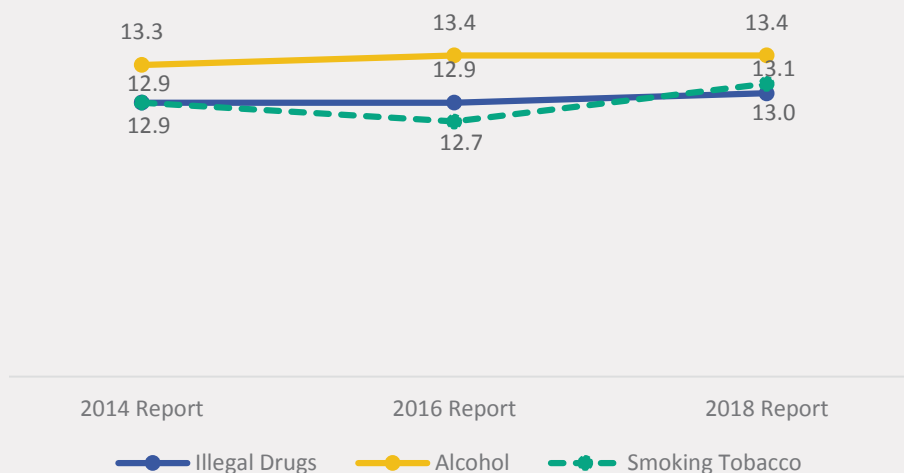
TREND REPORT: ALCOHOL USE AT INTAKE AND FOLLOW-UP

The difference in the percent of adolescents who reported using alcohol in the past 12 months at intake and at follow-up increased in the 2016 report and then again in the 2018 report. In each biannual report there was a significant decrease from intake to follow-up in the percent of adolescents who reported using alcohol.



TREND REPORT: AGE OF FIRST USE

Youth were asked, at intake, how old they were when they first began to use illegal drugs, when they had their first alcoholic drink (more than a few sips), and when they began smoking regularly. The age of first use for each type of substance has remained steady for the past 3 biannual reports for individuals included in the follow-up sample.



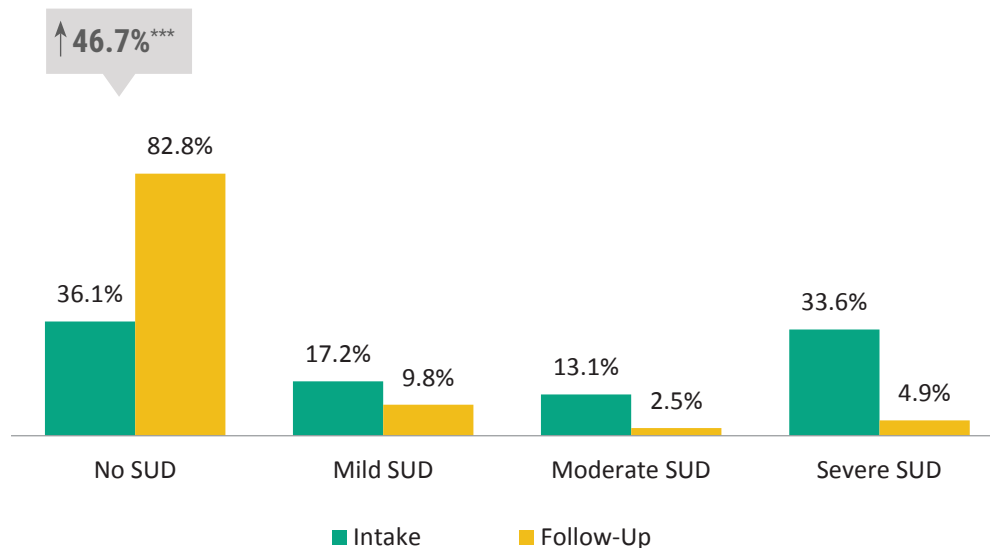
SELF-REPORTED SEVERITY OF SUBSTANCE USE DISORDER

Another way to examine overall change in degree of severity of substance use is to ask adolescents to self-report whether they met the 11 symptom criteria included in the DSM-5 for diagnosing substance use disorder (SUD). The DSM-5 diagnostic criteria for substance use disorders included in the adolescent intake and follow-up interviews are similar to the criteria for DSM-IV, which has evidence of excellent test-retest reliability and validity.^{47,48} However, the DSM-5 does away with the distinction between substance abuse and dependence, substituting severity ranking instead as well as deleting the criterion about legal problems arising from substance use and adds a new criterion about craving and compulsion to use.⁴⁹ Under DSM-5, anyone meeting any two of the 11 criteria during the same 12-month period would receive a diagnosis of substance use disorder. The severity of substance use disorder (i.e., none, mild, moderate, or severe) is based on the number of criteria reported by the adolescent.

Change in severity of SUD in the prior 12 months was examined for adolescents at intake and follow-up. Figure 3.38 displays the change in the percent of individuals in each SUD severity classification, based on self-reported criteria in the preceding 12 months. At intake, 36.1% met criteria for no substance use disorder (meaning they reported 0 or 1 DSM-5 criteria for SUD), while at follow-up, the majority (82.8%) met criteria for no SUD. At the other extreme of the continuum, 33.6% met criteria for severe SUD at intake, while at follow-up, only 4.9% met criteria for severe SUD.

The proportion of adolescents who met criteria for no SUD increased significantly from intake to follow-up

FIGURE 3.38. DSM-5 SUBSTANCE USE DISORDER SEVERITY AT INTAKE AND FOLLOW-UP (n = 122)



***p < .001.

⁴⁷ Hasin, D., & Paykin, A. (1999). Alcohol dependence and abuse diagnoses: Concurrent validity in a nationally representative sample. *Alcoholism: Clinical and Experimental Research*, 23(1), 144-150.

⁴⁸ Hasin, D., Trautman, K., Miele, G., Samet, S., Smith, M., & Endicott, J. (1996). Psychiatric Research Interview for Substance and Mental Disorders (PRISM): Reliability for substance abusers. *American Journal of Psychiatry*, 153(9), 1195-1201.

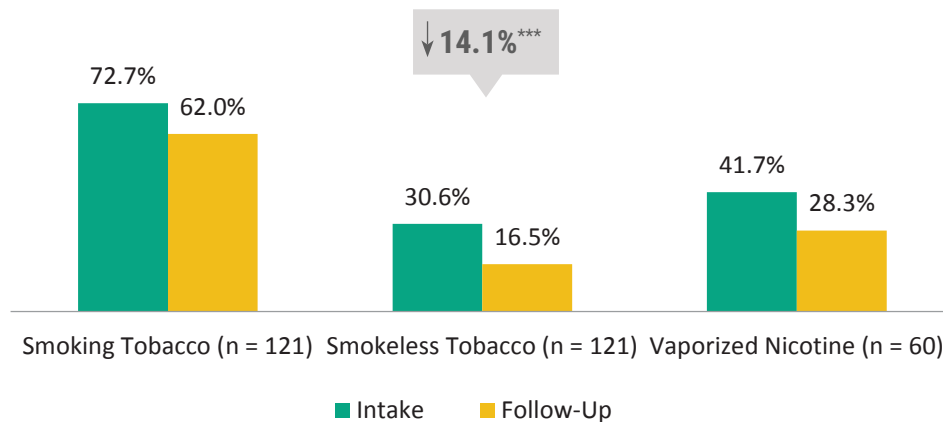
⁴⁹ Malone, M., & Hoffmann, N. (2016). A comparison of DSM-IV versus DSM-5 substance use disorder diagnoses in adolescent populations. *Journal of Child & Adolescent Substance Abuse*, 25(5), 399-408.

Tobacco and Vaporized Nicotine Use

PAST-12-MONTH TOBACCO AND VAPORIZED NICOTINE USE

Overall, there was no change in smoking tobacco use from intake to follow-up (see Figure 3.39). The majority of clients reported smoking tobacco in the 12 months before entering treatment (72.7%) and in the 12 months before follow-up (62.0%). Smaller percentages of clients reported using smokeless tobacco, with a significant decrease, from intake (30.6%) to follow-up (16.5%). For the individuals who were asked about vaporized nicotine use in the 12 months before intake (n = 60), about 2 in 5 reported using vaporized nicotine before intake and 28.3% reported using vaporized nicotine in the 12 months before follow-up, which was not a significant decrease.

FIGURE 3.39. PAST-12-MONTH SMOKING AND SMOKELESS TOBACCO USE AND VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP (N = 121)⁵⁰



**p < .01.

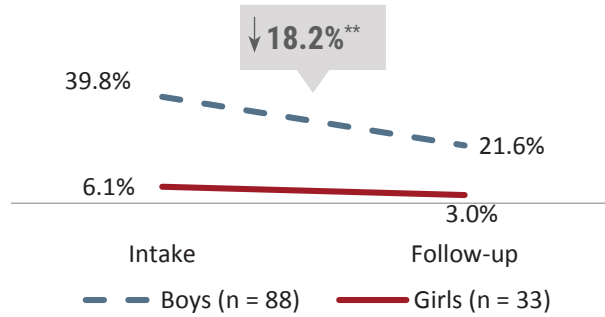
GENDER DIFFERENCES IN PAST-12-MONTH SMOKELESS TOBACCO USE

Significantly more boys than girls reported using smokeless tobacco at intake and follow-up (see Figure 3.40). Nonetheless, the number of boys and girls who reported using smokeless tobacco decreased significantly from intake to follow-up. About 1 in 5 boys reported using smokeless tobacco in the 12 months before follow-up.

Significantly more boys than girls used smokeless tobacco at intake and follow-up

⁵⁰ Survey items about using vaporized nicotine were added mid-way through data collection for this two-year period; thus, data is available for only 60 individuals who were asked about vaporized nicotine use before intake and follow-up.

FIGURE 3.40. GENDER DIFFERENCES IN SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 121)^a

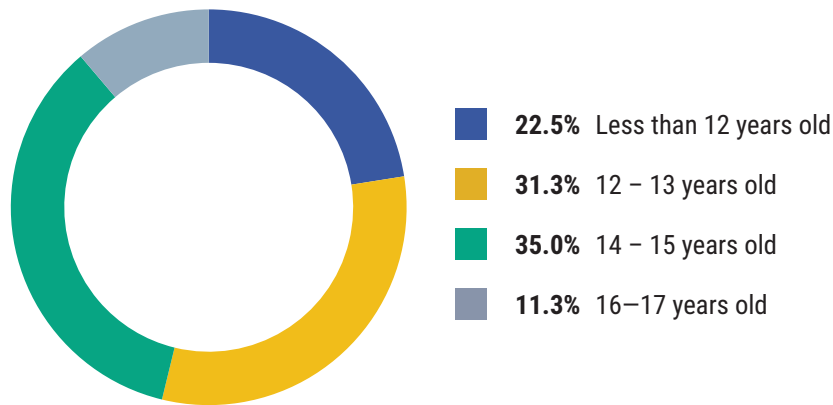


^a—Significant gender difference at intake ($p < .001$) and follow-up ($p < .05$).
****** $p < .01$.

AVERAGE AGE BEGAN SMOKING REGULARLY

Adolescents who reported smoking tobacco products in the 12 months before intake were asked how old they were when they began smoking regularly (i.e., on a daily basis). Among the 88 adolescents who reported smoking tobacco products, they began smoking regularly on average at age 13.1 years old.⁵¹ Figure 3.41 shows the percentage of adolescents who reported beginning to smoke regularly at different ages.

FIGURE 3.41. AVERAGE AGE BEGAN SMOKING TOBACCO REGULARLY (n = 80)



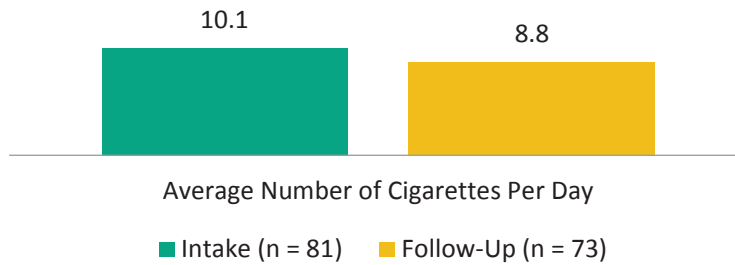
AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY

The average number of cigarettes clients reported smoking at intake and follow-up remained stable (see Figure 3.42). Of those who smoked tobacco at intake, clients reported smoking an average of 10.1 cigarettes in a day. At follow-up, among clients who reported smoking tobacco⁵², they reported smoking an average of 8.8 cigarettes in a day.

⁵¹ Seven adolescents who reported smoking tobacco in the 12 months before intake reported they had never begun smoking regularly, thus they did not report an age they began smoking. Also, one individual had a missing value for the age variable.

⁵² Seventy-five adolescents reported smoking in the 12 months before follow-up, however two had missing values for number of cigarettes smoked in a day.

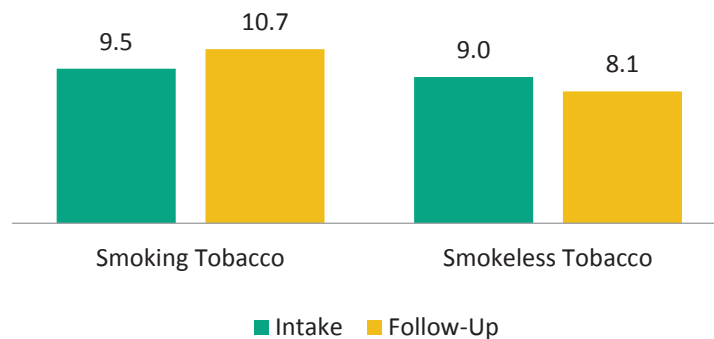
FIGURE 3.42. AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO SMOKED



AVERAGE NUMBER OF MONTHS OF SMOKING TOBACCO AND SMOKELESS TOBACCO USE

Figure 3.43 shows the number of months clients who used tobacco reported smoking tobacco and using smokeless tobacco at intake and follow-up. Among the clients who reported smoking tobacco in the 12 months before entering treatment (n = 88), they reported smoking tobacco, on average, 9.5 months. Among clients who reported smoking tobacco in the 12 months before follow-up (n = 75), they reported using, on average, 10.7 months. Among the adolescents who reported using smokeless tobacco in the 12 months before intake, they reported using smokeless tobacco in 9.0 months. Among the adolescents who reported using smokeless tobacco in the 12 months before follow-up, they reported using, on average, 8.1 months.

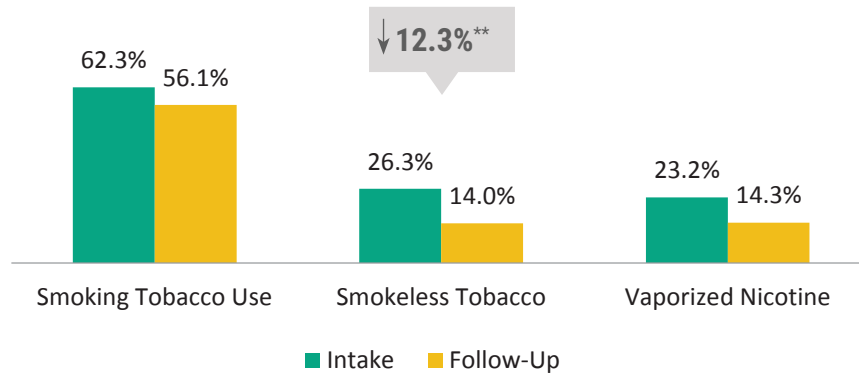
FIGURE 3.43. AMONG ADOLESCENTS WHO USED TOBACCO, THE AVERAGE NUMBER OF MONTHS OF TOBACCO USE AT INTAKE AND FOLLOW-UP



PAST-30-DAY TOBACCO USE

The number of clients who reported any past-30-day smoking tobacco use did not change from intake to follow-up. However, there was a significant decrease in the proportion of clients who reported smokeless tobacco use from intake to follow-up (see Figure 3.44).

