KENTUCKY OPIOID REPLACEMENT TREATMENT PROGRAM OUTCOME STUDY

ANNUAL REPORT | 2017

EXECUTIVE SUMMARY

This report summarizes client outcomes from a statewide evaluation of opioid treatment programs (OTPs). The goal of the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) is to examine outcomes using an evidence based assessment[1] for four core components including: (1) substance use; (2) mental health; (3) criminal justice involvement; and (4) quality of life. Three additional areas are assessed for the clients involved in the opioid treatment programs including health status, economic and living circumstances, and recovery supports. This study also examines program satisfaction and experiences. This annual KORTOS report presents outcome findings for 175 men and women who participated in an OTP from January 2015 through December 2015 and then completed a follow-up interview about 6 months after the intake assessment was completed.

[1] Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

Substance Use

The OTPs may play a unique and important role in addressing opioid abuse in Kentucky, where non-medical use of prescription opioids is a continuing health concern.[2, 3] The increase in heroin use is also reflected in this year's KORTOS report. Even though the majority of KORTOS clients reported use of prescription opioids when they entered treatment, as they have in past years' reports, the percent of clients who reported using heroin in the 30 days before entering treatment has increased again in 2015 to 57%.

Outcome findings show that overall illegal drug use significantly decreased from intake to follow-up (see side bar). Not only did clients' use of opioids decrease significantly from intake to follow-up, but their use of non-opioid drugs (such as marijuana, tranquilizers, benzodiazepines, stimulants)

[2] Substance Abuse and Mental Health Services Administration (SAMHSA). (2015). *2013-2014 National Survey on Drug Use and Health: Model-based prevalence estimates (50 states and the District of Columbia)*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Mental health Statistics and Quality.

[3] World Health Organization (2004). *Substitution maintenance therapy in the management of opioid dependence and HIV/AIDS prevention*. Geneva, Switzerland: United Nations Office on Drugs and Crime.

Four core components of the KORTOS evidence based assessment

and alcohol also decreased significantly. Overall, 72% of clients reported misuse of prescription opioids in the past 6 months at intake, whereas only 15% of clients reported misuse of prescription opioids at follow-up. Over two-thirds of clients (70.1%) reported heroin use at intake and that number decreased to 16.6% at follow-up. Use of non-prescribed methadone and buprenorphine-nalaxone (bup-nx) also decreased significantly.

Mental Health

The mental health of clients who participated in treatment was significantly improved at follow-up with fewer clients reporting symptoms of depression, generalized anxiety, comorbid depression and anxiety, and suicidal thoughts or attempts (see side bar).

Criminal Justice Involvement

At intake, 18% of clients reported an arrest in the 6 months before treatment compared to 1% in the past 6 months at follow-up. Further, 17% of clients reported being incarcerated in the past 6 months at treatment intake and 5% of clients reported being incarcerated in the past 6 months at follow-up.

Quality of Life

Clients rated their quality of life and their satisfaction with their lives as significantly higher after participating in the program.

Health Status

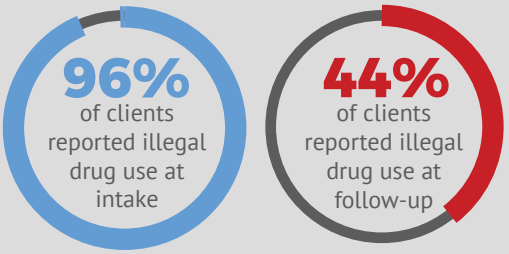
Clients reported significantly reduced stress-related health consequences, number of days of poor physical and mental health, and number of days their physical or mental health problems limited their daily activities at follow-up when compared to intake. Two in five clients (42.3%) reported chronic pain at intake and significantly fewer clients reported they had experienced chronic pain in the 6 months before follow-up.

Economic and Living Conditions

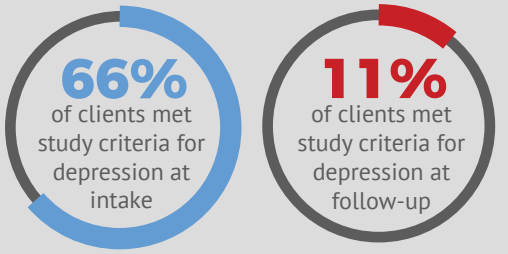
Economic and living circumstances were improved for a significant number of clients. Current employment status significantly improved with half of clients reporting full-time employment at follow-up compared to 35% of clients at intake (see side bar on p. 3). The number of clients who reported they were homeless at some point in the past 6 months decreased from 17% to 1%. Significantly fewer clients reported living in a jail,

Overall, KORTOS clients had significant improvements in key factors that have been associated with facilitating recovery.

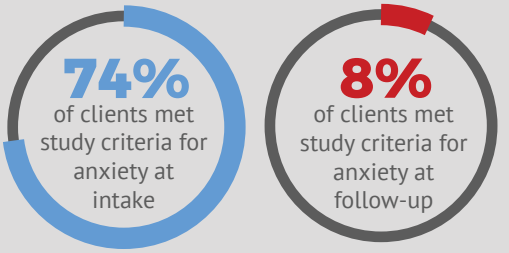
PAST-6-MONTH SUBSTANCE USE



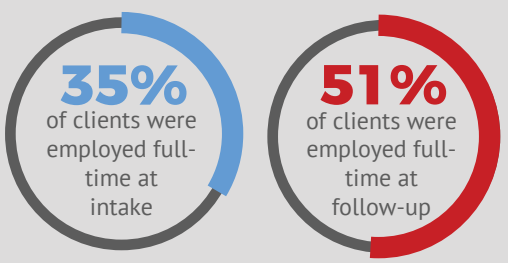
PAST-6-MONTH DEPRESSION



PAST-6-MONTH ANXIETY



PAST-6-MONTH EMPLOYMENT



Three supplemental components of the KORTOS evidence based assessment

Health Status

Economic and Living Conditions

Recovery Supports

treatment program, shelter, or on the street at follow-up. Furthermore, fewer clients reported experiencing economic hardship in terms of difficulty with being able to afford basic living needs (such as food, shelter, and utilities) and health care needs at follow-up.

Recovery Supports

Compared to intake, significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up. Clients also reported having significantly more people they could count on for recovery support at follow-up. Over 90% of clients stated they thought they had a moderately or very good chance of staying off drugs or alcohol at follow-up.

Client Satisfaction with Treatment Experience

Program clients reported high levels of satisfaction with their program experience. The vast majority of clients reported that they were treated with respect, understood the expectations of the program, felt better about themselves, and got the services needed to get better. In addition, clients reported many positive aspects of their participation in the program including decreased substance use, improved mental health and their feelings about themselves, improved financial situation, and improved relationships with others.

Several findings suggest additional opportunities to provide or target additional support for clients. Continued drug use during medication assisted treatment has been associated with early program termination[4,5] and longer treatment retention has been associated with more positive outcomes.[6,7] Forty-four percent of KORTOS clients reported using illegal drugs in the 6 months before follow-up. Additionally, smoking was very high for clients at intake and remained high at follow-up (81%). Smoking has been associated with increased mental health symptoms and physical health problems. Further, while the number of participants reporting having difficulty meeting basic needs for financial reasons decreased from intake to follow-up, 15% of clients still reported having difficulty meeting basic living needs at follow-up. Similarly, while the number of clients reporting full-time employment increased significantly, 38% remained unemployed at follow-up.

[4] Davstad, I., Stenbacka, M., Leifman, A., Beck, O., Kormaz, S., & Romelsjö, A. (2007). Patterns of illicit drug use and retention in a methadone program: A longitudinal study. *Journal of Opioid Maintenance, 3*(1), 27–34.

[5] White, W., Campbell, M., Spencer, R., Hoffman, H., Crissman, B., & DuPont, R. (2014). Patterns of abstinence or continued drug use among methadone maintenance patients and their relation to treatment retention. *Journal of Psychoactive Drugs, 46*(2), 114-122.

[6] Hubbard, R., Craddock, S., & Anderson, J. (2003). Overview of 5-year followup outcomes in the drug abuse treatment outcome studies (DATOS). *Journal of Substance Abuse Treatment, 25*, 125-134.

