



**ADOLESCENT KENTUCKY
OUTCOME TREATMENT STUDY**

2020

ANNUAL REPORT

PROJECT ACKNOWLEDGMENTS

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Suggested citation: Cole, J., Logan, T., Miller, J., &
Scrivner, A. (2020). *Adolescent Kentucky Treatment
Outcome Study (AKTOS) 2020 Annual Report*.
Lexington, KY: University of Kentucky, Center on Drug
and Alcohol Research.

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EXECUTIVE SUMMARY

This report summarizes client outcomes from a statewide evaluation of publicly funded substance abuse treatment programs for adolescents (i.e., under 18 years old) through the Community Mental Health Centers in Kentucky.

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

State-funded substance abuse treatment programs in Kentucky are required by Kentucky Revised Statute (222.465) to collect data on substance abuse clients in a client outcome study. AKTOS is an important part of the Kentucky Division of Behavioral Health's performance-based measurement of treatment outcomes in Kentucky's communities. Data collected

in the study includes an evidence-based assessment administered by substance abuse treatment staff at treatment intake (n = 521)

This report describes the sample of adolescents in two main ways: (1) providing characteristics of the 521 adolescents who completed an intake interview in FY 2017 and FY 2018, and (2) the presentation of outcomes for a subsample of 147 youth who completed a 12-month follow-up telephone interview conducted by the University of Kentucky Center on Drug and Alcohol Research (UK CDAR) in FY 2018 and FY 2019. Of the adolescents who agreed to be contacted and were eligible for the follow-up survey (n = 215), the CDAR research team completed follow-up surveys with 147 individuals—a follow-up rate of 68.4%.

Results show that most adolescent clients were satisfied with the treatment services they received. The majority of clients (76.9%)

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 agreed staff helped them obtain information they needed so they could take charge of managing their substance use problems, staff were willing to work around schedule conflicts, services were available at times that were good for clients, and that more often than not, staff were knowledgeable, helpful, and professional, and it did not take a long time to get into services

At follow-up, there were significant reductions in use of any illegal drugs from intake (93.2%) to follow-up (42.9%). Specifically, there were significant reductions

“I liked how I got to talk without being judged.”

- AKTOS FOLLOW-UP CLIENT

in use of marijuana, Central Nervous System (CNS) depressants, opioids/opiates, heroin, stimulants, and synthetic drugs. Additionally, there were significant reductions in the percent of youth who reported alcohol and smokeless tobacco use. Furthermore, at intake, 35.2% met criteria for no substance use disorder, while at follow-up, the majority (78.2%) met criteria for no SUD.

Adolescents' self-reported mental health problems were significantly reduced at follow-up. Specifically, the percent of adolescents who had a score indicating clinically significant internalizing problems and externalizing problems decreased significantly from intake to follow-up. The percent of youth who reported suicide ideation and/or attempts decreased from 29.3% at intake to 12.2% at follow-up. The proportion of youth who reported any type of disordered eating decreased significantly. Adolescents' self-reported use of functional emotion regulation strategies increased significantly from intake to follow-up.

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 2.2 at intake to 2.5 at follow-up. Self-reported school absences for any reason in the past 3 months decreased significantly from intake (15.3) to follow-up (7.8). 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 53.2% at intake to 21.5% at follow-up. Finally, among students who were enrolled in school at intake and follow-up, the percent who were satisfied or very satisfied with their school situation increased from 56.5% at intake to 75.3% 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 49 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 ($n = 49$) had obtained a high school diploma or GED (44.9%), and 40.8% were enrolled in secondary

Overall, AKTOS clients made significant improvements in all targeted areas



REPORTED ANY ILLEGAL DRUG USE

93% at intake | **43%** at follow-up



MET STUDY CRITERIA FOR INTERNALIZING PROBLEMS

44% at intake | **26%** at follow-up



REPORTED DETENTION, SUSPENSION, OR EXPULSION IN PAST 3 MONTHS

53% at intake | **22%** at follow-up



BETTER RECOVERY STATUS

10% at intake | **38%** at follow-up

school. A small percent (10.2%) of individuals had less than a high school diploma or GED and were not enrolled in school (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, a little more than half of individuals who had less than a high school diploma or GED (55.9%) reported they were unemployed and almost half of individuals with a high school diploma or GED (47.1%) were employed full-time.

The majority of youth reported their primary caregiver(s) was their biological parent(s) at intake (70.1%) and follow-up (64.3%). Less than one-fourth 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 increase at follow-up. 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 (30.8%) than at intake (41.5%).

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, the percent of youth who reported being in detention or incarcerated, and the number of youths who were under supervision of the justice system decreased significantly.

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.

Consistent with the perspective that recovery is a multidimensional construct, encompassing several dimensions of individuals' lives and functioning, items from the intake and follow-up surveys were combined to measure change in multiple key dimensions of individuals' lives. Analysis

showed a significant increase in the percent of individuals classified as having better status at follow-up as compared to intake. Nonetheless, most individuals (60.4%) were still struggling with at least one indicator of worse status at follow-up. The most common indicators of worse status reported by individuals at follow-up were having been arrested or in detention/incarcerated, meeting criteria for a DSM-5 substance use disorder, and lower education attainment and progress.

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

“The therapists helped me and made me feel comfortable when other places didn’t.”

-AKTOS FOLLOW-UP CLIENT

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.

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 2017 and 2018 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/nicotine (smoking, smokeless, and vaporized nicotine) 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) central nervous system (CNS) depressants [i.e., tranquilizers, benzodiazepines, sedatives, and barbiturates], (c) opioids [i.e., prescription opiates, methadone, and buprenorphine], (d) heroin, (e) stimulants/cocaine [i.e., cocaine, methamphetamine, Ecstasy, MDMA, Adderall, and Ritalin], (f) synthetic drugs [i.e., bath salts, synthetic marijuana], 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) internalizing problems, (2) externalizing problems, (3) attention 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) satisfaction with school situation, (6) education status for individuals 18 years old and older at follow-up, and (7) 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: Multidimensional Status. With the perspective that recovery encompasses multiple dimensions of individuals' lives, a multidimensional status index was developed from 7 indicators. This section focuses on change in multidimensional status for the 2020 AKTOS follow-up sample.

Section 10: Summary and Conclusions. This section presents, summarizes, and discusses the implications of the major findings from the AKTOS Follow-Up 2020 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 2017 and 2018 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 adolescents more vulnerable to addiction than adults.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} 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 for public health.

Kentucky's sociocultural context includes some of the highest rates in the United States for drug overdose fatalities among 15 – 24 year olds, teen smoking, teen births, and obesity in 10- to 17-year-old individuals.^{7,8,9,10,11} In 2017-2018, Kentucky had the highest rate of smoking tobacco

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 United Health Foundation. (2020). *Drug deaths in Kentucky, 2019*. Retrieved from <https://www.americashealthrankings.org/explore/annual/measure/Drugdeaths/state/KY>.

⁸ Centers for Disease Control and Prevention, National Center for Health Statistics. (2020). *Stats of the States, Drug overdose mortality by state*. Retrieved February 25, 2020 from https://www.cdc.gov/nchs/pressroom/sosmap/drug_poisoning_mortality/drug_poisoning.htm.

⁹ Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, *National Survey on Drug Use and Health (NSDUH), 2017 and 2018*.


¹⁰ Centers for Disease Control and Prevention (CDC), *National Vital Statistics Reports (NVSr)*, Vol. 67, No. 8: Births: Final Data for 2017, November 7, 2018. <https://www.kff.org/other/state-indicator/teen-birth-rate-per-1000>.

¹¹ 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>.


KENTUCKY IN CONTEXT

The AKTOS assessment was originally developed to consider the unique features of Kentucky and has been revised frequently after data analysis and feedback from users and other stakeholders to consider the unique context of Kentucky.

Kentucky ranks among the highest in the nation for drug overdose deaths and smoking:




4th highest
in the nation for
DRUG OVERDOSE DEATHS AMONG 12-TO 25-YEAR OLDS



Highest
in the nation for
CIGARETTE USE IN THE PAST MONTH

Kentucky ranks as one of the unhealthiest nations:



43rd
in the nation for
OVERALL HEALTH RANKINGS

50th
in the nation for
CANCER DEATHS

46th
in the nation for
OBESITY

50th
in the nation for
PHYSICAL INACTIVITY

49th
in the nation for
FREQUENT MENTAL DISTRESS

Kentucky also ranks as one of the lowest in the nation for financial well-being as well as the number of children in poverty:



37th
in the nation for
FINANCIAL OPPORTUNITY

37th
in the nation for
FINANCIAL WELL-BEING

44th
in the nation for
CHILDREN LIVING IN POVERTY

In 2017, Kentucky ranked as

45th for well-being



which was higher
than it ranked in 2016
(49th).

and any tobacco use for adolescents.¹² In 2019 Kentucky ranked 43rd 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. In particular, Kentucky has high rates of cancer deaths, obesity, physical inactivity, frequent mental distress, and child poverty.¹³ Kentucky also ranks low (37th) in financial opportunity, financial well-being, and has a high percentage of children living in poverty (see Figure 1.1).¹⁴ In fact, in 2017, Kentucky ranked as 45th of the states for well-being, which was higher than it ranked in 2016 (49th).¹⁵

The goal of AKTOS is to provide a biannual outcome evaluation of Community Mental Health Centers' substance abuse treatment programs for the Department for Behavioral Health, Developmental and 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 521 adolescents who completed an intake interview in FY 2017 and FY 2018, and (2) the presentation of outcomes for a subsample of 147 youth who completed an intake interview in FY 2017 and FY 2018 and a 12-month follow-up telephone interview in FY 2018 and FY 2019.

AKTOS includes a face-to-face intake interview conducted by treatment program staff using an evidence-based assessment to measure targeted factors. In FY 2017 and FY 2018, 521 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. About half of clients (51.8%, n = 270) gave consent to be contacted for the follow-up interview. Then the follow-up sample was selected from 240 clients who agreed to be contacted for the follow-up interview and gave the minimum amount of locator information.

¹² Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, (2019). *Teens Ages 12-17 Reporting Cigarette and Tobacco Product Use in the Past Month, National Survey on Drug Use and Health (NSDUH), 2017 and 2018*. Retrieved April 13, 2020 from <https://www.kff.org/other/state-indicator/teens-ages-12-17-reporting-cigarette-and-tobacco-product-use-in-the-past-month>.

¹³ United Health Foundation. (2020). *America's health rankings annual report, State findings: Kentucky, 2019*. Minnetonka, MN: United Health Foundation Retrieved on April 13, 2020 from <https://www.americashealthrankings.org/explore/annual/measure/Overall/state/KY>

¹⁴ Annie E. Casey Foundation. (2020). *2019 KIDS COUNT Profile, Kentucky*. Retrieved on April 13, 2020 from https://www.aecf.org/m/databook/2019KC_profile_KY.pdf.

¹⁵ Gallup Polls. (2018). *State of American well-being: 2017 state well-being rankings*. Retrieved on April 13, 2020 from https://wellbeingindex.sharecare.com/wp-content/uploads/2018/02/Gallup-Sharecare-State-of-American-Well-Being_2017-State-Rankings_FINAL.pdf.

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.

DESCRIPTION OF ADOLESCENT CLIENTS WHO COMPLETED AN INTAKE INTERVIEW

DEMOGRAPHICS

The majority of clients with an intake survey submitted in FY 2017 and 2018 were male (70.2%), White (76.7%), and were 16 or 17 years old at intake (71.4%). One in ten clients reported they were multiracial, fewer than one in ten clients reported they were African American/Black (8.3%), 4.0% were Hispanic, and 1.0% were other races/ethnicities. Clients were, on average, 15.9 years old, ranging from 12 to 17 years old. Less than half of clients (45.1%) reported they were referred to treatment by the court (e.g., judge, court designated worker, probation officer), 12.3% reported they were referred to treatment by their school personnel, and 8.6% reported they were referred to treatment by adult or child protective services. Nearly 1 in 5 (19.0%) reported they sought treatment on their own/their families.

TABLE 1.1. DEMOGRAPHICS FOR ALL AKTOS CLIENTS AT INTAKE

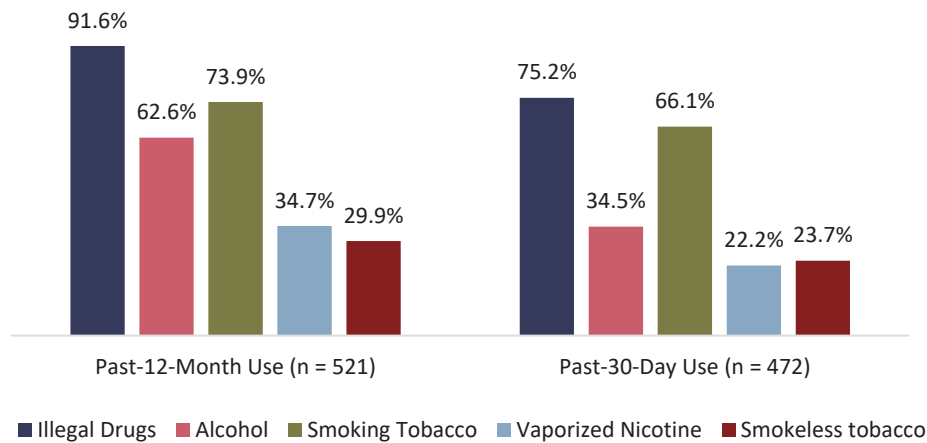
Age	15.9 years (range of 12-17)
Gender	
Female	29.2%
Male	70.2%
Transgender.....	0.6%
Race	
White.....	76.7%
African American	8.3%
Hispanic.....	4.0%
Other race/ethnicity (including Asian, American Indian)	1.0%
Multiracial	10.0%
Referred by	
The court	45.1%
School personnel	12.3%
Child or Adult Protective Services.....	8.6%
Self	19.0%
Other sources	15.0%

SUBSTANCE USE

The vast majority of adolescents who completed an intake survey (91.6%) reported using illegal drugs, 62.6% reported using alcohol, 73.9% reported smoking tobacco, 34.7% reported using

vaporized nicotine, and 29.9% reported using smokeless tobacco 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 = 49) are not included in the analysis of substance use in the 30 days before entering treatment. Of the 472 adolescents who were not in a controlled environment all 30 days, 75.2% reported using illegal drugs, 34.5% reported using alcohol, 66.1% reported smoking tobacco, 23.7% reported using smokeless tobacco, and 22.2% reported using vaporized nicotine in the 30 days before entering treatment.

FIGURE 1.1. ALCOHOL AND DRUG USE AMONG NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS (N = 521) OR 30 DAYS (N = 472) BEFORE PROGRAM ENTRY



The drug classes reported by the greatest number of adolescents in the 12 months before entering treatment were marijuana (88.9%), tranquilizers/ benzodiazepines/sedatives (33.2%), prescription opioids (29.6%), stimulants (27.6%; methamphetamine, prescription stimulants, cocaine), synthetic/ designer drugs (22.8%; i.e., bath salts, synthetic marijuana), and hallucinogens (20.5%).

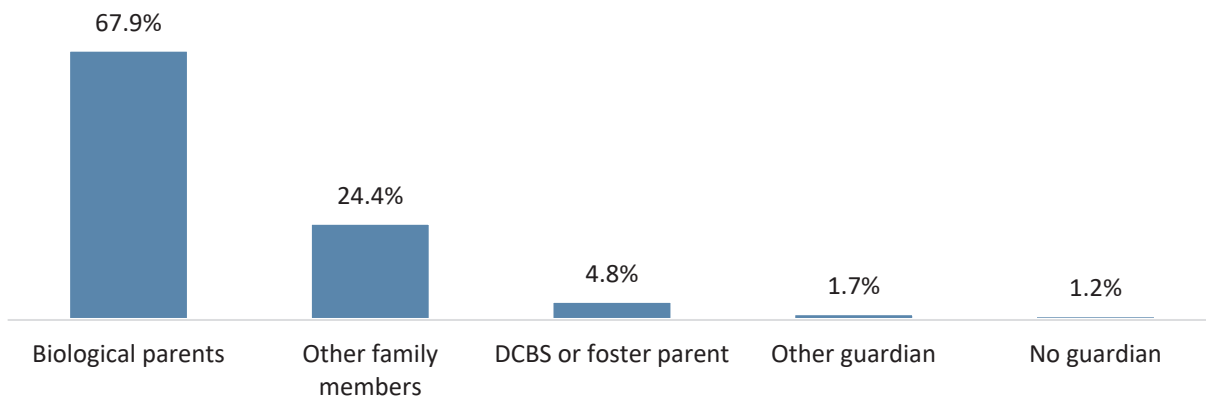
CAREGIVER AND LIVING SITUATION

The vast majority of adolescents reported their current caregiver was a family member: their biological parents (67.9%), followed by other family members including grandparents, kinship care, adoptive parents (24.4%), foster parent or DCBS (4.8%), and other guardian (1.7%). A small percentage of clients (1.2%) reported they had no caregiver (i.e., emancipated minor; see Figure 1.2).

“I liked that the therapist was nonjudgmental. I also liked the group session with parents since the therapist was the mediator.”

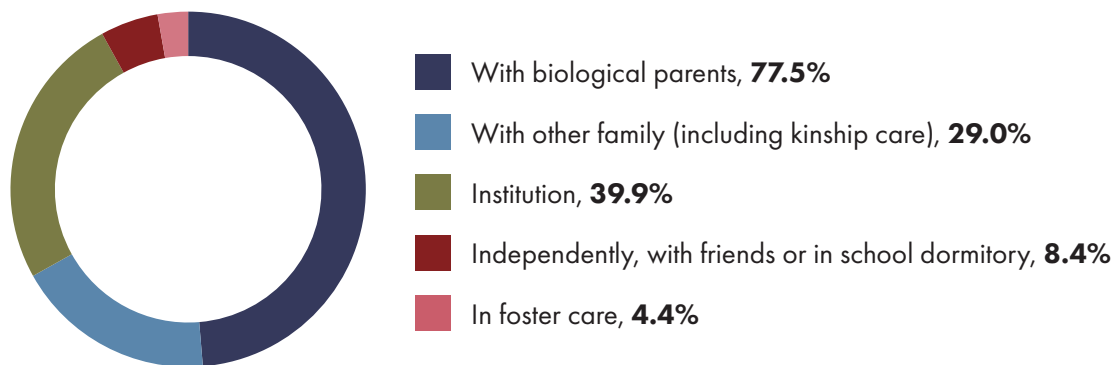
- AKTOS FOLLOW-UP CLIENT

FIGURE 1.2. CURRENT CAREGIVER AT INTAKE (N = 521)



The majority of adolescents reported they lived at home with their biological parents (77.5%; see Figure 1.3). Smaller percentages reported they lived with other family members in the 12 months before intake (29.0%), in an institution (39.9%; e.g., group home, residential treatment, or juvenile detention), independently (8.4%; including on their own, with peer roommates, or in a school dormitory), and in foster care (4.4%; i.e., non-kinship care).

FIGURE 1.3. USUAL LIVING ARRANGEMENT IN THE PAST 12 MONTHS AT INTAKE (N = 521)



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.¹⁸ Adverse childhood experiences, defined as abuse and household dysfunction, are associated with increased risk of many health, mental health, and social problems in adulthood.¹⁹ 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

¹⁸ 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.

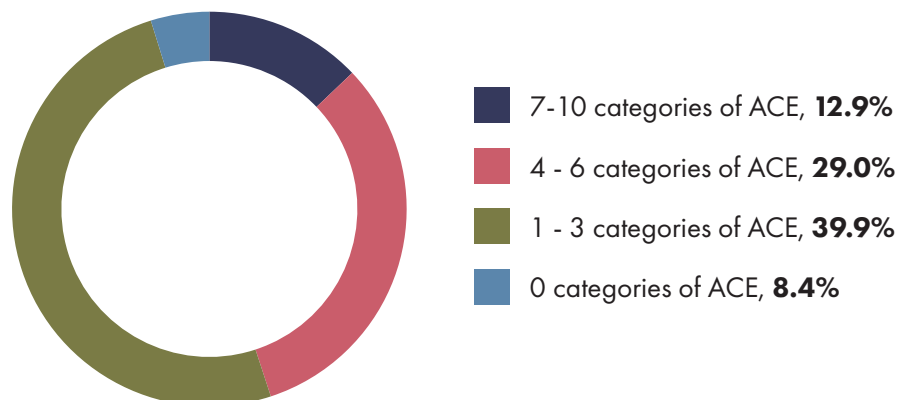
¹⁹ Edwards, V. J., Anda, R. F., Dube, S. R., Dong, M., Chapman, D. F., & Felitti, V. J. (2005). The wide-ranging health consequences of adverse childhood experiences. In Kathleen Kendall-Tackett & Sarah Giacomoni (Eds.), *Victimization of children and youth: Patterns of abuse, response strategies*. Kingston, NJ: Civic Research Institute.

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).²⁰

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.^{21,22,23}

The average number of categories of adverse childhood experiences adolescents reported was 3.5 (median = 3.0). Only small percentages of male and female adolescents reported 0 of the 10 adverse childhood experiences (see Figure 1.4). Girls reported a higher average number of ACE categories than boys reported (4.2 vs. 3.3; see Figure 1.5).

FIGURE 1.4. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES AT INTAKE (N = 521)



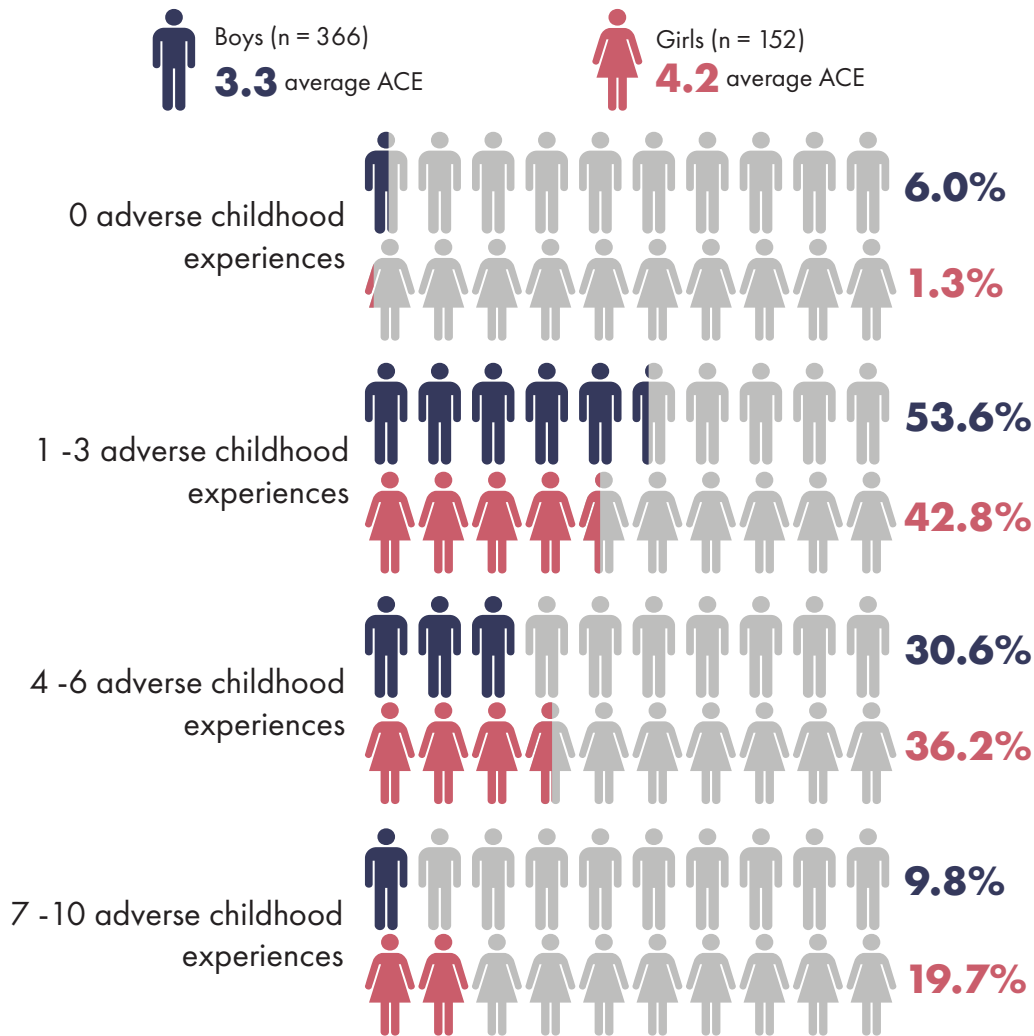
²⁰ Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245-258.

²¹ 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.

²² 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.