FIGURE 3.44. PAST-30-DAY SMOKING AND SMOKELESS TOBACCO AND VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP (N = 114)

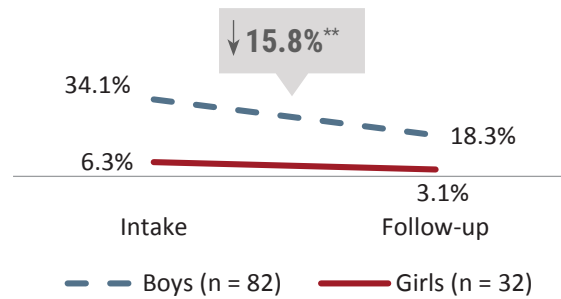


**p<.01

GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO USE

Significantly more boys than girls reported using smokeless tobacco at intake and follow-up (see Figure 3.45). Nonetheless, the number of boys and girls who reported using smokeless tobacco decreased significantly from intake to follow-up. About 1 in 5 boys reported using smokeless tobacco in the 12 months before follow-up.

FIGURE 3.45. GENDER DIFFERENCES IN SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 82)^a

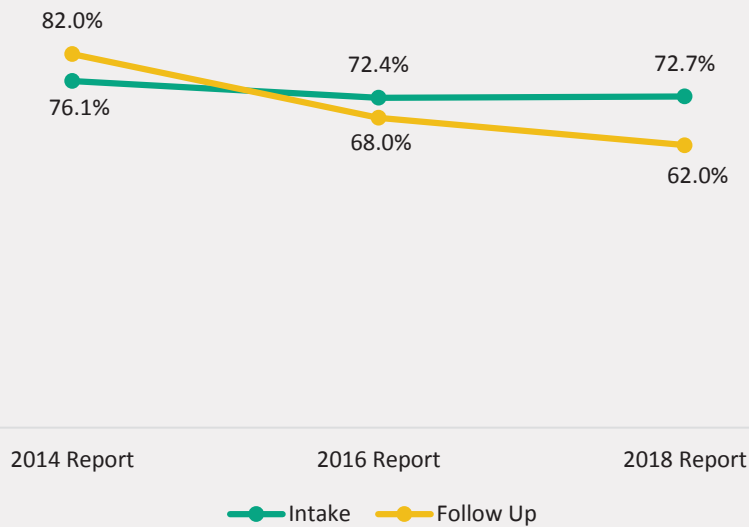


a—Significant gender difference at intake (p < .01) and follow-up (p < .05).

**p < .01.

TREND REPORT: SMOKING TOBACCO

High percentages of youth reported smoking tobacco in the past 12 months before follow-up than at intake in the 2014 report, whereas in the 2016 report and 2018 report smaller percentages of youth reported smoking tobacco at follow-up than at intake. Even so, the majority of youth reported smoking tobacco products in the 12 months before intake and follow-up in each of the biannual report data sets.



SECTION 4

MENTAL HEALTH SYMPTOMS

This section examines change from pre-program compared to 12-month follow-up on seven mental health measures: (1) internalizing problems, (2) externalizing problems, (3) attention problems, (4) thoughts of suicide or attempts, (5) disordered eating, (6) stress and coping, and (7) emotion regulation. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

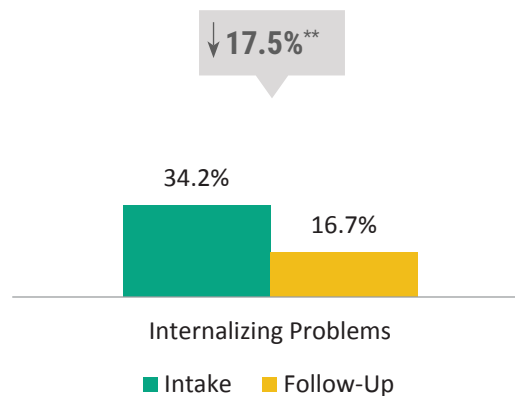
Internalizing Problems

To assess adolescents' self-reported internalizing problems at intake and follow-up, five items from the Internalizing Problems subscale of the brief form of Pediatric Symptom Checklist (PSC-17) were included in the intake and follow-up surveys. The Internalizing Problems subscale of the PSC-17 includes 5 items that ask about depression and anxiety symptoms. Example items ask how often the adolescent "Feels sad, unhappy," and "Worries a lot." The response options range from 0 (Never), 1 (Sometimes), and 2 (Often). Thus, as a severity measure, the Internalizing Problems subscale scores can range from 0 to 10.

The number of adolescents who met criteria for clinically significant internalizing problems decreased significantly by 17.5% from intake to follow-up (see Figure 4.1).

The number of adolescents who met criteria for clinically significant internalizing problems decreased significantly from intake to follow-up

FIGURE 4.1. CLINICALLY SIGNIFICANT SCORE ON THE PSC-17 INTERNALIZING PROBLEMS SUBSCALE AT INTAKE AND FOLLOW-UP (n = 120)⁵³



** p < .01

GENDER DIFFERENCES IN INTERNALIZING PROBLEMS

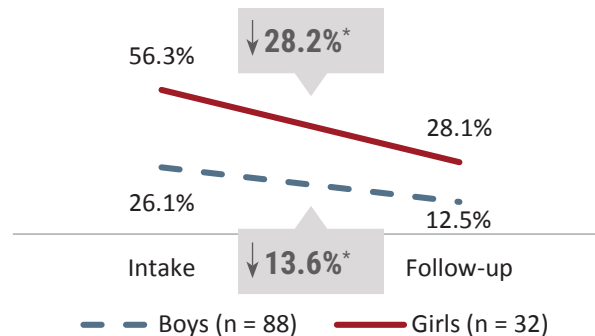
Compared to boys, significantly more girls met criteria for clinically significant internalizing problems at intake and follow-up (see Figure

Significantly more girls met criteria for internalizing problems at intake and follow-up

⁵³ Two individuals declined to answer the mental health questions at follow-up.

4.2). More than half of girls had clinically significant internalizing problems at intake compared to one quarter of boys. The number of boys and girls who met criteria for clinically significant internalizing problems decreased significantly from intake to follow-up.

FIGURE 4.2. GENDER DIFFERENCES IN MEETING CRITERIA FOR INTERNALIZING PROBLEMS^a



a—Statistical difference by gender at intake ($p < .01$) and follow-up ($p < .05$).
* $p < .05$.

Externalizing Problems

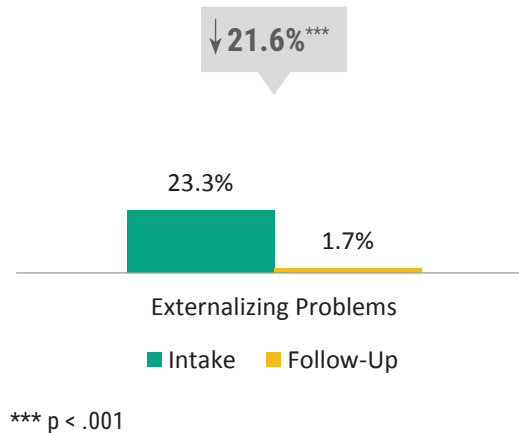
To assess for conduct problems and aggressive behavior (i.e., externalizing problems) the 7 items from the Externalizing Problems subscale of the PSC-17 were included in the intake and follow-up surveys. Examples of items ask how often the adolescent “Fights with others,” “Does not understand other people’s feelings,” and “Takes things that do not belong to him or her.” The response options range from 0 (Never), 1 (Sometimes), and 2 (Often). Thus, as a severity measure, the Externalizing Problems subscale scores can range from 0 to 14.

The number of adolescents who met criteria for clinically significant externalizing problems decreased significantly from intake to follow-up

The number of adolescents who met criteria for clinically significant externalizing problems decreased significantly 21.6% from intake to follow-up (see Figure 4.3).

“I felt comfortable with my counselor and that I wasn’t judged.”

- AKTOS FOLLOW-UP CLIENT

FIGURE 4.3. CLINICALLY SIGNIFICANT SCORE ON THE PSC-17 EXTERNALIZING PROBLEMS SUBSCALE AT INTAKE AND FOLLOW-UP (n = 120)⁵⁴

Attention Problems

To assess adolescents' self-reported attention problems related to attention deficits at intake and follow-up, five items from the Attention Problems subscale of the brief form of Pediatric Symptom Checklist (PSC-17)^{55, 56} were included in the intake and follow-up surveys. Items ask about attention deficit and hyperactivity. The survey items ask adolescents to tell how often they experience each of the problems, such as "Is distracted easily," and "Acts as if driven by a motor." The response options range from 0 (Never), 1 (Sometimes), and 2 (Often). Response values are summed and can range from 0 to 10. A cutoff of 7 suggests clinically significant attention deficits and/or hyperactivity.

The number of adolescents who met criteria for clinically significant attention problems decreased by 15%

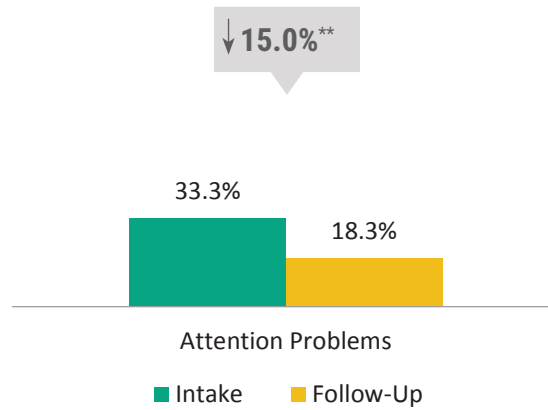
The percent of adolescents who had scores of 7 or higher on the Attention Problems subscale at intake and follow-up are presented in Figure 4.4.

⁵⁴ Two individuals declined to answer the mental health questions at follow-up.

⁵⁵ Jellinek, M., Murphy, J., Robinson, J., Feins, A., Lamb, S., & Fenton, T. (1988). The Pediatric Symptom Checklist: Screening school-age children for psychosocial dysfunction. *Journal of Pediatrics*, 112, 201-209.

⁵⁶ Murphy, J. (2015). *Review of research on the PSC-17 Pediatric Symptom Checklist*. Retrieved 09/14/2016 from www.massgeneral.org/psychiatry/services/psc_17.

FIGURE 4.4. CLINICALLY SIGNIFICANT SCORE ON THE PSC-17 ATTENTION PROBLEMS SUBSCALE AT INTAKE AND FOLLOW-UP (n = 120)⁵⁷



**p < .01.

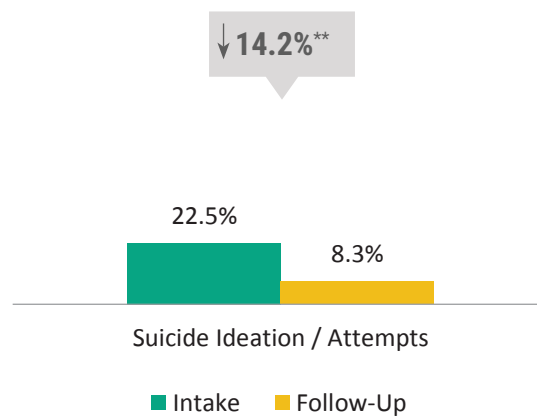
Suicide Ideation and Attempts

Suicide ideation and attempts was measured with self-reported questions about thoughts of suicide and actual attempts to commit suicide (e.g., suicidality). These two items were adapted from the T-ASI psychiatric domain.

The number of adolescents who reported suicidality decreased significantly from intake to follow-up (see Figure 4.5).

The number of adolescents who reported they had thoughts of suicide or attempts decreased by 14% from intake to follow-up

FIGURE 4.5. ADOLESCENTS REPORTING SUICIDE IDEATION AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (n = 120)⁵⁸



**p < .01.

GENDER DIFFERENCE IN SUICIDE IDEATION / ATTEMPTS

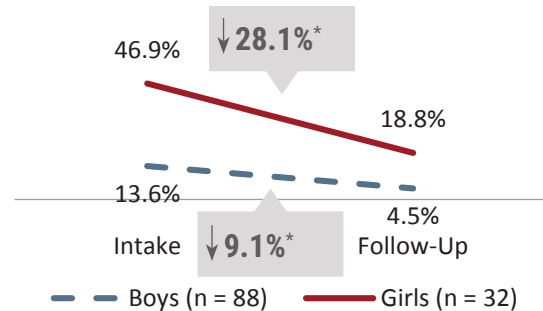
At intake, almost half of girls (46.9%) reported they had experienced suicide ideation and/or attempts in

⁵⁷ Two individuals declined to answer the mental health questions at follow-up.

⁵⁸ Two individuals declined to answer the mental health questions at follow-up.

the 12 months before entering treatment compared to 13.6% of boys. The proportion of girls and boys who reported they had experienced suicide ideation and/or attempts decreased significantly from intake to follow-up. At follow-up, there was still a significant difference in suicide by gender.

FIGURE 4.6. GENDER DIFFERENCE IN SUICIDE IDEATION / ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 120)^a

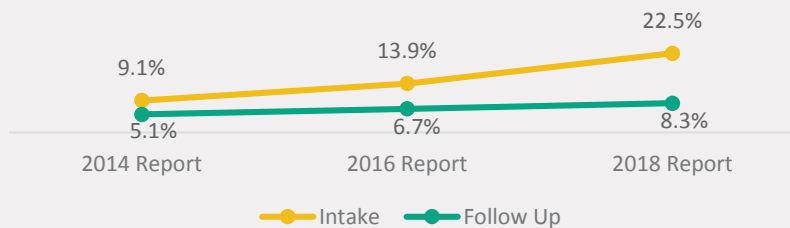


a—Statistical difference by gender at intake ($p < .001$) and follow-up ($p < .05$).

* $p < .05$.

TREND REPORT: THOUGHTS OF SUICIDE AND/OR SUICIDE ATTEMPTS

The percent of youth who have reported thoughts of suicide and/or suicide attempts in the past 12 months at treatment intake has increased from the 2014 report to the 2016 report and again in this year's report. Similar percentages of youth have reported thoughts of suicide and/or suicide attempts at follow-up in each of the biannual reports.



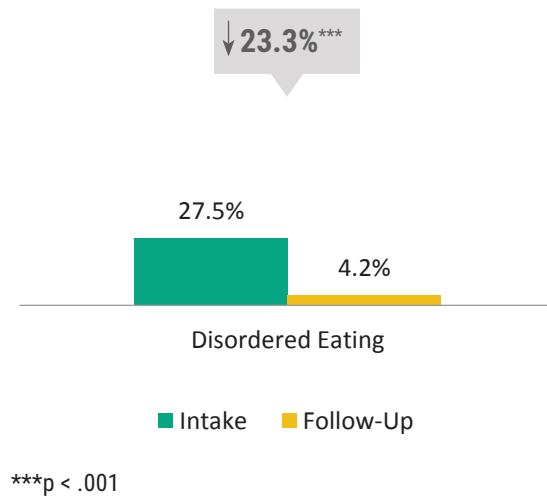
Disordered Eating

Three items from the SCOFF Questionnaire,⁵⁹ which is a screening tool designed to identify a possible eating disorder for further assessment, were included in the intake and follow-up surveys. An answer of “yes” for any of the three items was a positive screening for disordered eating: (1) “Do you make you make yourself sick because you feel uncomfortably full?” (2) “Do you believe yourself to be fat when others say you are too thin?” and (3) “Have you recently lost more than 15 lbs. in a three-month period?”

⁵⁹ Luck, A. J., Morgan, J. F., Reid, F., O'Brien, A., Brunton, J., Price, C., Perry, L., Lacey, J. H. (2002). The SCOFF questionnaire and clinical interview for eating disorders in general practice: comparative study. *British Medical Journal*, 325, 7367, 755-756.

A little more than one-fourth of adolescents answered yes to at least one of the disordered eating questions at intake and only 4.2% answered yes to one of the questions at follow-up (see Figure 4.7).

FIGURE 4.7. POSITIVE SCREEN FOR DISORDERED EATING AT INTAKE AND FOLLOW-UP (n = 120)⁶⁰

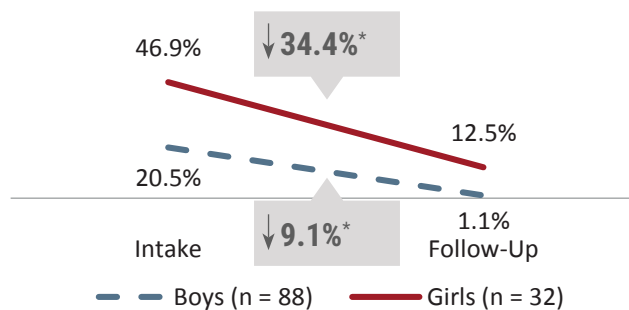


GENDER DIFFERENCE IN DISORDERED EATING

At intake, almost half of girls (46.9%) had a positive screen for disordered eating compared to 20.5% of boys. The proportion of girls and boys who screened positive for disordered eating decreased significantly from intake to follow-up. At follow-up, there was still a significant difference by gender.