[7] Gibson, A., Degenhardt, L., Mattick, R., Ali, R., White, J., & O'Brien, S. (2008). Exposure to opioid maintenance treatment reduces long-term mortality. *Addiction, 103*, 462-468.

There were several gender differences at intake and at follow-up which may warrant gender specific assessments and supports. Significantly more men reported using alcohol and/or illegal drugs in the past 6 months and past 30 days at follow-up as well as past-6-month illegal drug use at follow-up. More men also reported using non-opioid drugs (e.g., marijuana, cocaine, amphetamines, tranquilizers, hallucinogens, inhalants, barbiturates, and synthetic drugs) at follow-up. Significantly more men reported using smokeless tobacco at intake and follow-up. In addition, more men reported alcohol use at follow-up and binge drinking at intake.

Women had more symptoms of depression at intake and follow-up and comorbid depression and anxiety at follow-up compared to men. Women reported a higher average number of days of poor physical health at intake and poor mental health at intake and follow-up. A higher percentage of women also reported an arrest in the 6 months before intake when compared to men.

More women were currently unemployed at both intake and follow-up and they reported working fewer months at intake and follow-up when compared to men.

Among individuals who were currently employed, men had a significantly higher median hourly wage than women at both intake and follow-up. At intake, employed women made only $0.65 for every dollar employed men made and at follow-up, the gap in median hourly wages was still large, with employed women making only $0.68 for every dollar employed men made.

The 2017 KORTOS evaluation indicates that opioid treatment programs in Kentucky have been successful in facilitating positive changes in clients' lives in a variety of ways, including decreased substance use, decreased mental health symptoms, decreased involvement with the criminal justice system, improved quality of life, improved health status, decreased economic hardship, and more support for recovery.

"[The program] has kept me sober. The counselors help me a lot. It's not just about getting methadone but helping me try to change my thinking and lifestyle."

—KORTOS Follow-up Client

TABLE OF CONTENTS

EXECUTIVE SUMMARY 2

PROJECT ACKNOWLEDGMENTS 8

INTRODUCTION AND OVERVIEW 9

SECTION 1. KORTOS CLIENT CHARACTERISTICS 12
- Description of KORTOS Clients at Treatment Intake 12
- KORTOS Follow-up Sample 16
- KORTOS 2015 Quality of Data and Locator Efforts 18

SECTION 2. SUBSTANCE USE 20
- Alcohol and/or Drug Use 21
- Any Illegal Drugs 23
- Prescription Opioid Misuse 25
- Non-prescribed Use of Methadone 27
- Non-prescribed Use of Bup-nx 28
- Heroin 29
- Trend Report 32
- Non-opioid Drug Use 33
- Alcohol Use 35
- Tobacco Use 42

SECTION 3. MENTAL HEALTH 45
- Depression Symptoms 45
- Anxiety Symptoms 46
- Comorbid Depression and Anxiety Symptoms 47
- Suicidal Ideation and/or Attempts 48

SECTION 4. CRIMINAL JUSTICE SYSTEM INVOLVEMENT 49
- Arrests 49
- Incarceration 50
- Criminal Justice System Supervision 51

SECTION 5. QUALITY OF LIFE 52
- Quality of Life Ratings 52
- Positive and Negative Feelings 52
- Satisfaction with Life Rating 54

SECTION 6. HEALTH STATUS 56
- Stress-related Health Consequences 56
- Perceptions of Physical and Mental Health 56

Perceptions of Poor Physical or Mental Health Limiting Activities.. 57
Physical Health Issues 58

SECTION 7. EDUCATION, ECONOMIC STATUS, AND LIVING CIRCUMSTANCES 60
Education 60
Employment 60
Living Circumstances 65
Difficulty Meeting Living and Health Care Needs for Financial Reasons 66

SECTION 8. RECOVERY SUPPORTS 68
Mutual Help Recovery Group Meeting Attendance 68
Number of People Client Can Count on for Recovery Support 68
What Will Be Most Useful in Staying Off Drugs/Alcohol 69

SECTION 9. CLIENT SATISFACTION WITH OPIOID TREATMENT PROGRAMS 71
Overall Client Satisfaction 71
Client Ratings of Program Experiences 71
Positive and Negative Aspects of Program 72

SECTION 10. IMPLICATIONS AND CONCLUSIONS 74
Areas of Concern 76
Study Limitations 77
Conclusion 78

APPENDIX A. METHODS 79

APPENDIX B. LOCATING EFFORTS FOR THE 2015 KORTOS FOLLOW-UP STUDY 81

APPENDIX C. CLIENT CHARACTERISTICS AT INTAKE FOR THOSE WHO COMPLETED A FOLLOW-UP INTERVIEW AND THOSE WHO DID NOT COMPLETE A FOLLOW-UP INTERVIEW 84

APPENDIX D. TRENDS IN PRESCRIPTION OPIOID, METHADONE, BUP-NX, AND HEROIN USE AMONG KORTOS CLIENTS WITH A COMPLETED FOLLOW-UP INTERVIEW 92

PROJECT ACKNOWLEDGMENTS

PRESENTED BY:

Kentucky Department for Mental health,
Developmental and Intellectual Disabilities
Division of Mental health
275 East Main St.
Frankfort, KY 40621-0001
(502) 564-4527

- **WENDY MORRIS**
  Commissioner
- **JAMES GEDRA**
  Acting Director
  Division of Mental health
- **MAGGIE SCHROEDER**
  Substance Abuse Treatment Branch Manager
- **KARLA THOMPSON**
  Program Administrator,
  State Opioid Treatment Authority

PREPARED BY:

University of Kentucky, Center on Drug and Alcohol Research
333 Waller Ave, Suite 480
Lexington, KY 40504
http://cdar.uky.edu/kortos

The 2017 KORTOS report includes data from 175 clients at Kentucky opioid treatment programs (OTPs) who completed both an intake interview between January 1, 2015 and December 31, 2015 and a six-month follow-up interview targeted between July 2015 and June 2016.

Suggested citation: Logan, TK, Miller, J., Cole, J., & Scrivner, A. (2017). *Kentucky's Opioid Replacement Treatment Program Outcome Study 2017 Annual Report.* Lexington, KY: University of Kentucky, Center on Drug & Alcohol Research.

Center on Drug and Alcohol Research

Kentucky UNBRIDLED SPIRIT

INTRODUCTION AND OVERVIEW

While prescription opioids are instrumental to reducing pain, misuse can lead to serious negative consequences such as addiction or even overdose. Non-medical use of prescription opioids is a continuing health concern in Kentucky where 4.1% of individuals 18 years and older report nonmedical use of pain relievers.[2] Since 2000, the rate of deaths from drug overdose involving opioids has increased 200%. In 2015, Kentucky was one of 19 states that had a statistically significant increase in age-adjusted drug overdose deaths per 100,000 population (21.1%) from 24.7 in 2014 to 29.9 in 2015, the 3rd highest in the United States.[8] Heroin and prescription opioids were the primary drug class involved in drug overdose deaths.[9] In 2015, among 52,404 drug overdose deaths that occurred in the U.S., 63.1% involved an opioid.[10]

One of the key methods for treating persons addicted to opioids who have not been successful in traditional substance abuse treatment programs is through medication assisted therapy (or treatment, MAT) primarily with methadone or buprenorphine-naloxone (bup-nx). One of three priority areas of the United States Health and Human Services' (HHS) launched initiative in 2015 to reduce prescription opioid- and heroin-related overdose, death, and dependence to expand the use of medication-assisted therapy.[10] These federally regulated opioid treatment programs (OTPs) provide evidence-based, clinically monitored, medication-assisted therapy with methadone or bup-nx.[11] Research evidence supports the effectiveness of methadone maintenance and bup-nx maintenance in retaining clients in treatment and suppressing opioid use.[12, 13, 14] The number of persons receiving methadone in substance use treatment in Kentucky rose from 2009 to 2012 , but decreased in 2013 while the number of persons receiving bup-nx multiplied by 5 from 2011 to 2013.[15]

In 2007, Kentucky OTPs began collecting outcome data on medication-assisted therapy. The outcome evaluation project is conducted in collaboration with the Kentucky Division of Mental health. The Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) is conducted by the Mental health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR) and is an important part of the Department for Mental health, Developmental, and Intellectual Disabilities, Division of Mental health's performance-based measurement of

---

[8] Rudd, R.A., Seth, P., David, F., & Scholl, L. (2016). Increased in drug and opioid-involved overdose deaths – United States, 2010-2015. *Morbidity and Mortality Weekly Report, 65*(50-51), 1445-1452.