²³ 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 BY GENDER (N = 518)***

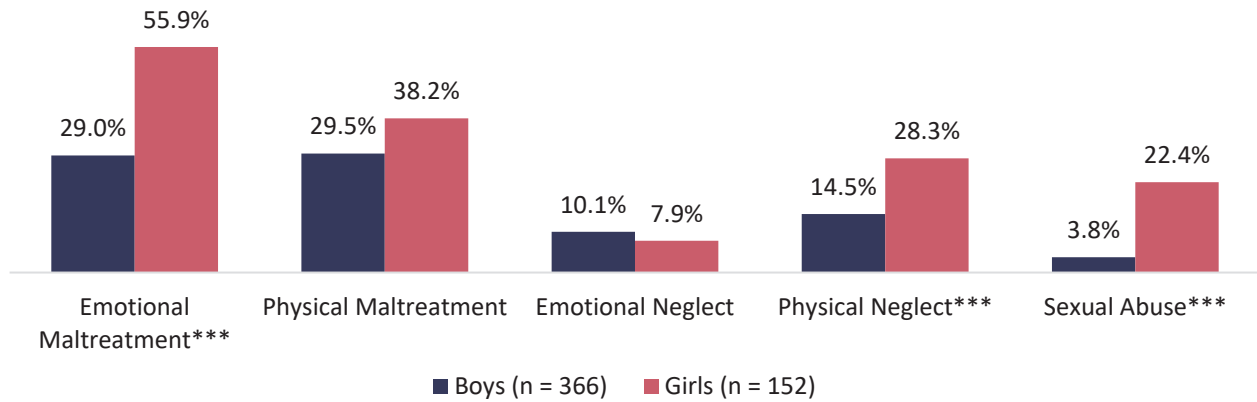


***p < .001.

Significantly more girls reported ever experiencing emotional maltreatment, physical neglect, and sexual abuse²⁴ compared to boys (see Figure 1.6A). Specifically, more than half of girls (55.9%) reported they had experienced emotional maltreatment in their family homes compared to 29.0% boys. More than one-fourth of girls (28.3%) and 14.5% of boys reported they had experienced physical neglect. There was no gender difference in the proportion of individuals who reported emotional neglect and physical maltreatment. The most sizable difference in proportion was found for sexual abuse (by any type of perpetrator) with 22.4% of girls and 3.8% of 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 1.6A: 46.4% of boys and 68.4% of girls.

²⁴ The items included here asked about forced sexual touching or acts by an adult (known or not known).

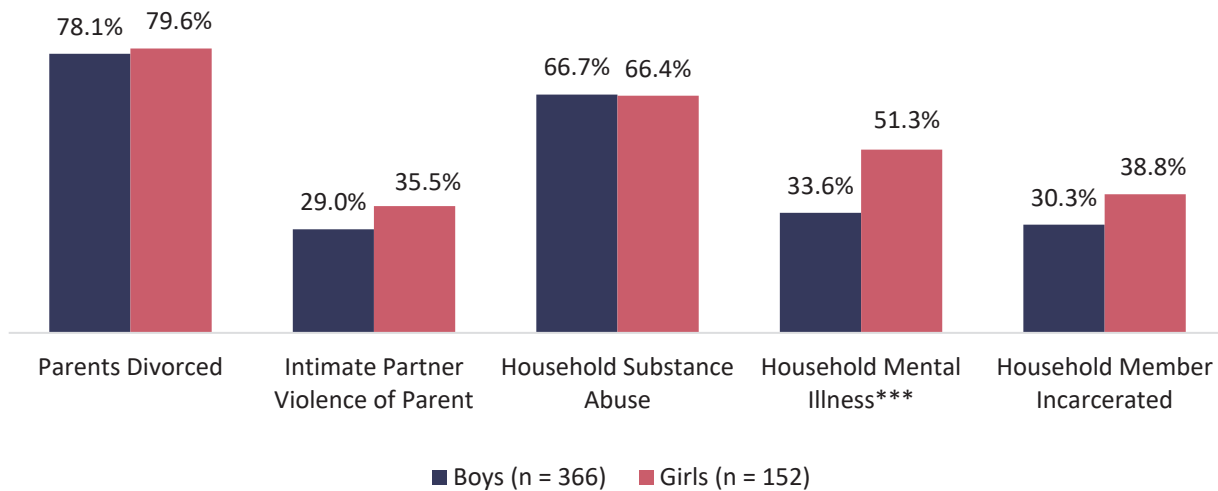
FIGURE 1.6A. ADVERSE CHILDHOOD EXPERIENCES OF MALTREATMENT AND ABUSE AT INTAKE BY GENDER (n = 518)²⁵



***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 1.6B). Similar percentages of boys and girls reported they had witnessed intimate partner violence (IPV) of a parent and a household member had been incarcerated. Significantly more girls than boys reported a household member had been depressed or mentally ill (i.e., was seriously depressed, attempted suicide or had a mental illness).

FIGURE 1.6B. ADVERSE CHILDHOOD EXPERIENCES OF HOUSEHOLD RISK AT INTAKE BY GENDER (n = 518)²⁶



***p < .001.

²⁵ Three individuals who reported their gender as transgender were not included in this analysis because three individuals is too few to include as a group in statistical analysis.

²⁶ Three individuals who reported their gender as transgender were not included in this analysis because three 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.^{27, 28, 29} Associations of the ACE score with substance use disorder, substance use, and mental health measures was examined among the 521 youth who completed an intake interview in FY 2017 and FY 2018.

Significant associations were found:³⁰



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. There was a linear relationship between the number of categories of adverse childhood experiences and severity of substance use disorder at intake. Individuals with no substance use disorder (2.4) had significantly fewer categories of adverse childhood experiences compared to individuals with mild SUD (3.5), moderate SUD (3.7), and severe SUD (4.4).



SUBSTANCE USE

The number of categories of adverse childhood experiences was significantly associated with the number of months individuals reported using smoked tobacco products ($r = .195, p < .001$), alcohol ($r = .184, p < .001$), marijuana ($r = .211, p < .01$), opioids/opiates other than heroin ($r = .115, p < .01$), CNS depressants ($r = .123, p < .01$), stimulants/cocaine ($r = .134, p < .01$), and other illegal drugs ($r = .165, p < .001$) in the 12 months before entering treatment. In other words, individuals who reported more categories of adverse childhood experiences reported more months of smoking tobacco, 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 ($r = .405, p < .001$), internalizing problems scale ($r = .474, p < .001$), and externalizing problems scale ($r = .342, p < .001$) were statistically significant.



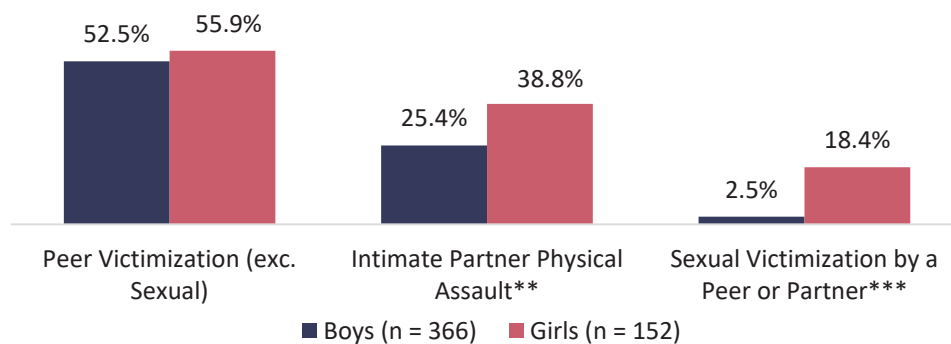
EMOTION REGULATION

The correlations between the number of adverse childhood experiences and the emotion regulation strategies subscales were statistically significant for the Internal-Dysfunctional ($r = .462, p < .001$) and External-Dysfunctional ($r = .330, p < .001$) subscales, but not for the Internal-Functional and External-Functional subscales. Specifically, adolescents who reported a higher number of adverse childhood experiences reported using more dysfunctional emotion regulation strategies for both internal and external strategies.

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 more than half of girls reported emotional or physical victimization by peers (see Figure 1.7). Significantly more girls than boys reported they had experienced physical assault by a partner and sexual victimization by peers or partners.

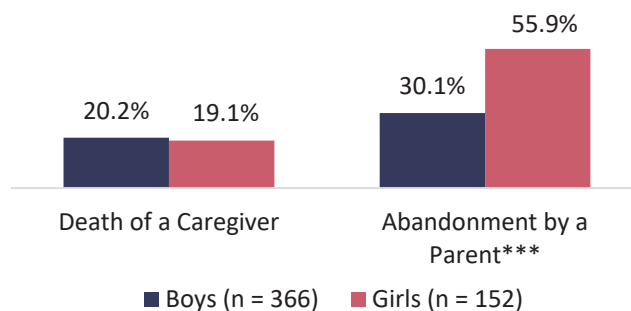
FIGURE 1.7. PEER VICTIMIZATION, INTIMATE PARTNER VIOLENCE, SEXUAL VICTIMIZATION BY PEERS AND OTHER MAJOR CHILDHOOD STRESSORS AT INTAKE BY GENDER (n = 518)³¹



p < .01, *p < .001.

Similar percentages of boys and girls reported death of a caregiver (including a parent): about 1 in 5 (see Figure 1.8). Significantly more girls than boys reported they had a sense of parental abandonment, with more than one-half of girls reporting this compared to less than one-third of boys.

FIGURE 1.8. OTHER MAJOR CHILDHOOD STRESSORS AT INTAKE BY GENDER (n = 518)³²



***p < .001.

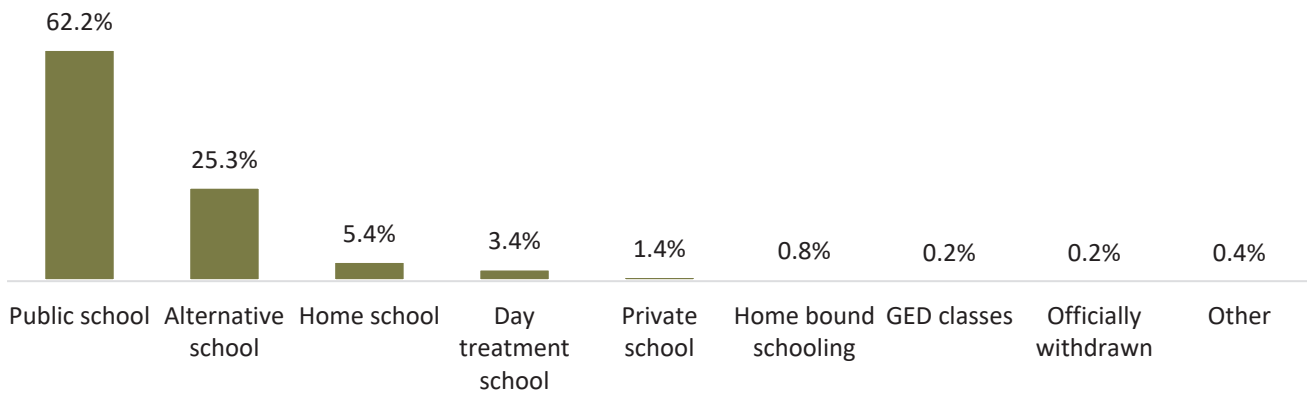
³¹ Three individuals who reported their gender as transgender were not included in this analysis because three individuals is too few to include as a group in statistical analysis.

³² Three individuals who reported their gender as transgender were not included in this analysis because three individuals is too few to include as a group in statistical analysis.

EDUCATION, EMPLOYMENT, AND FREE TIME

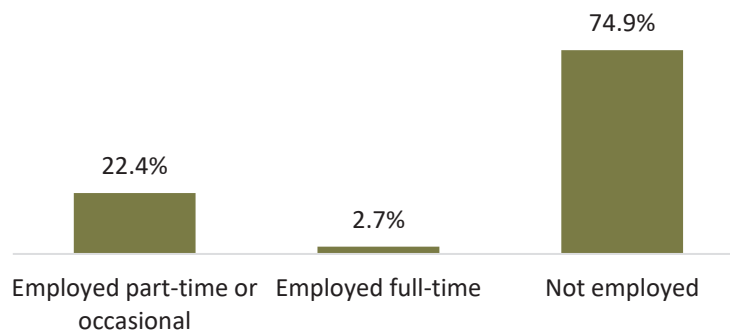
At intake, 19 individuals (3.6%) reported they had a high school diploma or GED. Among the remaining 502 individuals, almost all (99.0%) were enrolled in school at intake. The majority of clients reported they were attending public school (62.2%; see Figure 1.9). The next most frequently mentioned type of schooling was alternative school (25.3%). Small percentages of clients reported the following types of schooling: home school (5.4%), day treatment (3.4%), private school (1.4%), home bound (0.8%), GED classes (0.2%), officially withdrawn (0.2%), and other (0.4%).

FIGURE 1.9. SCHOOL STATUS AT INTAKE (n = 502)³³



A minority of adolescents (25.1%) reported at intake they were currently employed part-time or had occasional or seasonal employment (22.4%), or employed full-time (2.7%; see Figure 1.10). Thus, the majority of youth were not employed at intake (74.9%). Of the nineteen individuals with a high school diploma or GED at intake, 63.2% were not employed, 26.3% (n = 5) were employed part-time, and 10.5% had occasional or seasonal work (not depicted in a Figure).

FIGURE 1.10. EMPLOYMENT STATUS AT INTAKE (N = 521)

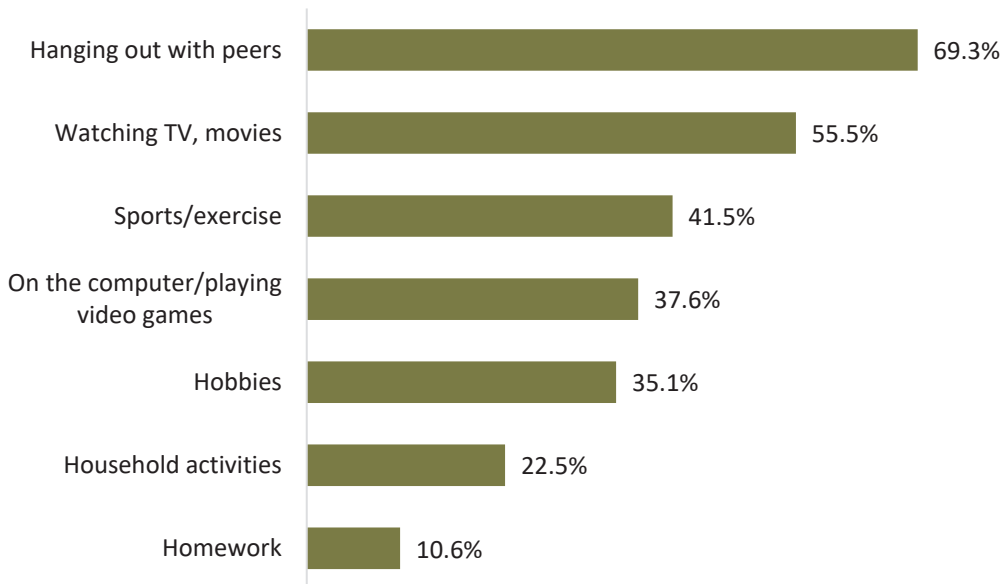


On weekdays, AKTOS clients reported spending an average of 7.6 hours per day on devices (e.g., watching streaming shows, TV, playing video games, on the internet via a computer or smart phone). On weekends, clients reported spending an average of 8.0 hours per day on devices.

³³ Nineteen individuals who reported they had a school diploma or GED at intake are not included in this Figure.

AKTOS clients were asked to report the three types of activities we listed that they spent the most time in a typical week engaged in (outside of school and work). Figure 1.11 shows the percent of adolescents who reported spending most of their time (not in school or at work) on the activities in a typical week.

FIGURE 1.11. THREE ACTIVITIES CLIENTS SPENT THE MOST TIME ENGAGED IN (EXCLUDING SCHOOL/WORK) AT INTAKE (n = 521)



JUSTICE SYSTEM INVOLVEMENT

About 2 in 5 adolescents (40.5%) reported they had been arrested and charged with an offense in the 12 months before entering treatment. A little over one-fourth (28.0%) reported they had been incarcerated in the 12 months before entering treatment. More than half of adolescents (54.5%) 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 intake surveys are 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. Clients' responses to the follow-up interviews are kept confidential to help facilitate the honest evaluation of client outcomes and satisfaction with program services. When interviewers contacted clients to complete the follow-up survey, individuals who were not eligible to participate in the follow-up survey (e.g., residential treatment, incarcerated, military service) are removed from the sample of

eligible participants. There were no direct refusals. More than one-fourth of eligible participants (31.6%) were not successfully contacted to complete the follow-up surveys.³⁴

This report describes outcomes for 147 adolescents (ages 10-17 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 335.8 days) after the intake survey was completed. Detailed information about the methods and follow-up efforts can be found in Appendix A.

DEMOGRAPHICS

Of the 147 adolescents who completed a 12-month follow-up interview, 70.1% were male and 29.9% were female (see Table 1.2). The racial/ethnic distribution of the follow-up sample was: White (70.1%), Black/African American (12.2%), Hispanic (3.4%), American Indian (0.7%), Asian (0.7%), and multiracial (12.9%). They were an average of 16.2 years old at the time of the intake interview. The majority of adolescents (78.9%) were 16 or 17 years old at intake.

TABLE 1.2 DEMOGRAPHICS FOR AKTOS FOLLOW-UP SAMPLE CLIENTS AT INTAKE (n = 147)

Age	16.2 years (range of 13-17)
Gender	
Female	70.1%
Male	29.9%
Race	
White.....	70.1%
African American.....	12.2%
Multiracial	12.9%
Hispanic.....	3.4%
American Indian	0.7%
Asian.....	0.7%

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 3.4 (median = 3.0). Girls reported a higher average number of ACE categories than boys reported (4.1 vs. 3.1; see Figure 1.13).

³⁴ 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.

FIGURE 1.12. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES AT INTAKE (N = 147)

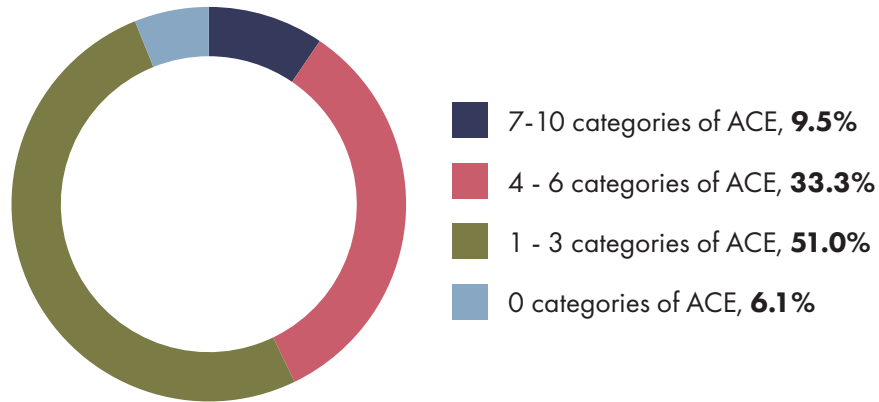


FIGURE 1.13. THE NUMBER OF CATEGORIES OF ADVERSE CHILDHOOD EXPERIENCES BY GENDER (N = 147)*

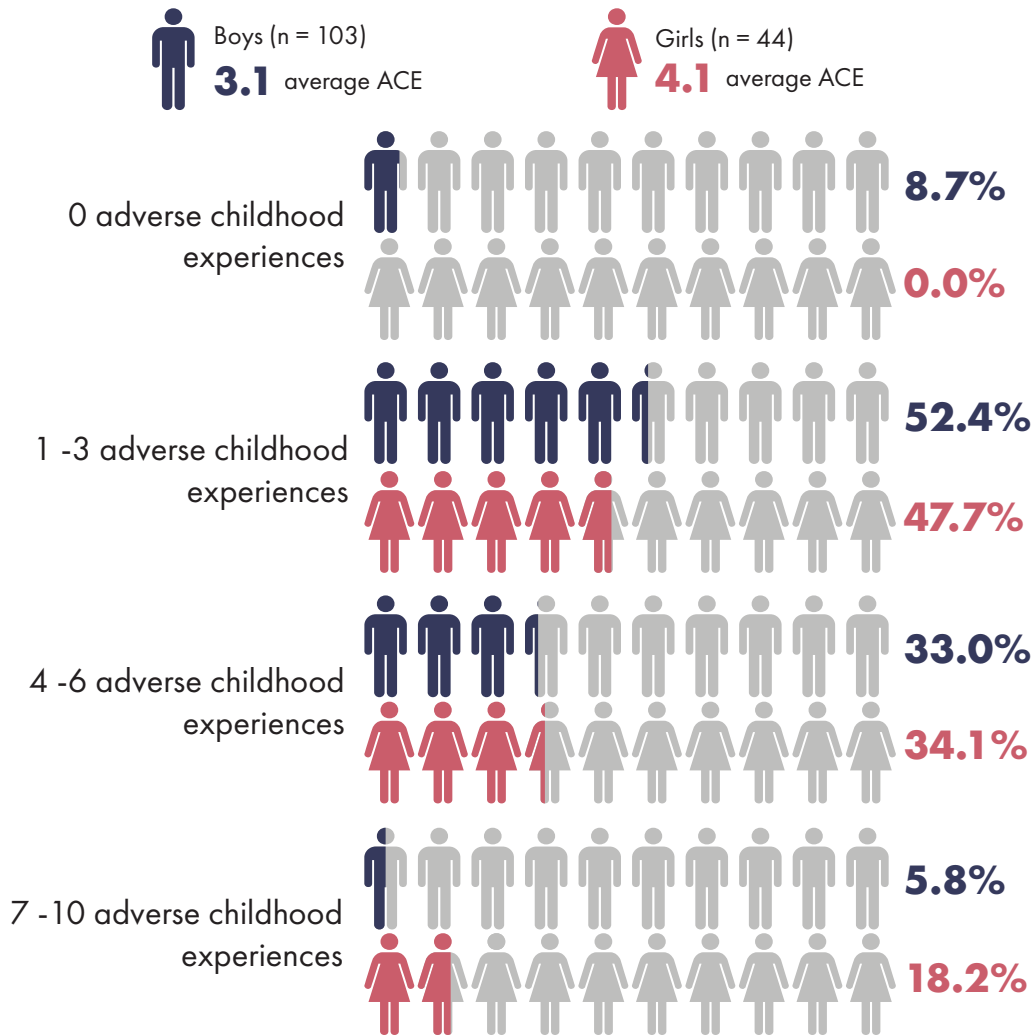
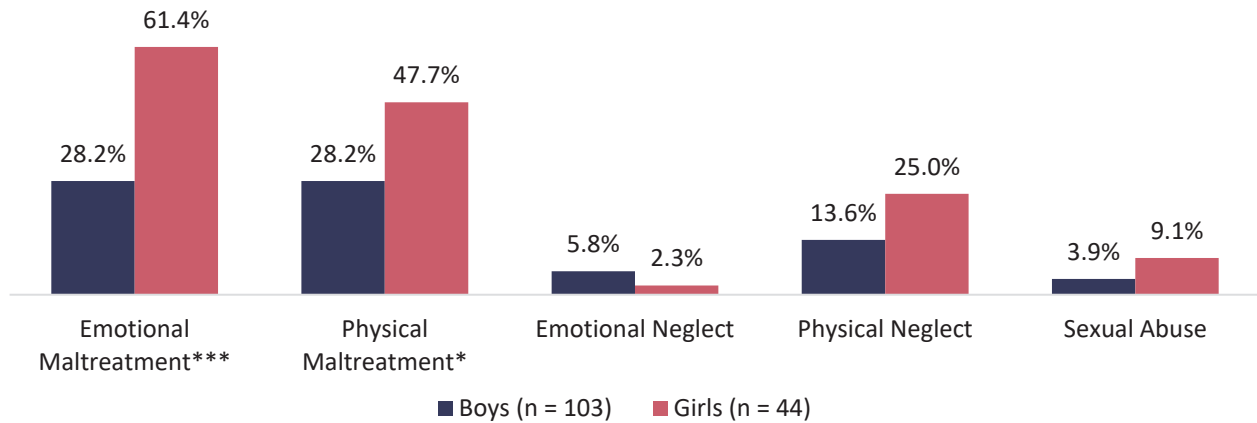


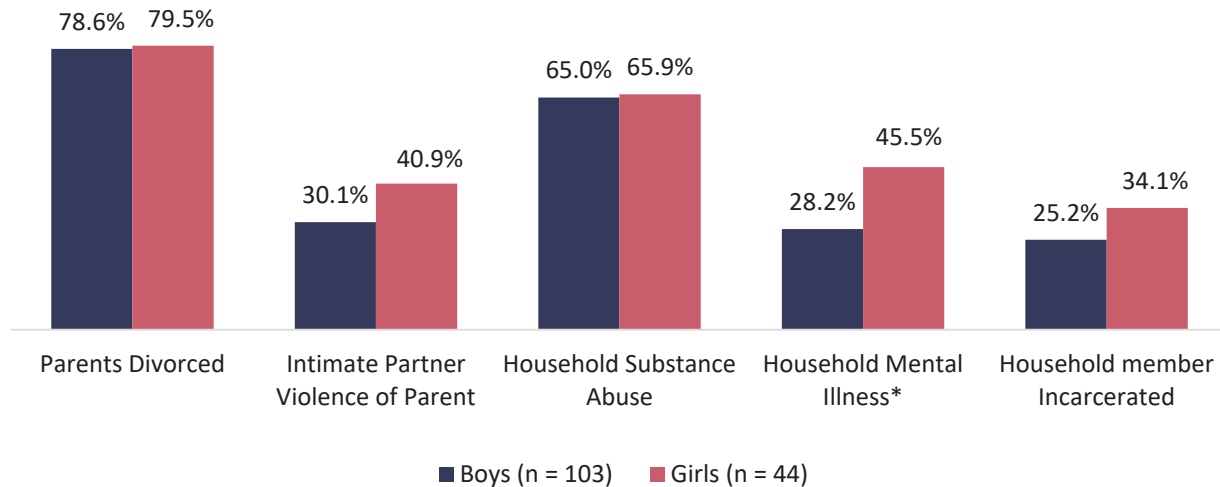
FIGURE 1.14A. ADVERSE CHILDHOOD EXPERIENCES OF MALTREATMENT AND ABUSE AT INTAKE BY GENDER (n = 147)



*p < .05, ***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. Similar percentages of girls and boys reported that a household member abused alcohol and/or used illegal drugs. 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 = 147)



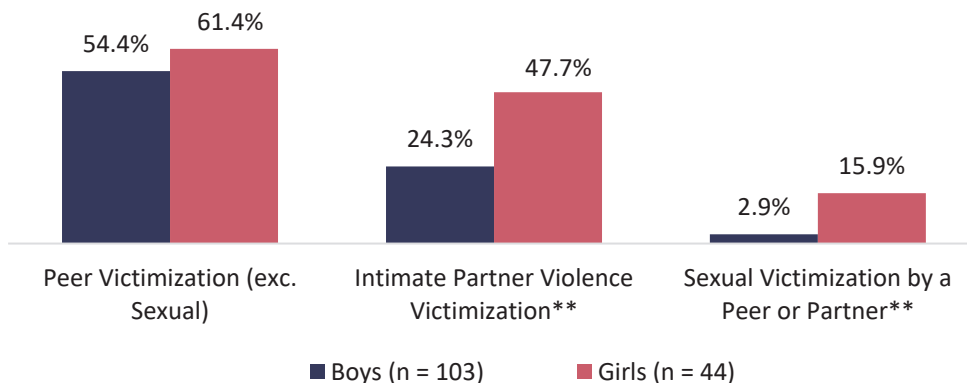
*p < .05.