Compared to boys, significantly more girls reported disordered eating at intake and follow-up

FIGURE 4.8. GENDER DIFFERENCE IN DISORDERED EATING AT INTAKE AND FOLLOW-UP (N = 120)^a



a—Statistical difference by gender at intake (p < .01) and follow-up (p < .01).
*p < .05.

Stress and Coping

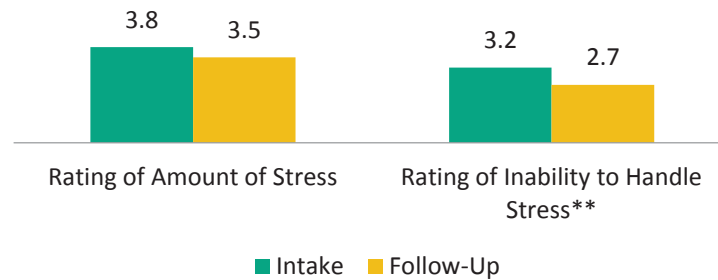
Adolescents’ perceptions of the amount of stress in their lives and their ability to handle stress were measured in the intake and follow-up interviews. Individuals were asked to think about the past 12 months when rating the amount of stress in their life. Response options ranged from 1 (No stress) to 6 (Extreme stress). Then adolescents were asked to rate their ability to handle stress, with response

⁶⁰ Two individuals declined to answer the mental health questions at follow-up.

options ranging from 1 (“I can shake off stress”) to 6 (“Stress eats away at me”). Thus, higher scores on both scales indicate worse states (i.e., more stress and poorer coping ability).

Figure 4.9 shows a non-significant decrease in the average amount of stress and a significant decrease in adolescents’ inability to handle stress over time. In other words, adolescents’ level of stress did not change significant but their sense of their ability to cope with stress improved over time.

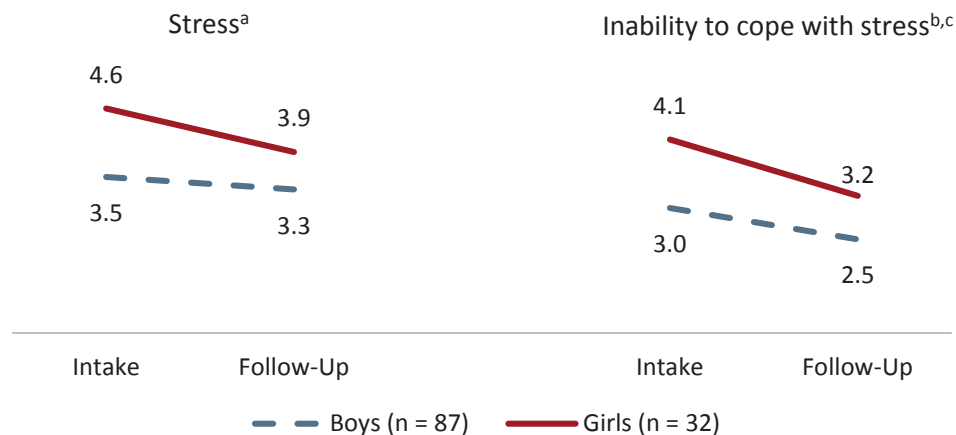
FIGURE 4.9. AVERAGE RATINGS OF STRESS AND INABILITY TO COPE WITH STRESS AT INTAKE AND FOLLOW-UP (N = 119)⁶¹



GENDER DIFFERENCE IN STRESS AND INABILITY TO COPE WITH STRESS

Compared to boys, girls reported a higher level of stress at intake and a higher inability to cope with stress at intake and follow-up (see Figure 4.10). Boys’ average decrease in stress was not statistically significant; however, their decrease in their rating of their inability to cope with stress was statistically significant. The average rating of stress and inability to cope with stress decreased significantly for girls.

FIGURE 4.10. GENDER DIFFERENCES IN STRESS AND INABILITY TO COPE WITH STRESS AT INTAKE AND FOLLOW-UP (n = 199)



a—Compared to boys, girls had significantly higher scores at intake; $p < .001$.

b—Compared to boys, girls had significantly higher scores at intake; $p < .01$.

c—Compared to boys, girls had significantly higher scores at follow-up; $p < .05$.

⁶¹ Three individuals declined to answer questions about stress at follow-up.

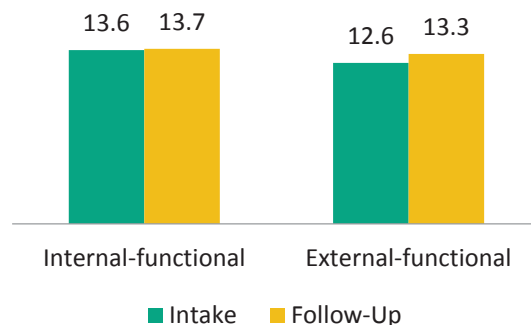
Emotion Regulation

The Regulation of Emotions Questionnaire (REQ),⁶² an 18-item self-report measure of emotion regulation, was included in the intake and follow-up surveys. The measure is based on a functionalist framework of emotions, which defines the function of emotions as providing useful information about a situation to enhance the individual's capacity to deal with situations.⁶³ Thus, functional emotion regulation strategies use the information provided by the emotion (i.e., holding and processing the emotion), whereas a dysfunctional strategy does not use the information (i.e., rejecting, avoiding, blocking) in a helpful way. The REQ was designed to assess functional and dysfunctional emotion regulation strategies that draw on internal and external resources adolescents use: (1) Internal-dysfunctional, (2) Internal-functional, (3) External-dysfunctional, and (4) External-functional. The REQ items ask respondents to think about how they usually handle upset feelings. They are asked to respond with 1 (Strongly disagree), 2 (Disagree), 3 (Neither disagree nor agree), 4 (Agree), and 5 (Strongly agree).

Individuals' scores on the REQ functional subscales at intake and follow-up are presented in Figure 4.11. Each of the functional subscales (Internal-functional and External-functional) have four items and a minimum score of 4 and a maximum score of 20. Scores on the REQ Internal-functional and External-functional scales did not change significantly. Examples of items from the Internal-functional subscale are: "You rethink your thoughts or beliefs," and "You rethink your goals or plans." Examples of items from the External-functional subscale are: "You ask others for advice," and "You talk to someone about how you feel."

Adolescents' self-reported use of functional emotion regulation strategies did not change significantly from intake to follow-up

FIGURE 4.11. AVERAGE SCORES ON EMOTIONAL REGULATION FUNCTIONAL SUBSCALES AT INTAKE AND FOLLOW-UP (n = 120)⁶⁴



Scores on the REQ dysfunctional subscales at intake and follow-up are presented in Figure 4.12. Each of the dysfunctional subscales (Internal-dysfunctional and External-dysfunctional) have five items and a minimum score of 5 and a maximum score of 25. Examples of items from the Internal-dysfunctional

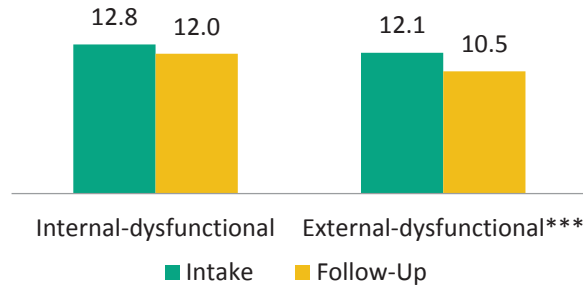
⁶² Berking, M., Wupperman, P., Reichardt, A., Pejic, T., Dippel, A., & Znog, H. (2008). Emotion regulation skills as a treatment target in psychotherapy. *Behaviour Research and Therapy*, 46, 1230-1237.

⁶³ Phillips, K. F., & Power, M. J. (2007). A new self-report measure of emotion regulation in adolescents: The Regulation of Emotions Questionnaire. *Clinical Psychology and Psychotherapy*, 14, 145-156.

⁶⁴ Two individuals declined to answer the emotion regulation questions at follow-up.

subscale are: “You harm or punish yourself in some way,” and “You dwell on your thoughts and feelings.” Examples of items from the External-dysfunctional subscale are “You try to make others feel bad,” and “You take your feelings out on objects around you (break something, punch something).” Individuals’ scores on the REQ Internal-dysfunctional did not change significantly, however, average scores on the External-dysfunctional subscale decreased significantly from intake to follow-up. In other words, adolescents reported using external-dysfunctional emotion regulation strategies less frequently at follow-up than at intake (see Figure 4.12).

FIGURE 4.12. AVERAGE SCORES ON EMOTIONAL REGULATION DYSFUNCTIONAL SUBSCALES AT INTAKE AND FOLLOW-UP (n = 120)⁶⁵



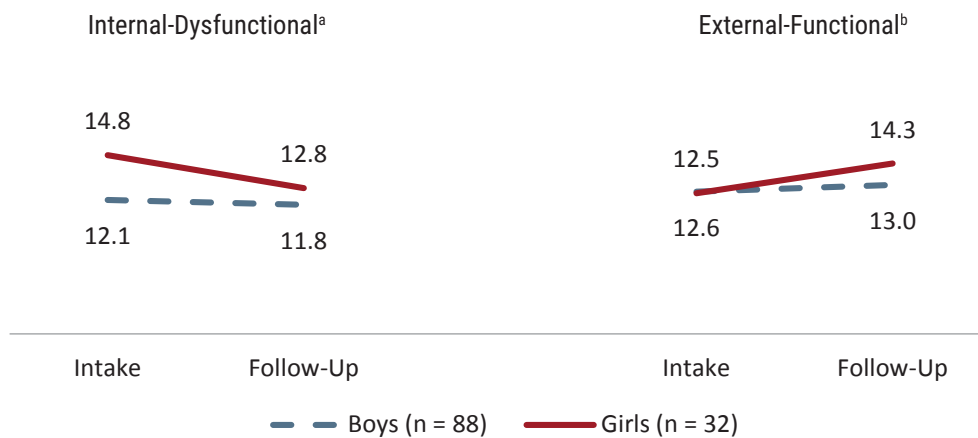
***p < .001.

GENDER DIFFERENCES IN EMOTION REGULATION

There were gender differences in the average scores on the emotion regulation subscales: one at intake, internal-dysfunctional, and one at follow-up, external-functional (see Figure 4.13).

Compared to boys, girls had higher scores on the internal-dysfunctional subscale at intake

FIGURE 4.13. GENDER DIFFERENCES IN EMOTION REGULATION STRATEGIES AT INTAKE AND FOLLOW-UP^a



a—Statistical difference by gender at intake (p < .01).

b—Statistical difference by gender at follow-up (p < .05).

⁶⁵ Two individuals declined to answer the emotion regulation questions at follow-up.

SECTION 5

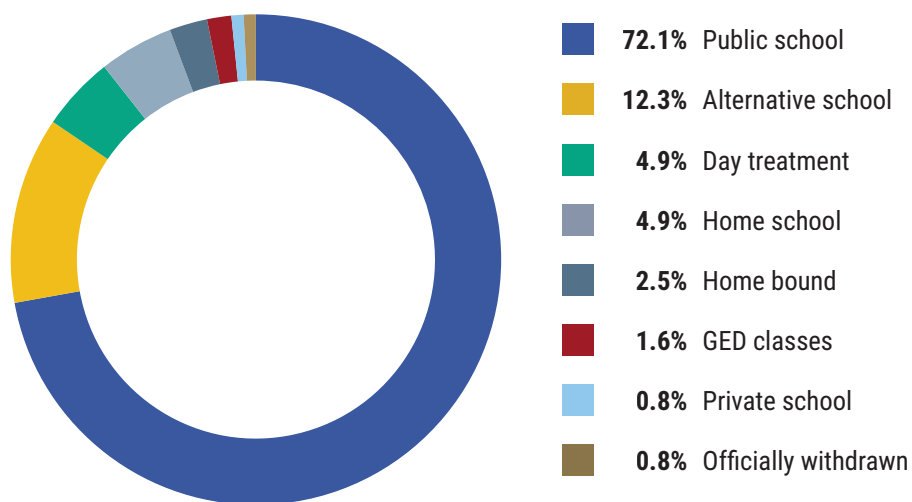
EDUCATION AND EMPLOYMENT

This section examines changes in education and employment from pre-program to 12-month follow-up. Specifically, this subsection presents data on: (1) attending school, (2) grade point average, (3) school absences for any reason and specifically for disciplinary reasons, (4) detention, suspension, and expulsion, (5) satisfaction with school, (6) education status for individuals 18 years old and older, and (7) employment status among those who were attending school and among those who were not attending school. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

Attending School

At intake, none of the individuals reported they had a high school diploma. The vast majority reported they were currently attending school or taking GED classes at intake (98.3%), with only 0.8% reporting they were officially withdrawn from school (see Figure 5.1). The largest percentage of youth were enrolled in public school (72.1%), followed by 12.3% in alternative school, 4.9% in day treatment, 4.9% in home school, 2.5% in home bound, 1.6% in GED classes, and 0.8% in private school.

FIGURE 5.1. PERCENT OF ADOLESCENTS ATTENDING DIFFERENT TYPES OF SCHOOLS AT INTAKE (n = 122)

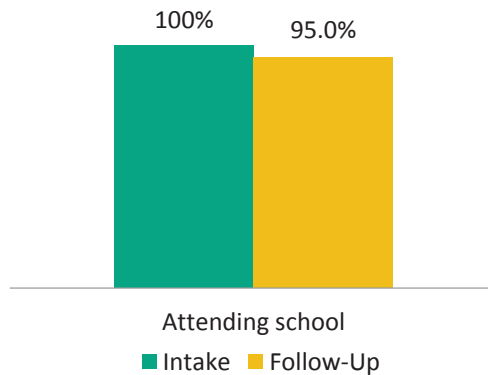


Of the individuals who had not received their high school diploma/GED by follow-up, Figure 5.2 shows the percent of adolescents enrolled in school (including public, private, alternative, day treatment, home school, and GED classes) at intake (100%) and follow-up (95%).

"I like how I learned to control my anger."

- AKTOS FOLLOW-UP CLIENT

FIGURE 5.2 AMONG ADOLESCENTS WITH LESS THAN A HIGH SCHOOL DIPLOMA AT FOLLOW-UP, THE PERCENT ATTENDING SCHOOL AT INTAKE AND FOLLOW-UP^a (n = 101)⁶⁶



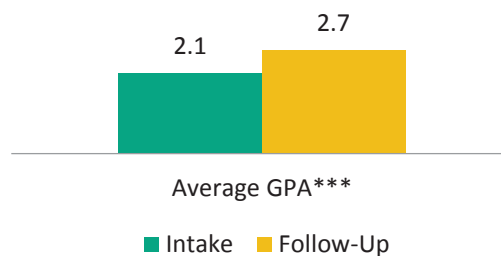
a—No measure of association could be computed for the crosstabulation because there was a value of 0 for the cell, Not attending school at intake.

Grade Point Average

Among adolescents who were enrolled in school at intake and follow-up, adolescents’ academic performance was assessed by examining their self-reported grade point average (GPA; see Figure 5.3). The highest GPA is 4.0, equivalent to an A, and the lowest GPA is a 0.0, equivalent to an F or E. At intake, the average GPA was 2.1 (about a C). At follow-up, adolescents’ average GPA had increased significantly to 2.7 (closer to a B than a C).

Self-reported GPA increased significantly from intake to follow-up

FIGURE 5.3. AMONG THOSE ENROLLED IN SECONDARY SCHOOL AT INTAKE AND FOLLOW-UP (N = 88),⁶⁷ SELF-REPORTED AVERAGE GPA



***p < .001

School Absences for Any Reason and for Disciplinary Reasons

Youth who had less than a high school diploma or GED were asked if they had attended school in the past 3 months it was in session. For those who answered yes, they were asked several questions in the

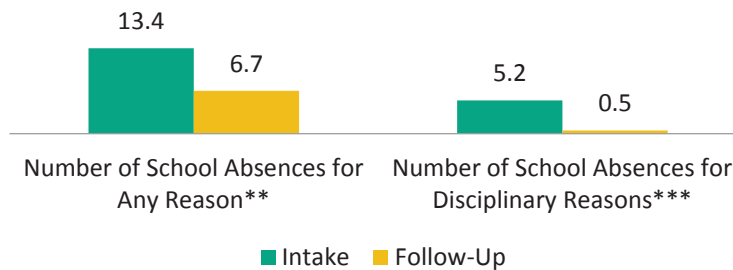
⁶⁶ There were missing values for highest level of education completed at follow-up for 7 individuals.