[9] Slavova, S., Akers,D., & Rock, P. (2016). *Kentucky Resident Drug Overdose Deaths, 2015*. Lexington, KY: Kentucky Injury Prevention and Research Center.

[10] Office of the Assistant Secretary for Planning and Evaluation. (2015, March 26). *Opioid abuse in the U.S. and HHS actions to address opioid-drug related overdoses and deaths*. Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation.

[11] National Institute on Drug Abuse. (2011). *Prescription drugs abuse and addiction: research report series.* NIH Publication Number 05-4881. Retrieved from http://drugabuse.gov/publications/research-reports/prescription-drugs

[12] Mattick, R., Breen, C., Kimber, J., & Davoli, M. (2009). Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database System Review, Jul 8* (3).

[13] Kakko, J. Svanborg, K. D., Kreek, M J., & Heilig, M. (2003). 1-year retention and social function after buprenorphine-assisted relapse prevention treatment for heroin dependence in Sweden: A randomised, placebo-controlled trial. *Lancet, 361*, 662-668.

[14] Mattick, R. P., Kimber, J., Breen, C., & Davoli, M. (2008). Methadone maintenance therapy versus placebo or methadone maintenance for opioid dependence. *Cochrane Database of Systematic Reviews, 2*. CD002207.

[15] Substance Abuse and Mental Health Services Administration. (2015). *Mental health barometer: Kentucky, 2014*. HHS Publication No. SMA-15-4895KY. Rockville, MD: Substance Abuse and Mental Health Services Administration.

treatment outcomes in Kentucky's communities. The KORTOS project collects data from clients receiving medication-assisted treatment with methadone or bup-nx at licensed OTPs since they follow clinical monitoring protocols; thus this report does not include data from independent physicians who prescribe bup-nx outside of an OTP. In calendar year 2015, fourteen Kentucky licensed OTPs submitted data for KORTOS.[16]

In this annual report, data are included for 175 clients from Kentucky OTPs who completed an intake interview between January 1, 2015 and December 31, 2015 and a six-month follow-up interview about 6 months after the intake between July 1, 2015 and June 30, 2016.

Results are reported within ten main sections.

Section 1. Overview and Description of KORTOS Clients. This section briefly describes the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) including a description of clients who participated in Kentucky's participating licensed OTPs in calendar year 2015 and who had completed an intake (n = 517) as well as clients who completed a 6-month follow-up interview (n = 175).

Section 2. Substance Use. This section examines change in substance use (illegal drugs, alcohol, and tobacco) for 6-month and 30-day periods at intake and follow-up. Specific classes of illegal drugs examined include misuse of prescription opioids, non-prescribed methadone, non-prescribed bup-nx, heroin, and other illegal drugs. In addition, self-reported severity of alcohol and drug use based on the Addiction Severity Index (ASI) alcohol and drug use composite scores are compared at intake and follow-up. Results for each targeted factor are presented for the overall sample and separately by gender where there were significant differences.

Section 3. Mental Health. This section examines changes in self-reported mental health from intake to follow-up. Specifically, this section examines: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, (4) suicide ideation and attempts. Results for each targeted factor are presented for the overall sample and separately by gender where there were significant differences.

Section 4. Criminal Justice System Involvement. This section describes change in client involvement with the criminal justice system during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) the number of times arrested, among clients with any arrests, (3) any incarceration, (4) the number of nights incarcerated, among clients with any incarceration, and (5) criminal justice supervision status. Results for each targeted factor are presented for the overall sample and separately by gender where there were significant differences.

Section 5. Quality of Life. This section describes change in quality of life ratings from intake to follow-up including: (1) quality of life ratings, (2) clients' positive and negative feelings, and (3) satisfaction with life. Results for each targeted factor are presented for the overall sample and

[16] In 2015, 14 OTPs submitted intake surveys for clients: Mental health Group, BHG Paintsville, bluegrass.org/Narcotics Addiction Program, Center for Mental health-Elizabethtown, Center for Mental health-Frankfort, Center for Mental health-Louisville, Corbin Professional Associates, M.O.R.E. Center, Northern Kentucky Medical Clinic, Perry County Treatment Services, Pikeville Treatment Center, The Infinity Center – Ashland, Ultimate Treatment Center, and Western Kentucky Medical.

separately by gender where there were significant differences.

Section 6. Health Status. This section presents changes in clients' self-reported stress and physical health issues including: (1) stress-related health consequences, (2) perceptions of physical and mental health, (3) chronic pain, and (4) body mass index. Results for each targeted factor are presented for the overall sample and separately by gender where there were significant differences.

Section 7. Education, Economic Status, and Living Circumstances. This section examines changes in education, employment, living situation, and economic hardship from intake to follow-up including: (1) highest level of education completed, (2) the percent of clients who worked full-time or part-time, (3) the number of months clients were employed full-time or part-time, (4) hourly wage, (5) if clients consider themselves to be homeless, (6) their living situation (i.e., own home or someone else's home, residential program, shelter), and (7) economic hardship (i.e., difficulty meeting living and health care needs). Results for each targeted factor are presented for the overall sample and separately by gender where there were significant differences.

Section 8. Change in Recovery Supports. This section focuses on four main changes in recovery supports: (1) percentage of clients attending mutual help recovery group meetings, (2) the number of people the client said they could count on for recovery support, (3) what will be most useful to the client in staying off drugs/alcohol, and (4) clients' perceptions of their chances of staying off drugs/alcohol. Results for each targeted factor are presented for the overall sample and separately by gender where there were significant differences.

Section 9. Client Satisfaction with the Opioid Treatment Programs. This section describes: (1) overall client satisfaction with the program, (2) clients' ratings of program experiences, and (3) positive and negative aspects of program participation.

Section 10. Implications and Conclusions. This section summarizes the highlights from the evaluation results and suggests implications from these findings for the state.

Section 1.
KORTOS CLIENT CHARACTERISTICS

This section briefly describes the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who participated in federally licensed Kentucky opioid treatment programs in calendar year 2015 and who had an intake assessment that was submitted to CDAR (n = 517), including clients who also completed a 6-month follow-up interview (n = 175).

KORTOS includes a face-to-face interview with program staff at the beginning of a new medication-assisted treatment episode. The interview is an evidence based assessment[17] that asks about targeted factors such as substance use, mental health, involvement in the criminal justice system, quality of life, health status, and economic and living circumstances prior to entering treatment (submitted to UK CDAR from January 1, 2015 to December 31, 2016). In 2015, 517 adults completed an intake interview[18] that was submitted by 14 Kentucky licensed OTPs to UK CDAR.[19] The first section below describes characteristics for all clients from those programs with a completed and submitted intake assessment.

DESCRIPTION OF KORTOS CLIENTS AT TREATMENT INTAKE

DEMOGRAPHICS

Table 1.1 shows that over half of clients were male (57.1%) and most were White (96.3%). Clients were, on average, 35 years old, with the youngest client being 18 and the oldest being 66 years old. Overall, 47.1% of clients were never married, 26.6% were separated or divorced, and 1.9% were widowed. About 1 in 4 clients (24.3%) reported being married and less than half of clients reported they had at least one child under the age of 18 who was living with them at the time of intake (44.6%).

"The program helped me get clean. I feel safe there and I have been treated well there."

—KORTOS Follow-up Client

[17] Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

[18] When a client had more than one intake survey in the same fiscal year, 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.

[19] In 2015, 14 OTPs submitted intake surveys for clients: Mental health Group, BHG Paintsville, bluegrass.org/Narcotics Addiction Program, Center for Mental health-Elizabethtown, Center for Mental health-Frankfort, Center for Mental health-Louisville, Corbin Professional Associates, M.O.R.E. Center, Northern Kentucky Medical Clinic, Perry County Treatment Services, Pikeville Treatment Center, The Infinity Center – Ashland, Ultimate Treatment Center, and Western Kentucky Medical.