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 girls reported emotional or physical victimization by peers (see Figure 1.15). Nearly half of girls reported intimate partner violence compared to about one-fourth of boys. Significantly more girls than boys reported they had experienced intimate partner violence and sexual victimization by peers or partners.

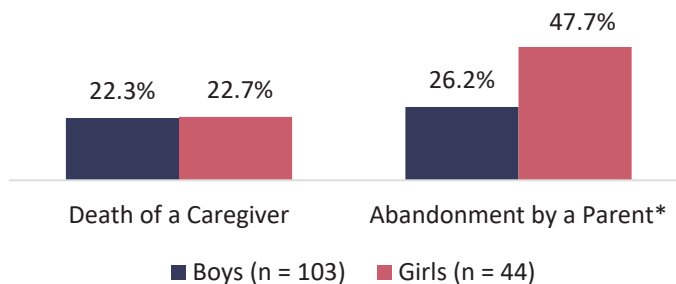
FIGURE 1.15. PEER VICTIMIZATION, INTIMATE PARTNER VIOLENCE, AND SEXUAL VICTIMIZATION BY PEERS AT INTAKE BY GENDER (n = 147)



**p < .01.

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 = 147)



*p < .05.

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 substance use, education, employment, caregiver and living situation, mental health, and justice system involvement. Individuals who were followed up were significantly older than individuals who were not followed up. Also, more individuals who had completed a follow-up interview reported they were Black/African American than individuals who did not complete a follow-up interview. Differences in recovery supports were found between the two groups at intake. First, significantly more individuals who completed a follow-up interview reported they had attended a mutual help recovery meeting in the 30 days before entering treatment when compared to individuals who did not complete a follow-up interview. Also, individuals who completed a follow-up interview reported a higher average number of people they could count on for recovery support when compared to individuals who had not completed a follow-up interview. See Appendix B for detailed comparisons of adolescents who completed a follow-up interview (n = 147) and adolescents who did not complete a follow-up interview (n = 374).

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 (76.9%) gave a positive rating between 8 and 10 of their satisfaction with the treatment program (not in a table). The average rating was 8.3.

CLIENT RATINGS OF PROGRAM EXPERIENCES

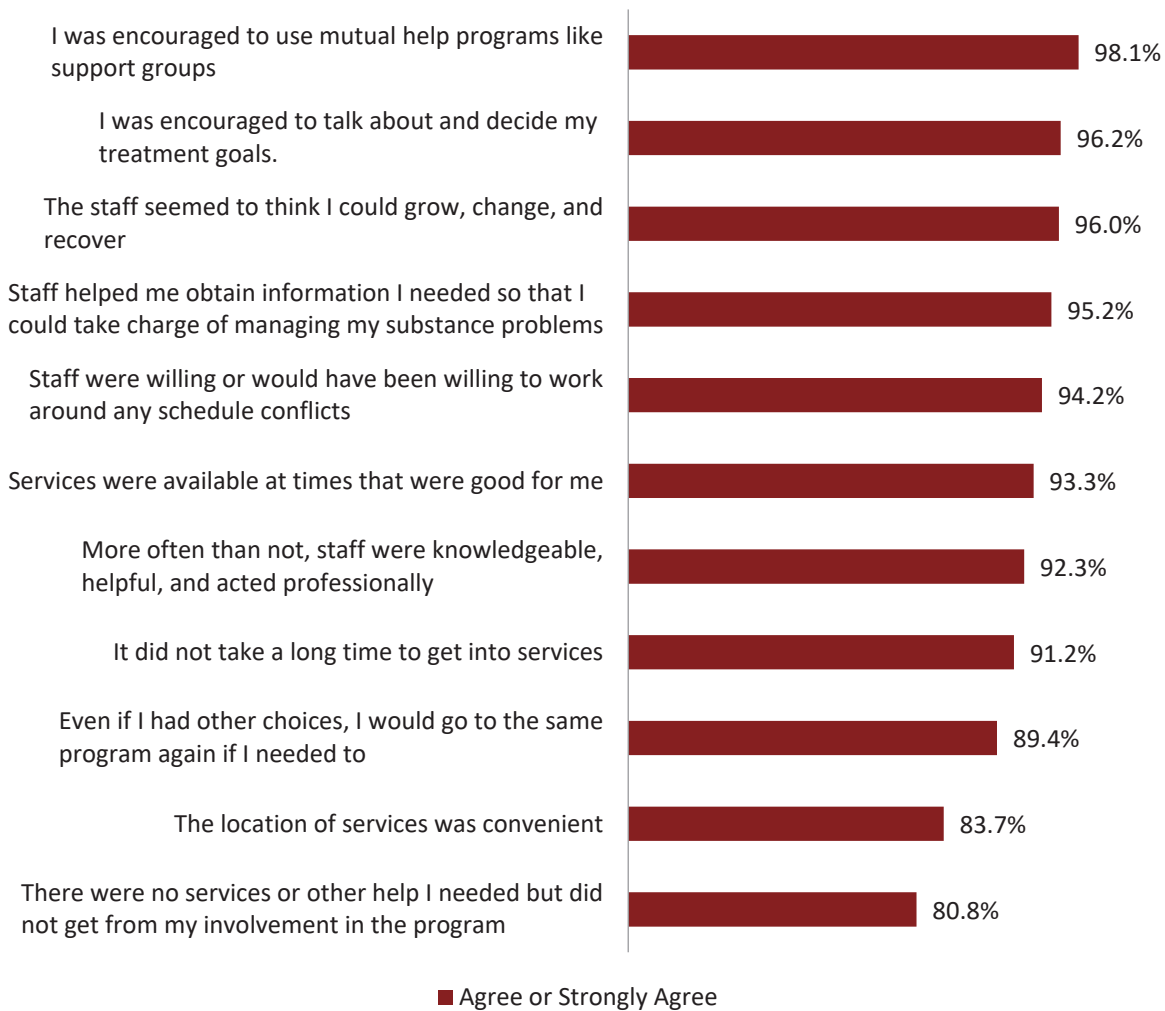
When asked about specific aspects of their treatment program, most individuals reported they either agreed or strongly agreed with each aspect of the program that was assessed (see Figure 2.1). The majority of clients agreed: they were encouraged to use mutual help programs; the staff seemed to think they could grow, change, and recover; they were encouraged to talk about and decide their treatment goals; staff helped them obtain information they needed so they could take charge of managing their substance use problems; staff were willing to work around schedule conflicts; services were available at times that were good for clients; more often than not, staff were knowledgeable, helpful, and professional; and it did not take a long time to get into services.

"I was treated well and could be open with them."

-AKTOS FOLLOW-UP CLIENT

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.

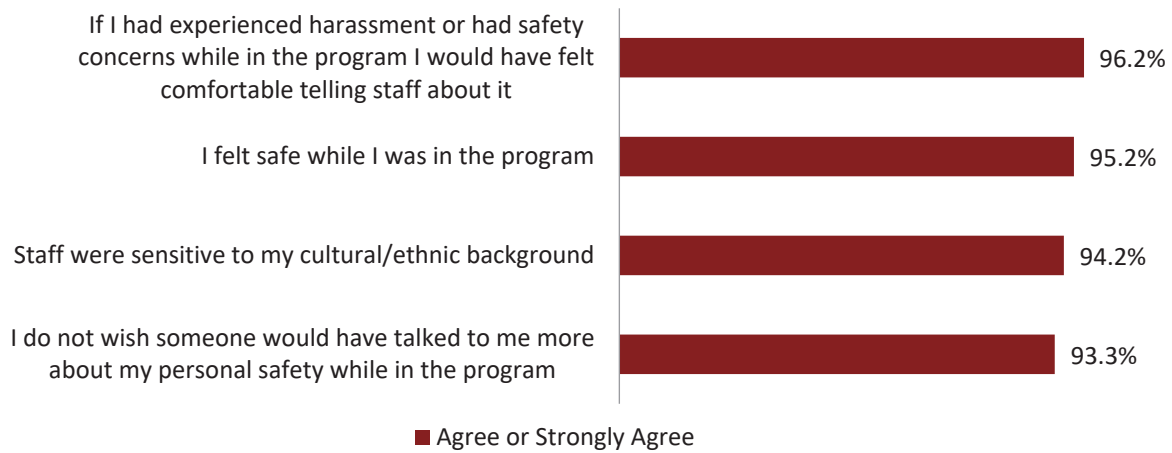
FIGURE 2.1. PERCENT OF CLIENTS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE TREATMENT PROGRAM AT FOLLOW-UP (n = 104)³⁶



Clients reported that their safety was treated with importance in the treatment (see Figure 2.2). For example, the vast majority agreed or strongly agreed that if they had experienced harassment or had safety concerns while in the program, they would have felt comfortable telling staff about it, they felt safe in the program, and staff were sensitive to their cultural/ethnic background. Additionally, the majority reported they did not wish someone would have talked to them more about their personal safety in the program.

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 (n = 104). Answers of don't know/don't remember were treated as missing on these items.

FIGURE 2.2. PERCENT OF CLIENTS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE TREATMENT PROGRAM AT FOLLOW-UP (n = 104)³⁷



³⁷ 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 (n = 104). Answers of don't know/don't remember were treated as missing on these items. Only two clients reported "don't know" for some of the satisfaction items.

SECTION 3. SUBSTANCE USE

This section describes pre-program compared to 12-month follow-up change in illegal drug, alcohol, and tobacco/nicotine 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) central nervous system (CNS) depressants [i.e., tranquilizers, benzodiazepines, sedatives, and barbiturates], (c) opioids [i.e., prescription opiates, methadone, and buprenorphine], (d) heroin, (e) stimulants/cocaine [i.e., cocaine, methamphetamine, Ecstasy, MDMA, Adderall, and Ritalin], (g) synthetic drugs [i.e., bath salts, synthetic marijuana], 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 = 147) 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 = 133)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 = 13) or the 30 days before follow-up (n = 1), 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.
4. **Change in self-reported severity of substance use disorder from intake to follow-**

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.

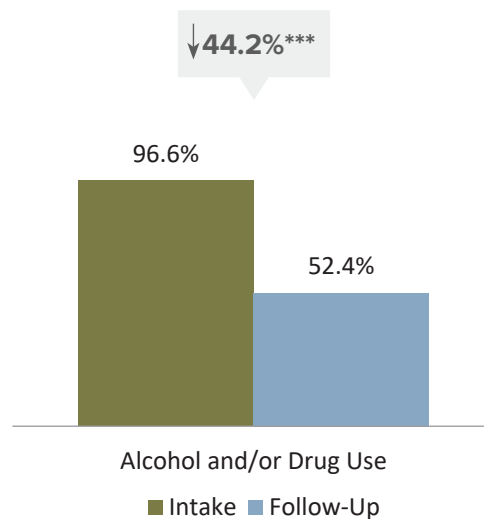
up. Another way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they met the 11 criteria included in the DSM-5 for diagnosing substance use disorder. Under DSM-5 criteria, anyone meeting any two of the 11 criteria during the same 12-month 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 44.2% 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 52.4% reported using alcohol and/or drugs. In other words, a total of 70 youth (47.6%) 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 = 147)

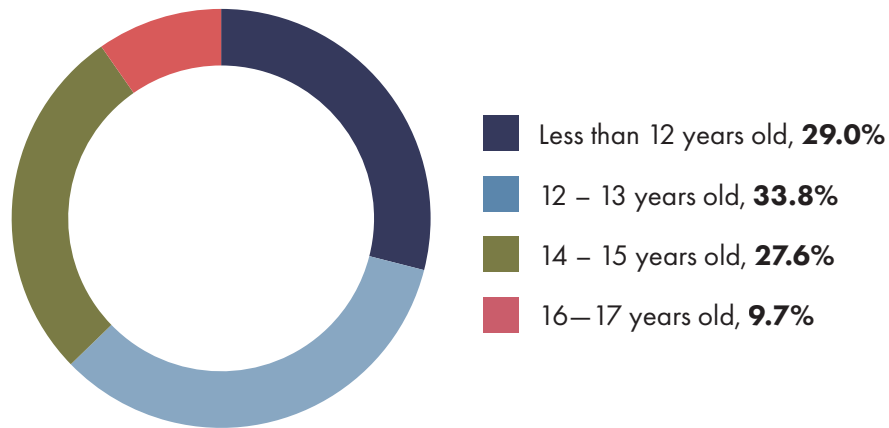


***p < .001.

AVERAGE AGE FIRST USED ALCOHOL OR DRUGS

The average age youth-initiated alcohol or drug use was 12.5 years old. The majority of youth in the AKTOS follow-up sample (62.8%) were early initiators of substance use (i.e., before the age of 14; see Figure 3.2).

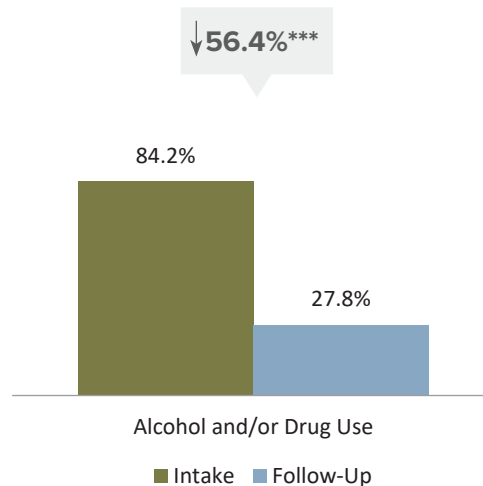
The majority of youth were early initiators of substance use

FIGURE 3.2. AVERAGE AGE CLIENT FIRST USED ALCOHOL OR DRUGS (n = 145)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-fourth (27.8%) reported using alcohol and/or drugs (see Figure 3.3). In other words, a total of 96 youth (72.2% 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 = 133)



***p < .001.

³⁹ Age of first use of alcohol and/or drugs was missing for two clients.

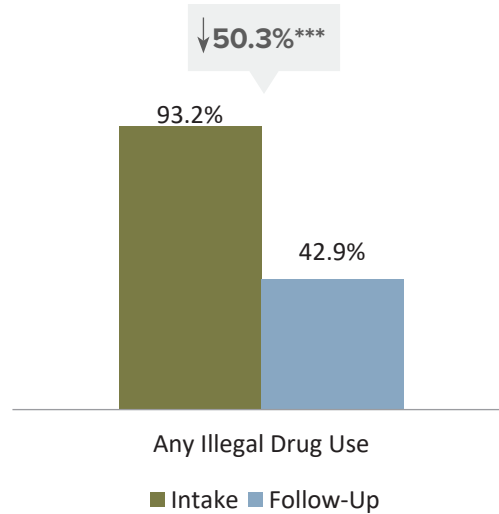
ANY ILLEGAL DRUGS

PAST-12-MONTH ILLEGAL DRUG USE

The vast majority of clients (93.2%) reported using illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 42.9% at follow-up (see Figure 3.4).

The number of clients reporting illegal drug use decreased by 50%

FIGURE 3.4. PAST-12-MONTH USE OF ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 147)

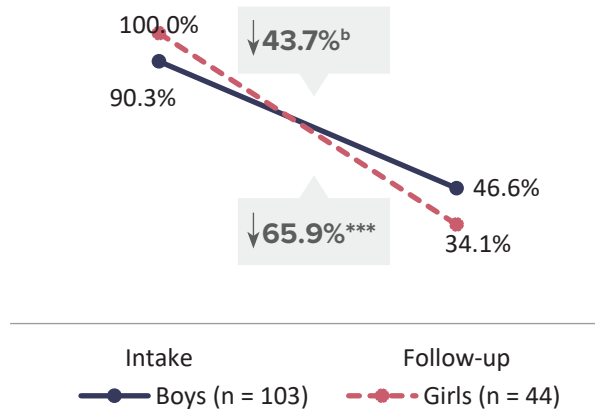


GENDER DIFFERENCE IN ILLEGAL DRUG USE

Compared to boys, significantly more girls reported using illegal drugs in the 12 months before intake (see Figure 3.5). The number of girls and boys who used illegal drugs in the past 12 months decreased significantly from intake to follow-up.

Significantly more girls reported using illegal drugs in the past 12 months at intake when compared to boys

FIGURE 3.5. GENDER DIFFERENCES IN PAST-12-MONTH USE OF ILLEGAL DRUGS^{a,b}



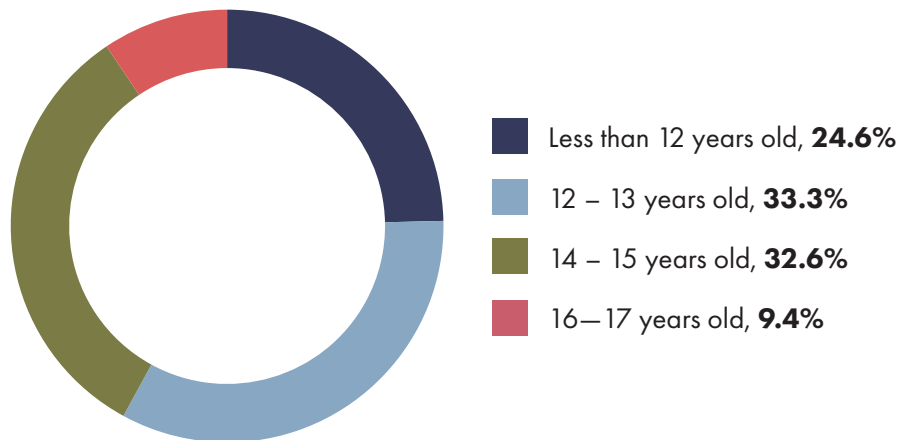
a—Statistical difference by gender at intake ($p < .05$).
 b—No measure of association could be computed for the crosstabulation for change in illegal use from intake to follow-up for female individuals because there was a value of 0 for the variable at intake.
 * $p < .05$.

AVERAGE AGE FIRST USED ILLEGAL DRUGS

The adolescents who reported using illegal drugs were, on average, 12.9 years old when they first began using illegal drugs. Figure 3.6 shows the percentage of adolescents who reported first using illegal drugs at different ages.

Youth were on average 12.9 years old when they first used illegal drugs

FIGURE 3.6. AVERAGE AGE FIRST USED ILLEGAL DRUGS (n = 138)⁴⁰

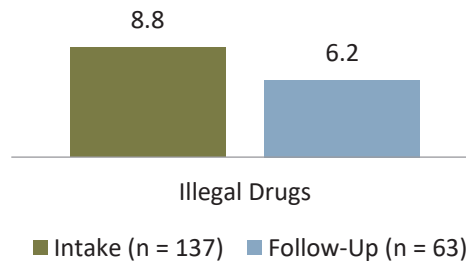


⁴⁰ Nine individuals reported they had never used illegal drugs, and one individual had a missing value for age of first use of any illegal drug.

AVERAGE NUMBER OF MONTHS USED ANY ILLEGAL DRUGS

Among the clients who reported using illegal drugs in the 12 months before entering treatment (n = 137), they reported using illegal drugs on average 8.8 months (see Figure 3.7). Among clients who reported using illegal drugs at follow-up (n = 63), they reported using on average 6.2 months.⁴¹

FIGURE 3.7. AMONG CLIENTS WHO USED ANY ILLEGAL DRUGS, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP

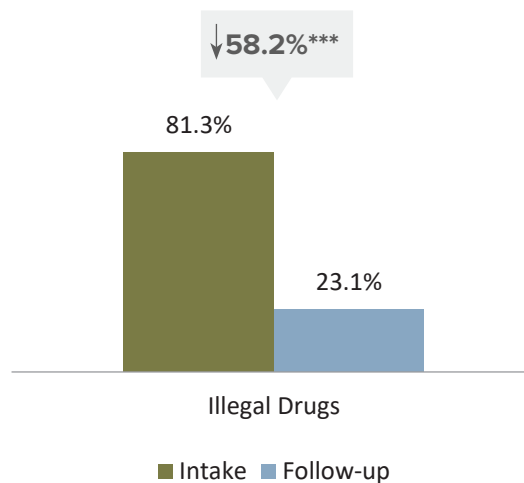


PAST-30-DAY ILLEGAL DRUG USE

The majority of clients (81.3%) 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 3.8). At follow-up, 23.1% 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.

There was a significant reduction of 58% in the number of clients who reported past 30-day illegal drug use

FIGURE 3.8. PAST-30-DAY USE OF ANY ILLEGAL DRUG AT INTAKE AND FOLLOW-UP (n = 134)



*** p < .001.

⁴¹ 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.

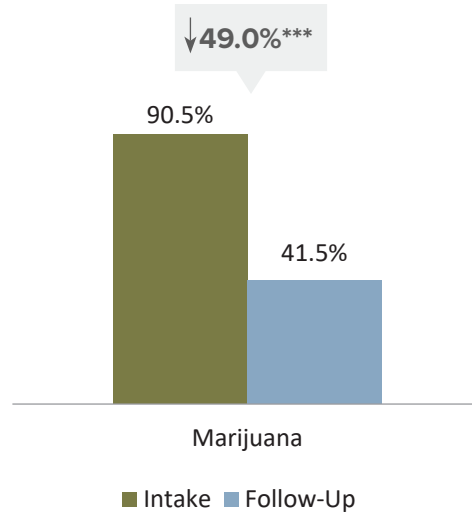
MARIJUANA

PAST-12-MONTH MARIJUANA USE

Nine in 10 clients (90.5%) reported using marijuana in the 12 months before entering treatment, which decreased to 41.5% at follow-up (see Figure 3.9).

The number of clients reporting marijuana use decreased by 49%

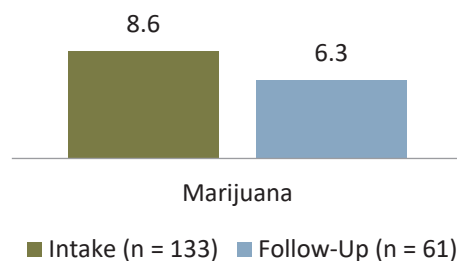
FIGURE 3.9. PAST-12-MONTH USE OF MARIJUANA AT INTAKE AND FOLLOW-UP (n = 147)



AVERAGE NUMBER OF MONTHS USED MARIJUANA

Among the clients who reported using marijuana in the 12 months before entering treatment (n = 133), they reported using marijuana on average 8.6 months (see Figure 3.10). Among clients who reported using marijuana at follow-up (n = 61), they reported using an average of 6.3 months.