⁶⁷ Ninety-six adolescents had less than a high school diploma or GED at follow-up and were enrolled in school at intake and follow-up. Data on grades was missing for 7 adolescents at follow-up and 1 did not know their average grade.

intake and follow-up surveys about the number of days they missed for various reasons in the past 3 months.

Among those who were enrolled in school in the past 3 months at both intake and follow-up, the average number of school absences decreased significantly from 13.4 days at intake to 6.7 days at follow-up (see Figure 5.4). Not only was there a significant decrease in total school absences, but also there was a significant decrease in the average number of absences for disciplinary reasons (e.g., in-school and out-of-school suspension, and expulsion). The average number of absences due to suspension or expulsion decreased from 5.2 days at intake to 0.5 days at follow up.

FIGURE 5.4. AMONG THOSE ENROLLED IN SCHOOL IN THE PAST 3 MONTHS SCHOOL WAS IN SESSION AT INTAKE AND FOLLOW-UP (n = 79),⁶⁸ AVERAGE NUMBER OF SCHOOL ABSENCES

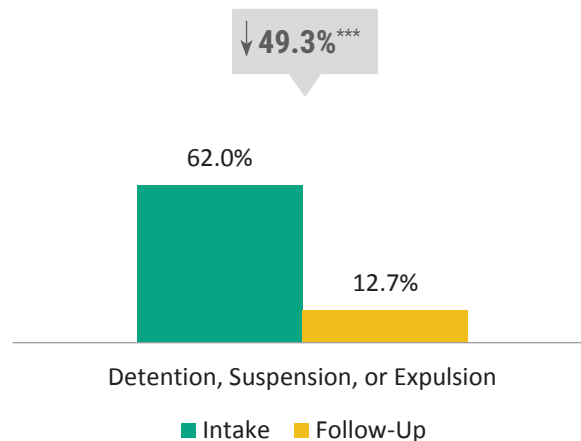


p < .01, *p < .001

Detention, Suspension, and Expulsion

The number of adolescents who reported being in detention, suspended, or expelled in the past 3 months school was in session decreased significantly by 49.3% from intake to follow-up (see Figure 5.5). At intake, the majority of individuals (62.0%) reported they had been in detention, suspended, or expelled, whereas at follow-up, this had decreased to 12.7%.

FIGURE 5.5. AMONG THOSE ENROLLED IN SCHOOL IN THE PAST 3 MONTHS SCHOOL WAS IN SESSION AT INTAKE AND FOLLOW-UP (n = 79), THE PERCENTAGE OF CLIENTS WHO WERE IN DETENTION OR EXPELLED

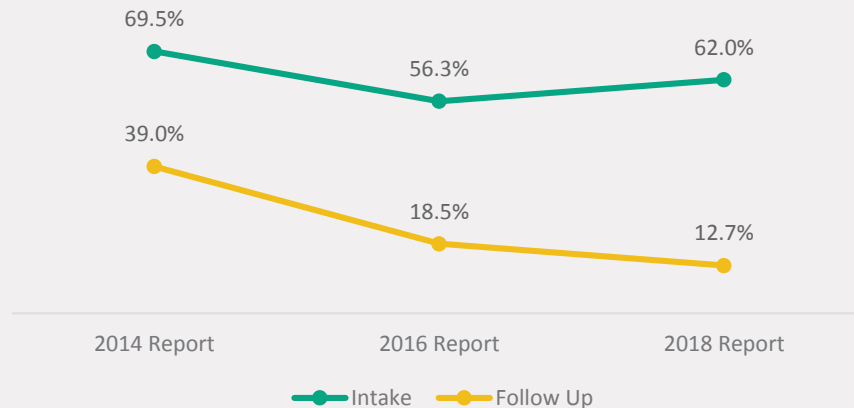


***p < .001

⁶⁸ Eighty-one individuals reported they were enrolled in school at in the 3 months before intake and the 3 months before follow-up but 2 of these individuals had missing values on the number of days they missed school for various reasons at follow-up.

TREND REPORT: DETENTION, SUSPENSION, AND EXPULSION

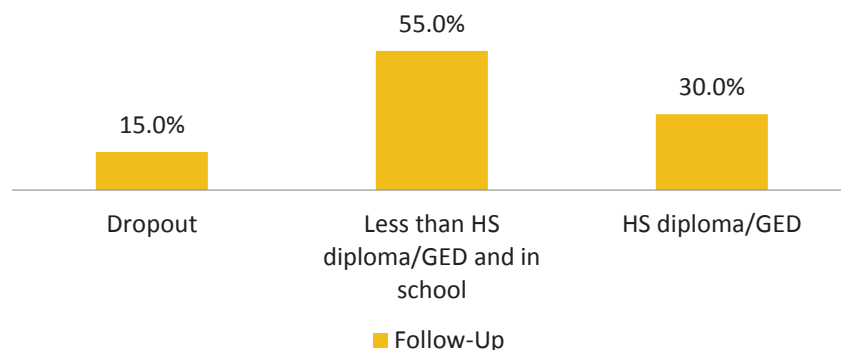
Among the adolescents who reported being in school the last 90 days school was in session, the majority reported they had missed school because they were in detention, suspended, or expelled at intake. Significant decreases in the percent of enrolled youth who reported they missed school because of detention, suspension, or expulsion were found at follow-up for all three biannual reports, with the decreases increasing in the 2016 and 2018 reports.



Education Status Among Individuals 18 Years Old and Older

Because all of the adolescents were under 18 years old at intake, it was expected that only a small number of individuals may already have a high school diploma or GED; in fact, none had already attained a high school diploma or GED at intake. However, by follow-up, 40 individuals were 18 (or 19) years old. Because this is an age when a typical individual graduates from high school, we examined the education status at follow-up of this subsample (see Figure 5.6). Among these individuals, 15.0% were not enrolled in school and had less than a high school diploma or GED (i.e., dropout); these are the individuals that cause the greatest concern. More than half (55.0%) had less than a high school diploma or GED and they were enrolled in secondary school, GED classes, or were enrolled in online classes (not clear which types of classes). Three in 10 (30.0%) had attained a high school diploma or GED by follow-up.

FIGURE 5.6. EDUCATION STATUS AT FOLLOW-UP AMONG CLIENTS 18 YEARS OLD AND OLDER (N = 40)

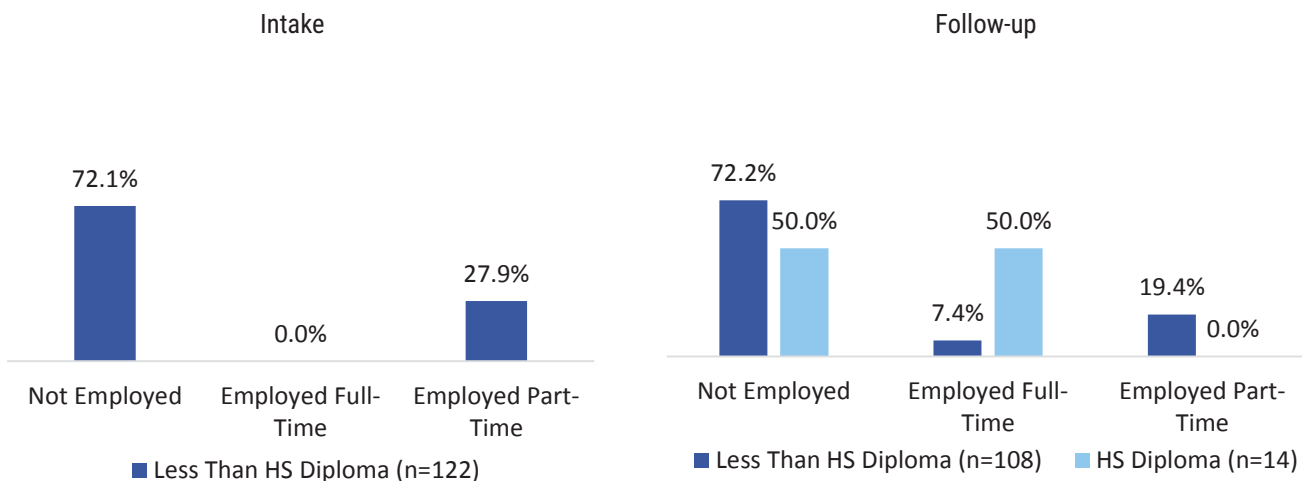


Employment

Adolescents' current employment is reported separately for those who had less than a high school diploma/GED and those who had a high school diploma/GED at each period (see Figures 5.7A & 5.7B). The majority of adolescents reported being unemployed at intake, with about one-fourth reporting they had part-time employment.

At follow-up, the majority of individuals reported being unemployed. Among individuals who had attained a high school diploma/GED at follow-up, 50.0% were unemployed and 50.0% were employed full-time (see Figure 5.7B). Among individuals who did not have a high school diploma/GED at follow-up, most were unemployed (72.2%), 7.4% were employed full-time and 19.4% were employed part-time at follow-up.

FIGURE 5.7A & 5.7B. EMPLOYMENT STATUS BY COMPLETION OF HIGH SCHOOL DIPLOMA/GED AT INTAKE AND FOLLOW-UP^{69, 70}



"I liked how the staff was open."
 - AKTOS FOLLOW-UP CLIENT

⁶⁹ No individuals reported they had a high school diploma or GED at intake.

⁷⁰ Even though seven individuals had missing data for highest level of education at follow-up, they provided information on their current schooling that indicated they had not yet completed high school; therefore, these seven individuals are included with the other 101 individuals who reported a highest level of education less than high school or GED at follow-up.

SECTION 6

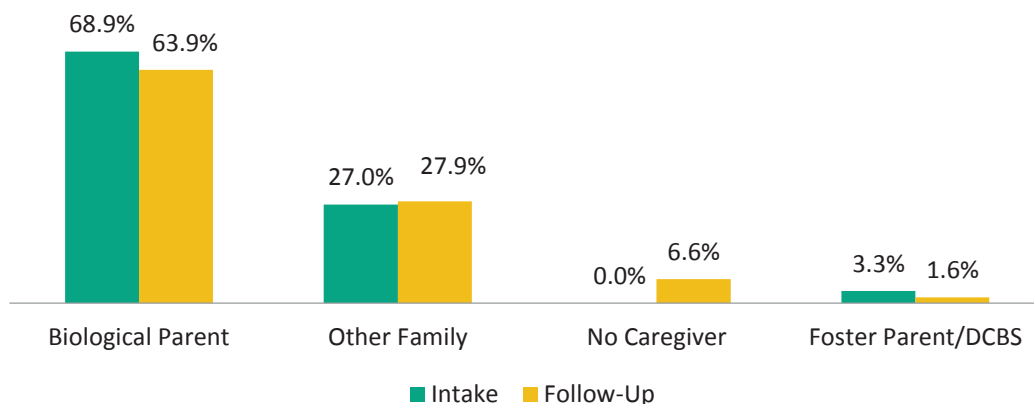
CAREGIVER AND LIVING SITUATION

This section of targeted factors examines change in the adolescent's primary caregiver and their involvement in the adolescent's life, and living situation before they entered treatment and at 12-month follow-up. Specifically, clients are asked at both periods about: (1) their primary caregiver, (2) their primary caregiver's involvement in their life, and (3) the types of residences they had lived in the past 12 months (i.e., parents' home, other relatives' home, foster care, institutional facility, on their own). Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

Primary Caregiver

The majority of youth reported at intake and follow-up that their primary caregiver was their biological parent (see Figure 6.1). At intake and follow-up, the next most frequently reported caregiver was other family (including kinship foster care and adoptive parents). The small increase in the number of individuals who had no caregiver was related to their age. Of the 8 individuals who reported at follow-up that they had no primary caregiver, all were 18 or 19 years old at the time of the follow-up survey.

FIGURE 6.1. PRIMARY CAREGIVER AT INTAKE AND FOLLOW-UP (n = 122)



Caregiver Involvement

Parental involvement is an important mediating factor among adolescents, such that greater parental involvement is associated with lower substance use and risk for addiction.^{71, 72} A brief measure of parental involvement that assesses the quality and quantity of interactions between parents and adolescents was included in the intake and follow-up interviews.⁷³ Five items from a parental

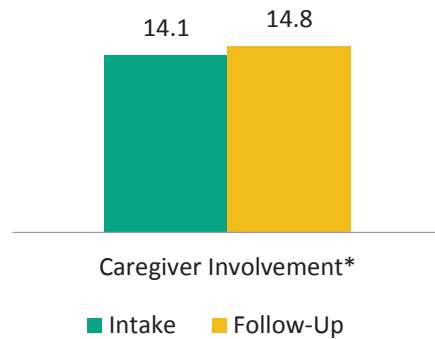
⁷¹ Broman, C. L., Reckase, M. D., & Freeman-Doan, C. R. (2006). The role of parenting in drug use among Black, Latino, and White adolescents. *Journal of Ethnicity in Substance Abuse*, 5(1), 39-50.

⁷² Choquet, M., Hassler, C., Morin, D., Falissard, B., & Chau, N. (2008). Perceived parenting styles and tobacco, alcohol and cannabis use among French adolescents: Gender and family structure differentials. *Alcohol & Alcoholism*, 43(1), 73-80.

⁷³ Harris, K. M., Furstenberg, F. F., & Marmar, J. K. (1998). Paternal involvement with adolescents in intact families: The influence of fathers over the life course. *Demography*, 35(2), 201-216.

involvement scale that was used in the National Survey of Children (NSC) were included. The first three items assess the affective quality of the youth's relationship to his/her primary caregiver. The remaining three items assess the behavioral dimension of parental involvement by asking about spending time together and supportive types of communication and interaction. The minimum score is 5 and the maximum score is 17. Higher scores indicate greater involvement of the caregiver in the youth's life. Adolescents' ratings of their primary caregiver's involvement in their lives significantly increased from intake to follow-up (see Figure 6.2).

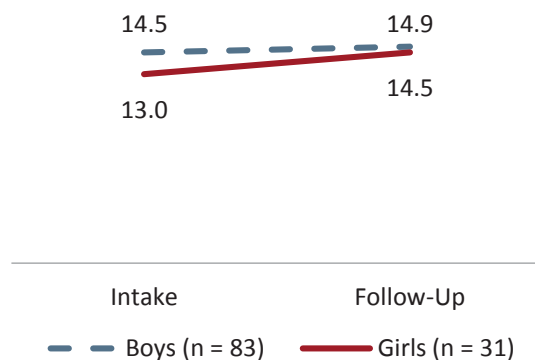
FIGURE 6.2. AVERAGE SCORE ON CAREGIVER INVOLVEMENT IN YOUTH'S LIFE SCALE AT INTAKE AND FOLLOW-UP (N = 114)⁷⁴



*p < .05.

At intake, girls had, on average, lower scores on the caregiver involvement scale compared to boys (see Figure 6.3). However, girls' ratings of caregiver involvement increased significantly from intake to follow-up. At follow-up, there was no difference by gender.

FIGURE 6.3. GENDER DIFFERENCE IN CAREGIVER INVOLVEMENT AT INTAKE AND FOLLOW-UP (N = 114)^{a,b}



a—Statistical difference by gender at intake (p < .01).

b—There was a significant change in caregiver involvement for girls.