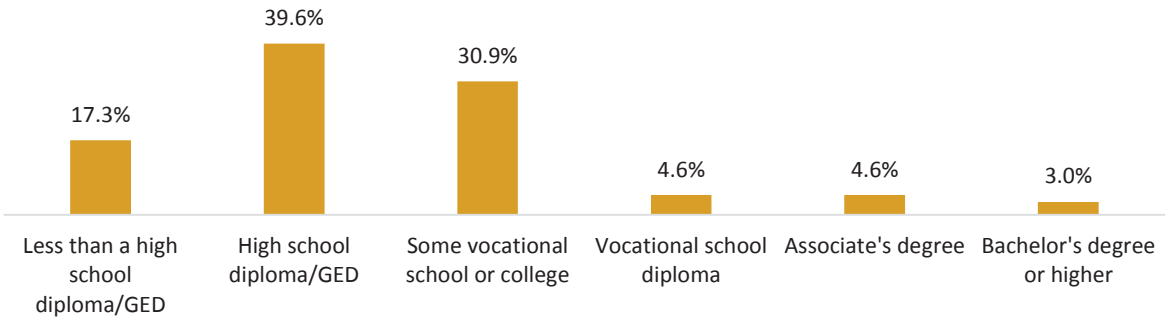
Table 1.1. Demographics for All KORTOS Clients at Intake (n = 517)

Age	35 years (Min. = 18, Max. = 66)
Gender	
Male	57.1%
Female	42.7%
Transgender	0.2%
Race	
White/Caucasian	96.3%
Black/African American	1.2%
Other or multiracial	2.5%
Marital status	
Never married	47.1%
Separated or divorced	26.6%
Married	24.3%
Widowed	1.9%
Have children under the age of 18 who live with them	44.6%

EDUCATION

Around 17% of clients had less than a high school diploma or GED at intake (see Figure 1.1). The highest level of education of 39.6% of the sample was a high school diploma or GED. Just over 30% of clients had completed some vocational/technical school or college and only a minority of clients had completed vocational/technical school (4.6%), an associate's degree (4.6%), or a bachelor's degree or higher (3.0%).

Figure 1.1. Highest Level of Education Completed at Intake (n = 501)[20]



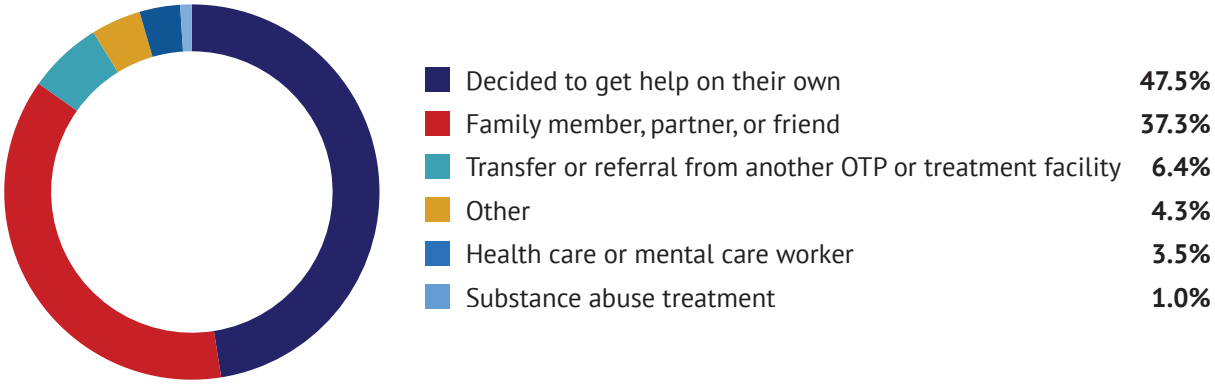
REFERRAL SOURCE

Figure 1.2 shows the treatment referral source for all KORTOS clients. More than one-third of

[20] Sixteen individuals had invalid data for years of education completed.

clients (37.3%) reported they were referred by a family member, partner or friend and 47.5% decided to get help on their own. A small percentage of clients (3.5%) were referred by a health care or mental health care worker, 6.4% were transferred or referred by another OTP, 1.0% were referred by a substance abuse treatment facility, and 4.3% were referred by other sources.

Figure 1.2 Referral Source for All KORTOS Clients at Intake (n = 517)



EMPLOYMENT

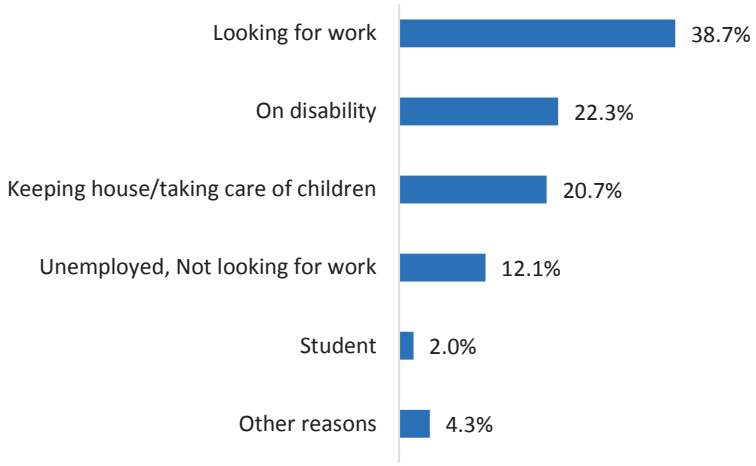
Two-fifths of clients (40.2%) reported they had not worked in the past 6 months, 12.9% had worked 1 to 3 months, and 46.9% had worked 4 or more months (not depicted in figure). Nearly two-fifths of individuals reported they were currently employed full-time (38.0%), 49.4% reported being unemployed, and 12.5% were employed part-time or had occasional or seasonal employment (see Figure 1.3). Among those who reported being employed full or part-time at intake (n = 254), the median hourly wage was $12.00.[21]

Figure 1.3. Current Employment Status at Intake (n = 517)

Figure 1.4 shows that of the individuals who were currently unemployed at intake (n = 255), around two-fifths stated they were looking for work (38.7%), 22.3% were on disability, 20.7% were keeping the house or taking care of children full-time at home, 12.1% were unemployed and not looking for work, 2.0% were students, and the remaining 4.3% gave other reasons for not being employed (e.g., on furlough or temporarily laid off, retired, other health problems prevented them from work but they weren't on disability, or in a controlled environment).

[21] Eight clients had missing or invalid data for hourly wage at intake.

Figure 1.4. Of Those Unemployed, Reasons for Being Unemployed (n = 255)

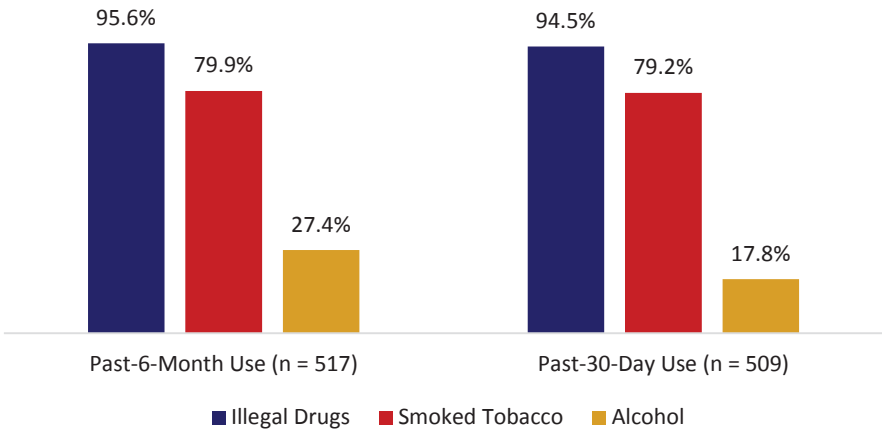


SUBSTANCE USE

The majority of clients who completed an intake interview reported using illegal drugs[22] (95.6%) and smoking tobacco (79.9%) while over one-quarter of clients reported using alcohol (27.4%) in the 6 months before intake (see Figure 1.5). The drug classes reported by the greatest number of clients were prescription opioids/opiates[23] (70.7%), heroin (58.9%), marijuana (53.5%), and tranquilizers (36.9%).