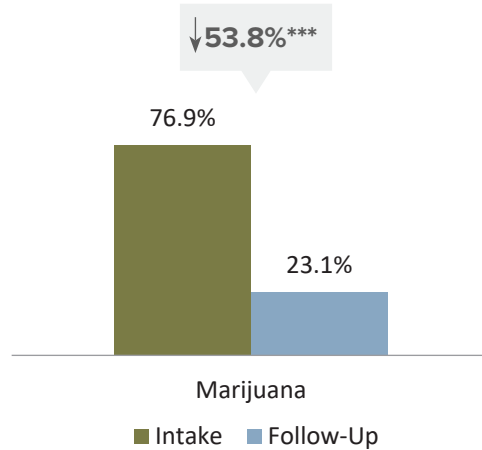
FIGURE 3.10. AMONG ADOLESCENTS WHO USED MARIJUANA, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED MARIJUANA AT INTAKE AND FOLLOW-UP



PAST-30-DAY MARIJUANA USE

The number of clients who reported using marijuana decreased from 76.9% at intake to 23.1% at follow-up (see Figure 3.11).

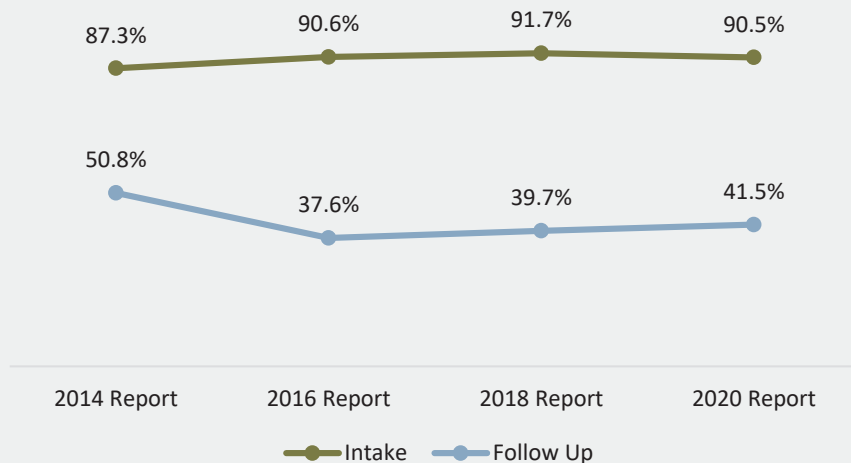
FIGURE 3.11. PAST-30-DAY USE OF MARIJUANA AT INTAKE AND FOLLOW-UP (n = 134)



***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 similar percentage in the 2018 and 2020 report.



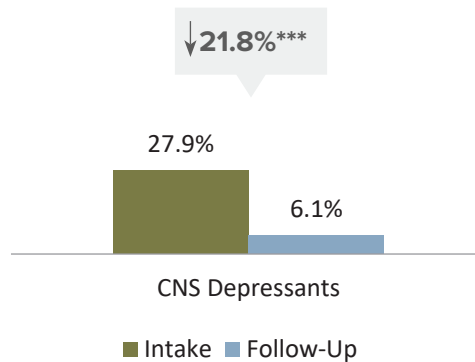
CNS DEPRESSANT USE

PAST-12-MONTH CNS DEPRESSANT USE

In the 12 months before entering treatment, 27.9% of adolescents reported using CNS depressants (e.g., tranquilizers, sedatives, benzodiazepines, hypnotics). The number of adolescents who reported using CNS depressants decreased to 6.1% at follow-up (see Figure 3.12).

The number of clients reporting CNS depressant use decreased by 22%

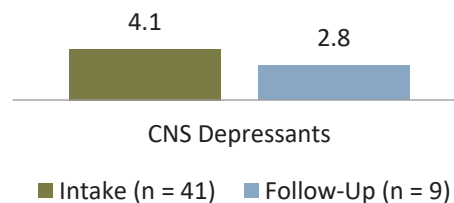
FIGURE 3.12. PAST-12-MONTH USE OF CNS DEPRESSANTS AT INTAKE AND FOLLOW-UP (n = 147)



AVERAGE NUMBER OF MONTHS USED CNS DEPRESSANTS

Among the clients who reported using CNS depressants in the 12 months before entering treatment (n = 41), they reported using an average 4.1 months (see Figure 3.13). Among clients who reported using CNS depressants at follow-up (n = 9), they reported using an average 2.8 months.⁴²

FIGURE 3.13. AMONG ADOLESCENTS WHO USED CNS DEPRESSANTS, THE AVERAGE NUMBER OF MONTHS CLIENTS USED CNS DEPRESSANTS AT INTAKE AND FOLLOW-UP

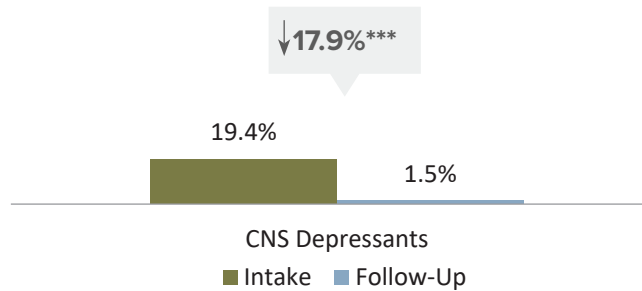


⁴² Because number of months of CNS depressants were measured separately (e.g., barbiturates, tranquilizers), the value is a calculation of the maximum number of months clients used any of these specific types of CNS depressants.

PAST-30-DAY CNS DEPRESSANT USE

The number of clients who reported using CNS depressants decreased significantly from 19.4% at intake to 1.5% at follow-up (see Figure 3.14).

FIGURE 3.14. PAST-30-DAY USE OF CNS DEPRESSANTS AT INTAKE AND FOLLOW-UP (n = 134)^a



***p < .001.

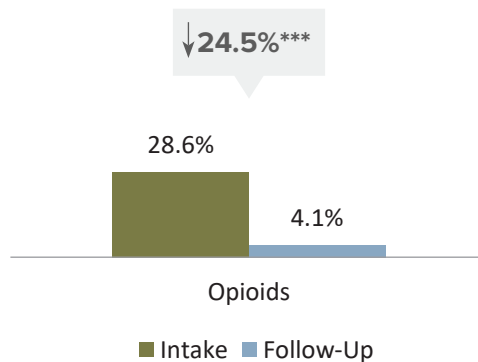
OPIOID USE

PAST-12-MONTH OPIOID USE

In the 12 months before entering treatment 28.6% of adolescents reported using opioids⁴³ other than heroin, including prescription opiates, methadone, and buprenorphine. The number of adolescents who reported using opioids decreased to 4.1% at follow-up (see Figure 3.15).

The number of clients reporting opioid use decreased by 25%

FIGURE 3.15. PAST-12-MONTH USE OF OPIOIDS AT INTAKE AND FOLLOW-UP (n = 147)



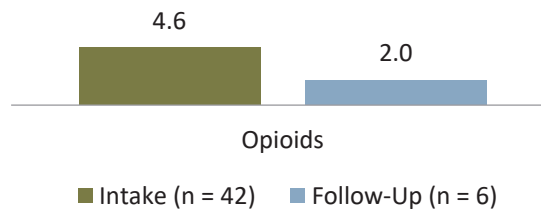
***p < .001.

⁴³ For brevity's sake, we will refer to this class of substance as opioids, which includes prescription opiates, methadone, buprenorphine, and opioids.

AVERAGE NUMBER OF MONTHS USED OPIOIDS

Among the clients who reported using opioids in the 12 months before entering treatment (n = 42), they reported using opioids on average 4.6 months (see Figure 3.16). Among clients who reported using opioids at follow-up (n = 6), they reported using an average 2.0 months.⁴⁴

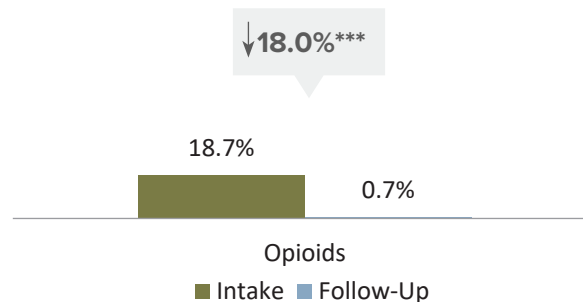
FIGURE 3.16. AMONG ADOLESCENTS WHO USED OPIOIDS, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED OPIOIDS



PAST-30-DAY OPIOID USE

Nearly 1 in 5 adolescents (18.7%) reported past-30-day use of opioids at intake, with a significant decrease to 0.7% at follow-up (see Figure 3.17).

FIGURE 3.17. PAST-30-DAY USE OF OPIOIDS AT INTAKE AND FOLLOW-UP (n = 134)



***p < .001.

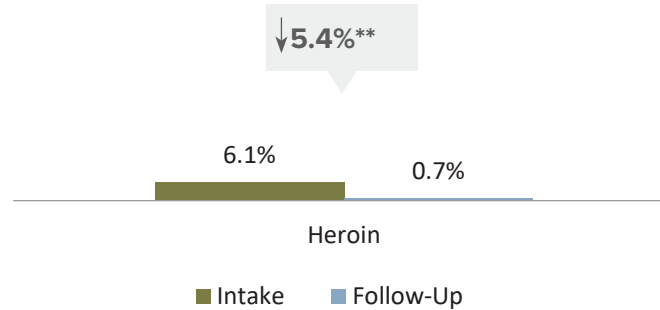
HEROIN USE

PAST-12-MONTH HEROIN USE

In the 12 months before entering treatment 6.1% of adolescents reported using heroin. The number of adolescents who reported using heroin decreased significantly at follow-up, 0.7% (see Figure 3.18).

⁴⁴ 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. PAST-12-MONTH USE OF HEROIN AT INTAKE AND FOLLOW-UP (n = 147)



**p < .01.

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 3.7% 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.

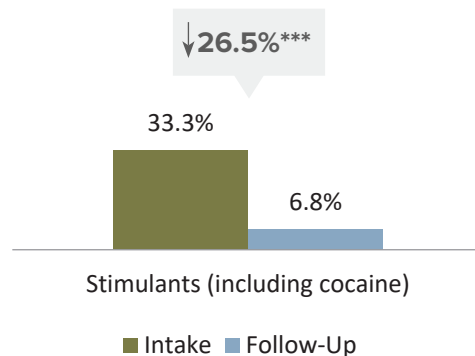
STIMULANT/COCAINE USE

PAST-12-MONTH STIMULANT/COCAINE USE

In the 12 months before entering treatment, one-third (33.3%) of adolescents reported using stimulants/cocaine (e.g., cocaine, speed, methamphetamine, Ritalin). The number of adolescents who reported using stimulants decreased to 6.8% at follow-up (see Figure 3.19).

The number of clients reporting stimulant use decreased by 27%

FIGURE 3.19. PAST-12-MONTH USE OF STIMULANTS AT INTAKE AND FOLLOW-UP (n = 147)



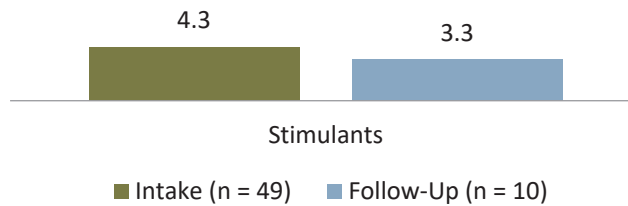
***p < .001.

Among the 49 individuals who reported stimulant/cocaine use in the 12 months before entering treatment, 71.4% (n = 35) reported using stimulants (e.g., amphetamines, Adderall, methamphetamine) and 51.0% (n = 25) reported using cocaine in the 12 month period.

AVERAGE NUMBER OF MONTHS USED STIMULANTS/COCAINE

Among the clients who reported using stimulants in the 12 months before entering treatment ($n = 49$), they reported using stimulants/cocaine on average 4.3 months (see Figure 3.20). Among a small number of clients ($n = 7$) who reported using stimulants at follow-up, they reported using an average of 3.3 months.

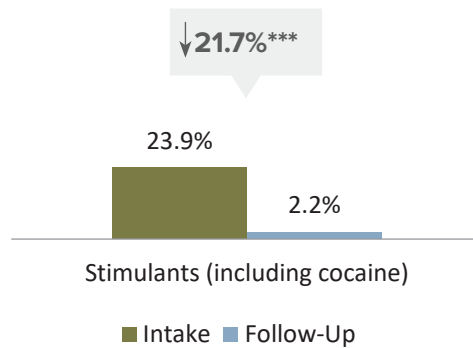
FIGURE 3.20. AMONG ADOLESCENTS WHO USED STIMULANTS, THE AVERAGE NUMBER OF MONTHS CLIENTS USED STIMULANTS AT INTAKE AND FOLLOW-UP



PAST-30-DAY STIMULANT/COCAINE USE

In the 30 days before entering treatment, 23.9% of adolescents reported using stimulants (e.g., cocaine, speed, methamphetamine, Ritalin). The number of adolescents who reported using stimulants/cocaine decreased to 2.2% at follow-up (see Figure 3.21).

FIGURE 3.21. PAST-12-MONTH USE OF STIMULANTS AT INTAKE AND FOLLOW-UP ($n = 134$)



*** $p < .001$.

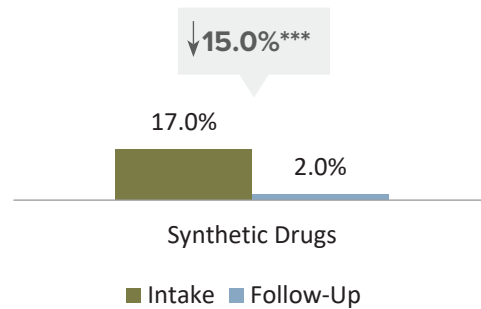
SYNTHETIC DRUG USE

PAST-12-MONTH SYNTHETIC DRUG USE

In the 12 months before entering treatment 17.0% of adolescents reported using synthetic drugs such as synthetic marijuana and bath salts. The number of adolescents who reported using synthetic drugs decreased to 2.0% at follow-up (see Figure 3.22).

The number of clients reporting synthetic drug use decreased by 15%

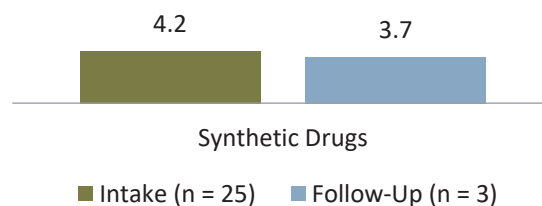
FIGURE 3.22. PAST-12-MONTH USE OF SYNTHETIC DRUGS AT INTAKE AND FOLLOW-UP (n = 147)



AVERAGE NUMBER OF MONTHS USED SYNTHETIC DRUGS

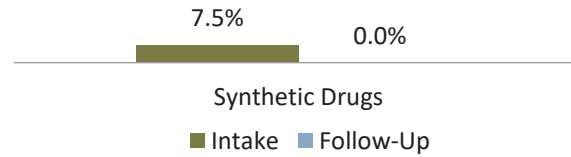
Among the clients who reported using synthetic drugs in the 12 months before entering treatment (n = 25), they reported using synthetic drugs on average 4.2 months (see Figure 3.23). Among clients who reported using synthetic drugs at follow-up (n = 3), they reported using an average 3.7 months.

FIGURE 3.23. 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, whereas as no individuals reported using synthetic drugs in the 30 days before follow-up (see Figure 3.24).

FIGURE 3.24. PAST-30-DAY USE OF SYNTHETIC DRUGS AT INTAKE AND FOLLOW-UP (n = 134)^a

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

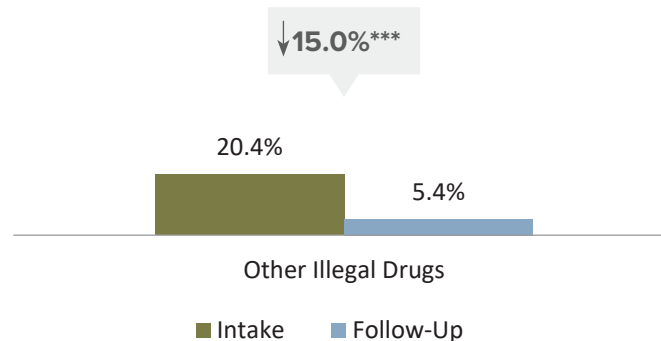
OTHER ILLEGAL DRUGS

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 5 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 3.25).

The number of clients reporting other illegal drug use decreased by 15%

FIGURE 3.25. PAST-12-MONTH USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (n = 147)



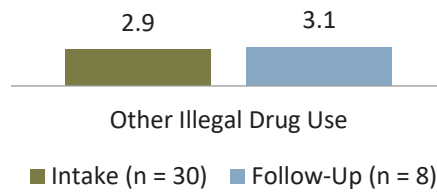
***p < .001.

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 = 30), they reported using other illegal drugs on average 2.9 months (see Figure 3.26). Among clients who reported using other illegal drugs at follow-up (n = 8), they reported using an average of 3.1 months.⁴⁵

⁴⁵ 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.

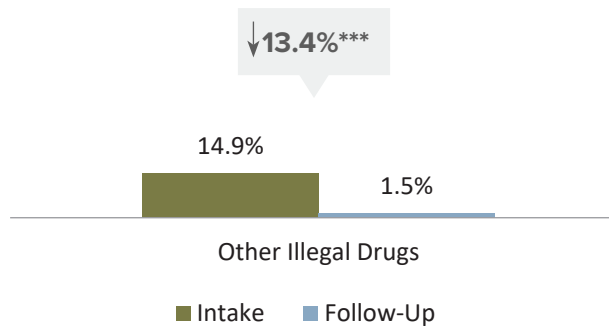
FIGURE 3.26. AMONG ADOLESCENTS WHO USED OTHER ILLEGAL DRUGS, THE AVERAGE NUMBER OF MONTHS CLIENTS USED OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP



PAST-30-DAY USE OF OTHER ILLEGAL DRUGS

About 15% of adolescents reported using other illegal drugs in the 30 days before entering treatment. At follow-up, only 1.5% adolescents reported using other illegal drugs (see Figure 3.27).

FIGURE 3.27. PAST-30-DAY USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (n = 134)



***p < .001.

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.⁴⁶

PAST-12-MONTH ALCOHOL USE

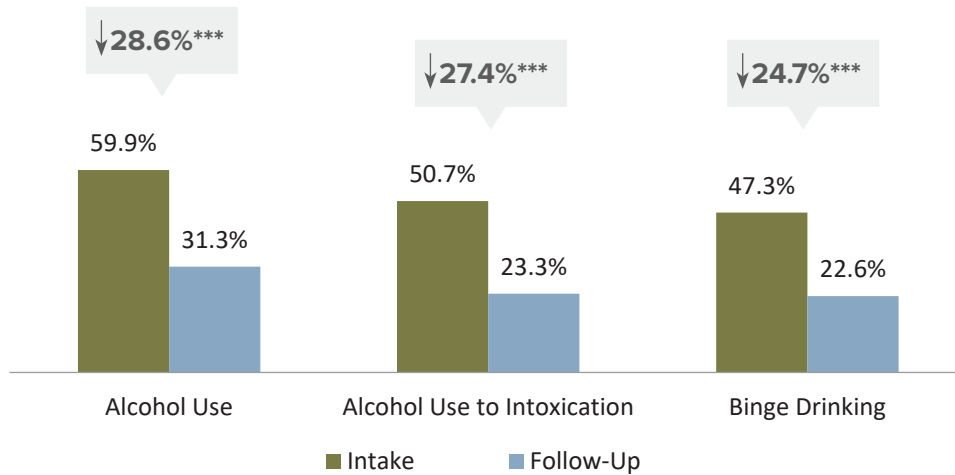
About three-fifths of adolescents (59.9%) reported using alcohol in the 12 months before entering treatment, while a little less than one-third of adolescents reported alcohol use in the 12 months before follow-up (see Figure 3.28). Overall, for the AKTOS follow-up sample, there was a 28.6%

⁴⁶ 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.

decrease in the number of clients reporting any alcohol use. Half of adolescents reported using alcohol to intoxication in the 12 months before intake. The number of adolescents who reported using alcohol to intoxication decreased to 23.3% 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 29%

FIGURE 3.28. PAST-12-MONTH USE OF ALCOHOL AT INTAKE AND FOLLOW-UP (N = 147)



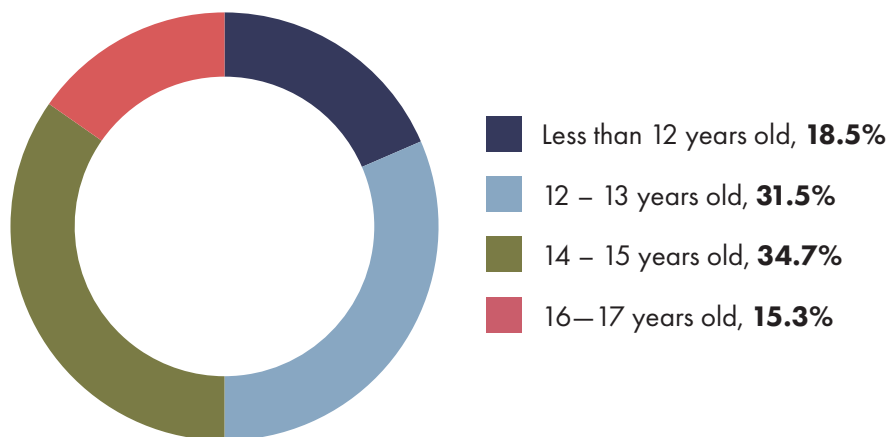
***p < .001.

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 13.2 years old when they had their first alcoholic drink (other than a few sips). Figure 3.29 shows the percentage of adolescents who reported having their first alcohol drink at different ages.

Adolescents were on average 13.2 years old when they first drank alcohol

FIGURE 3.29. AVERAGE AGE CLIENT HAD FIRST ALCOHOLIC DRINK (n = 124)⁴⁷

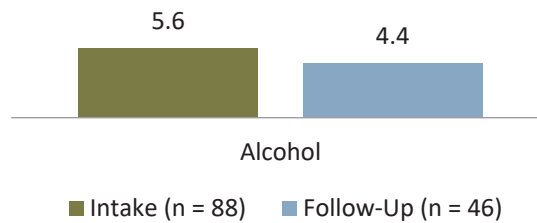


⁴⁷ Twenty-three individuals reported never using more than a few drinks of alcohol in their lifetime.

AVERAGE NUMBER OF MONTHS USED ALCOHOL

Figure 3.30 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 = 88), they reported using alcohol, on average, 5.6 months. Among clients who reported using alcohol in the 12 months before follow-up (n = 46), they reported using, on average, 4.4 months.

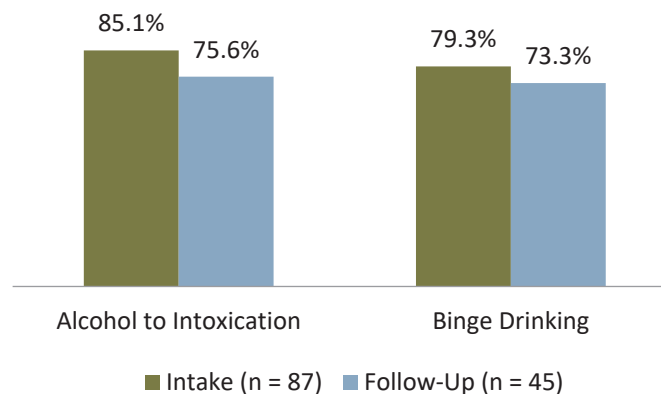
FIGURE 3.30. AMONG ADOLESCENTS WHO USED ALCOHOL, THE AVERAGE NUMBER OF MONTHS ADOLESCENTS USED ALCOHOL AT INTAKE AND FOLLOW-UP



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,⁴⁸ 85.1% used alcohol to intoxication in the 12 months before intake and 79.3% binge drank alcohol (see Figure 3.31). Of the clients who used alcohol in the 12 months before follow-up,⁴⁹ 75.6% of clients reported alcohol use to intoxication and 73.3% binge drank alcohol.