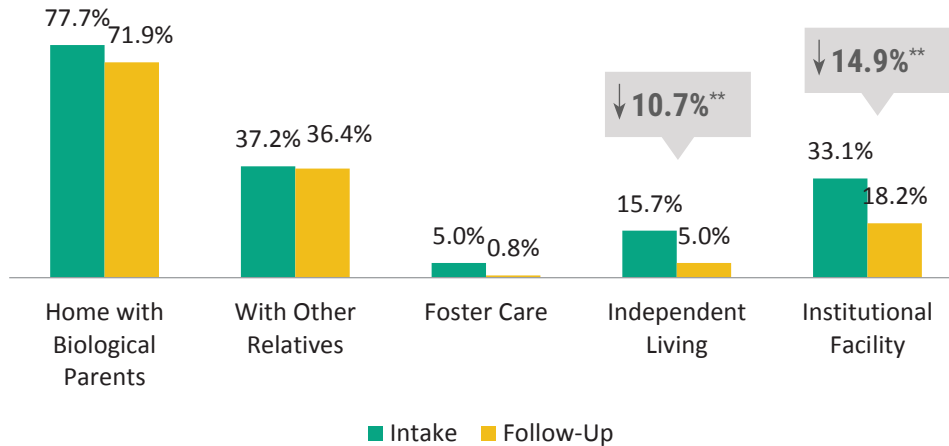
Living Situation

Individuals were asked to report all the types of residences they lived in the prior 12 months at intake and follow-up. Because individuals could report more than one type of residence the categories

⁷⁴ Eight individuals reported they had no caregiver at follow-up; therefore, they were not asked items about the caregiver's involvement in their lives.

presented in Figure 6.4 are not mutually exclusive. The majority of youth reported at intake and follow-up that they had lived with their biological parents at home in the prior 12 months. About one-third reported at intake and follow-up they had lived with other relatives (including kinship foster care). A very small number of individuals reported living in foster care at intake and follow-up. The number of individuals who reported they had lived independently (e.g., on their own, in a school dormitory) decreased significantly from intake to follow-up. Finally, the number of individuals who reported they had lived in an institutional setting (e.g., juvenile detention, residential treatment, group home) decreased 14.9% at follow-up.

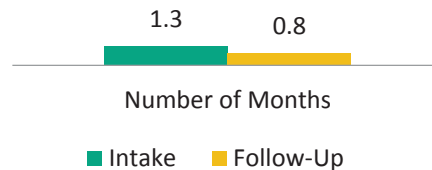
FIGURE 6.4. LIVING SITUATION IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP (n = 121)⁷⁵



**p < .01.

Individuals were asked to report how many months they lived somewhere other than with their biological parents or other relatives (i.e., foster care, health care, group home, residential treatment, juvenile detention, on their own, or on the street outdoors). There was a slight but non-significant decrease in the number of months individuals lived in foster care, institutional settings, or on their own (see Figure 6.5).

FIGURE 6.5. NUMBER OF MONTHS LIVED IN FOSTER CARE, INSTITUTIONAL SETTINGS, ON THEIR OWN, OR ON THE STREETS AT INTAKE AND FOLLOW-UP (N = 118)⁷⁶



⁷⁵ One individual had missing values on variables for living situation at follow-up.

⁷⁶ Four individuals had missing values at follow-up; interviewers skipped the question in error.

SECTION 7

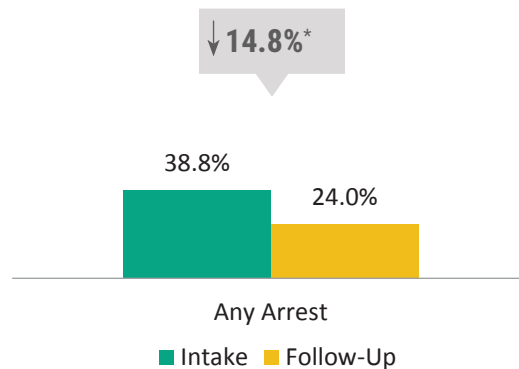
JUSTICE SYSTEM INVOLVEMENT

This section describes self-reported change in client involvement with the justice system during the 12-month period before entering treatment and the 12-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) the number of times arrested, (3) types of offenses among those with arrests, (4) detention, (5) the number of nights in detention among those who reported being in detention, and (6) supervision by the justice system. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

Arrests

A minority of adolescents (38.8%) reported being arrested and charged with an offense in the 12 months before entering treatment, with a significant decrease of 14.8% at follow-up (see Figure 7.1).

FIGURE 7.1. PERCENT OF CLIENTS REPORTING ARRESTS IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (n = 121)⁷⁷



*p < .05.

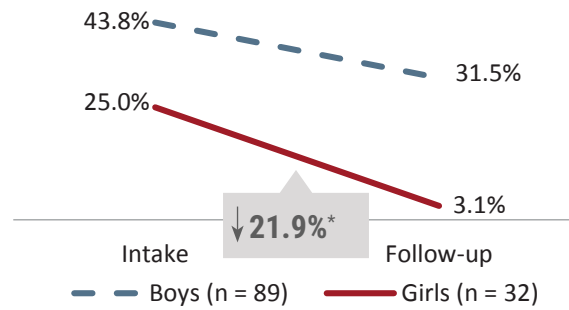
GENDER DIFFERENCES IN ARRESTS

There was no significant difference in the proportion of boys and girls who reported being arrested in the past 12 months at intake (see Figure 7.2). The number of girls who reported being arrested decreased significantly from intake to follow-up, whereas the proportion did not change significantly for boys. Compared to girls, significantly more boys reported being arrested and charged with an offense in the 12 months before follow-up.

Significantly more boys reported being arrested at follow-up compared to girls

⁷⁷ One individual had missing data for number of arrests in the 12 months before follow-up.

FIGURE 7.2. GENDER DIFFERENCES IN REPORTING ARRESTS IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP
(n = 122)^a

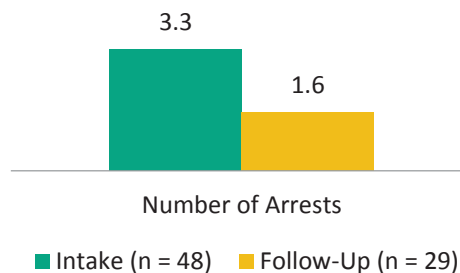


a— Significant difference by gender at follow-up; $p < .01$.

AMONG THOSE WITH AN ARREST, AVERAGE NUMBER OF ARRESTS

Among those individuals who reported any arrests at each period, the average number of arrests are presented in Figure 7.3.

FIGURE 7.3. AVERAGE NUMBER ARRESTS AT INTAKE AND FOLLOW-UP, AMONG THOSE WITH AT LEAST ONE ARREST



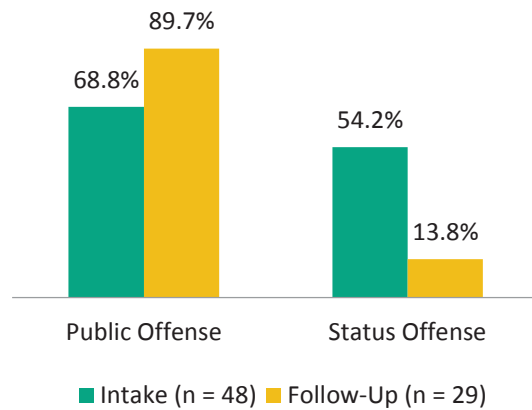
TYPES OF CRIMINAL CHARGES

A status offense is a noncriminal act that is considered a law violation only because of a youth's status as a minor. Examples of status offenses include: runaway, truancy, beyond control of the parent, and violating curfew. A public offense is a criminal offense regardless of the age of the offender (e.g., theft, drug possession, assault, public intoxication). Adolescents who reported any arrests were asked to report the total number of arrests as well as the number of status offenses in the 12 months before intake and follow-up, and from these two numbers, the number of public offenses could be calculated.

Even though there were fewer youth with arrests at follow-up, a higher percentage of those with any arrests reported they had been charged with a public offense at follow-up

Figure 7.4 shows the percent of adolescents who reported being charged with public and status offenses, among those who reported being arrested at intake (n = 48) and follow-up (n = 29).

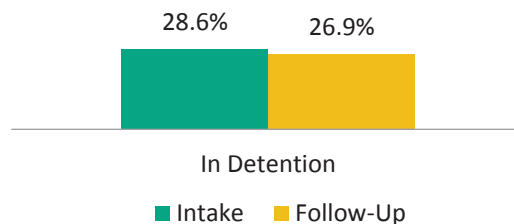
FIGURE 7.4. AMONG THOSE WHO REPORTED BEING ARRESTED AT INTAKE AND FOLLOW-UP, PERCENT OF ADOLESCENTS WHO WERE CHARGED WITH PUBLIC AND STATUS OFFENSES



Detention

A little over one-fourth of adolescents reported spending at least one night in detention⁷⁸ in the 12 months prior to entering treatment and follow-up (See Figure 7.5). There was no change over time.

FIGURE 7.5. PERCENTAGE OF CLIENTS REPORTING INCARCERATION IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP (n = 119)⁷⁹



AVERAGE NUMBER OF NIGHTS INCARCERATED

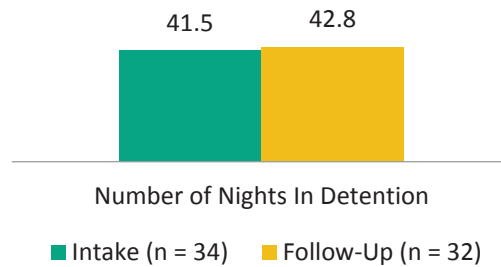
The number of nights in detention remained stable among those who reported spending at least one night in detention at intake and follow-up (see Figure 7.6).

"The therapist was really understanding. We really connected."
 - AKTOS FOLLOW-UP CLIENT

⁷⁸ Because some individuals were 18 years old or older at follow-up, some of the time spent incarcerated could have been in an adult offender facility (e.g., jail) and not juvenile detention.

⁷⁹ Three individuals had missing values for the number of nights spent in detention/jail at follow-up.

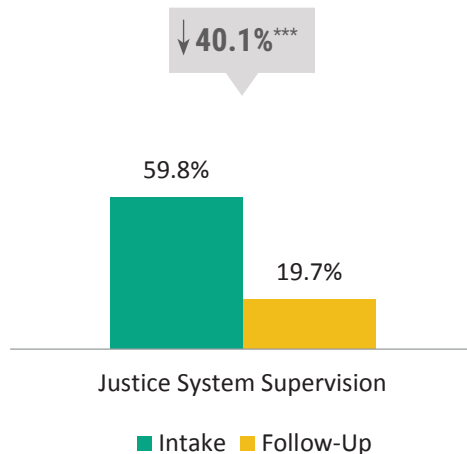
FIGURE 7.6. AVERAGE NUMBER OF NIGHTS IN DETENTION IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP, AMONG THOSE WHO WERE IN DETENTION



Self-Reported Justice System Supervision

The number of youth who self-reported they were under justice system supervision (e.g., drug court, probation, or diversion) decreased significantly by 40.1% from 59.8% at intake to 19.7% at follow-up (see Figure 7.7).

FIGURE 7.7. PERCENT OF CLIENTS REPORTING SUPERVISION BY THE JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP (n = 122)



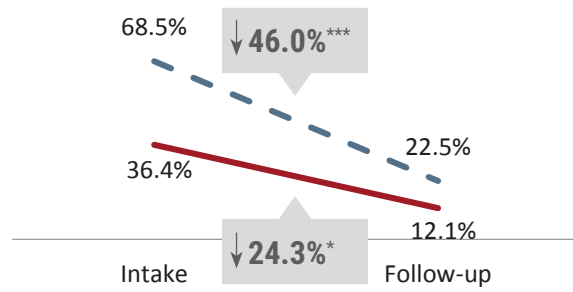
***p < .001.

GENDER DIFFERENCES IN JUSTICE SYSTEM SUPERVISION

Significantly more boys than girls reported they were under supervision of the justice system at intake; however, by follow-up there was no significant difference by gender (see Figure 7.8). The number of boys and girls who reported being under justice system supervision decreased significantly.

Significantly more boys reported being under justice system supervision compared to girls

FIGURE 7.8. GENDER DIFFERENCES IN JUSTICE SYSTEM SUPERVISION IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (n = 122)^a



a— Significant difference by gender at intake; $p < .01$.
 * $p < .05$, *** $p < .001$.

SECTION 8

RECOVERY SUPPORTS

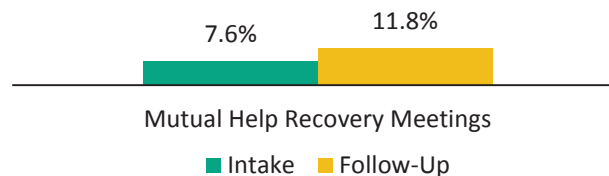
This section focuses on three main changes in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) the number of people the participant said they could count on for recovery support, and (3) satisfaction with their recovery support. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences between male and female clients.

Mutual Help Recovery Group Meetings

At intake, only 7.6% of adolescent clients reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days (See Figure 8.1). At follow-up, 11.8% of clients reported they had gone to mutual help recovery group meetings in the past 30 days, which was not a significant change.

The percent of clients attending mutual help recovery groups remained low at intake and follow-up

FIGURE 8.1. PARTICIPATION IN MUTUAL HELP RECOVERY GROUP MEETINGS IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (n=119)⁸⁰

**AVERAGE NUMBER OF PEOPLE ADOLESCENTS COULD COUNT ON FOR RECOVERY SUPPORT**

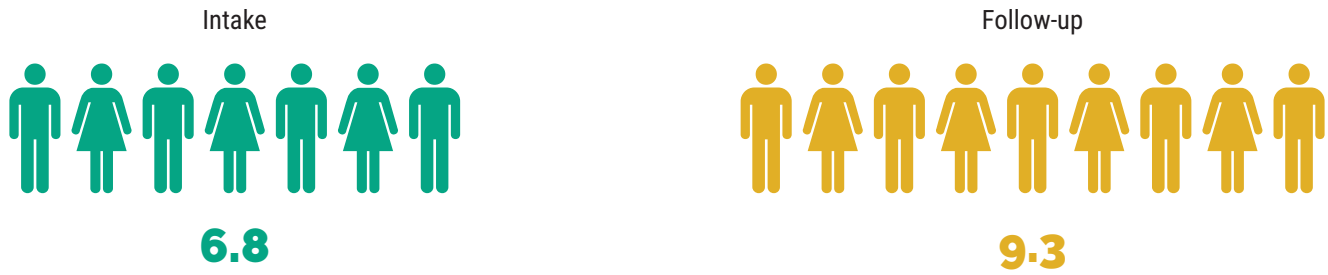
The average number of people adolescents reported that they could count on for recovery support increased significantly from intake to follow-up (see Figure 8.2).

"They were really helpful. I liked the program a lot."

- AKTOS FOLLOW-UP CLIENT

⁸⁰ Three individuals had missing data for mutual help recovery group meetings in the 30 days before follow-up.

FIGURE 8.2. AVERAGE NUMBER OF PEOPLE ADOLESCENTS COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (n = 118)⁸¹

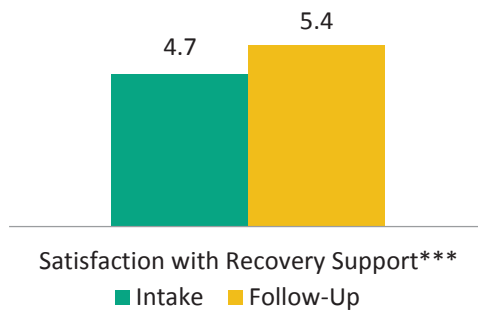


*p < .05.

Satisfaction with Recovery Support

Individuals were asked to rate their satisfaction with the level of recovery support they had in their life at intake and follow-up. Response options ranged from 1 (Extremely dissatisfied) to 6 (Extremely satisfied). Figure 8.3 shows individuals' ratings of their satisfaction with their recovery support, which significantly increased, indicating greater satisfaction at follow-up than at intake.

FIGURE 8.3. AVERAGE RATING OF SATISFACTION WITH RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (N = 118)⁸²



***p < .001.

⁸¹ Four individuals had missing values for the number of people clients could count on for recovery support at follow-up.

⁸² Four individuals had missing data for their satisfaction with recovery support at follow-up.

SECTION 9

ASSOCIATIONS OF FACTORS WITH SUBSTANCE USE AT FOLLOW-UP

This section focuses on multivariate analysis examining factors related to alcohol and drug use during the 12-month follow-up period for the 2018 AKTOS follow-up sample.

At follow-up, 32.0% (n = 39) of adolescents reported using any alcohol in the 12 months before follow-up and 42.6% (n = 52) of adolescents reported using any illegal drugs in the 12 months before follow-up. Separate logistic regression models were used to examine the association between selected targeted factors and use of alcohol and illegal drugs during the follow-up time period.