Because being in a controlled environment reduces opportunities for substance use, individuals who were in a controlled environment all 30 days before entering treatment (n = 8) are not included in the analysis of substance use in the 30 days before entering treatment. Of the 509 individuals who were not in a controlled environment all 30 days, 94.5% reported using illegal drugs, 79.2% reported smoking tobacco, and 17.8% reported using alcohol in the 30 days before entering treatment.

Figure 1.5. Alcohol, Drug, and Tobacco Use 6 Months and 30 Days Before Treatment



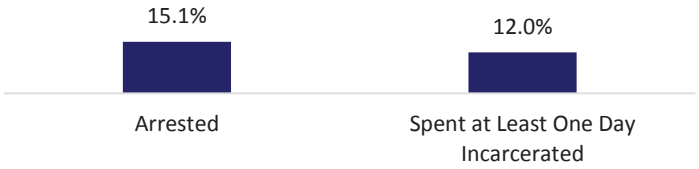
[22] Of note, seven individuals reported no drug use in the past 6 months at intake.

[23] For brevity's sake, the class of substances including prescription opiates and opioids will be referred to as opioids.

CRIMINAL JUSTICE INVOLVEMENT

Fewer than 1 in 6 individuals reported being arrested at least once (15.1%) and 1 in 8 reported being incarcerated at least one night (12.0%) in the 6 months before entering treatment (see Figure 1.6). Among those who were arrested (n = 78), they were arrested an average of 2.1 times. Among those who were incarcerated (n = 62), they were incarcerated an average of 20.1 nights.

Figure 1.6. Criminal Justice Involvement 6 Months Before Treatment at Intake (n = 517)



KORTOS FOLLOW-UP SAMPLE

Follow-up interviews are targeted to be conducted with a selected sample of KORTOS clients about 6 months after the intake interview is completed. At the completion of the intake interview, program staff inform individuals about the KORTOS follow-up study and ask if they are interested in participating. Clients who agree to participate are asked to provide contact information. All individuals who agree to be contacted by UK CDAR for the follow-up interview and have given at least one mailing address and one phone number, or two phone numbers if they do not have a mailing address in their locator information, are eligible for the follow-up component of the study. All eligible individuals are then selected by the month in which they completed intake interviews.[24]

Of the 517 clients who completed an intake interview, 268 agreed to be contacted for the follow-up interview (51.7% agreement rate).[25] A total of 233 provided the required contact information at the end of the intake interview and were selected into the follow-up sample, and of these, 208 were eligible for the follow-up interview about 6 months later. To be eligible for the follow-up study, clients had to still be in an OTP at the time of the follow-up interview and not in a controlled environment.[26] Of these 208 eligible clients, UK CDAR interviewers completed follow-up assessments with 175 clients (84.1% follow-up rate).

Follow-up procedures for the outcome study use several best practices. First, the follow-up assessments are conducted independently from the treatment programs by UK CDAR staff. Second, UK CDAR has over 20 years of extensive experience following people up for studies and staff are extensively trained, supervised, and monitored. Third, confidentiality of clients is protected through

[24] If a person has more than one intake interview in a given year, the interview with the earliest date will be selected into the follow-up sample.

[25] From this group of clients who voluntarily agreed to be contacted for the follow-up study, the research team pulled the follow-up sample by first identifying clients who had provided the minimum amount of contact information (e.g., two phone numbers or one phone number and one address), and then selecting those clients by intake month.

[26] Of the 233 clients selected into the follow-up sample, 13 were no longer at the OTP, 9 were incarcerated, and 3 were in a residential treatment program at the time of follow-up.

specific study procedures, UK human subjects protections, and through a federal certificate of confidentiality. Clients are provided with full information about their rights as a research subject and the protections for confidentiality provided by the study. Clients must consent to the study twice, once at the completion of the intake interview and once when on the phone for the follow-up interview. In 2015, no clients refused follow-up participation and there was a high follow-up rate (84.1%). This means that only 15.9% of individuals included in the sample to be followed up were not successfully contacted within the targeted eligibility time period.[27]

This report describes outcomes for 175 adults who participated in a Kentucky OTP and who completed an intake interview and a follow-up telephone interview about 5 months (average of 147.0 days) after the intake interview was completed. Detailed information about the methods and follow-up efforts can be found in Appendices A and B.

[27] 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.

KORTOS 2015 Quality of Data and Locator Efforts

For the 2015 follow-up study, 350 participants were included in the sample of individuals to be followed up from July 2013 to June 2014. Efforts to locate and contact these participants were examined.

Of these clients, 223 completed a follow-up survey for a follow-up rate of 82.6%.

PHONE CALLS

2,955
ESTIMATED TOTAL CALLS

- **6.2** — An estimated total of 2,182 calls were made to client phone numbers, an average of 6.2 per client.
- **2.4** — An estimated total of 773 calls were made to contact phone numbers, an average of 2.4 per client.
- **84%** — 5 out of 6 clients had at least one unique contact phone number.

MAILINGS

675
ESTIMATED TOTAL MAILINGS

- **1.9** — An estimated total of 649 mailings were sent to a client address, an average of 1.9 per client.
- **0.1** — An estimated total of 26 mailings were sent to contact addresses, an average of 0.1 per client.
- **29%** — Almost 30% of clients had at least one complete, unique contact address.

ONLINE SEARCH

Client information was verified through external search in cases where client contact information was incomplete or incorrect. Overall, approximately 41% of all clients were searched to verify correct information and 20.8% of all clients were searched in-depth.

INTERNET SEARCHES

- **92%** — of all clients were searched with light effort (i.e., verification, VINE, Whitepages)
- **53%** — of all clients were searched with medium effort (i.e., social media, other public directory databases)
- **29%** — of all clients were searched with in-depth effort (i.e., in-depth searching methods)

Of the 175 adults who completed a 6-month follow-up interview, 44.6% were male and 55.4% were female. Most follow-up clients were White (94.9%), 1.7% were African American and 3.4% were Hispanic, American Indian, or multiracial. They were an average of 34.7 years old. Half of the clients were never married (50.3%), 25.7% were separated or divorced, 21.1% were married, and 2.9% were widowed. Nearly half of follow-up clients (43.4%) had at least one child under age 18 who was living with them.

TABLE 1.2. DEMOGRAPHICS FOR KORTOS FOLLOW-UP CLIENTS AT INTAKE (N = 175)

Age	34.7 years (range of 21 - 65)
Gender	
Male	44.6%
Female	55.4%
Transgender	0.0%
Race	
White/Caucasian	94.9%
Black/African American	1.7%
Other or multiracial	3.4%
Marital status	
Never married	50.3%
Separated or divorced	25.7%
Married	21.1%
Widowed	2.9%
Have children under the age of 18 who live with them	43.4%

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 some significant differences for demographics, substance use, mental health, physical health, economic hardship, and criminal justice involvement.

Specifically, more females completed a follow-up interview than did not and many of the significant differences, therefore, may be due to gender differences between the two groups. More of the clients who completed a follow-up interview reported they had depression, generalized anxiety, a chronic medical problem, and had difficulty meeting basic living and health care needs for financial reasons when compared to clients who were not followed up. Significantly more clients who were followed up reported a higher number of average arrests, being incarcerated, as well as using non-prescribed methadone and heroin when compared to clients who did not complete a follow-up interview.

See Appendix C for detailed comparisons of clients who completed a follow-up interview (n = 175) and clients who did not complete a follow-up interview (n = 342).