FIGURE 3.31. PAST-12-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



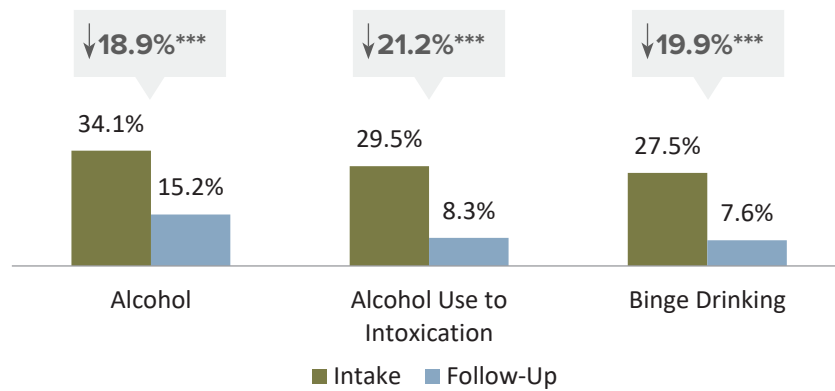
⁴⁸ Among the 88 individuals who reported using alcohol in the 12 months before intake, one had a missing value for alcohol use to intoxication and one had a missing value for binge drinking in the same period.

⁴⁹ Among the 46 individuals who reported using alcohol in the 12 months before follow-up, one had a missing value for alcohol use to intoxication and one had a missing value for binge drinking in the same period.

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 3.32). The number of adolescents who reported binge drinking alcohol in the 30-day periods did not decrease significantly from intake to follow-up.

FIGURE 3.32. PAST-30-DAY USE OF ALCOHOL AT INTAKE AND FOLLOW-UP (n = 132)⁵⁰



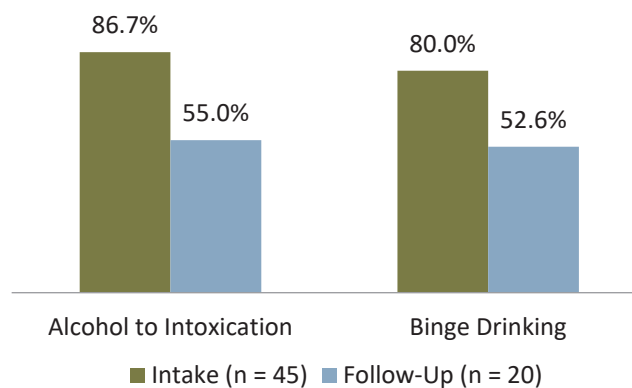
***p < .001.

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

Of the adolescents who used alcohol in the 30 days before intake, 86.7% used alcohol to intoxication and 80.0% binge drank in the 30 days before intake (see Figure 3.33).

Of the adolescents who reported using alcohol in the 30 days before follow-up, 55.0% reported using alcohol to intoxication and 52.6% reported binge drinking in the 30 days before follow-up.

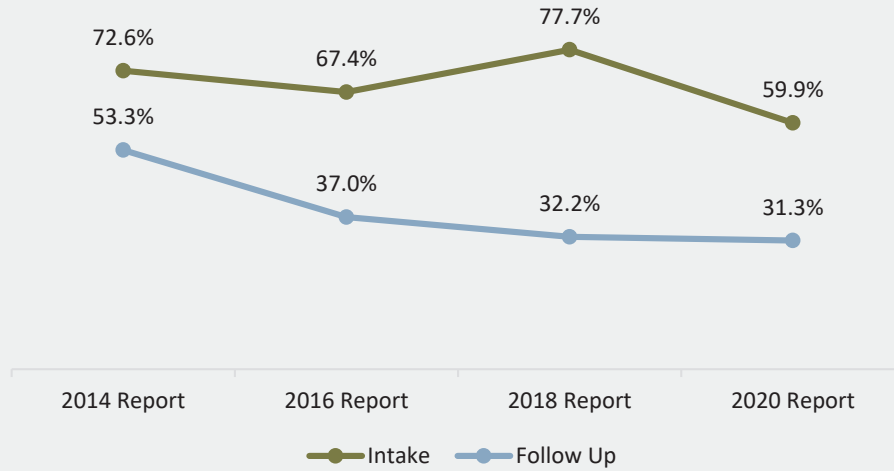
FIGURE 3.33. PAST-30-DAY USE OF ALCOHOL TO INTOXICATION AND BINGE DRINKING, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



⁵⁰ Two individuals had missing values for alcohol use to intoxication and three individuals had missing values for binge drinking in the 30 days before follow-up.

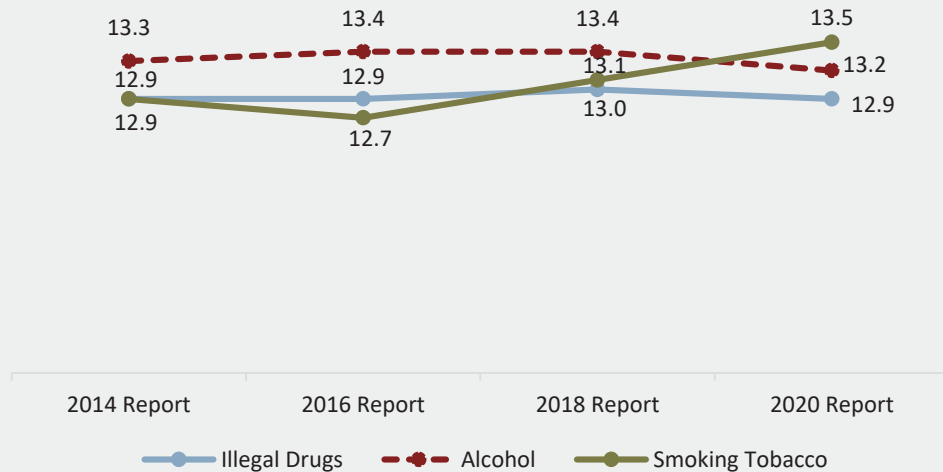
TREND REPORT: ALCOHOL USE AT INTAKE AND FOLLOW-UP

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. In the 2020 report, the percent of adolescents who reported using alcohol was smaller at intake than it had been in previous years.



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 illegal drugs and alcohol has remained relatively steady for the past 4 biannual reports for individuals included in the follow-up sample. The age of first regular use of smoking tobacco was 13.5 in the 2020 report.

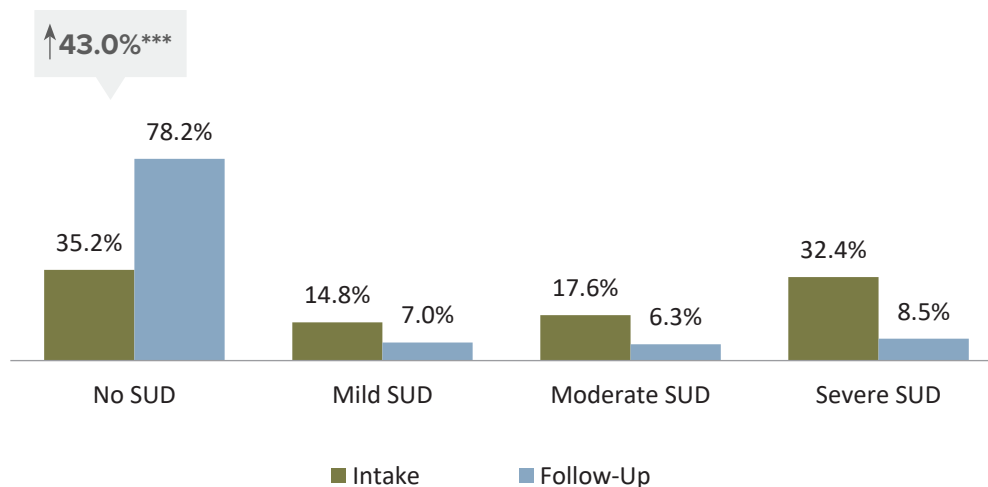


SELF-REPORTED SEVERITY OF SUBSTANCE USE DISORDER

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.^{51, 52} 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.⁵³ 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 3.34 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, 35.2% met criteria for no substance use disorder (meaning they reported 0 or 1 DSM-5 criteria for SUD), while at follow-up, the majority (78.2%) met criteria for no SUD. At the other extreme of the continuum, 32.4% met criteria for severe SUD at intake, while at follow-up, only 8.5% met criteria for severe SUD.

FIGURE 3.34. DSM-5 SUBSTANCE USE DISORDER SEVERITY AT INTAKE AND FOLLOW-UP (n = 142)⁵⁴



***p < .001.

⁵¹ 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.

⁵² 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.

⁵³ 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.

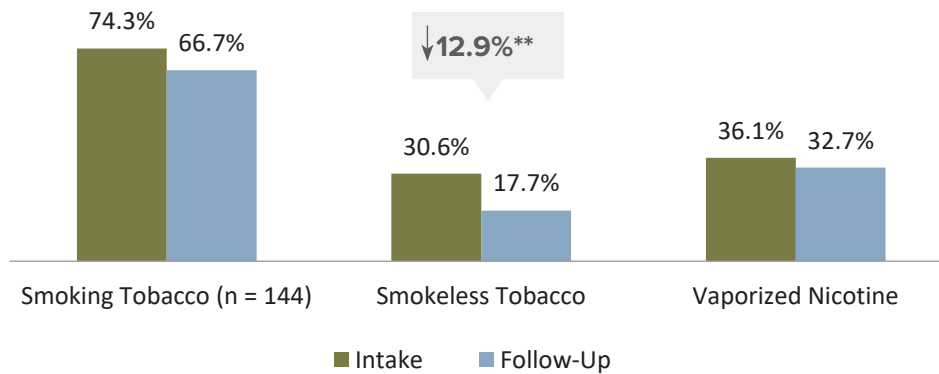
⁵⁴ Five individuals had missing values for at least one of the items used to compute DSM-5 criteria for substance use disorder at follow-up.

TOBACCO AND VAPORIZED NICOTINE USE

PAST-12-MONTH TOBACCO AND VAPORIZED NICOTINE USE

Overall, there was no significant change in smoking tobacco use from intake to follow-up (see Figure 3.35). The majority of clients reported smoking tobacco in the 12 months before entering treatment (74.3%) and in the 12 months before follow-up (66.7%). Smaller percentages of clients reported using smokeless tobacco, with a significant decrease, from intake (30.6%) to follow-up (17.7%). More than one-third of adolescents (36.1%) reported using vaporized nicotine before intake and 32.7% reported using vaporized nicotine in the 12 months before follow-up, which was not a significant decrease.

FIGURE 3.35. PAST-12-MONTH SMOKING AND SMOKELESS TOBACCO USE AND VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP (N = 147)⁵⁵



**p < .01.

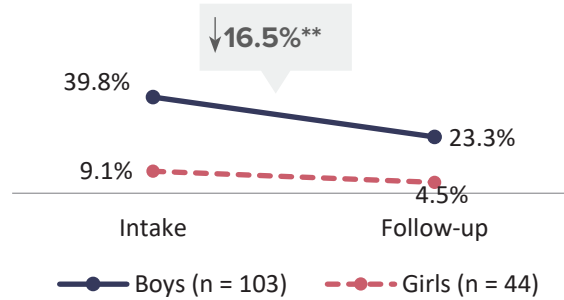
GENDER DIFFERENCES IN PAST-12-MONTH SMOKELESS TOBACCO USE

Significantly more boys than girls reported using smokeless tobacco at intake and follow-up (see Figure 3.36). The number of boys who reported using smokeless tobacco decreased significantly from intake to follow-up. Nearly one-fourth of boys reported using smokeless tobacco in the 12 months before follow-up compared to 4.5% of girls.

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

⁵⁵ Three individuals had missing data on smoking tobacco at follow-up.

FIGURE 3.36. GENDER DIFFERENCES IN SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 147)^a



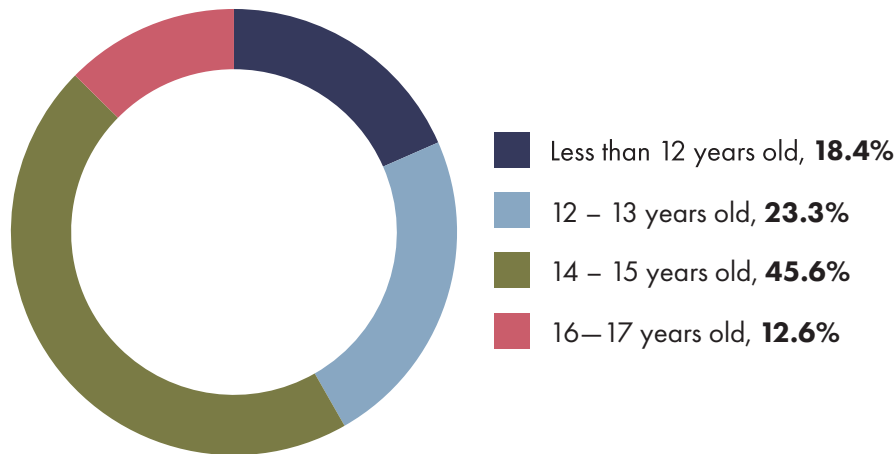
^a—Significant gender difference at intake ($p < .001$) and follow-up ($p < .01$).
 ** $p < .01$.

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). They began smoking regularly on average at age 13.5 years old.⁵⁶ Figure 3.37 shows the percentage of adolescents who reported beginning to smoke regularly at different ages.

Adolescents were on average 13.5 years old when they began smoking tobacco regularly

FIGURE 3.37. AVERAGE AGE BEGAN SMOKING TOBACCO REGULARLY (n = 103)



AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY

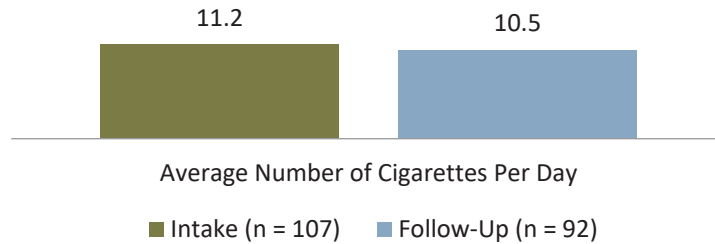
The average number of cigarettes clients reported smoking at intake and follow-up remained stable (see Figure 3.38). Of those who smoked tobacco at intake, clients reported smoking an average of 11.2 cigarettes in a day. At follow-up, among clients who reported smoking tobacco,⁵⁷ they reported

⁵⁶ Four 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.

⁵⁷ Ninety-six adolescents reported smoking in the 12 months before follow-up, however four had missing values for number of cigarettes smoked in a day.

smoking an average of 10.5 cigarettes in a day.

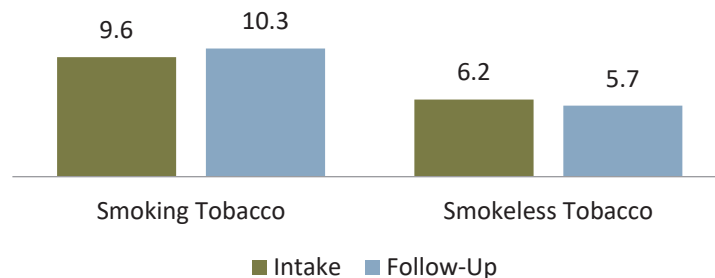
FIGURE 3.38. AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO SMOKED



AVERAGE NUMBER OF MONTHS OF SMOKING TOBACCO AND SMOKELESS TOBACCO USE

Figure 3.39 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 = 107), they reported smoking tobacco, on average, 9.6 months. Among clients who reported smoking tobacco in the 12 months before follow-up (n = 96), they reported using, on average, 10.3 months. Among the adolescents who reported using smokeless tobacco in the 12 months before intake, they reported using smokeless tobacco in 6.2 months. Among the adolescents who reported using smokeless tobacco in the 12 months before follow-up, they reported using, on average, 5.7 months.

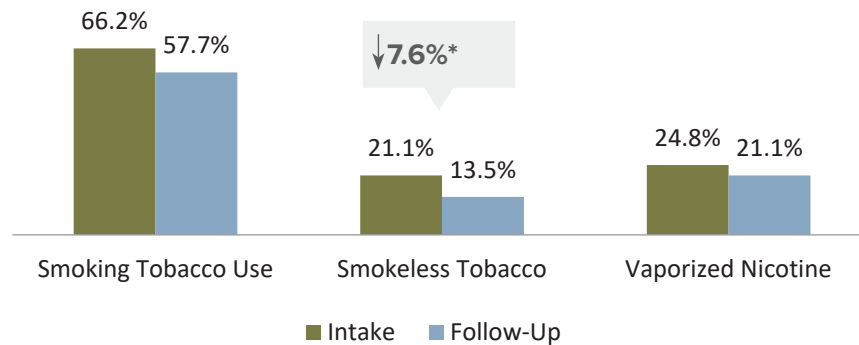
FIGURE 3.39. AMONG ADOLESCENTS WHO USED TOBACCO, THE AVERAGE NUMBER OF MONTHS OF TOBACCO USE AT INTAKE AND FOLLOW-UP



PAST-30-DAY TOBACCO USE

The number of clients who reported any past-30-day smoking tobacco and vaporized nicotine use did not change from intake to follow-up. There was a significant decrease in the proportion of clients who reported smokeless tobacco use from intake to follow-up (see Figure 3.40).

FIGURE 3.40. PAST-30-DAY SMOKING AND SMOKELESS TOBACCO AND VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP (N = 133)⁵⁸



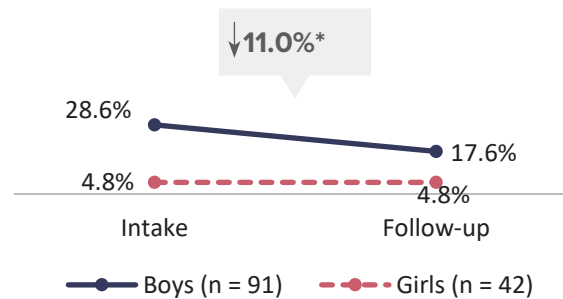
* $p < .05$.

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 3.41). Nonetheless, the number of boys who reported using smokeless tobacco decreased significantly from intake to follow-up.

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

FIGURE 3.41. GENDER DIFFERENCES IN SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 133)^a



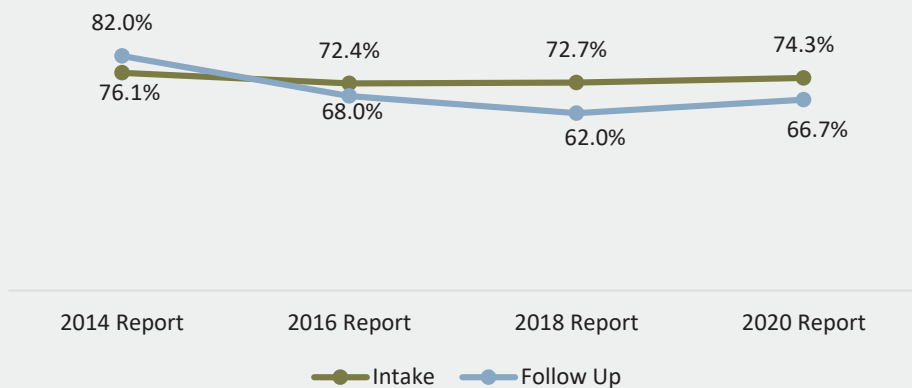
^a—Significant gender difference at intake ($p < .01$) and follow-up ($p < .05$).

* $p < .05$.

⁵⁸ Three individuals had missing data for smoking tobacco in the past 30 days at follow-up.

TREND REPORT: SMOKING TOBACCO

High percentages of youth reported smoking tobacco in the past 12 months at intake and follow-up in all report years.



*“People were kind,
tried to relate to you on
your level.”*

-AKTOS FOLLOW-UP CLIENT

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

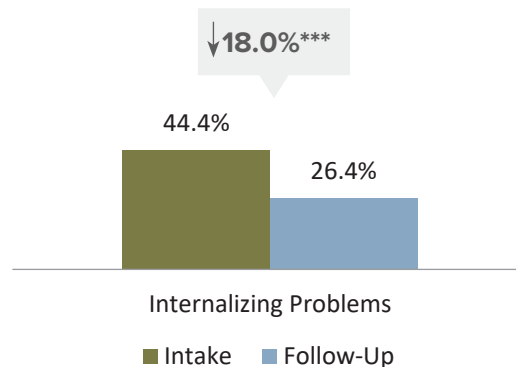
To assess adolescents self-reported internalizing problems at intake and follow-up, five items from the Internalizing Problems subscale of the brief form of Pediatric Symptom Checklist (PSC-17) were included in the intake and follow-up surveys. The Internalizing Problems subscale of the PSC-17 includes 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. Scores of 5 or higher indicate clinically significant internalizing problems.

The number of adolescents who met criteria for clinically significant internalizing problems decreased significantly by 18.0% from intake to follow-up (see Figure 4.1).

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

FIGURE 4.1. ADOLESCENTS WITH INTERNALIZING PROBLEMS AT INTAKE AND FOLLOW-UP (n = 144)⁵⁹



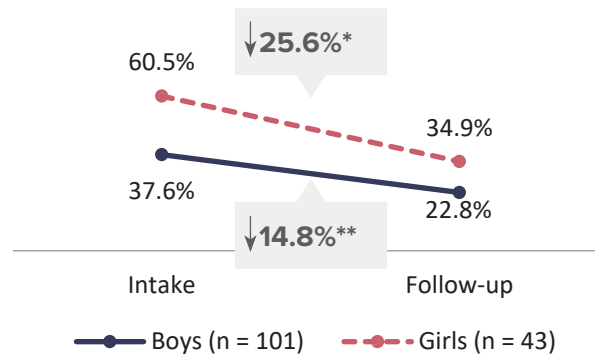
⁵⁹ Three individuals had missing values on at least one of the items of the PSC Internalizing subscale at follow-up.

GENDER DIFFERENCES IN INTERNALIZING PROBLEMS

Compared to boys, significantly more girls met criteria for internalizing problems at intake: 60.5% vs. 37.6% (see Figure 4.2). The number of boys and girls who met criteria for internalizing problems decreased significantly from intake to follow-up. At follow-up, there was no significant difference in the percent of boys and girls with internalizing problems.

Significantly more girls met criteria for internalizing problems at intake when compared to boys

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



^a—Statistical difference by gender at intake ($p < .05$).

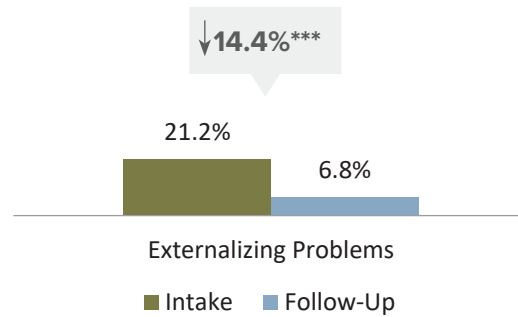
* $p < .05$, ** $p < .01$.

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. A cutoff score of 7 suggests clinically significant externalizing problems.

The number of adolescents who met criteria for clinically significant externalizing problems decreased significantly by 14.4% from intake to follow-up (see Figure 4.3).

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

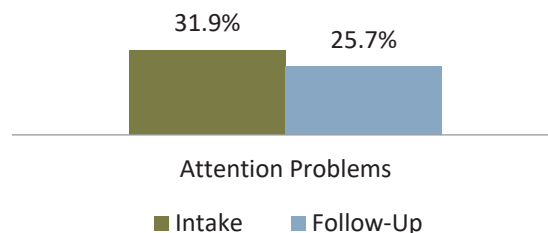
FIGURE 4.3. ADOLESCENTS WITH EXTERNALIZING PROBLEMS AT INTAKE AND FOLLOW-UP (n = 146)⁶⁰

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),^{61, 62} 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 score of 7 suggests clinically significant attention deficits and/or hyperactivity.

The percent of adolescents who met criteria for Attention Problems subscale at intake and follow-up are presented in Figure 4.4.

The number of adolescents who met criteria for attention problems did not change significantly

FIGURE 4.4. ADOLESCENTS WITH ATTENTION PROBLEMS SUBSCALE AT INTAKE AND FOLLOW-UP (n = 144)⁶³

⁶⁰ One client had missing values on at least one item of the PSC Externalizing Problems subscale at follow-up.

⁶¹ 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.

⁶² 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.

⁶³ Three individuals had missing values on at least one item of the PSC Attention Problems subscale at follow-up.

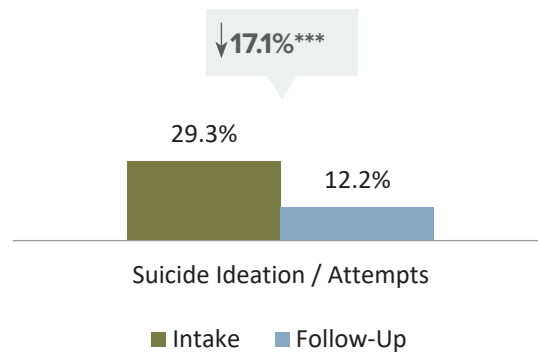
SUICIDE IDEATION AND ATTEMPTS

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

The percent of adolescents who reported they had thoughts of suicide or attempts decreased by 17% from intake to follow-up

FIGURE 4.5. ADOLESCENTS REPORTING SUICIDE IDEATION AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (n = 147)



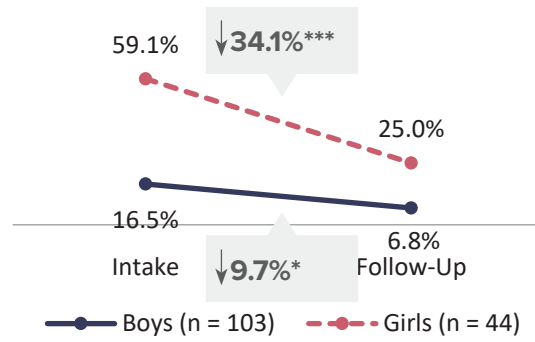
***p < .001.