The targeted factors in Table 9.1 were entered into a binary logistic regression model as predictor variables and any alcohol use in the past 12 months at follow-up (Yes/No) was entered as the dependent variable. Results of the analysis show that adolescents with more adverse childhood experiences and adolescents who used internal-dysfunctional emotion regulation strategies more frequently had greater odds of using alcohol in the 12 months before follow-up. Gender, age, and their scores on the Internalizing Problems scale were not significantly associated with alcohol use in the follow-up period.

TABLE 9.1. ASSOCIATION OF TARGETED FACTORS AND ALCOHOL USE AT FOLLOW-UP

| Factor | B | SE | Odds Ratio | 95% CI for OR |
|--|-------|------|------------|----------------|
| Gender | -.814 | .585 | .443 | [.141, 1.396] |
| Age at intake | .435 | .232 | 1.545 | [.980, 2.435] |
| Number of ACE categories experienced in lifetime | .332 | .128 | 1.394** | [1.085, 1.791] |
| Score on the PSC Internalizing Problems subscale at intake | -.098 | .098 | .907 | [.748, 1.098] |
| Score on the Emotion Regulation Internal-Dysfunctional scale | .162 | .068 | 1.176** | [1.029, 1.343] |

Note: Categorical variable was coded as gender (1 = male, 2 = female).
*p<.05, **p<.01

The targeted factors in Table 9.2 were entered into a binary logistic regression model as predictor variables and any illegal drug use in the past 12 months at follow-up (Yes/No) was entered as the dependent variable. Results of the analysis show that the only predictor variable associated with illegal drug use in the 12-month follow-up period was age, such that older adolescents had greater odds of reporting illegal drug use at follow-up.

"The counselor was very up front with me and knew what I needed."

- AKTOS FOLLOW-UP CLIENT

TABLE 9.2. ASSOCIATION OF TARGETED FACTORS AND ILLEGAL DRUG USE AT FOLLOW-UP

| Factor | B | SE | Odds Ratio | 95% CI for OR |
|--|----------|-----------|-------------------|----------------------|
| Gender | .275 | .484 | 1.316 | [.510, 3.398] |
| Age at intake | .435 | .198 | 1.544* | [1.048, 2.276] |
| Number of ACE categories experienced in lifetime | .170 | .111 | 1.185 | [.953, 1.472] |
| Score on the PSC Internalizing Problems subscale at intake | -.087 | .086 | .917 | [.774, 1.086] |
| Score on the Emotion Regulation Internal-Dysfunctional scale | .005 | .057 | 1.005 | [.899, 1.124] |

Note: Categorical variable was coded as gender (1 = male, 2 = female).

*p<.05

SECTION 10

SUMMARY AND RECOMMENDATIONS

This section summarizes and discusses the major findings and their implications from the 2018 Adolescent Kentucky Treatment Outcome Study.

Substance use disorders in youth are best understood within the context of several interrelated problems,^{83,84} such as childhood adversity and victimization,⁸⁵ comorbid psychiatric disorders,⁸⁶ and problem behaviors (i.e., delinquency).⁸⁷ The 122 youth who completed intake and follow-up interviews for the 2018 AKTOS Follow-Up Study were, on average, 16 years old at intake and came into treatment with significant adversities. At treatment intake 97.5% of the youth in this study reported they had used alcohol and/or illegal drugs in the 12 months before entering treatment, and the average age adolescents began using drugs was 13 and 13.4 years old for alcohol. The vast majority of youth reported experiencing at least one category of adverse childhood experiences in their lifetime, including 63.6% of girls and 33.7% of boys reporting any of the types of maltreatment/abuse. Moreover, the percentages of youth reporting specific types of household risk factors measured within ACE were high, particularly for having a household member with an alcohol abuse problem or using illegal drugs and youth's parents living separately (due to divorce or never being married). Additionally, many youth's educational involvement was suboptimal: for example, an average GPA equivalent to a C grade, and more than half of youth enrolled in school (62.0%) had been in school detention, suspended, or expelled from school in the past 90 days school was in session at treatment intake. Further, more than half of adolescents reported they were under supervision by the justice system at treatment intake and about 38.8% had been arrested in the 12 months before intake. Finally, minorities of clients had clinically significant attention problems, internalizing problems, and externalizing problems, as well as thoughts of suicide or attempts before entering treatment.

The outcome data show significant decreases in substance use and severity of substance use over time. The follow-up findings show that 97.5% of adolescents reported that they had used alcohol and/or drugs in the 12 months before intake. By follow-up, the number of adolescents who reported they had used alcohol and/or drugs decreased to 50.4%. Specifically, the percent of adolescents who reported using illegal drugs (including misuse of prescription drugs) in the past 12 months decreased from 93.4% at intake to 42.1% at follow-up and the percent of adolescents who reported using alcohol decreased from 77.7% at intake to 32.2% at follow-up. In other words, 67.8% of youth reported abstaining from alcohol and 57.9% of youth reported abstaining from drugs in the 12-month follow-up period. Other studies have found abstinence rates ranging from 14% to 54% at one-year follow-up, with most of these

⁸³ Jessor, R., and Jessor, S.L. (1997). *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. New York: Academic Press.

⁸⁴ Teplin, L., Abram, K., McClelland, G., Dulcan, M., & Mericle, A. (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*, 59, 1133-1143.

⁸⁵ Tonmyr, L., Thornton, T., Draca, J., & Wekerle, C. (2010). A review of childhood maltreatment and adolescent substance use relationship. *Current Psychiatry Reviews*, 6(3), 223-234.

⁸⁶ Rohde, P., Lewinsohn, P. M., & Seeley, J. R. (1996). Psychiatric comorbidity with problematic alcohol use in high school students. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35(1), 101-109.

⁸⁷ Kuperman, S., Schlosser, S., Kramer, J., Bucholz, K., Hesselbrock, V., Reich, T., et al. (2001). Developmental sequences from disruptive behavior diagnosis to adolescent alcohol dependence. *American Journal of Psychiatry*, 158, 2022-2026.

studies finding 12-month abstinence rates from 30% to 40%.⁸⁸ Not only did substance use decrease significantly, but severity of substance use also decreased, as measured by the number of symptom criteria endorsed for substance use disorder per the DSM-5. The percent of adolescents who met the criteria for severe substance use disorder decreased significantly and the percent of adolescents with symptom criteria consistent with no substance use disorder increased significantly at follow-up.

Youth who abuse substances are at higher risk of dropout or non-completion of a degree.⁸⁹ Poor grades or school performance can be an indication of dropout risk. Keeping youth in school until high school graduation has substantial impacts on their future earning capability. For every year of education an individual completes, there is an estimated 10% gain in career earnings.⁹⁰ In fact, some studies have found the rate of return is higher for completing a high school diploma than for completing college.⁹¹ Individuals who complete a high school degree or obtain some college education have exponentially higher income than those who do not advance their education.^{92,93} Because of this, it is important to examine education in a substance abuse treatment outcome study. In the AKTOS sample, the majority of individuals who had not yet obtained a high school diploma at follow-up were still enrolled in school at follow-up (95.0%). Additionally, there was a significant increase in GPA from intake (2.1) to follow-up (2.7) and significant decreases in the number of school absences for any reason as well as school absences for disciplinary reasons. Not only were there improvements in academic performance and attendance among those enrolled in school, but also significantly fewer individuals enrolled in school had received disciplinary measures such as detention, suspension, or expulsion at follow-up. Another positive finding is that when individuals who had reached the age that most individuals typically graduate from high school (i.e., 18 years old) by follow-up were examined (n = 40), the vast majority (85.0%) were either still enrolled in secondary school (55.0%), or had obtained a high school diploma or GED (30.0%). Only a minority of individuals who were 18 years old at follow-up (15.0%, n = 6) had dropped out of secondary school. How does this percent compare to the percent of youth in Kentucky who do not graduate from high school in four years? In the 2015-2016 school year, the graduation rate for Kentucky was 88.6%, meaning that 11.4% of students did not graduate.⁹⁴ Thus, the dropout rate for the individuals in the follow-up sample is slightly higher than the rate for the general population of high school students in Kentucky.

The majority of individuals either continued their education and had improvements in their grades and/or reductions in disciplinary measures or obtained at least a high school diploma or GED. Nonetheless, a small minority of individuals dropped out of secondary school before attaining a high school diploma or GED, which suggests a need for more intensive school-based programs to retain and successfully intervene with high-risk youth. The benefits of keeping youth in school are well documented but require significant investments from the community including treatment staff, families, schools, and other

⁸⁸ Williams, R. J., & Chang, S. Y. (2000). A comprehensive and comparative review of adolescent substance abuse treatment outcome. *Clinical Psychology: Science & Practice*, 7, 138-166.

⁸⁹ DuPont, R. L., Campbell, M. D., Campbell, T. G., Shea, C. L., & DuPont, H. S. (2013). Self-reported drug and alcohol use and attitudes toward drug testing in high schools with random student drug testing. *Journal of Child & Adolescent Substance Abuse*, 22(2), 104-119.

⁹⁰ Psacharopoulos, G., & Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics*, 12(2), 111-134.

⁹¹ Heckman, J., Lochner, P., & Todd, P. (2008). Earnings functions and rates of return. *Journal of Human Capital*, 2(1), 1-31.

⁹² Autor, D. H., Katz, L.F. & Kearney, M.S. (2005). *Rising Wage Inequality: The Role of Composition and Prices*. NBER technical working paper 11627.

⁹³ Heckman, J.J., & LaFontaine, P.A. (2010). The American high school graduation rate: Trends and levels. *The Review of Economics and Statistics*, 92(2), 244-262.

⁹⁴ Kentucky Department of Education. (2015). Kentucky School Report Card, 2013-2014, Graduation Rate. <https://applications.education.ky.gov/src/DeliveryTargetByState.aspx>

community agencies.

Comorbid mental health problems are common in adolescents with substance use disorders.^{95,96} Externalizing behavior has been associated with early substance use initiation and greater substance use overall.⁹⁷ Adolescents' self-reported symptoms showed a significant decrease from intake to follow-up in attention problems, internalizing problems, externalizing problems, thoughts of suicide and/or suicide attempts, disordered eating, and overall stress. Moreover, the frequency of individuals' use of external-dysfunctional emotion regulation strategies decreased over time as well as their self-reported inability to cope with stress. Increasing functional emotional regulation strategies (e.g., seeking advice, talking about feelings, doing something enjoyable) and decreasing dysfunctional emotion regulation strategies (e.g., taking anger out on others, avoiding negative feelings) are important targets for substance abuse treatment because emotion regulation deficits are robust predictors of substance use risk.^{98,99}

Adolescents' involvement with the justice system decreased over time, with significantly fewer individuals reporting they had been arrested and charged with an offense, or were under supervision by the justice system at follow-up. Nonetheless, there was no significant change in the percent of adolescents who reported they had been in detention/incarcerated in the 12 months before treatment and the 12 months before follow-up.

A number of studies on interpersonal victimization have found an association of interpersonal victimization, trauma exposure, and substance use/substance use disorders.^{100,101,102} In this sample of adolescent clients of publicly-funded substance abuse treatment in Kentucky, interpersonal victimization and childhood adversities were relatively common experiences. High percentages of clients had experienced interpersonal victimization in their lives and had exposure to multiple household adversities, such as divorced parents/parents living apart and someone in their household abusing alcohol or using illicit drugs. Importantly, significant associations were found between the number of categories of adverse childhood experiences and their substance use and mental health problems in the period before entering treatment. Moreover, multivariate analysis showed that individuals with more adverse childhood experiences at intake had greater odds of using alcohol in the 12-month follow-up period.

⁹⁵ Armstrong, T. D., & Costello, E. J. (2002). Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *Journal of Consulting and Clinical Psychology, 70*, 1224-1239.

⁹⁶ Turner, W.C., Muck, R.D., Muck, R.J., Stephens, R.L., & Sukumar, B. (2004). Co-occurring disorders in the adolescent mental health and substance abuse treatment systems. *Journal of Psychoactive Drugs, 36*, 455-462.

⁹⁷ Lillehoj, C., Trudeau, L., Spoth, R., & Madon, R. (2005). Externalizing behaviors as predictors of substance initiation trajectories among rural adolescents. *Journal of Adolescent Health, 37*, 493-501.

⁹⁸ Cheetham, A., Allen, N. B., Yücel, M., & Lubman, D. I. (2010). The role of affective dysregulation in drug addiction. *Clinical Psychology Review, 30*(6), 621-34. doi: 10.1016/j.cpr.2010.04.005.

⁹⁹ Holtmann, M., Buchmann, A. F., Esser, G., Schmidt, M. H., Banaschewski, T., & Laucht, M. (2011). The child behavior checklist-dysregulation profile predicts substance use, suicidality, and functional impairment: A longitudinal analysis. *Journal of Child Psychology & Psychiatry, 52*(2), 139-147.

¹⁰⁰ Kilpatrick, D. G., Saunders, B. E., & Smith, D. W. (2003). *Youth victimization: Prevalence and implications. Research in brief*. Washington, DC: US Department of Justice, Office of Justice Programs.

¹⁰¹ McCart, M. R., Zajac, K., Danielson, C. K., Strachan, M., Ruggiero, K. J., Smith, D. W., Saunders, B. E., & Kilpatrick, D. G. (2011). Interpersonal victimization, posttraumatic stress disorder, and change in adolescent substance use prevalence over a ten-year period. *Journal of Clinical Child and Adolescent Psychology, 40*, 136-143. Doi:10.1080/15374416.2011.533411.

¹⁰² Vermeiren, R., Schwab-Stone, M., Deboutte, D., Leckman, P. E., & Ruchkin, V. (2003). Violence exposure and substance use in adolescents: Findings from three countries. *Pediatrics, 111*, 535-540. doi: 10.1542/peds.111.3.535

Early identification of individuals who experience adverse childhood experiences to target for intervention for trauma symptomatology and emotion regulation deficits could prevent a number of negative consequences. Yet, many programs do not systematically screen for victimization experiences.¹⁰³ Substance abuse treatment could address these experiences, which may have profound and lasting effects on youth's emotion regulation, cognitive capacities, and interpersonal relationships. Assessment of a range of victimization experiences should be explored with youth entering substance abuse treatment, and because prior research has shown that youth may not disclose victimization experiences at intake, the Center for Substance Abuse Treatment (CSAT) TIP on child abuse and neglect issues recommends that properly trained substance abuse treatment providers assess for victimization at intervals during the course of treatment.¹⁰⁴ Furthermore, assessment of adverse childhood experiences and trauma exposure should also be followed with trauma-integrated substance abuse treatment. Some prior research shows that youth with trauma exposure and symptomatology do not do as well in treatment that focuses solely on substance use and does not also address trauma symptoms.^{105,106}

Youth reported high satisfaction with treatment providers, which is important because higher levels of satisfaction with treatment are associated with positive treatment outcomes.¹⁰⁷ Specifically, the majority of youth gave a highly positive rating of 8 to 10 for their treatment experience on a scale of 1 to 10, with 10 representing the best experience. Additionally, the vast majority of clients agreed that they received the services they needed to help them get better, they felt better about themselves as a result of their treatment experience, they were treated with respect, and they understood their treatment plan, their rights as a client, and staff member's expectations of them.

Areas of Concern

Even with the significant positive changes in adolescents' behavior and functioning a minority of adolescents continued to struggle with substance use, comorbid mental health problems, school attendance and performance, and justice system involvement.

Substance use and smoking. Half of youth (50.4%) in AKTOS reported using alcohol and/or drugs at some point in the 12-month follow-up period and approximately one-third (34.2%) of youth reported using alcohol and/or drugs in the 30 days before the follow-up survey. Specifically, 42.1% of youth reported using illegal drugs and 32.2% reported using alcohol in the 12-month follow-up period. In a review of 60 studies on recovery outcomes for adolescents in substance abuse treatment, substance use rates at 12-month follow-up, which were calculated from the recovery/remission rates presented in the review, ranged from 33% to 68%, with an average use rate of 58%.¹⁰⁸ Thus, the substance use rates in

¹⁰³ Dennis, M. L., & Stevens, S. J. (2008). Maltreatment issues and outcomes of adolescents enrolled in substance abuse treatment. *Child Maltreatment, 8*(1), 3-6.