Section 2.
SUBSTANCE USE

This section describes change in illegal drug, alcohol, and tobacco use for adult clients from intake to follow-up. Past-6-month substance use is examined as well as past-30-day substance use for clients who were not in a controlled environment all 30 days before entering treatment or the follow-up interview. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

Changes in illegal drug, alcohol, and tobacco use before entering the program and during the 6-month follow-up period are presented in this section. In addition to examining the overall use of illegal drugs, several specific categories of illegal drugs were examined including: (a) prescription opioid misuse (including opioids such as morphine, Percocet, Oxycontin, Lortab), (b) non-prescribed methadone, (c) non-prescribed buprenorphine-naloxone (bup-nx), (d) heroin, and (e) non-opioid drugs other than those mentioned above (including marijuana, cocaine, amphetamines, tranquilizers, hallucinogens, inhalants, and barbiturates). Analysis is presented in detail for KORTOS study participants who were not in a controlled environment for the entire period of 6 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:

- **Change in past-6-month substance use from intake to follow-up.** Comparison of any illegal drugs, prescription opioid misuse, non-prescribed methadone, non-prescribed bup-nx, heroin, other non-opioid drug use, alcohol, and tobacco in the 6 months before the client entered the program and use of these substances during the 6-month follow-up period (n = 175) are presented.

- **Average number of months clients used substances at intake and follow-up.** For those who used any illegal drugs, alcohol, or tobacco, the average number of months of use before program entry and during the follow-up period are reported.

- **Change in 30-day substance use from intake to follow-up.** Comparison of any illegal drugs, prescription opioid misuse, non-prescribed methadone, non-prescribed bup-nx, heroin, other non-opioid drug use, alcohol, and tobacco use in the 30 days before the client entered the program and during the follow-up period (n = 169) is presented.[28]

- **Change in self-reported alcohol and drug composite scores from intake to follow-up.** The Addiction Severity Index (ASI) composite scores are examined for change over time for illegal drugs (n = 163), alcohol (n = 26) and those with both alcohol and illegal drug use among clients who used drugs and/or alcohol (n = 163). The ASI composite score assesses self-reported addiction severity even among those reporting no substance use in the past 30 days. The alcohol and drug composite scores are computed from items about 30-day alcohol (or drug) use and the number of days individuals used multiple drugs in a day, as well as the

[28] Six individuals were in a controlled environment all 30 days before intake and were not included in past-30-day analysis.

impact of substance use on the individual's life, such as money spent on alcohol, number of days individuals had alcohol (or drug) problems, how troubled or bothered individuals were by their alcohol (or drug) problems, and how important treatment was to them.

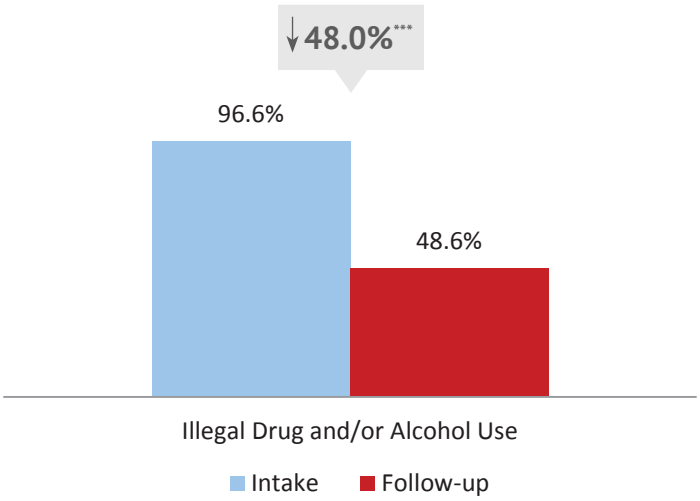
ALCOHOL AND/OR DRUG USE

PAST-6-MONTH ALCOHOL AND/OR DRUG USE

The majority of clients (96.6%) reported using alcohol and/or illegal drugs in the 6 months before entering the program, which decreased to 48.6% at follow-up. This was a 48.0% significant decrease in the number of clients reporting use of alcohol and/or illegal drugs (see Figure 2.1).

The number of clients reporting alcohol and/or illegal drug use decreased by 48%

FIGURE 2.1. PAST 6-MONTH ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 175)



***p < .001.

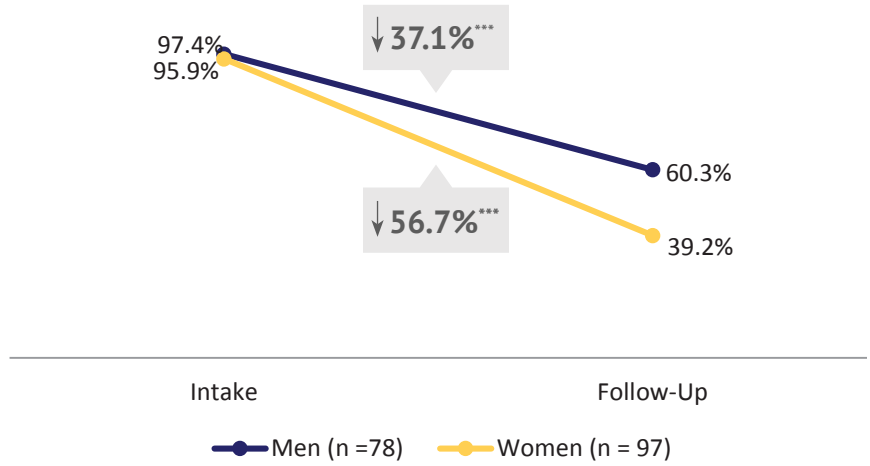
Gender Difference in Past-6-month Alcohol and/Or Drug Use

While the percent of both men and women who reported past-6-month alcohol and/or drug use significantly decreased from intake to follow-up (37.1% and 56.7%, respectively), significantly more men reported using alcohol and/or drugs at follow-up (see Figure 2.2).

"The counseling is great. It helped me stay sober for over a year now."

—KORTOS Follow-up Client

Figure 2.2. Gender Differences in Past-6-month Alcohol and/or Drug Use at Intake and Follow-up[a]



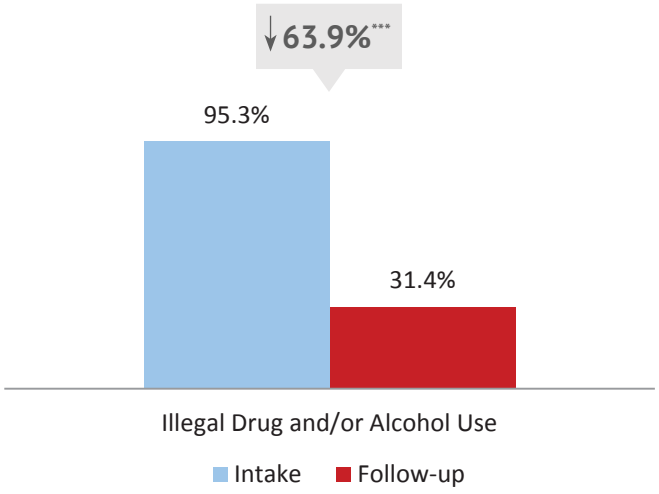
*** p < .001.
a—Significant difference by gender at follow-up, p < .01.

PAST-30-DAY ALCOHOL AND/OR DRUG USE

The majority of clients (95.3%) reported using alcohol and/or illegal drugs in the 30 days before entering the program, which decreased to 31.4% at follow-up. This was a 63.9% significant decrease (see Figure 2.3).

The number of clients reporting alcohol and/or illegal drug use in the past 30 days decreased by 64%

Figure 2.3. Past 30-day Alcohol and/Or Drug Use at Intake and Follow-up (n = 169)

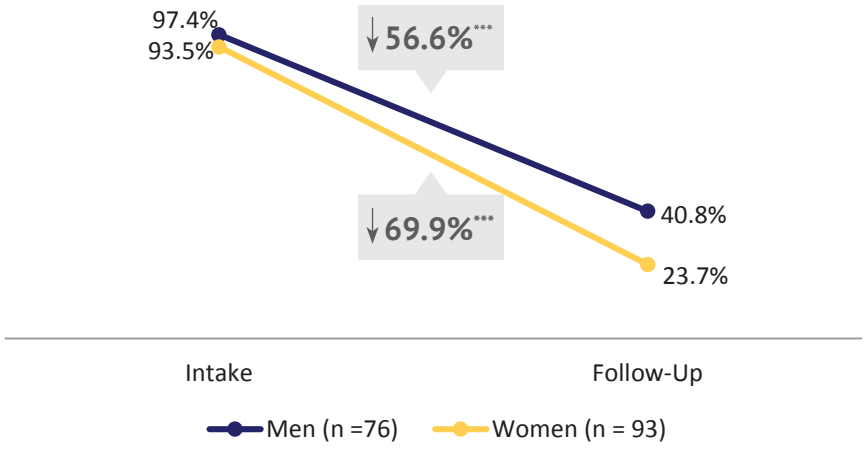


***p < .001.

Gender Difference in Past-30-day Alcohol and/Or Drug Use

Significantly more men than women reported past-30-day alcohol and/or drug use at follow-up (see Figure 2.4). The number of men and women who reported alcohol and/or drug use in the past 30 days decreased over time (56.6% and 69.9%, respectively).