GENDER DIFFERENCE IN SUICIDE IDEATION /ATTEMPTS

At intake, about 3 in 5 girls (59.1%) reported they had experienced suicide ideation and/or attempts in the 12 months before entering treatment compared to 16.5% 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 ideation and/or attempts by gender.

Compared to boys, significantly more girls reported suicide ideation and/or attempts at intake and follow-up

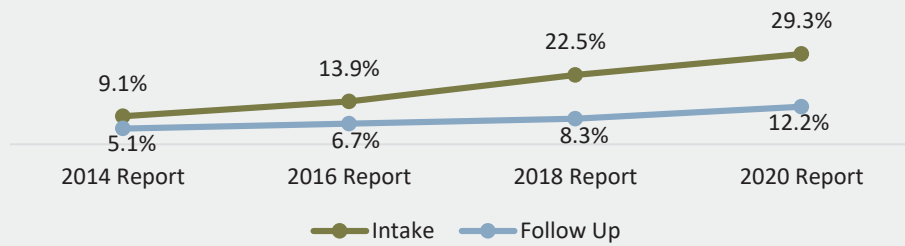
FIGURE 4.6. GENDER DIFFERENCE IN SUICIDE IDEATION / ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 147)^a



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

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 is 3.2 times higher in the 2020 report compared to the 2014 report.



DISORDERED EATING

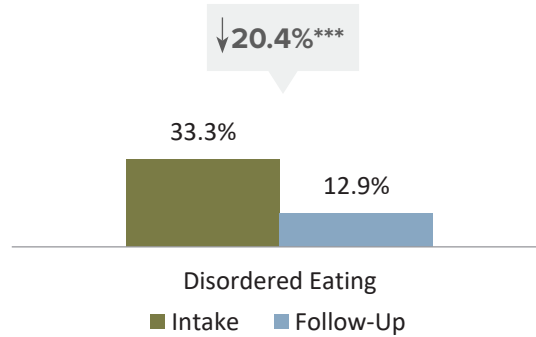
Three items from the SCOFF Questionnaire,⁶⁴ which is a screening tool designed to identify possible eating disorder for further assessment, were included in the intake and follow-up surveys. An answer of “yes” for any of the three items was a positive screening for disordered eating: (1) “Do you make 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?”

The percent of adolescents who reported disordered eating decreased by 20% from intake to follow-up

⁶⁴ 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.

One-third of adolescents answered yes to at least one of the disordered eating questions at intake and only 12.9% 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 = 147)



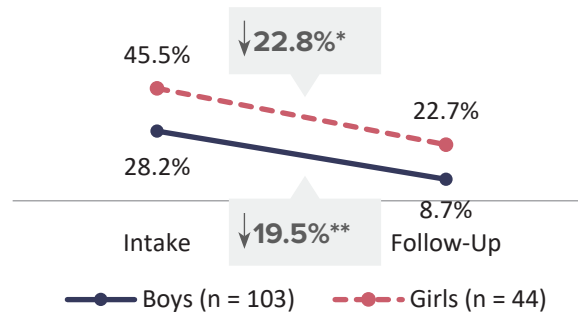
***p < .001.

GENDER DIFFERENCE IN DISORDERED EATING

At intake, almost half of girls (45.5%) had a positive screen for disordered eating compared to 28.2% 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 = 147)^a



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

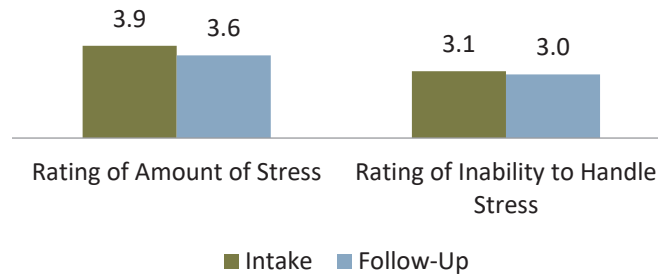
*p < .05, **p < .01.

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 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 no significant change in the average amount of stress and adolescents' inability to handle stress over time. In other words, adolescents' average level of stress did not change nor did their perceived ability to cope with stress change from intake to follow-up.

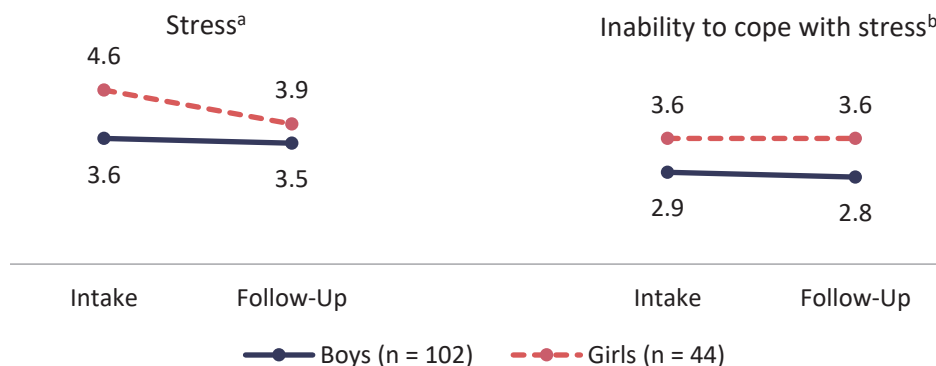
FIGURE 4.9. AVERAGE RATINGS OF STRESS AND INABILITY TO COPE WITH STRESS AT INTAKE AND FOLLOW-UP (N = 146)⁶⁵



GENDER DIFFERENCE IN STRESS AND INABILITY TO COPE WITH STRESS

Compared to boys, girls reported a higher average level of stress at intake and a higher inability to cope with stress at intake and follow-up (see Figure 4.10). Girls' average rating of stress decreased significantly from intake to follow-up. There were no other significant changes for girls or boys.

FIGURE 4.10. GENDER DIFFERENCES IN STRESS AND INABILITY TO COPE WITH STRESS AT INTAKE AND FOLLOW-UP (n = 146)



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

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

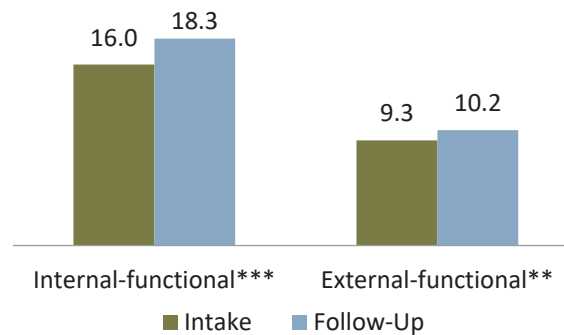
⁶⁵ One individual declined to answer questions about stress at follow-up.

EMOTION REGULATION

The Regulation of Emotions Questionnaire (REQ),⁶⁶ 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 situation to enhance the individual's capacity to deal with situations.⁶⁷ 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 increased significantly, indicating individuals increased their use of functional strategies, on average. 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."

FIGURE 4.11. AVERAGE SCORES ON EMOTIONAL REGULATION FUNCTIONAL SUBSCALES AT INTAKE AND FOLLOW-UP (n = 108)⁶⁸



p < .01, *p < .001.

Scores on the REQ dysfunctional subscales at intake and follow-up are presented in Figure 4.12.

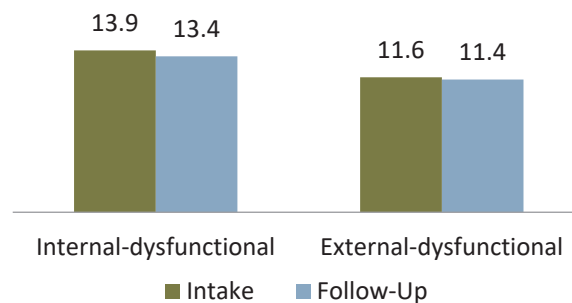
⁶⁶ Berking, M., Wupperman, P., Reichardt, A., Pejic, T., Dippel, A., & Znog, H. (2008). Emotion regulation skills as a treatment target in psychotherapy. *Behaviour Research and Therapy*, 46, 1230-1237.

⁶⁷ 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.

⁶⁸ Toward the end of the data collection for the follow-up period, the emotional regulation items were dropped from the survey; thus, 39 individuals had missing values for the REQ subscales.

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 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 and External-dysfunctional subscales did not change significantly.

FIGURE 4.12. AVERAGE SCORES ON EMOTIONAL REGULATION DYSFUNCTIONAL SUBSCALES AT INTAKE AND FOLLOW-UP (n = 108)⁶⁹

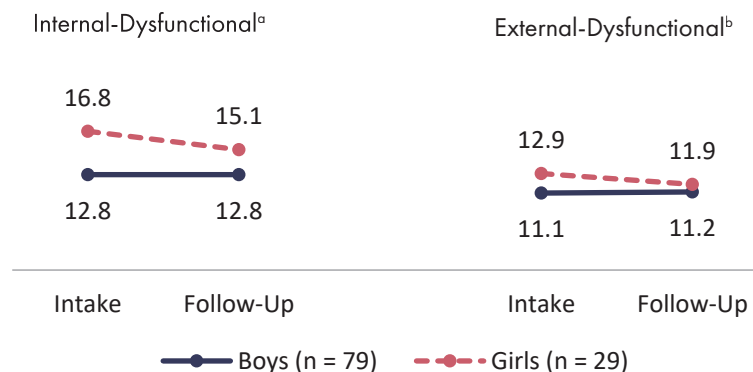


GENDER DIFFERENCES IN EMOTION REGULATION

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

Girls had higher scores on the internal-dysfunctional subscale at intake and follow-up

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



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

b—Statistical difference by gender at intake ($p < .05$).

⁶⁹ Toward the end of the data collection for the follow-up period, the emotional regulation items were dropped from the survey; thus, 39 individuals had missing values for the REQ subscales.

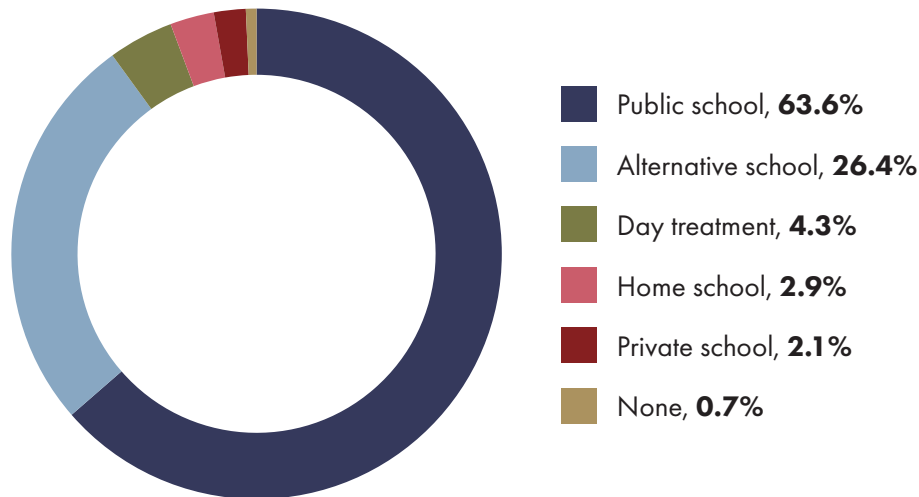
SECTION 5. EDUCATION AND EMPLOYMENT

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, seven individuals reported they had a high school diploma. Almost all individuals without a high school diploma reported they were currently attending school at intake (99.3%), with only 0.7% reporting they were not in school (see Figure 5.1). The largest percentage of youth were enrolled in public school (63.6%), followed by 26.4% in alternative school, 4.3% in day treatment, 2.9% in home school, and 2.1% in private school.

FIGURE 5.1. PERCENT OF ADOLESCENTS ATTENDING DIFFERENT TYPES OF SCHOOLS AT INTAKE (n = 140)

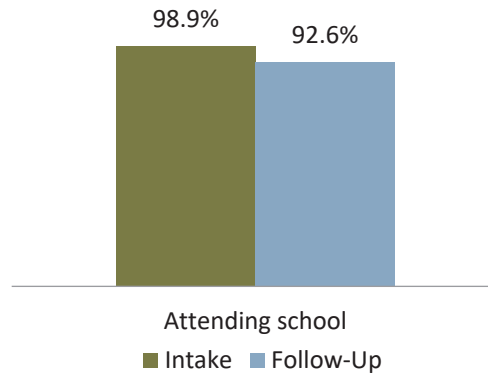


Of the individuals who had not received their high school diploma by follow-up, Figure 5.2 shows the percent of adolescents enrolled in school (including public, private, alternative, day treatment, home school, and GED classes) at intake and follow-up. There was no significant change in the number of youths attending school.

“They helped me through a lot of things that no one else could help me through.”

-AKTOS FOLLOW-UP CLIENT

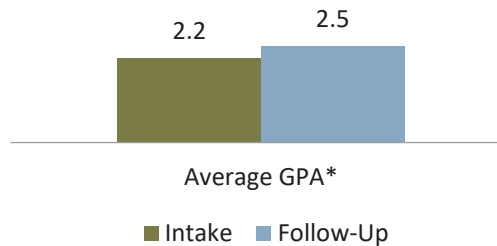
FIGURE 5.2. AMONG ADOLESCENTS WITH LESS THAN A HIGH SCHOOL DIPLOMA AT FOLLOW-UP, THE PERCENT ATTENDING SCHOOL AT INTAKE AND FOLLOW-UP (n = 94)⁷⁰



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 2.2 (about a C). At follow-up, adolescents' average GPA had increased significantly to 2.5 (midway between a B and C).

FIGURE 5.3. AMONG THOSE ENROLLED IN SECONDARY SCHOOL AT INTAKE AND FOLLOW-UP (N = 75),⁷¹ SELF-REPORTED AVERAGE GPA



*p < .05.

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

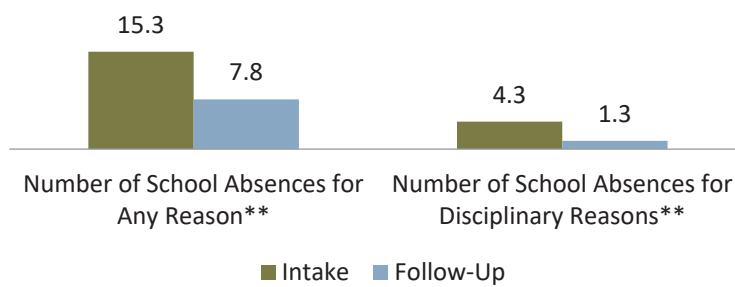
⁷⁰ Nineteen individuals had missing values for highest level of education completed at follow-up and 34 individuals reported they had a high school diploma at follow-up.

⁷¹ Eighty-six adolescents had less than a high school diploma at follow-up and were enrolled in school at intake and follow-up. Data on grades was missing for 11 adolescents at follow-up: 6 were home schooled or in GED classes and were not asked the question about grades, 2 did not know their average grade, for 2 the interviewer skipped the question in error, and 1 declined to answer.

in the 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 15.3 days at intake to 7.8 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 4.3 days at intake and 1.3 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 ($n = 77$),⁷² AVERAGE NUMBER OF SCHOOL ABSENCES

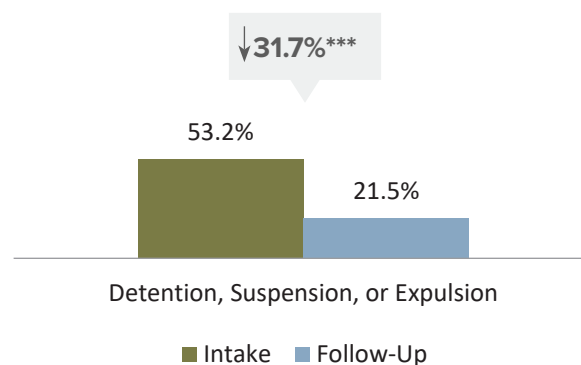


** $p < .01$.

DETENTION, SUSPENSION, AND EXPULSION

The percent of adolescents who reported being in detention, suspended, or expelled in the past 3 months school was in session decreased significantly by 31.7% from intake to follow-up (see Figure 5.5). At intake, half of individuals (53.2%) reported they had been in detention, suspended, or expelled, whereas at follow-up, this had decreased to 21.5%.

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



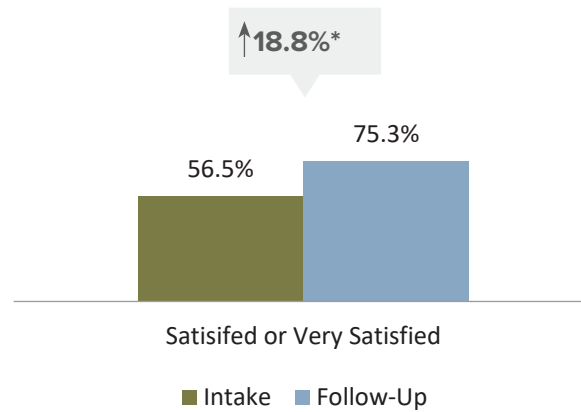
*** $p < .001$.

⁷² Seventy-nine 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.

SATISFACTION WITH SCHOOL

Among students currently enrolled in school at intake and follow-up, significantly more reported they were satisfied or very satisfied with their current school situation at follow-up than at intake (see Figure 5.6).

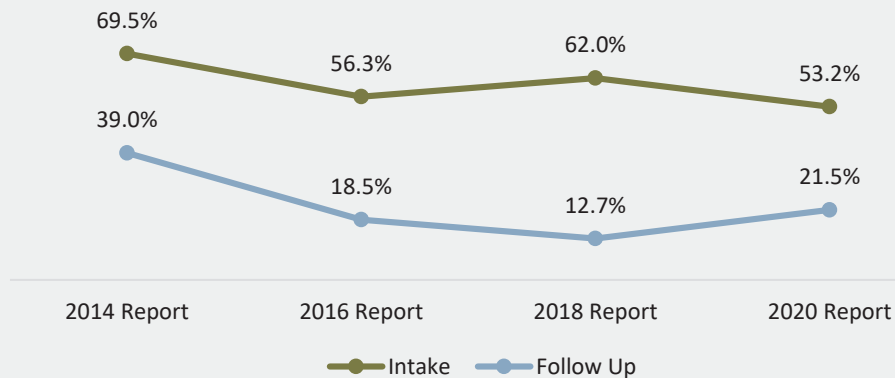
FIGURE 5.6. AMONG THOSE CURRENTLY ENROLLED IN SCHOOL AT INTAKE AND FOLLOW-UP (n = 85),⁷³ THE PERCENTAGE OF CLIENTS WHO WERE SATISFIED OR VERY SATISFIED WITH THEIR SCHOOL SITUATION



*p < .05.

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 four biannual reports, with the decreases increasing in the 2016 and 2018 reports.

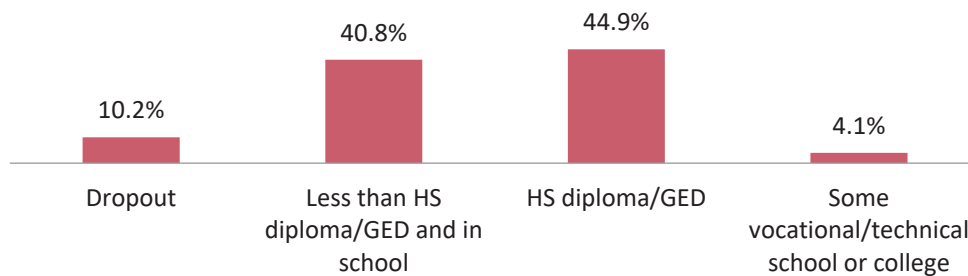


⁷³ One person had missing data for the school satisfaction question because the interviewer skipped the item.

EDUCATION STATUS AMONG INDIVIDUALS 18 YEARS OLD AND OLDER

Because all the adolescents were under 18 years old at intake, it was expected that only a small number of individuals may have already had a high school diploma or GED; seven had already attained a high school diploma or GED. However, by follow-up, 65 individuals were 18 years old.⁷⁴ Because this is an age when individuals typically graduate from high school, we examined the education status at follow-up of this subsample (see Figure 5.7). Among these 49 individuals who were 18 years old or older and had valid data for highest level of education at follow-up, 10.2% 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. Two-fifths (40.8%) 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), 44.9% had a high school diploma or GED, and 4.1% had some vocational/technical school or some college at follow-up.

FIGURE 5.7. EDUCATION STATUS AT FOLLOW-UP AMONG CLIENTS 18 YEARS OLD AND OLDER (N = 49)



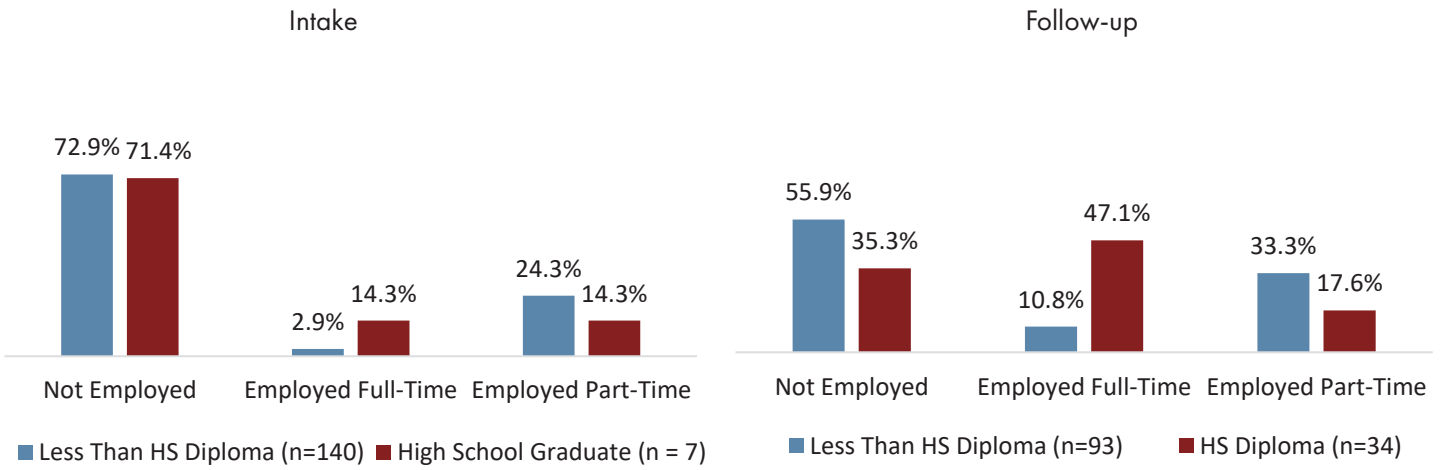
EMPLOYMENT

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 5.8A & 5.8B). The majority reported being unemployed at intake, with nearly one-fourth reporting they had part-time employment (including occasional or seasonal work).

At follow-up, nearly half of high school graduates reported they were employed full-time with an additional 17.6% reporting they were employed part-time (including occasional or seasonal work). A little more than one-third of high school graduates reported they were not employed at follow-up. Among individuals who had less than a high school diploma/GED at follow-up, 55.9% were unemployed, 33.3% were employed part-time, and 10.8% were employed full-time (see Figure 5.8B).

⁷⁴ Sixteen of these individuals had missing data for the highest level of education at follow-up because of a faulty skip pattern in a version of the survey.

FIGURE 5.8A & 5.8B. EMPLOYMENT STATUS BY COMPLETION OF HIGH SCHOOL DIPLOMA/GED AT INTAKE AND FOLLOW-UP⁷⁵



⁷⁵ One individual with less than a high school diploma/GED at follow-up had a missing value for employment status at follow-up.