¹⁰⁴ Center for Substance Abuse Treatment. (2000). *Substance abuse treatment for persons with child abuse and neglect issues. Treatment Improvement protocol (TIP) Series, No. 36.* Rockville, MD: Substance Abuse and mental Health Services Administration.

¹⁰⁵ Funk, R. R., McDermeit, M., Godley, S. H., & Adams, L. (2003). Maltreatment issues by level of adolescent substance abuse treatment: The extent of the problem at intake and relationship to early outcomes. *Child Maltreatment, 8*(1), 36-45.

¹⁰⁶ Grella, C. E., & Joshi, V. (2003). Treatment processes and outcomes among adolescents with a history of abuse who are in drug treatment. *Child Maltreatment, 8*(1), 7-18.

¹⁰⁷ Waxman, H.M. (1996). Using outcomes assessment for quality improvement. In L.I. Sederer & B. Dickey (Eds.), *Outcomes assessment in clinical practice*, (pp. 25-33), Boston, Massachusetts: Williams and Wilkins.

¹⁰⁸ White, W. L. (2012). Recovery/remission from substance use disorders: An analysis of reported outcomes in 415 scientific reports, 1868-2011. Philadelphia, PA: Philadelphia Department of Behavioral Health and Intellectual disability Services.

AKTOS are consistent with the substance use rates in other treatment outcome studies.¹⁰⁹

Nicotine use is a significant health risk behavior for youth in substance abuse treatment in Kentucky. Cigarette smoking among adolescents increases the risk of other drug use and the risk of nicotine addiction.¹¹⁰ In the 2015 Youth Risk Behavior Surveillance System (YRBSS), Kentucky had the second highest rate of cigarette smoking among youth of all 35 states included in the survey: 16.9% for past-month cigarette use.¹¹¹ In the AKTOS sample for this report, in the 30 days before follow-up 56.1% of adolescents reported smoking tobacco, which was 3.3 times greater than the percent of adolescents in the general population in Kentucky (16.9%). Increasing numbers of youth in the U.S. report using vaporized nicotine products (e.g., e-cigarettes) from 2011 to 2015, and in 2016, among high school students, e-cigarettes were the most commonly used tobacco product.¹¹² Additionally, rates of smokeless tobacco use at intake were lower than for smoking tobacco and vaporized nicotine use at intake for the AKTOS sample. Yet, compared to the national rate of past-year smokeless tobacco among 12 – 17 year old individuals in the National Survey on Drug Use and Health (NSDUH) in 2016 (3.0%),¹¹³ the percent of AKTOS participants who used smokeless tobacco at treatment intake was 10 times higher (30.6%).

In the AKTOS 2018 Report, findings for tobacco use were not as positive as the findings for alcohol and drug use in terms of reductions in the number of adolescents who reported using in the 12 months before intake and follow-up. For example, in the 12 months before intake nearly three-fourths of youth (72.7%) smoked tobacco. In the 12 months before follow-up, the percent of adolescents who reported smoking tobacco products had decreased slightly, but not significantly, to 62.0%. The percent of youth who reported using vaporized nicotine products decreased slightly, but not significantly, from intake to follow-up.

What's more, of those who reported smoking tobacco products, the average age they began smoking tobacco regularly was 13.1 years old. For individuals who begin using nicotine in adolescence, symptoms of addiction can develop quickly.¹¹⁴ Prior research has shown that individuals who began smoking tobacco before age 14 are significantly less likely to have stopped smoking in young adulthood than individuals who began smoking at age 14 or later.¹¹⁵ These findings are consistent with other research on tobacco use among adolescents in substance abuse treatment.^{116,117} Nonetheless,

¹⁰⁹ Williams, R. J., & Chang, S. Y. (2000). A comprehensive and comparative review of adolescent substance abuse treatment outcome. *Clinical Psychology: Science and Practice*, 7(2), 138-166.

¹¹⁰ Centers for Disease Control & Prevention (CDC). (1994). *Preventing tobacco use among young people: A report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services.

¹¹¹ Centers for Disease Control and Prevention (CDC). (2017). State Tobacco Activities Tracking and Evaluation (STATE) System. Youth Risk Behavioral Surveillance System (YRBSS) Data. Retrieved on April 3, 2018 from <https://www.cdc.gov/statesystem/cigaretteuseyouth.html>.

¹¹² Jamal, A., Gentzke, A., Hu, S. S., Cullen, K. A., Apelberg, B. J., Homa, D. M., & King, B. A. (2017). Tobacco use among middle and high school students—United States, 2011-2016. *Morbidity and Mortality Weekly Report*, 66(23), 597-603.

¹¹³ Substance Abuse and Mental Health Services Administration. (2017). *National Survey on Drug Use and Health: Trends in prevalence of various drugs for ages 12 or older, ages 12 to 17, ages 18 to 25, and ages 26 or older: 2015 – 2015*. Retrieved on April 3, 2018 from <https://www.drugabuse.gov/national-survey-drug-use-health>.

¹¹⁴ DiFranza, J. R., Rigotti, N. A., McNeill, A. D., Ockene, J. K., Savageau, J. A., St Cyr, D., & Coleman, M. (2000). Initial symptoms of nicotine dependence in adolescents. *Tobacco Control*, 9(3), 313-319.

¹¹⁵ Breslau, N. and Peterson, E. L. (1996). Smoking cessation in young adults: age at initiation of cigarette smoking and other suspected influences. *American Journal of Public Health*, 86, 214–220.

¹¹⁶ Campbell, C. I., Chi, F., Sterling, S., Kohn, C., & Weisner, C. (2009). Self-initiated tobacco cessation and substance use outcomes among adolescents entering substance use treatment in a managed care organization. *Addictive Behaviors*, 34(2), 171-179.

¹¹⁷ Myers, M. G., & MacPherson, L. (2004). Smoking cessation efforts among substance abusing adolescents. *Drug and Alcohol Dependence*, 73(2), 209-213.

substance use treatment offers a unique opportunity to intervene with tobacco-using adolescents by integrating tobacco cessation interventions with other substance use treatment, which can be important for attaining and continuing abstinence.¹¹⁸

Adverse Childhood Experiences. Adolescents' reports of adverse childhood experiences were high, with an average of 3.4 categories of adverse childhood experiences at treatment intake. Adolescents with more categories of adverse childhood experiences also had more mental health symptoms, more months of substance use, and greater severity of substance use at treatment intake. These findings underscore the importance of treatment programs screening for and tailoring treatment plans to address adolescents' maltreatment and victimization experiences as well as household dysfunction. A body of research has consistently found that youth who experience victimization are more likely to experience subsequent victimization.^{119,120} Treatment providers may need to work with parents, caregivers, and school staff to increase the supervision and protection capabilities for children to intervene and cease the progression of victimization to revictimization.¹²¹ Nonetheless, more research is needed to evaluate the effectiveness of therapies on reducing victimization.

Mental Health Problems. Even though the percent of adolescents who met criteria for clinically significant attention problems, internalizing problems, and externalizing problems decreased significantly and the percent of youth who reported suicidality and disordered eating also decreased significantly from intake to follow-up, minorities of youth continued to experience these mental health problems at follow-up. For example, in the 12 months before follow-up, a little more than 1 in 4 girls met criteria for internalizing problems (28.1%) and nearly 1 in 5 girls reported suicidality (18.8%). Furthermore, the decrease in adolescents' average ratings of stress were statistically significant; however, the average rating of stress at follow-up was at the mid-point between "No stress" and "Extreme stress." In other words, adolescents had fairly elevated levels of perceived stress at follow-up.

Because adolescents with substance use disorders and comorbid psychiatric disorders have poorer substance abuse treatment outcomes than those with only substance use disorders, there is growing evidence that integrated treatment of comorbid psychiatric disorders in substance abuse treatment may improve treatment engagement and treatment completion as well as treatment outcome.^{122,123,124} Unfortunately, the empirical literature comparing integrated treatment with substance use disorder-only treatment is limited and studies typically have small sample sizes.¹²⁵ Thus, more research is needed to

¹¹⁸ Baca, C. T., & Yahne, C. E. (2009). Smoking cessation during substance abuse treatment: What you need to know. *Journal of Substance Abuse Treatment, 36*, 205-219.

¹¹⁹ Widom, C. S., Czaja, S. J., & Dutton, M. A. (2008). Childhood victimization and lifetime revictimization. *Child Abuse & Neglect, 32*(8), 785-796.

¹²⁰ Finkelhor, D., Ormrod, R., & Turner, H. (2007). Re-victimization patterns in a national longitudinal sample of children and youth. *Child Abuse & Neglect, 31*, 479-502.

¹²¹ Finkelhor, D., Turner, H., Hamby, S., & Ormrod, R. (2011). *Polyvictimization: Children's exposure to multiple types of violence, crime, and abuse*. Bulletin, Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention Juvenile Justice Bulletin.

¹²² Grella, C. E., Hser, Y. I., Joshi, V., & Rounds-Bryant, J. (2001). Drug treatment outcomes for adolescents with comorbid mental and substance use disorders. *Journal of Nervous & Mental Disease, 189*(6), 384-392.

¹²³ Wise, B. K., Cuffe, S. P., Fischer, T. (2001). Dual diagnosis and successful participation of adolescents in substance abuse treatment. *Journal of Substance Abuse Treatment, 21*(3), 161-165.

¹²⁴ Cornelius, J. R., Maisto, S. A., Martin, C. S., Bukstein, O. G., Salloum, I. M., Daley, D. C., Wood, D. S., & Clark, D. B. (2004). Major depression associated with earlier alcohol relapse in treated teens with AUD. *Addictive Behavior, 29*, 1035-1038.

¹²⁵ Torchalla, R., Nosen, L., Rostam, H., & Allen, P. (2012). Integrated treatment programs for individuals with concurrent substance use disorders and trauma experiences: A systematic review and meta-analysis. *Journal of Substance Abuse Treatment, 42*, 65-77.

provide more guidance on the value of integrated treatment for substance use disorders and comorbid psychiatric disorders.

Education. Even though the majority of individuals either continued their education and had improvements in their grades and/or reductions in disciplinary measures or obtained at least a high school diploma or GED, a minority of youth reported unfavorable education outcomes during the follow-up period. For example, 12.7% of youth enrolled in school at follow-up reported they had missed school for disciplinary reasons (i.e., detention, suspension, or expulsion) in the last 90 days school was in session. Second, a small minority of individuals dropped out of secondary school before attaining a high school diploma or GED, which suggests a need for more intensive school-based programs to retain and successfully intervene with high-risk youth.

Justice System Involvement. Involvement with the justice system is a problem for Kentucky youth involved in substance abuse treatment; the majority of adolescents in the AKTOS follow-up sample (59.8%) reported they were under supervision by the justice system, either through probation, court diversion, or juvenile drug court at treatment intake. Even though the percent of youth who were arrested and charged with an offense decreased from intake to follow-up, the percent of youth who reported they were in juvenile detention (or jail) did not change. Research has found that juvenile offenders who continue to use drugs are more likely to continue criminal offending.¹²⁶ Thus, continuing to build strong linkages between community substance abuse treatment programs and juvenile courts and the juvenile justice system is needed to effectively address the needs of juveniles at higher risk for drug use and criminal offending.

Recovery Supports. In this sample of adolescents, the average number of people adolescents could count on for recovery support increased at follow-up; however, there was no significant increase in the number of individuals who reported attending mutual help recovery meetings. Participation in mutual help recovery meetings is an important recovery support that is associated with abstinence and lower risk of relapse among adults.¹²⁷ Nonetheless, limited research has examined the role of AA and NA meeting attendance among adolescents.¹²⁸ The few studies that have been conducted suggest that adolescents who attend AA/NA meetings after residential substance abuse treatment are more likely to remain abstinent.^{129,130,131} Yet, adolescents' attendance at group meetings that are predominately composed of adults may not be helpful and may even be harmful.^{132,133} Many communities, including many if not most in Kentucky, may not have mutual help group meetings specifically for adolescents.

¹²⁶ Young, D., Dembo, R., & Henderson, C. (2007). A national survey of substance abuse treatment for juvenile offenders. *Journal of Substance Abuse Treatment, 32*, 255-266.

¹²⁷ Gossop, M., Stewart, D., & Marsden, J. (2008). Attendance at Narcotics Anonymous and Alcoholics Anonymous meetings, frequency of attendance and substance use outcomes after residential treatment for drug dependence: a 5-year follow-up study. *Addiction, 103*(1), 119-125.

¹²⁸ Kelly, J., Brown, S., Abrantes, A., Kahler, C., & Myers, M. (2008). Social recovery model: An 8-year investigation of adolescent 12-step group involvement following inpatient treatment. *Alcohol Clinical & Experimental Research, 32*(8), 1468-1478.

¹²⁹ Hsieh, S., Hoffman, N., & Hollister, D. (1998). The relationship between pre-, during-, and post-treatment factors, and adolescent substance abuse behaviors. *Addictive Behaviors, 23*, 477-488.

¹³⁰ Kelly, J., Myers, M., & Brown, S. (2000). A multivariate process model of adolescent 12-step attendance and substance use outcome following inpatient treatment. *Psychology of Addictive Behavior, 14*, 376-389.

¹³¹ Kelly, J., Myers, M., & Brown, S. (2002). Do adolescents affiliate with 12-step groups? A multivariate process model of effects. *Journal of Studies on Alcohol, 63*, 293-304.

¹³² Kelly, J., & Myers, M. (1997). Adolescent treatment outcome in relation to 12-step group attendance. Abstracted in *Alcoholism: Clinical and Experimental Research, 21*, 27A.

¹³³ Kelly, J., Myers, M., & Brown, S. (2005). The effects of age composition of 12-step groups on adolescent 12-step participation and substance use outcomes. *Journal of Child and Adolescent Substance Abuse, 15*(1), 63-72.

Other forms of recovery support may be crucial to helping adolescents maintain their recovery, such as peer support, particularly in communities that lack mutual help group meetings that are specific for adolescents. Research shows that adolescents benefit from continuing care following treatment, such as drug use monitoring, follow-up visits at home, telephone calls, and linking to other family services.^{134,135} Yet, aftercare resources tend to be limited in many communities.

Limitations of the Study

There are several areas of limitation to the findings presented in this report. First, this study examined 122 adolescents who received substance abuse treatment in state fiscal years 2015 and 2016, but did not examine a comparison group of similar adolescents who did not receive treatment, which prevents us from inferring that changes from intake to follow-up are due solely to treatment. Because adolescents may still be experimenting with substances, it is difficult to tease apart developmental and peer influences from the effects of treatment when examining outcomes for this age group. Second, both the intake data and the follow-up data are self-reported. While self-reports have been shown to be valid in comparison to urinalyses,¹³⁶ reliance on self-reports in this study may be an important limitation. Third, unlike many outcome studies, this study does not focus on a single treatment modality or a set of pre-selected treatment modalities such as residential treatment, or any one approach like social skills training. Likewise, this treatment outcome study is not a clinical trial that tests the efficacy of interventions. The Adolescent KTOS project examines treatment outcomes from everyday clinical practice among the 14 Community Mental Health Centers and their affiliates that provide state and Substance Abuse Prevention and Treatment (SAPT) Block Grant-funded services. It includes clients who have participated in many different treatment modalities including residential, intensive outpatient, and outpatient. Fourth, clinicians have varying interview skills and this might impact the reliability and validity of the data they collected for the intake.

Conclusion

Findings from the AKTOS 2018 report indicate successful treatment experiences for many youth, with significant reductions in substance use and severity, decreases in mental health problems, greater attainment of high school diplomas, improved academic performance, and fewer youth with school disciplinary problems. Minorities of youth reported continued substance use, mental health problems, school attendance problems, and involvement with the juvenile justice system, indicating these dimensions of functioning require more attention and intervention in substance abuse treatment programs. Slowing down or stopping youth's substance use trajectories may lead to substantial increases in education, lower psychiatric comorbidities, and lower criminal behavior and involvement in the justice system—all of which may have significant positive effects on the youth's long-term development.

¹³⁴ Godley, M. D., Godley, S. H., Dennis, M. L., Funk, R. R., & Passetti, L. L. (2007). The effect of assertive continuing care on continuing care linkage, adherence and abstinence following residential treatment for adolescents with substance use disorders. *Addiction*, *102*(1), 81-93.