Figure 2.4. Gender Differences in Past-30-day Alcohol and/or Drug Use at Intake and Follow-up[a]



*** p < .001.
a—Significant difference by gender at follow-up, p < .05.

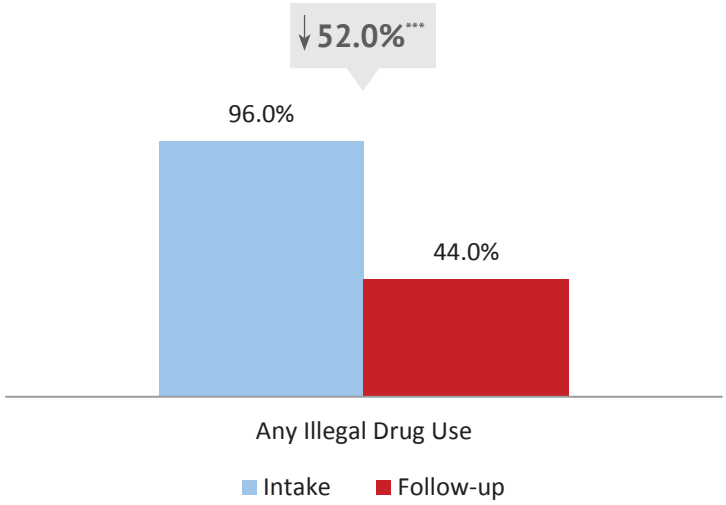
ANY ILLEGAL DRUGS

PAST-6-MONTH ANY ILLEGAL DRUG USE

Almost all clients (96.0%) reported using illegal drugs in the 6 months before entering the program, which decreased to 44.0% at follow-up. This was a 52.0% significant decrease in the number of clients reporting use of any illegal drugs (see Figure 2.5).

The number of clients reporting illegal drug use decreased by 52%

Figure 2.5. Past-6-month Illegal Drug Use at Intake and Follow-up (n = 175)

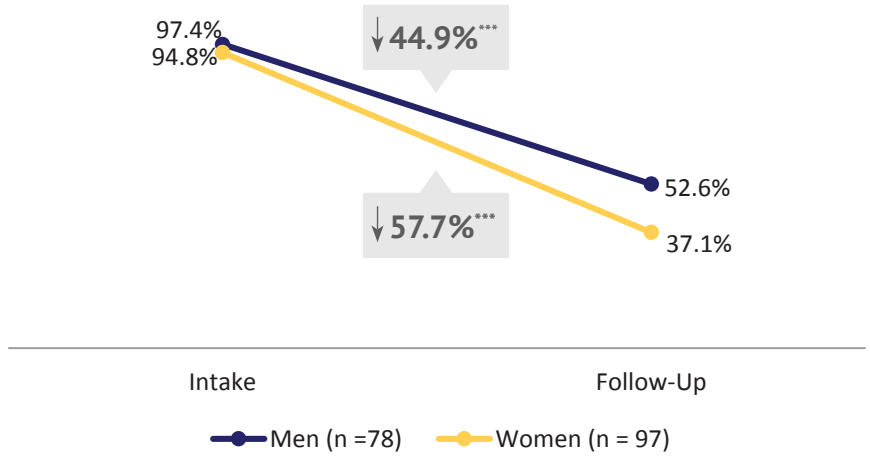


***p < .001.

Gender Difference in Past-6-month Illegal Drug Use

Both men and women saw a significant decrease in past-6-month illegal drug use over time, however, significantly more men reported illegal drug use at follow-up compared to women (see Figure 2.6).

Figure 2.6. Gender Differences in Past-6-month Illegal Drug Use at Intake and Follow-up[a]



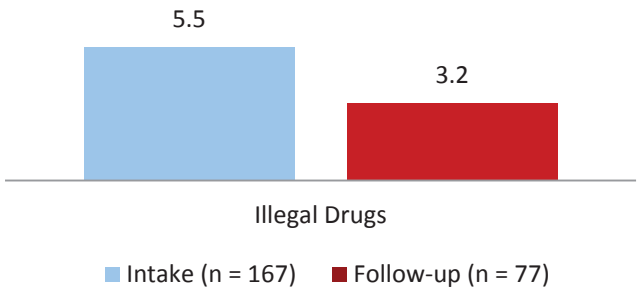
***p < .001.

a—Significant difference by gender at follow-up, p < .05.

Average Number of Months Used Any Illegal Drugs

Clients who reported any illegal drug use at intake (n = 167) reported an average maximum of 5.5 months of use. Among clients who reported any illegal drug use in the 6 months before follow-up (n = 77), the maximum number of months they reported using any drug was, on average, 3.2 months (see Figure 2.7).

Figure 2.7. Average Number of Months Clients Used Illegal Drugs



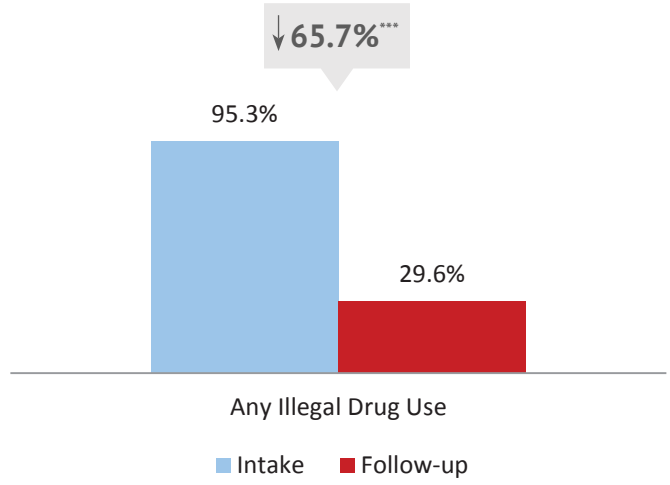
PAST-30-DAY ANY ILLEGAL DRUG USE

There was a significant 65.7% decrease in past-30-day illegal drug use (see Figure 2.8). At intake, 95.3% of clients reported any illegal drug use in the 30 days before entering the

There was a significant reduction of 66% in the number of clients who reported past 30-day illegal drug use

program and at follow-up, 29.6% of clients reported any illegal drug use in the past 30 days.

Figure 2.8. Past-30-day Use of Any Illegal Drugs at Intake and Follow-up (n = 169)



***p < .001.

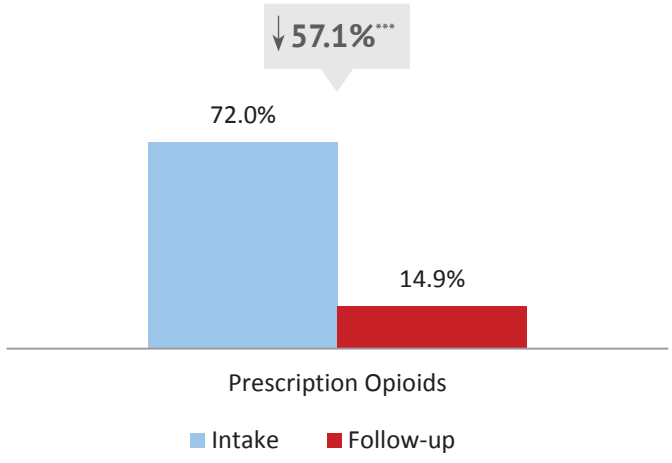
PRESCRIPTION OPIOID MISUSE

PAST-6-MONTH PRESCRIPTION OPIOID MISUSE

Nearly three-fourths of clients (72.0%) reported misusing prescription opioids (such as morphine, Percocet, Oxycontin, Lortab) in the 6 months before program entry. At follow-up, 14.9% of clients reported misusing prescription opioids (see Figure 2.9). This means there was an 57.1% significant decrease in the number of clients reporting prescription opioid misuse.