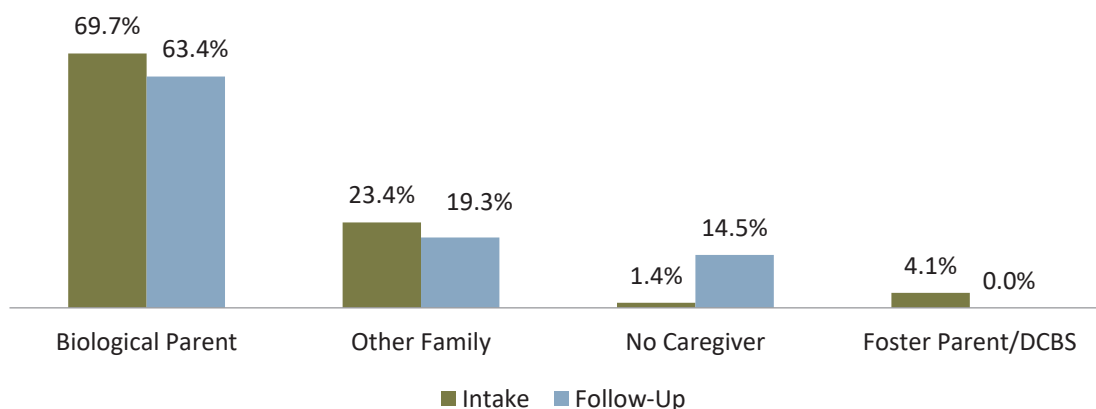
SECTION 6. CAREGIVER AND LIVING SITUATION

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 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 increase in the number of individuals who had no caregiver was related to their age. Of the 21 individuals who reported at follow-up that they had no primary caregiver, all but one was 18 years old at the time of the follow-up survey.

FIGURE 6.1. PRIMARY CAREGIVER AT INTAKE AND FOLLOW-UP (n = 145)⁷⁶



CAREGIVER INVOLVEMENT

Parental involvement is an important mediating factor substance among adolescents, such that greater parental involvement is associated with lower substance use and risk for addiction.^{77,78} A brief measure of parental involvement that assesses the quality and quantity of interactions between

⁷⁶ Two individuals had missing values of caregiver at follow-up.

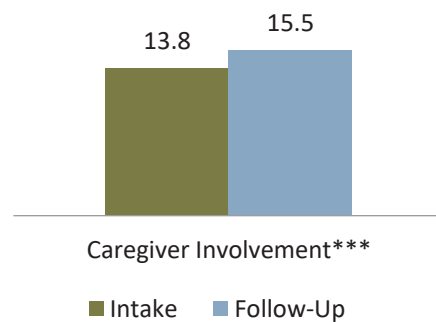
⁷⁷ Broman, C. L., Reckase, M. D., & Freeman-Doan, C. R. (2006). The role of parenting in drug use among Black, Latino, and White adolescents. *Journal of Ethnicity in Substance Abuse, 5*(1), 39-50.

⁷⁸ 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.

parents and adolescents was included in the intake and follow-up interviews.⁷⁹ Five items from a parental involvement scale that was used in the National Survey of Children (NSC) were included. The first two 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 = 121)⁸⁰



***p < .001.

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

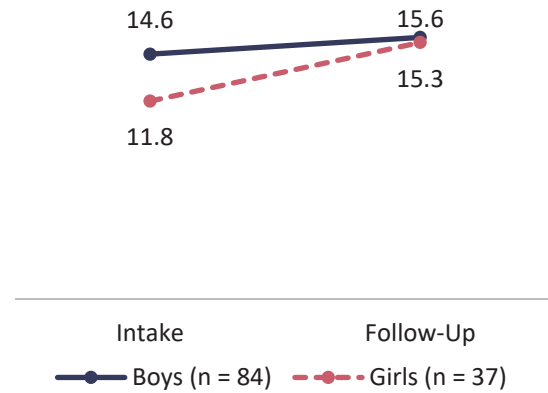
*“We could open up
without consequences.
We could talk about
life.”*

-AKTOS FOLLOW-UP CLIENT

⁷⁹ Harris, K. M., Furstenberg, F. F., & Marmer, J. K. (1998). Paternal involvement with adolescents in intact families: The influence of fathers over the life course. *Demography*, 35(2), 201-216.

⁸⁰ Twenty-three individuals reported they had no caregiver at intake and/or follow-up; therefore, they were not asked items about the caregiver's involvement in their lives. Three additional individuals had missing values on at least one of the items used to compute the caregiver involvement scale.

FIGURE 6.3. GENDER DIFFERENCE IN CAREGIVER INVOLVEMENT AT INTAKE AND FOLLOW-UP (N = 121)^{a,b}

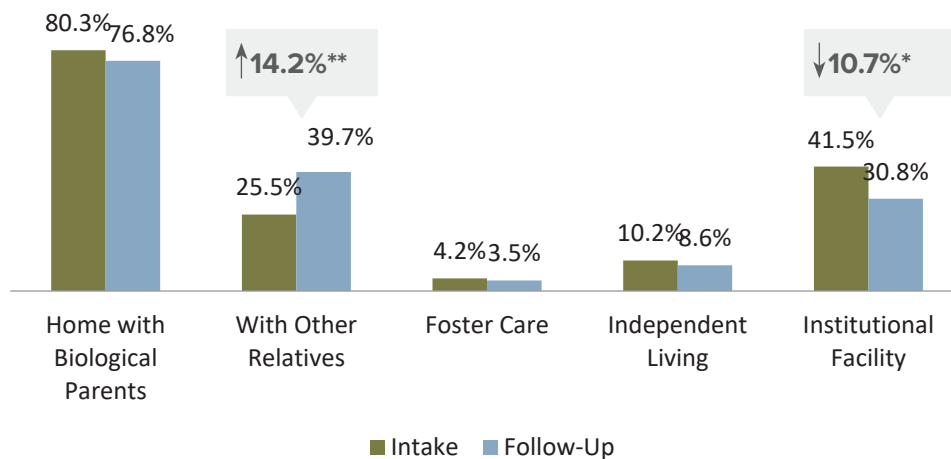


a—Statistical difference by gender at intake ($p < .001$).
 b—There was a significant change in caregiver involvement for boys ($p < .01$) and girls ($p < .001$).

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 presented in Figure 6.3 are not mutually exclusive. The majority reported at intake and follow-up that they had lived with their biological parents at home in the prior 12 months (see Figure 6.4). About one-fourth reported at intake they had lived with other relatives (including kinship foster care, with a significant increase to two-fifths at follow-up. A very small percent of individuals reported living in foster care at intake and follow-up. The percent of individuals who reported they had lived independently (e.g., on their own, in a school dormitory) did not change significantly. Finally, the percent of individuals who reported they had lived in an institutional setting (e.g., juvenile detention, residential treatment, group home) decreased significantly at follow-up.

FIGURE 6.4. LIVING SITUATION IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP (n = 147)⁸¹

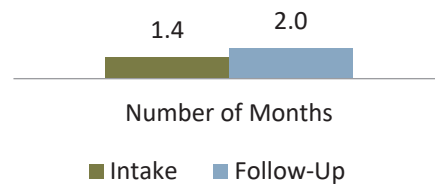


* $p < .05$, ** $p < .01$.

⁸¹ The following number of individuals had missing values for living situation variables at follow-up: biological parents (n = 5), other relatives (n = 6), foster care (n = 3), independent living (n = 7), institution (n = 1).

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 non-significant change 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 = 140)⁸²



⁸² Seven individuals had missing values at follow-up; interviewers skipped the question in error.

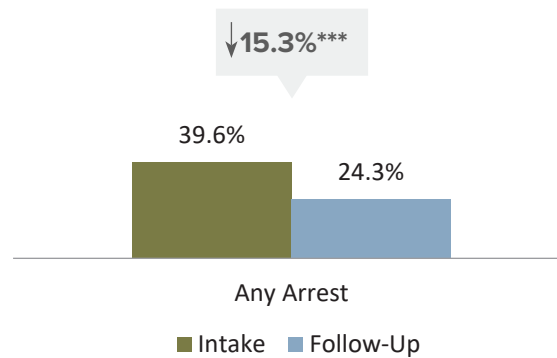
SECTION 7. JUSTICE SYSTEM INVOLVEMENT

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

About 2 in 5 adolescents (39.6%) reported being arrested and charged with an offense in the 12 months before entering treatment, with a significant decrease of 15.3% 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 = 144)⁸³



***p < .001.

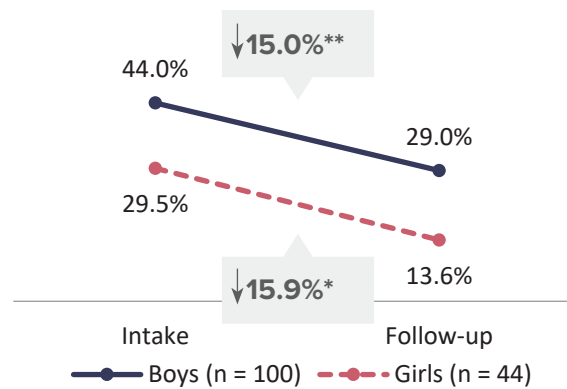
GENDER DIFFERENCES IN ARRESTS

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 percent of boys and girls who reported being arrested decreased significantly from intake to follow-up. 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

⁸³ Three individuals 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 = 144)^a

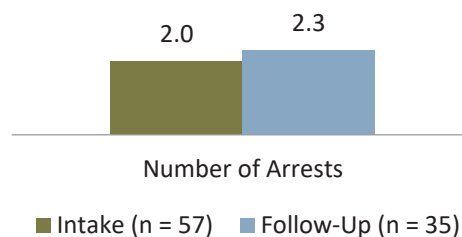


^a— Significant difference by gender at follow-up; $p < .05$.
* $p < .05$, ** $p < .01$.

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

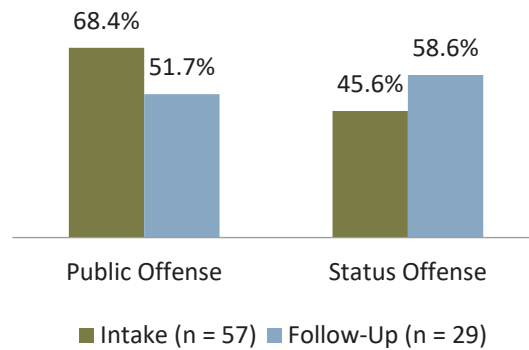


TYPES OF CRIMINAL CHARGES

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.

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 = 57) 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 OFFENSES⁸⁴

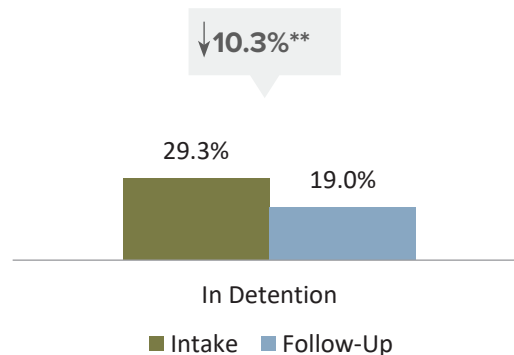


DETENTION

In the 12 months prior to entering treatment 29.3% of adolescents reported spending at least one night in detention. At follow-up, there was a significant decrease in the percent of adolescents who reported being in detention (or incarcerated)⁸⁵ (See Figure 7.5).

The percent of adolescents who reported being in detention in the past 12 months decreased from intake to follow-up

FIGURE 7.5. PERCENT OF CLIENTS REPORTING DETENTION IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP (n = 147)



** p < .01.

⁸⁴ Thirty-five individuals reported any arrest in the 12 months before follow-up; however, six individuals had missing data on the number of arrests for status offenses so we could not calculate how many of these individuals had arrests for status of public offenses.

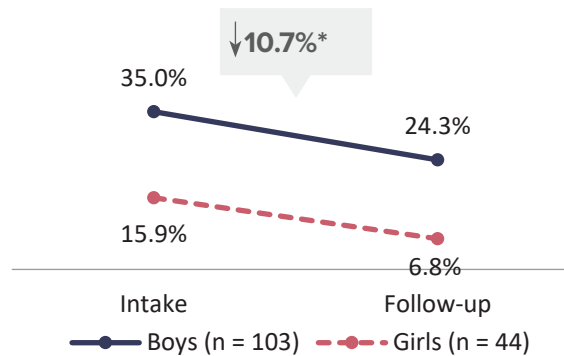
⁸⁵ Because some individuals were 18 years old or older at follow-up, some of the time spent incarcerated could have been in an adult offender facility (e.g., jail) and not juvenile detention.

GENDER DIFFERENCES IN DETENTION

Significantly more boys than girls reported they spent time in detention (or incarcerated) at intake and follow-up (see Figure 7.6). The percent of boys who reported being in detention decreased significantly from intake to follow-up.

The percent of adolescents who reported being in detention in the past 12 months decreased from intake to follow-up

FIGURE 7.6. GENDER DIFFERENCES IN REPORTING ARRESTS IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (n = 147)^a

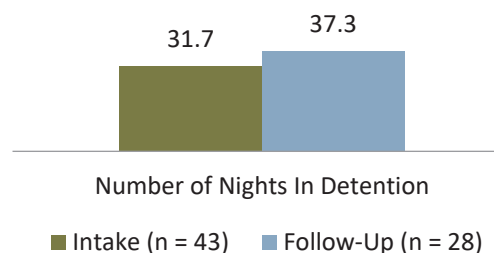


a— Significant difference by gender at intake and follow-up; $p < .05$.
* $p < .05$.

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 7.7).

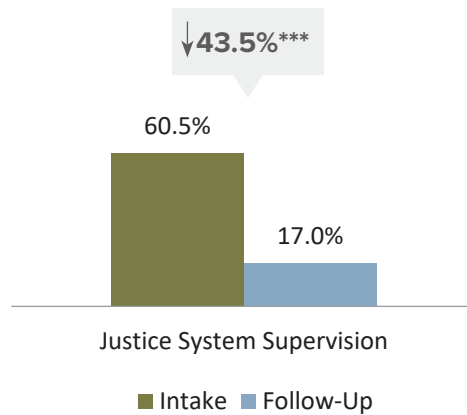
FIGURE 7.7. AVERAGE NUMBER OF NIGHTS IN DETENTION IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP, AMONG THOSE WHO WERE IN DETENTION



SELF-REPORTED JUSTICE SYSTEM SUPERVISION

The percent of youth who self-reported they were under justice system supervision (e.g., drug court, probation, or diversion) decreased significantly from 60.5% at intake to 17.0% at follow-up (see Figure 7.8).

FIGURE 7.8. PERCENT OF CLIENTS REPORTING SUPERVISION BY THE JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP (n = 147)



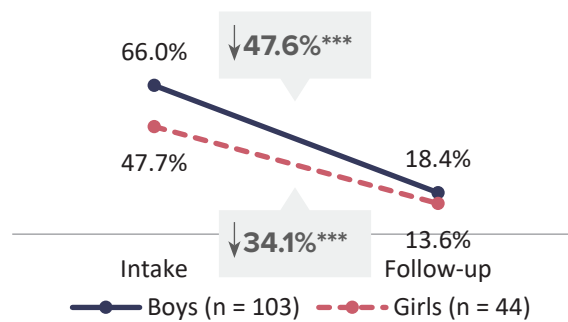
***p < .001.

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 7.9). The number of boys and girls who reported being under justice system supervision decreased significantly.

Significantly more boys reported being under justice system supervision at intake

FIGURE 7.9. GENDER DIFFERENCES IN JUSTICE SYSTEM SUPERVISION IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (n = 147)^a



^a— Significant difference by gender at intake; p < .05.
 ***p < .001.

SECTION 8. RECOVERY SUPPORTS

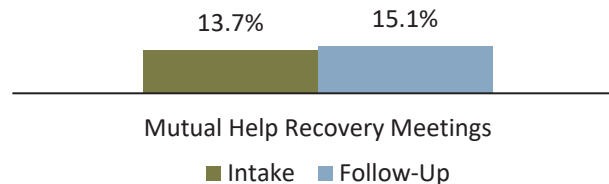
This section focuses on three main changes in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) the number of people the participant said they could count on for recovery support, and (3) satisfaction with their recovery support. Results for each targeted factor 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 13.7% 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, 15.1% 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 reporting attending mutual help recovery groups remained low and unchanged from intake to follow-up

FIGURE 8.1. PARTICIPATION IN MUTUAL HELP RECOVERY GROUP MEETINGS IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (n=146)⁸⁶



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).

⁸⁶ One individual 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 = 146)⁸⁷

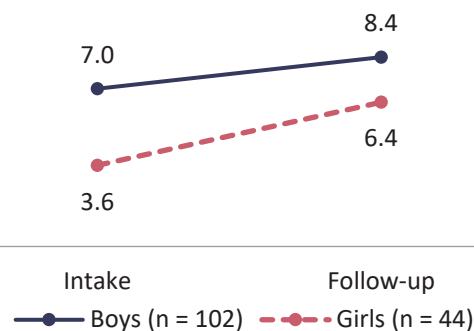


GENDER DIFFERENCES IN NUMBER OF PEOPLE CLIENT COULD COUNT ON FOR RECOVERY SUPPORT

Boys reported a higher average number of people they could count on for recovery support at intake than did girls; however, by follow-up there was no significant difference by gender (see Figure 7.8). The average number of people they could count on for recovery support increased significantly for girls, but not for boys.

Compared to girls, boys reported a higher average number of people they could count on for recovery support at intake

FIGURE 8.3. GENDER DIFFERENCES IN AVERAGE NUMBER OF PEOPLE CLIENT COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (n = 146)^{a,b***}



a— Significant difference by gender at intake; p < .01.
 b—A paired t-test was statistically significant for the change in average for girls (** * p < .001).

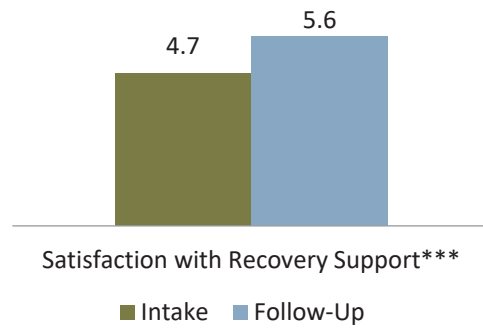
SATISFACTION WITH RECOVERY SUPPORT

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 8.4 shows individuals' ratings of their satisfaction with their recovery support, which

⁸⁷ One individual had missing values for the number of people clients could count on for recovery support at follow-up.

significantly increased, indicating greater satisfaction at follow-up than at intake.

FIGURE 8.4. AVERAGE RATING OF SATISFACTION WITH RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP
(N = 146)⁸⁸



***p < .001.

⁸⁸ One individual had missing data for their satisfaction with recovery support at follow-up.

SECTION 9. MULTIDIMENSIONAL STATUS AT FOLLOW-UP

This section focuses on change in multidimensional status for the 2020 AKTOS follow-up sample.

Recovery from substance abuse is “a process of change through which an individual achieves abstinence and improved health, wellness and quality of life” (p. 5).⁸⁹ The SAMHSA definition of recovery is similarly worded and encompasses health (including but not limited to abstinence from alcohol and drugs), having a stable and safe home, a sense of purpose through meaningful daily activities, and a sense of a community.⁹⁰ Consistent with the perspective that recovery is a multidimensional construct, encompassing several dimensions of individuals’ lives and functioning, items from the intake and follow-up surveys were combined to measure change in multiple key dimensions of individuals’ lives. Indicators of their status at intake and follow-up included severity of substance use disorder, the level of involvement of their primary caregiver in their lives, involvement in the criminal justice system, suicidal ideation or attempts, ability to cope with stress, highest level of education, and recovery support (see Table 9.1).

TABLE 9.1. MULTIDIMENSIONAL STATUS

INDICATOR	BETTER STATUS	WORSE STATUS
Substance use	No substance use disorder (SUD)	Mild, moderate or severe substance use disorder (SUD)
Caregiver involvement	Higher score on caregiver involvement scale, or was 18 years old or older and had no caregiver	Lower score on caregiver involvement scale, or had no caregiver (and was less than 18 years old)
Criminal justice system involvement.....	No arrest or detention	Any arrest or detention
Suicidality	No suicide ideation (thoughts) or attempts	Any suicide ideation (thoughts) or attempts
Handle stress	Rating of ability to handle stress of 1 to 5, with 1 being “I can shake stress off,” and 5 “Stress eats away at me.”	Rating of 6 = “Stress eats away at me.”
Education.....	Had at least a high school diploma/GED, or was still enrolled in school and had at least a C average	Had less than a high school diploma/GED and was not enrolled in school, or if enrolled in school, had less than a C average
Recovery support.....	Had at least one person he/she could count on for recovery support	Had no one he/she could count on for recovery support

⁸⁹ Center on Substance Abuse Treatment. (2007). *National summit on recovery: conference report* (DHHS Publication No. SMA 07-4276). Rockville, MD: Substance Abuse and Mental Health Services Administration.

⁹⁰ Laudet, A. (2016). Measuring recovery from substance use disorders. Workshop presentation at National Academies of Sciences, Engineering, and Medicine (February 24, 2016). Retrieved from https://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_171025.pdf

Table 9.2 presents the frequency of clients who reported each of the specific components of multidimensional status at follow-up.

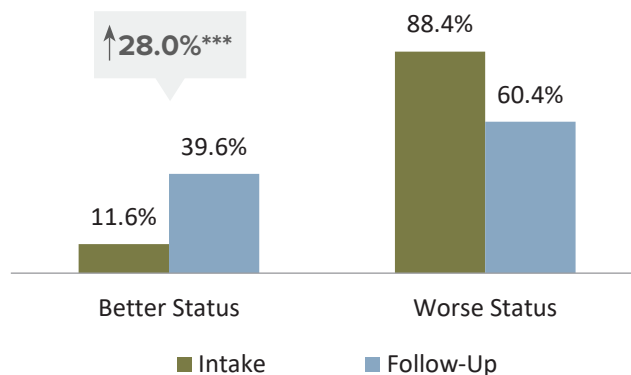
TABLE 9.2. PERCENT OF CLIENTS WITH SPECIFIC COMPONENTS OF BETTER OR WORSE STATUS AT FOLLOW-UP (n = 134)^a

COMPONENTS OF MULTIDIMENSIONAL STATUS INDEX	BETTER STATUS	WORSE STATUS
Severity of DSM-5 substance use disorder for the past 12 months	77.6%	22.4%
Score on the caregiver involvement scale	92.5%	7.5%
Arrests or detention/incarceration in the past 12 months.....	74.6%	25.4%
Thoughts of suicide or suicide attempts in the past 12 months.....	86.6%	13.4%
Ability to handle stress.....	88.7%	11.3%
Highest level of education and average grade, if enrolled in school.....	79.1%	20.9%
Recovery support.....	98.5%	1.5%

a— 13 cases had missing values on at least one of the variables that are included in the multidimensional recovery measure at follow-up.

At intake, 11.6% adolescents were classified as having better status, based on reporting all seven dimensions, when entering the program (see Figure 9.1). At follow-up, about two-fifths (39.6%) were classified as having better status, as indicated by all seven dimensions—an increase of 28.0%. In other words, this shows that 60.4% (n = 81) of adolescents were still struggling with at least one dimension at follow-up. Among the 81 individuals who were classified as worse status at follow-up, 55.6% had only one problem (not depicted in a figure).

FIGURE 9.1. MULTIDIMENSIONAL STATUS AT INTAKE AND FOLLOW-UP (N = 134)



***p < .001.

SECTION 10. SUMMARY AND RECOMMENDATIONS

This section summarizes and discusses the major findings and their implications from the 2020 Adolescent Kentucky Treatment Outcome Study.

Substance use disorders in youth are best understood within the context of several interrelated problems,^{91, 92} such as childhood adversity and victimization,⁹³ comorbid psychiatric disorders,⁹⁴ and problem behaviors (i.e., delinquency).⁹⁵ The 147 youth who completed intake and follow-up interviews for the 2020 AKTOS Follow-Up Study were, on average, 16 years old at intake and came into treatment with significant adversities. At treatment intake 96.6% 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 13.2 years old for alcohol. Adverse childhood experiences (ACE) were common; for example, almost three-fourths of girls (72.7%) and two-fifths of boys (40.8%) reported experiencing any of the types of maltreatment/abuse. Additionally, 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). 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 (53.2%) had been in school detention, suspended, or expelled from school in the past 90 days school was in session at treatment intake. Further, three-fifths of adolescents reported they were under supervision by the justice system at treatment intake and about two-fifths had been arrested in the 12 months before intake. Finally, minorities of clients had clinically significant internalizing problems, attention problems, and externalizing problems, as well as thoughts of suicide or attempts and disordered eating 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 96.6% 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 52.4%. Specifically, the percent of adolescents who reported using illegal drugs (including misuse of prescription drugs) in the past 12 months decreased from 93.2% at intake to 42.9% at

“The staff was helpful, really liked it. I learned how to stay sober.”

-AKTOS FOLLOW-UP CLIENT

⁹¹ Jessor, R., and Jessor, S.L. (1997). *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. New York: Academic Press.

⁹² 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.

⁹³ 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.

⁹⁴ 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.