¹³⁵ Garner, B. R., Godley, M. D., Passetti, L. L., Funk, R. R., & White, W. L. (2014). Recovery support for adolescents with substance use disorders: The impact of recovery support telephone calls provided by pre-professional volunteers. *Journal of Substance Abuse & Alcohol*, *2*(2), 1010-1033.

¹³⁶ Rutherford, M.J., Cacciola, J.S., Alterman, A.I., McKay, J.R. & Cook, T.G. (2000). Contrasts between admitters and deniers of drug use. *Journal of Substance Abuse Treatment*, *18*(4), 343-8.

APPENDIX A

METHOD

The intake and follow-up interview assessments are based on theory and research about substance use-related comorbidities relevant to substance use among adolescents. The assessment has five core components (e.g., substance use, mental health, school attendance and performance, justice system involvement, and adverse childhood experiences and victimization) and two supplemental components (e.g., caregiver involvement and recovery supports) that have demonstrated validity and reliability.¹³⁷ The assessments are brief, self-report instruments that document dynamic and changeable factors including substance use patterns as well as psychosocial symptoms, behavior, and events that have been identified in the literature as relevant to substance abuse. Additionally, the instruments have been developed in collaboration with key stakeholders to consider the context of Kentucky substance abuse treatment programs.

Clinicians/staff persons in the treatment centers conduct intake interviews using a web-based survey tool. Identifying data are encrypted and submitted to the master database on the UK CDAR secure server. At the completion of the intake interview, treatment staff persons ask clients if they would like to volunteer to participate in the 12-month follow-up study (i.e., the follow-up survey), using a standardized script embedded in the interview instrument. Adolescents who are interested in participating in the follow-up study give consent to be contacted by UK CDAR BHOS staff members to complete follow-up interviews approximately 12 months later. Follow-up surveys are conducted via telephone using a questionnaire with items similar to the ones used in the intake interview. UK CDAR BHOS faculty conduct regular meetings with follow-up interviewers to monitor progress with locating participants and completing follow-up surveys to ensure consistent application of locating strategies and interview techniques.

The target month for the follow-up interview is 12 months after the intake interview is completed. In other words, if a client completes an intake interview in May 2016, the target month for the follow-up interview is May 2017. The window for completing a follow-up interview with an individual selected into the follow-up sample begins two months before the target month and spans until two months after the target month. For example, if an intake interview is completed with an individual in May 2016, the target month for the follow-up interview is May 2017, and interviewers begin working to locate and contact the individual in March and can work on the file until the end of July 2017.

In FY 2015 and 2016, a total of 318 adolescents in publicly funded substance abuse treatment completed intake interviews. Of these 318 adolescents who completed an intake interview, almost half of clients (47.8%, $n = 152$) gave consent to be contacted for the follow-up interview. The follow-up sample was then selected from 146 clients who agreed to be contacted for the follow-up interview and gave the minimum amount of locator information.

Of the 146 adolescents who were included in the sample of individuals to be followed up, 9 were ineligible to complete the follow-up survey when they were contacted (see Table AA.1). Reasons for ineligibility include being in residential treatment ($n = 8$) or incarcerated ($n = 1$). Of the remaining 137 adolescents, interviewers completed follow-up surveys with 122 adolescents, representing a follow-

¹³⁷ Cole, J., Logan, T., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Adolescent Kentucky Treatment Outcome Study (AKTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug & Alcohol Research.

up rate of 89.1%. Of the eligible individuals, 15 were never successfully contacted or if they were contacted, interviewers were not able to complete a follow-up survey with them during the follow-up period: these cases are classified as expired (10.9%). No individuals declined to complete the follow-up survey when the interviewer contacted him/her; thus, the refusal rate was 0.0%. The project interviewers' efforts accounted for 89.7% (n = 131) of the cases included in the follow-up sample. The only cases not considered accounted for are those individuals who are classified as expired.

TABLE AA.1. FINAL CASE OUTCOMES FOR FOLLOW-UP EFFORTS

| | Number of Records (n = 146) | Percent |
|---|--|---------|
| Ineligible for follow-up survey | 9 | 6.2% |
| | Number of cases eligible for follow-up (n = 137) | |
| Completed follow-up surveys | 122 | 89.1% |
| Follow-up rate is calculated by dividing the number of completed surveys by the number of eligible cases and multiplying by 100 | | |
| Expired cases (i.e., never contacted, did not complete the survey during the follow-up period) | 15 | 10.9% |
| Expired rate ((the number of expired cases/eligible cases)*100) | | |
| Refusal | 0 | 0.0% |
| Refusal rate ((the number of refusal cases/eligible cases)*100) | | |
| Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals) | 131 | 89.7% |
| Percent of cases accounted for ((# of cases accounted for/total number of records in the follow-up sample)*100) | | |

Appendix B compares adolescents who completed a follow-up interview with those who did not complete a follow-up interview. Few differences were found between the two groups.

Data Analysis

This report examines adolescents' self-reported changes from intake to follow-up in outcomes for substance abuse treatment such as substance use, mental health, justice system involvement, and recovery supports. To assess whether the change in a factor (e.g., tobacco use) was statistically significant, paired t-tests were run for continuous variables and McNemar non-parametric test for pre- to post-test for dichotomous variables. McNemar is "a 2 X 2 cross classification of paired (or matched) response to a dichotomous variable" (Adedokun & Burgess, 2012, p. 125). Additionally, all analyses presented in the main text of the report examined gender differences using t-test for continuous variables and chi square test of independence for categorical variables. All statistically significant ($p < .05$) differences by gender are reported when they were found.

APPENDIX B.

CLIENT CHARACTERISTICS AT INTAKE FOR THOSE WITH COMPLETED FOLLOW-UP INTERVIEWS AND THOSE WITHOUT COMPLETED FOLLOW-UP INTERVIEWS

Youth who completed a follow-up interview are compared in this section with youth who did not complete a follow-up interview for any reason¹³⁸ (e.g., client did not give consent to be contacted for the follow-up interview, client was ineligible for follow-up, and interviewers were unable to locate the client for the follow-up survey).

Demographic Characteristics

The majority of the sample for this annual report was male and White (see Table AB.1). The average client age was around 16 years old. There were no significant differences in age, gender, or race by follow-up status.

TABLE AB.1. COMPARISON OF DEMOGRAPHICS FOR CLIENTS WHO WERE FOLLOWED UP AND CLIENTS WHO WERE NOT FOLLOWED UP^{139,140}

| | FOLLOWED UP | |
|----------------------|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| AGE | 15.8 years | 16.0 years |
| GENDER | | |
| Male | 69.1% | 73.0% |
| Female | 30.9% | 27.0% |
| RACE | | |
| White | 80.0% | 77.0% |
| African American | 8.2% | 10.7% |
| Other or multiracial | 11.8% | 12.3% |

Substance Use at Intake

Use of illegal drugs, alcohol, and tobacco in the 12 months before entering treatment is presented by follow-up status in Table AB.2. The majority of the clients reported using any illegal drug in the 12 months before entering the program. The drug class used by the greatest percentage of clients was

¹³⁸ Significance is reported for $p < .05$.

¹³⁹ Two clients who were not followed-up had a missing date of birth, age could not be calculated.

¹⁴⁰ One client who was not followed-up had missing data for race.

marijuana. The next most commonly reported drug used was synthetic drugs, with significantly more youth who completed a follow-up interview reporting they had used synthetic drugs compared to youth who had not completed a follow-up interview. Around one-fourth of clients used non-prescribed prescription opioids/opiates (including methadone and buprenorphine). Significantly more clients who completed a follow-up interview reported CNS depressant use (e.g., benzodiazepines, tranquilizers, sedatives, hypnotics) in the 12 months before treatment intake compared to those who did not complete a follow-up interview. Significantly more youth who were followed up reported using other illegal drugs (e.g., hallucinogens and inhalants) than youth who were not followed up. A small number of youth reported using heroin in the 12 months before intake. The majority of youth reported using alcohol and tobacco in the 12 months before intake, with significantly more followed-up youth reporting they had used alcohol than youth who were not followed up.

TABLE AB.2. PERCENT OF INDIVIDUALS REPORTING SUBSTANCE USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT

| SUBSTANCES | FOLLOWED UP | |
|---|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| Any illegal drug | 89.8% | 93.4% |
| Marijuana | 86.7% | 91.8% |
| Synthetic drugs (synthetic marijuana, bath salts)** | 18.4% | 32.0% |
| Opioids (other than heroin) | 22.4% | 26.2% |
| CNS depressants** | 15.8% | 28.7% |
| Stimulants including cocaine | 16.8% | 22.1% |
| Heroin | 6.6% | 5.7% |
| Other illegal drugs (e.g., hallucinogens, inhalants)* | 15.8% | 26.2% |
| Alcohol* | 66.8% | 77.9% |
| Smoking tobacco | 66.3% | 73.0% |
| Smokeless tobacco | 21.9% | 30.3% |

*p < .05, **p < .01.

Similar patterns were found in the past-30-day substance use measures with fewer individuals reporting use of each substance (not depicted in a Table or Figure). More clients who were followed-up reported using smokeless tobacco, synthetic drugs, CNS depressants, and other illegal drugs (e.g., hallucinogens and inhalants) in the past 30 days than those clients who did not complete a follow-up interview.

Table AB.3 displays the percent of youth in each SUD severity classification, based on self-reported criteria in the preceding 12 months, by follow-up status. There was no significant difference by follow-up status. A sizable minority of both groups met criteria for no substance use disorder. At the other extreme, about 3 in 10 youth who did not complete a follow-up interview and 1 in 3 youth who completed a follow-up interview were classified in the severe substance use disorder.

TABLE AB.3. SEVERITY OF SUBSTANCE USE DISORDER AT INTAKE

| | FOLLOWED UP | |
|---------------------------------|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| No substance use disorder | 40.3% | 36.1% |
| Mild substance use disorder | 13.3% | 17.2% |
| Moderate substance use disorder | 16.3% | 13.1% |
| Severe substance use disorder | 30.1% | 33.6% |

Mental Health at Intake

There were no significant differences in the percentage of followed-up and not followed-up clients who met criteria for the mental health problems measured in the intake interview (see Table AB.4).

TABLE AB.4. MET CRITERIA FOR MENTAL HEALTH PROBLEMS AT INTAKE

| | FOLLOWED UP | |
|-------------------------------------|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| Attention Problems | 29.1% | 34.4% |
| Internalizing Problems | 35.2% | 35.2% |
| Externalizing Problems | 16.8% | 23.8% |
| Disordered Eating | 32.1% | 28.7% |
| Suicidal Ideation/Attempted Suicide | 24.0% | 23.0% |

Education

Table AB.5 describes clients' school involvement and academic performance when entering treatment. The vast majority were enrolled in school when they entered treatment and also reported they had attended school the last 3 months school was in session. The mean GPA was equivalent to a C. Among those who attended school in the last 3 months school was in session, both groups reported 14.5 school absences, on average. There was no difference by follow-up status of clients who reported they had repeated a grade in school and they were suspended, in detention, or expelled in the last 3 months school was in session.

TABLE AB.5. CLIENTS' SCHOOL INVOLVEMENT AND ACADEMIC PERFORMANCE AT INTAKE

| | FOLLOWED UP | |
|--|---------------|----------------|
| | NO n = 194 | YES n = 122 |
| Enrolled in school (e.g., public, private, home school, alternative, GED classes) | 98.5% | 99.2% |
| Average GPA | 2.2 | 2.1 |
| Ever repeated a grade in school | 34.2% | 33.6% |
| Attended school in the last 3 months school was in session | 88.3% | 86.9% |
| Among those who attended school in the last 3 months school was in session: | n = 173 | n = 106 |
| Average number of days missed school for any reason in the last 3 months school was in session | 14.5 | 14.5 |
| Client was suspended or expelled in the last 3 months school was in session | 54.3% | 63.2% |

Caregiver Relationship and Living Situation

There were no significant differences in primary caregiver or living situation by follow-up status. The majority of youth reported their primary caregiver was a biological parent (see Table AB.6). About one-fourth of individuals stated their primary caregiver was other family members. The scores on the caregiver involvement scale was similar for clients who were followed up and those who were not followed up. Clients were asked to report with whom or where they had lived in the 12 months before entering treatment. They could report as many places as were applicable in the 12-month period, thus the percentages sum to greater than 100%. The majority reported they had lived with their biological parents, with nearly one-third stating they had lived with other family members, and one-third reporting they had lived in institutional settings (e.g., group home, residential treatment, juvenile detention). A small percentage of the sample reported they had been in foster care or that they had lived independently in the past 12 months.

TABLE AB.6 CLIENTS' RELATIONSHIP WITH PRIMARY CAREGIVER AND LIVING SITUATION BEFORE ENTERING TREATMENT

| | FOLLOWED UP | |
|--|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| CURRENT PRIMARY CAREGIVER | | |
| Biological parent | 70.9% | 68.9% |
| Other family including adoptive family | 23.5% | 27.0% |
| Foster parent or DCBS | 4.1% | 3.3% |
| Other caregiver (e.g., boyfriend's father, family friends) | 0.5% | 0.8% |
| No caregiver--emancipated minor | 1.0% | 0.0% |
| AVERAGE SCORE ON CAREGIVER INVOLVEMENT SCALE | 13.4 | 13.8 |
| WHERE THE CLIENT LIVED IN THE 12 MONTHS BEFORE ENTERING THE PROGRAM | | |
| Home with biological parent | 76.0% | 77.9% |
| With other family (including adoptive family) | 31.6% | 36.9% |
| In an institutional facility (e.g., group home, residential treatment, juvenile detention) | 34.2% | 33.6% |
| Foster care | 6.6% | 4.9% |
| Lived independently (including in a school dormitory) | 12.2% | 16.4% |

Justice System Involvement at Intake

About two-fifths of youth in the sample reported they had been arrested in the 12 months before entering treatment (see Table AB.7). Of the individuals who reported being arrested, youth who were followed up reported significantly more arrests in the 12 months before entering treatment when compared to youth who were not followed-up. Among adolescents who reported an arrest in the 12 months before intake, there was no significant difference in the percent of adolescents arrested for public offenses by follow-up status; nonetheless, significantly more of the followed up youth reported an arrest for a status offense. More than one half of clients were under supervision by the justice system (e.g., in Drug Court, probation, or court diversion) when they entered treatment, with no difference by follow-up status.

TABLE AB.7. JUSTICE SYSTEM INVOLVEMENT WHEN ENTERING TREATMENT

| | FOLLOWED UP | |
|--|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| Arrested for any charge in the 12 months before entering treatment | 40.3% | 39.3% |
| Of those with an arrest, | n = 79 | n = 48 |
| Average number of arrests** | 1.8 arrests | 3.3 arrests |
| Charged with a public offense | 79.7% | 68.8% |
| Charged with a status offense* | 31.6% | 54.2% |
| Currently under supervision by the justice system | 53.6% | 59.8% |

*p < .05, **p < .01.

There was no difference in follow-up status for clients who reported being in juvenile detention for at least one day in the 12 months before entering treatment (See Table AB.8). Among the individuals who were in juvenile detention at least one night, the average number of days in detention in the 12 months before entering treatment was 21.3 days for individuals who were not followed up and 41.5 days for individuals who were followed up, with no significant difference by follow-up status.

TABLE AB.8. JUVENILE DETENTION HISTORY IN THE 12 MONTHS BEFORE ENTERING TREATMENT

| | FOLLOWED UP | |
|--|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| In juvenile detention at least one day | 28.6% | 27.9% |
| Of those in detention | (n = 56) | (n = 34) |
| Average number of days in detention | 21.3 | 41.5 |

Recovery Supports at Intake

A small percent of youth reported they had been to a mutual help recovery meeting in the 30 days before intake, with no difference by follow-up status (see Table AB.9). Youth who completed a follow-up interview reported a higher number of people they could count on for recovery support than youth who did not complete a follow-up interview. Individuals in the two groups had the same average rating of satisfaction with the level of recovery support at intake.

TABLE AB.9. RECOVERY SUPPORTS WHEN ENTERING TREATMENT

| | FOLLOWED UP | |
|---|---------------|----------------|
| | NO n = 196 | YES n = 122 |
| Attended a mutual help recovery meeting in the past 30 days | 4.6% | 7.4% |
| Average number of people youth can count on for recovery support* | 4.7 | 6.7 |
| Average rating of satisfaction with level of recovery support in life | 4.7 | 4.7 |

*p < .05.