⁹⁵ 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.

follow-up and the percent of adolescents who reported using alcohol decreased from 59.9% at intake to 31.3% at follow-up. In other words, 38.7% of youth reported abstaining from alcohol and 57.1% 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 studies finding 12-month abstinence rates from 30% to 40%.⁹⁶ 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.⁹⁷ 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.⁹⁸ In fact, some studies have found the rate of return is higher for completing a high school diploma than for completing college.⁹⁹ Individuals who complete a high school degree or obtain some college education have exponentially higher income than those who do not advance their education.^{100,101} Because of this, it is important to examine education in a substance abuse treatment outcome study. In the AKTOS sample, the majority who had not yet obtained a high school diploma at follow-up were still enrolled in school at follow-up (92.6%). Additionally, there was a significant increase in GPA from intake (2.2) to follow-up (2.5) 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 = 49), the vast majority (85.7%) were either still enrolled in secondary school (40.8%), or had obtained a high school diploma or GED (44.9%). Only a minority of individuals who were 18 years old at follow-up (10.2%) 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 2018-2019 school year, the graduation rate for Kentucky was 91.6%, meaning that 9.4% of students who began ninth grade did not graduate within five years.¹⁰² Thus, the dropout rate for the individuals in the follow-up sample is similar to the rate for the general

⁹⁶ 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.

⁹⁷ 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.

⁹⁸ Psacharopoulos, G., & Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics*, 12(2), 111-134.

⁹⁹ Heckman, J., Lochner, P., & Todd, P. (2008). Earnings functions and rates of return. *Journal of Human Capital*, 2(1), 1-31.

¹⁰⁰ Autor, D. H., Katz, L.F. & Kearney, M.S. (2005). *Rising Wage Inequality: The Role of Composition and Prices*. NBER technical working paper 11627.

¹⁰¹ 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.

¹⁰² Kentucky Department of Education. (2020). *Kentucky School Report Card, 2018-2019, Graduation Rate*. <https://www.kyschoolreportcard.com>.

population of high school students in Kentucky.

Most 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 community agencies.

Comorbid mental health problems are common in adolescents with substance use disorders.^{103,104} Externalizing behavior has been associated with early substance use initiation and greater substance use overall.¹⁰⁵ 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, and disordered eating. However, adolescents' self-reported level of stress and inability to cope with stress did not change significantly. Moreover, the frequency of individuals' use of functional emotion regulation strategies (internal and external) increased over time. 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.^{106,107} Nonetheless, adolescents' self-reported use of dysfunctional emotion regulation did not decrease over time.

Adolescents' involvement with the justice system decreased over time, with significantly fewer individuals reporting they had been arrested and charged with an offense, in detention or incarceration, and under supervision by the justice system at follow-up.

A number of studies on interpersonal victimization have found an association of interpersonal victimization, trauma exposure, and substance use/substance use disorders.^{108,109,110} In this sample

¹⁰³ 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.

¹⁰⁴ 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.

¹⁰⁵ 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.

¹⁰⁶ 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.

¹⁰⁷ 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.

¹⁰⁸ 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.

¹⁰⁹ 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.

¹¹⁰ 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

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, mental health problems, and use of dysfunctional emotion regulation strategies in the period before entering treatment.

Early identification of individuals who experience adverse childhood experiences to target for intervention for trauma symptomatology and emotion regulation deficits could prevent negative consequences. Yet, many programs do not systematically screen for victimization experiences.¹¹¹ 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.¹¹² 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.^{113,114}

Youth reported high satisfaction with treatment providers, which is important because higher levels of satisfaction with treatment are associated with positive treatment outcomes.¹¹⁵ Specifically, three-fourths of individuals 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: they were encouraged to use mutual help programs; the staff seemed to think they could grow, change, and recover; they were encouraged to talk about and decide their treatment goals; staff helped them obtain information they needed so they could take charge of managing their substance use problems; staff were willing to work around schedule conflicts; services were available at times that were good for clients; more often than not, staff were knowledgeable, helpful, and professional; and it did not take a long time to get into services.

¹¹¹ Dennis, M. L., & Stevens, S. J. (2008). Maltreatment issues and outcomes of adolescents enrolled in substance abuse treatment. *Child Maltreatment*, 8(1), 3-6.

¹¹² 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.

¹¹³ 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.

¹¹⁴ 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.

¹¹⁵ 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.

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 (52.4%) in AKTOS reported using alcohol and/or drugs at some point in the 12-month follow-up period and 27.8% of youth reported using alcohol and/or drugs in the 30 days before the follow-up survey. Specifically, 42.9% of youth reported using illegal drugs and 31.3% reported using alcohol in the 12-month follow-up period. This use could be a brief relapse. 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%.¹¹⁶ Thus, the substance use rates in AKTOS are consistent with the substance use rates in other treatment outcome studies.¹¹⁷ One of the most encouraging findings related to substance use was the significant increase in the percent of individuals who met criteria for no substance use disorder at follow-up.

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.¹¹⁸ In the 2017 Youth Risk Behavior Surveillance System (YRBSS), Kentucky had the second highest rate of cigarette smoking among youth of all 37 states/territories included in the survey: 14.3% for past-month cigarette use.¹¹⁹ In the AKTOS sample for this report, in the 30 days before follow-up 57.7% of adolescents reported smoking tobacco, which was 4 times greater than the percent of adolescents in the general population in Kentucky (14.3%). 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, the e-cigarettes were the most commonly used tobacco product.¹²⁰ In 2017, 14.1% of youth in Kentucky reported current use of e-cigarettes, which was lower than the percent reporting current use of cigarettes.¹²¹ Additionally, rates of smokeless tobacco use at intake were lower than for smoking tobacco and vaporized nicotine use at intake for the AKTOS sample. Compared to Kentucky's rate of current smokeless tobacco use among high school

¹¹⁶ 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.

¹¹⁷ 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.

¹¹⁸ 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.

¹¹⁹ Centers for Disease Control and Prevention (CDC). (2018). State Tobacco Activities Tracking and Evaluation (STATE) System. Youth Risk Behavioral Surveillance System (YRBSS) Data. Retrieved on April 10, 2020 from <https://www.cdc.gov/statesystem/cigaretteuseyouth.html>

¹²⁰ 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.

¹²¹ Centers for Disease Control & Prevention (CDC). State Tobacco Activities Tracking and Evaluation (STATE) System, Custom Reports, State Highlights, Kentucky. Retrieved on April 9, 2020 from https://nccd.cdc.gov/STATESystem/rdPage.aspx?rdReport=OSH_STATE.Highlights&rdRequestForwarding=Form.

students in 2017 (10.6%),¹²² the percent of AKTOS participants who used smokeless tobacco at intake was twice as high (21.1%) and a little higher at follow-up (13.5%).

In the AKTOS 2020 Report, findings for tobacco use were not as positive as the findings for alcohol and drug use in terms of reductions in the percent 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 (74.3%) 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 66.7%. Similarly, the percent of youth who reported using vaporized nicotine products decreased slightly, but not significantly, from intake to follow-up. The percent of individuals who reported past-12-month smokeless tobacco use decreased significantly from intake to follow-up.

Among individuals who reported smoking tobacco products, the average age they began smoking tobacco *regularly* was 13.5 years old. For individuals who begin using nicotine in adolescence, symptoms of addiction can develop quickly.¹²³ 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.¹²⁴ These findings are consistent with other research on tobacco use among adolescents in substance abuse treatment.^{125,126} Nonetheless, 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.¹²⁷

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 reported more months of substance use and greater severity of substance use, had more mental health symptoms, and used more dysfunctional emotion regulation strategies 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

¹²² Centers for Disease Control & Prevention (CDC). State Tobacco Activities Tracking and Evaluation (STATE) System, Custom Reports, State Highlights, Kentucky. Retrieved on April 10, 2020 from https://nccd.cdc.gov/STATESystem/rdPage.aspx?rdReport=OSH_STATE.Highlights&rdRequestForwarding=Form

¹²³ 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.

¹²⁴ 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.

¹²⁵ 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.

¹²⁶ Myers, M. G., & MacPherson, L. (2004). Smoking cessation efforts among substance abusing adolescents. *Drug and Alcohol Dependence*, 73(2), 209-213.

¹²⁷ 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.

to experience subsequent victimization.^{128,129} 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.¹³⁰ Nonetheless, more research is needed to evaluate the effectiveness of therapies on reducing victimization.

Consistent with a wealth of research, girls reported significantly more categories of adverse childhood experiences. Significantly more girls than boys reported they had ever experienced emotional maltreatment, physical maltreatment, and had a household member with a mental illness. In addition, significantly more girls reported they had experienced intimate partner victimization and sexual victimization by a partner or peer when compared to boys.

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. Significantly more girls had internalizing problems, suicidality, and disordered eating when compared to boys. For example, in the 12 months before follow-up, a little more than 1 in 3 girls met criteria for internalizing problems (34.9%), 1 in 4 girls reported suicidality (25.0%), and 22.7% of girls had disordered eating. Furthermore, there were no changes in adolescents' self-reported levels of stress and inability to cope with stress. Adolescents had mid-levels of perceived stress and inability to cope with 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.^{131,132,133} Unfortunately, the empirical literature comparing integrated treatment with substance use disorder-only treatment is limited and studies typically have small sample sizes.¹³⁴ Thus, more research is needed to provide more guidance on how best to integrate treatment for substance use disorders and comorbid psychiatric disorders.

¹²⁸ Widom, C. S., Czaja, S. J., & Dutton, M. A. (2008). Childhood victimization and lifetime revictimization. *Child Abuse & Neglect*, 32(8), 785-796.

¹²⁹ 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.

¹³⁰ 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.

¹³¹ 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.

¹³² 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.

¹³³ 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.

¹³⁴ 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.

Education. Even though the majority 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, 21.5% 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.

Recovery Supports. In this sample of adolescents, the average number of people adolescents could count on for recovery support increased at follow-up and their satisfaction with recovery support also increased significantly 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.¹³⁵ Nonetheless, limited research has examined the role of AA and NA meeting attendance among adolescents.¹³⁶ 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.^{137,138,139} Yet, adolescents' attendance at group meetings that are predominately composed of adults may not be helpful and may even be harmful.^{140,141} Many communities, including many if not most in Kentucky, may not have mutual help group meetings specifically for adolescents. 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.^{142,143} Yet, aftercare resources tend to be limited in many communities.

Multidimensional Status. With the perspective that recovery encompasses multiple dimensions of individuals' lives, a multidimensional status index was developed from 7 indicators. Analysis

¹³⁵ 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.

¹³⁶ 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.

¹³⁷ 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.

¹³⁸ 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.

¹³⁹ 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.

¹⁴⁰ Kelly, J., & Myers, M. (1997). Adolescent treatment outcome in relation to 12-step group attendance. Abstracted in *Alcoholism: Clinical and Experimental Research*, 21, 27A.

¹⁴¹ 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.

¹⁴² 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.

¹⁴³ 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.

showed a significant increase in the percent of individuals classified as having better status at follow-up as compared to intake. Nonetheless, most individuals (60.4%) were still struggling with at least one indicator of worse status at follow-up. The most common indicators of worse status reported by individuals at follow-up were having been arrested or in detention/incarcerated, meeting criteria for a DSM-5 substance use disorder, and lower education attainment and progress.

LIMITATIONS OF THE STUDY

There are several areas of limitation to the findings presented in this report. First, this study examined 147 adolescents who received substance abuse treatment in state fiscal years 2017 and 2018, 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,^{144,145,146,147} reliance on self-reports in this study may be an important limitation. For example, in many studies that have compared agreement between self-report and urinalysis the concordance or agreement is acceptable to high.^{148,149,150} In fact, in some studies, when there were discrepant results between self-report and urinalysis of drugs and alcohol, the majority were self-reported substance use that was not detected with the biochemical measures.^{151,152,153} In other studies, higher percentages of underreporting have been found.¹⁵⁴ Prevalence of underreporting of substance use is quite varied in studies. Nonetheless, research has found that certain conditions facilitate the accuracy of self-report data such as assurances of confidentiality and memory prompts.¹⁵⁵ Moreover, the “gold standard” of biochemical measures of

¹⁴⁴ 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.

¹⁴⁵ Del Boca, F.K., & Noll, J.A. (2000). Truth or consequences: The validity of self-report data in health services research on addictions. *Addiction*, 95, 347-360.

¹⁴⁶ Harrison, L. D., Martin, S. S., Enev, T., & Harrington, D. (2007). *Comparing drug testing and self-report of drug use among youths and young adults in the general population* (DHHS Publication No. SMA 07-4249, Methodology Series M-7). Rockville, MD: Substance abuse and Mental Health Services Administration, Office of Applied Studies.

¹⁴⁷ 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, 343-348.

¹⁴⁸ Rowe, C., Vittinghoff, E., Colfax, G., Coffin, P. O., & Santos, G. M. (2018). Correlates of validity of self-reported methamphetamine use among a sample of dependent adults. *Substance Use & Misuse*, 53 (10), 1742-1755.

¹⁴⁹ Rygaard Hjorthoj, C., Rygaard Hjorthoj, A., & Nordentoft, M. (2012). Validity of Timeline Follow-Back for self-reported use of cannabis and other illicit substances—Systematic review and meta-analysis. *Addictive Behaviors*, 37, 225-233.

¹⁵⁰ Wilcox, C. E., Bogenschutz, M. P., Nakazawa, M., & Woody, G. (2013). Concordance between self-report and urine drug screen data in adolescent opioid dependent clinical trial participants. *Addictive Behaviors*, 38, 2568-2574.

¹⁵¹ Denis, C., Fatséas, M., Beltran, V., Bonnet, C., Picard, S., Combourieu, I., Daulouède, J., & Auriacombe, M. (2012). Validity of the self-reported drug use section of the Addiction Severity and associated factors used under naturalistic conditions. *Substance Use & Misuse*, 47, 356-363.

¹⁵² Hilario, E. Y., Griffin, M. L., McHugh, R. K., McDermott, K. A., Connery, H. S., Fitzmaurice, G. M., & Weiss, R. D. (2015). Denial of urinalysis-confirmed opioid use in prescription opioid dependence. *Journal of Substance Abuse Treatment*, 48, 85-90.

¹⁵³ Williams, R. J., & Nowatzki, N. (2005). Validity of self-report of substance use. *Substance Use & Misuse*, 40, 299-313.

¹⁵⁴ Chermack, S. T., Roll, J., Reilly, M., Davis, L., Kilaru, U., Grabowski, J. (2000). Comparison of patient self-reports and urinalysis results obtained under naturalistic methadone treatment conditions. *Drug and Alcohol Dependence*, 59, 43-49.

¹⁵⁵ Del Boca, F. K., & Noll, J. A. (2000). Truth or consequences: the validity of self-report data in health services research on addictions. *Addiction*, 95 (Suppl. 3), S347–S360.

substance use have many limitations: short windows of detection that vary by substance; detection varies on many factors such as the amount of the substance consumed, chronicity of use, sensitivity of the analytic method used.¹⁵⁶ Therefore, this study's method includes several key strategies to facilitate accurate reporting of sensitive behaviors at follow-up including: (a) the follow-up interviews are conducted by telephone with a University of Kentucky Center on Drug and Alcohol Research (UK CDAR) staff person who is not associated with any CMHC; (b) the follow-up responses are confidential and are reported at a group level, meaning no individual responses are linked to participants' identity; (c) the study procedures, including data protections, are consistent with federal regulations and approved by the University of Kentucky Human Subjects Institutional Review Board; (d) confidentiality is protected under Federal law through a Federal Certificate of Confidentiality; (e) participants can skip any question they do not want to answer; and (f) UK CDAR staff are trained to facilitate accurate reporting of behaviors and are regularly supervised for quality data collection and adherence to confidentiality.

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 2020 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.

¹⁵⁶ Williams, R. J., & Nowatzki, N. (2005). Validity of self-report of substance use. *Substance Use & Misuse, 40*, 299-313.

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) have demonstrated validity and reliability.¹⁵⁷ 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 like 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 July 2017, the target month for the follow-up interview is July 2018. 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 July 2017, and interviewers begin working to locate and contact the individual in May and can work on the file until the end of September 2017. In FY 2017 and 2018, 521 adolescents in publicly funded substance abuse treatment completed intake interviews. Of these 521 adolescents who completed an intake interview, a little more than half of clients (52.2%, $n = 272$) gave consent to be contacted for the follow-up interview. Then the follow-up sample was selected from 239 clients who agreed to be contacted for the follow-up interview and gave the minimum amount of locator information.

Of the 239 adolescents who were included in the sample of individuals to be followed up, 24 were ineligible to complete the follow-up survey when they were contacted (see Table AA.1). Reasons for ineligibility include being in residential treatment ($n = 13$), incarcerated ($n = 7$), does not remember

¹⁵⁷ 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.

participating in a program ($n = 2$), in military service ($n = 1$), there was invalid data ($n = 1$). Of the remaining 215 adolescents, interviewers completed follow-up surveys with 147 adolescents, representing a follow-up rate of 68.4%. No individuals declined to complete the follow-up survey when the interviewer contacted him/her; thus, the refusal rate was 0.0%. Of the eligible individuals, 68 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 (31.6%). Compared to previous biannual reports, the number of individuals in the expired category has increased. First, the quality of contact information collected at the time of intake interviews has worsened over time. Second, the percent of individuals who ever answer the follow-up interviewers' phone calls is decreasing. The volume of scam-related or robocalls increased 35% in 2019, accounting for over one-third of personal calls in the U.S.¹⁵⁸ Both of these factors have necessitated changes in procedures and strategies, which the follow-up study team has developed and put into place. The project interviewers' efforts accounted for 71.5% ($n = 171$) 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 = 239)	Percent
Ineligible for follow-up survey	24	10.0%
	Number of cases eligible for follow-up (N = 215)	
Completed follow-up surveys	147	
Follow-up rate is calculated by dividing the number of completed surveys by the number of eligible cases and multiplying by 100.....		68.4%
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period).....	68	
Expired rate ((the number of expired cases/eligible cases) * 100)		31.6%
Refusal	0	
Refusal rate ((the number of refusal cases/eligible cases) * 100)		0.0%
Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals)	171	
Percent of cases accounted for ((# of cases accounted for/ total number of records in the follow-up sample) * 100)		71.5%

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.

¹⁵⁸ <https://www.usatoday.com/story/tech/news/2019/12/04/robocalls-us-eighth-most-spammed-country-report/2613528001/>

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 reason¹⁵⁹ (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 was no significant difference in gender by follow-up status. However, individuals who completed a follow-up interview were significantly older than individuals who did not complete a follow-up interview. Also, significantly more individuals who completed a follow-up interview were African American when compared to individuals who did not complete a follow-up interview.

TABLE AB.1. COMPARISON OF DEMOGRAPHICS FOR CLIENTS WHO WERE FOLLOWED UP AND CLIENTS WHO WERE NOT FOLLOWED UP¹⁶⁰

	FOLLOWED UP	
	NO n = 374	YES n = 147
Age**	15.8 years	16.2 years
Gender		
Male	70.3%	70.1%
Female	28.9%	29.9%
Race*		
White.....	79.4%	70.1%
African American.....	6.7%	12.2%
Other or multiracial.....	13.9%	17.7%

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

¹⁵⁹ Significance is reported for p < .05.

¹⁶⁰ One client who was not followed-up had missing data for race.

SUBSTANCE USE AT INTAKE

Use of illegal drugs, alcohol, and tobacco in the 12 months before entering treatment by follow-up status is presented in Table AB.2. Most youths reported using any illegal drug in the 12 months before entering the program. The drug class used by the greatest percentage of clients was marijuana. The next most reported drugs were stimulants (including cocaine), followed by CNS depressants and opioids (other than heroin). Significantly more youth who were not followed up reported using synthetic drugs (e.g., synthetic marijuana, bath salts) than youth who were followed up. A small number of youths reported using heroin in the 12 months before intake. The majority reported using alcohol and tobacco in the 12 months before intake. Over one-third of youth in both groups reported using vaporized nicotine.

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

	FOLLOWED UP	
	NO n = 374	YES n = 147
Substances		
Any illegal drug	90.9%	93.2%
Marijuana.....	88.2%	90.5%
Stimulants including cocaine.....	36.6%	33.3%
CNS depressants.....	35.3%	27.9%
Opioids (other than heroin).....	34.5%	28.6%
Other illegal drugs (e.g., hallucinogens, inhalants)	27.0%	20.4%
Synthetic drugs (synthetic marijuana, bath salts)*	25.1%	17.0%
Heroin	5.6%	6.1%
Alcohol	63.6%	59.9%
Smoking tobacco.....	73.5%	74.8%
Smokeless tobacco.....	29.7%	30.6%
Vaporized nicotine.....	34.2%	36.1%

*p < .05.

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 marijuana in the past 30 days than those clients who did not complete a follow-up interview (76.9% vs. 67.5%). There were no other differences in past-30-day reports of other substances by follow-up status.

Table AB.3 displays the percent of youth in each SUD severity classification, based on self-reported criteria for the preceding 12 months, by follow-up status. There was no significant difference by follow-up status. A sizeable minority—about one-third—of both groups met criteria for no substance

use disorder. At the other extreme, about 2 in 5 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 category.

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

	FOLLOWED UP	
	NO n = 374	YES n = 147
No substance use disorder	32.4%	35.4%
Mild substance use disorder	13.9%	15.6%
Moderate substance use disorder	10.4%	17.0%
Severe substance use disorder	43.3%	32.0%

MENTAL HEALTH AT INTAKE

There were no significant differences in the percentage of followed-up and not followed-up clients who met criteria for internalizing problems, externalizing problems, attention problems, disordered eating, and suicidality at intake (see Table AB.4).

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

	FOLLOWED UP	
	NO n = 374	YES n = 147
Internalizing Problems (score of 5 or greater).....	46.3%	45.6%
Externalizing Problems (score of 7 or greater).....	23.3%	21.1%
Attention Problems	38.5%	31.3%
Disordered Eating	38.5%	33.3%
Suicidal Ideation/Attempted Suicide	30.2%	29.3%

EDUCATION

Table AB.5 describes clients' school involvement and academic performance when entering treatment. There were no statistically significant differences by follow-up status. The vast majority were enrolled in school when they entered treatment and reported they had attended school the last 3 months school was in session. The average GPA was equivalent to a C. Among those who attended school in the last 3 months school was in session, individuals in both groups reported similar average number of absences from school. About half of the adolescents reported 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 = 374	YES n = 147
Enrolled in school (e.g., public, private, home school, alternative, GED classes)	96.0%	94.6%
Average GPA	2.2	2.2
Ever repeated a grade in school	38.8%	32.7%
Attended school in the last 3 months school was in session.....	82.9%	85.0%
Among those who attended school in the last 3 months school was in session:	n = 310	n = 125
Average number of days missed school for any reason in the last 3 months school was in session	13.7	15.2
Client was in detention, suspended, or expelled in the last 3 months school was in session	52.6%	48.8%

CAREGIVER RELATIONSHIP AND LIVING SITUATION

There were no significant differences in primary caregiver or living situation by follow-up status. The majority 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, two-fifths stated they had lived in institutional settings (e.g., group home, residential treatment, juvenile detention). About one-fourth stated they had lived with other family members. 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 = 374	YES n = 147
Current primary caregiver		
Biological parent	67.1%	70.1%
Other family including adoptive family.....	24.9%	23.1%
Foster parent or DCBS.....	5.1%	4.1%
Other caregiver (e.g., boyfriend's father, family friends).....	1.9%	1.4%
No caregiver--emancipated minor	1.1%	1.4%
Average score on caregiver involvement scale	10.7	10.8
Where the client lived in the 12 months before entering the program		
Home with biological parent	76.7%	79.6%
In an institutional facility (e.g., group home, residential treatment, juvenile detention).....	39.3%	41.5%
With other family (including adoptive family)	30.5%	25.2%
Foster care	4.5%	4.1%
Lived independently (including in a school dormitory).....	7.8%	10.2%

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). Among adolescents who reported an arrest in the 12 months before intake, there was no significant difference in the average number of arrests and the percent of adolescents arrested for status offenses. Most 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 = 374	YES n = 147
Arrested for any charge in the 12 months before entering treatment	41.2%	38.8%
Of those with an arrest	n = 154	n = 57
Average number of arrests.....	2.5 arrests	2.0 arrests
Charged with a status offense	58.4%	45.6%
Currently under supervision by the justice system	52.1%	60.5%

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 24.2 days for individuals who were not followed up and 31.7 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 = 374	YES n = 147
In juvenile detention at least one day	27.5%	29.3%
Of those in detention	(n = 103)	(n = 43)
Average number of days in detention.....	24.2	31.7

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 significantly more individuals who were followed up stating they had been to mutual help recovery meetings before intake when compared to individuals who did not complete a follow-up (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 = 374	YES n = 147
Attended a mutual help recovery meeting in the past 30 days*	7.8%	13.6%
Average number of people youth can count on for recovery support*	4.8	6.0
Average rating of satisfaction with level of recovery support in life	4.7	4.7

*p < .05.