The number of clients reporting prescription opioid misuse decreased by 57%

Figure 2.9. Past-6-month Prescription Opioid Misuse at Intake and Follow-up (n = 175)

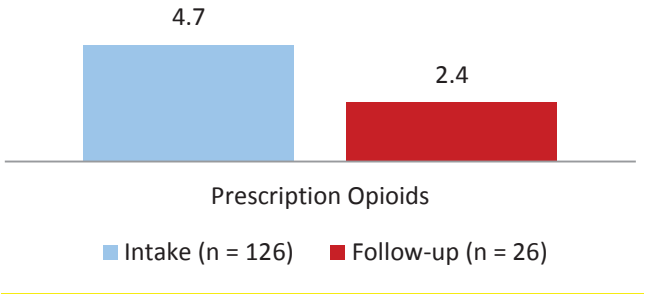


***p < .001.

Average Number of Months Misused Prescription Opioids

Figure 2.10 shows the average number of months prescription opioid users reported misusing prescription opioids at intake and during the 6-month follow-up. Among the clients who reported misusing prescription opioids before entering the program (n = 126), clients reported using prescription opioids an average of 4.7 of the 6 months. Among clients who reported misusing opioids at follow-up (n = 26), clients reported using an average of 2.4 of the 6 months before follow-up.

Figure 2.10. Average Number of Months Clients Used Prescription Opioids

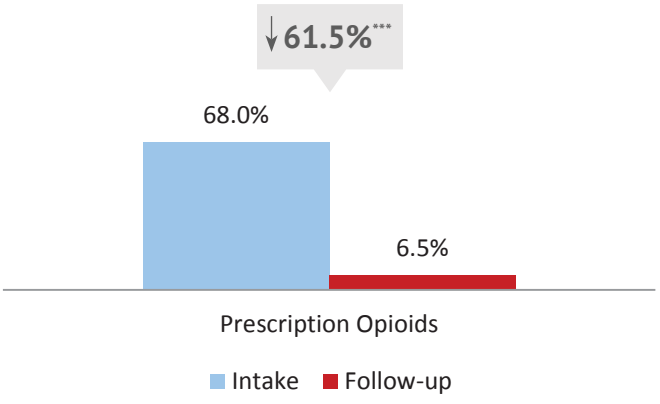


PAST-30-DAY PRESCRIPTION OPIOID MISUSE

At intake, 68.0% of clients reported misuse of prescription opioids and at follow-up, 6.5% of clients reported use of prescription opioids (see Figure 2.11). This reflects a significant decrease of 61.5% in the number of clients reporting misuse of prescription opioids.

The number of clients who misused opioids decreased significantly by 62%

Figure 2.11. Past-30-day Prescription Opioid Misuse at Intake and Follow-up (n = 169)



***p < .001.

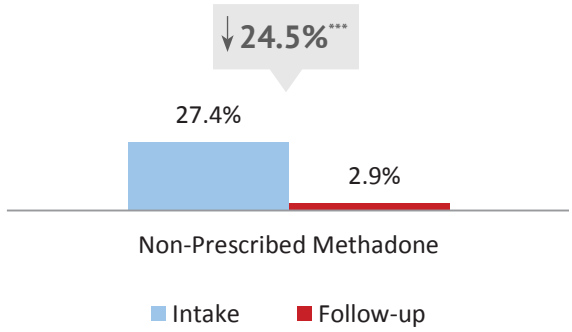
NON-PRESCRIBED USE OF METHADONE

PAST-6-MONTH NON-PRESCRIBED USE OF METHADONE

Nearly 3 in 10 clients reported using non-prescribed methadone in the 6 months before intake (see Figure 2.12). At follow-up, only 2.9% of clients reported non-prescribed use of methadone. This was a 24.5% significant decrease in the number of clients reporting non-prescribed use of methadone.

25% fewer clients reported non-prescribed methadone use at follow-up

Figure 2.12. Past-6-month Non-prescribed Methadone Use at Intake and Follow-up (n = 175)

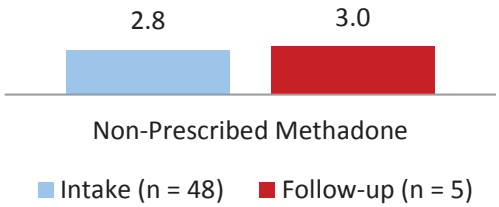


***p < .001.

Average Number of Months Used Non-prescribed Methadone

Among the clients who reported non-prescribed use of methadone in the 6 months before entering the program (n = 48), they reported using, on average, 2.8 months (see Figure 2.13). Among clients who reported non-prescribed use of methadone in the 6 months before follow-up (n = 5), they reported using an average of 3 out of 6 months.

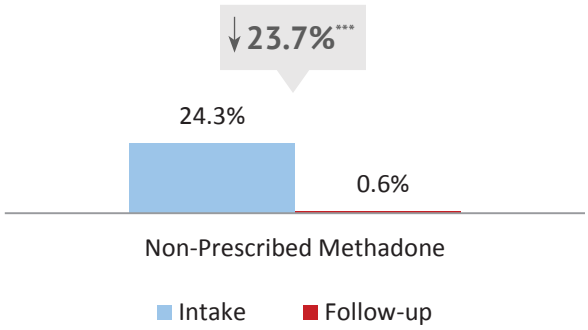
Figure 2.13. Average Number of Months Clients Used Non-prescribed Methadone



PAST-30-DAY NON-PRESCRIBED USE OF METHADONE

One quarter of clients (24.3%) reported using non-prescribed methadone in the 30 days before entering the program (see Figure 2.14). At follow-up only 0.6% of clients reported past-30-day use of non-prescribed methadone. This was a 23.7% significant decrease.

Figure 2.14. Past-30-day Non-prescribed Methadone Use at Intake and Follow-up (n = 169)



***p < .001.

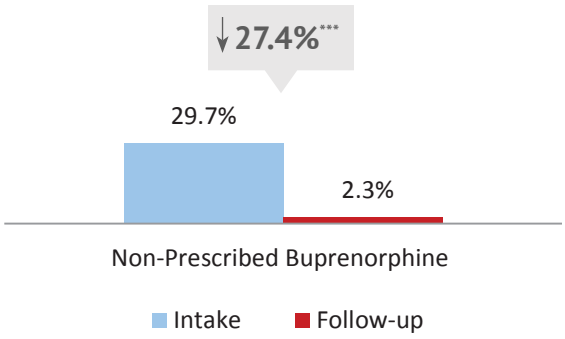
NON-PRESCRIBED USE OF BUP-NX

PAST-6-MONTH NON-PRESCRIBED USE OF BUP-NX

Figure 2.15 shows that 3 in 10 clients (29.7%) reported using non-prescribed bup-nx in the 6 months before intake. At follow-up, only 2.3% of clients reported using non-prescribed bup-nx – a significant decrease of 27.4%.

27% fewer clients reported bup-nx use at follow-up

Figure 2.15. Past-6-month Non-prescribed Use of Bup-nx at Intake and Follow-up (n = 175)

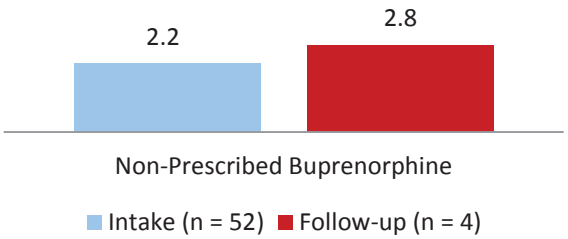


***p < .001.

Average Number of Months Used Non-prescribed Bup-nx

Among the clients who reported non-prescribed use of bup-nx in the 6 months before entering the program (n = 52), they used non-prescribed bup-nx, on average, 2.2 months (see Figure 2.16). At follow-up, those who reported non-prescribed bup-nx use (n = 4), reported using, on average, 2.8 months out of the past 6.

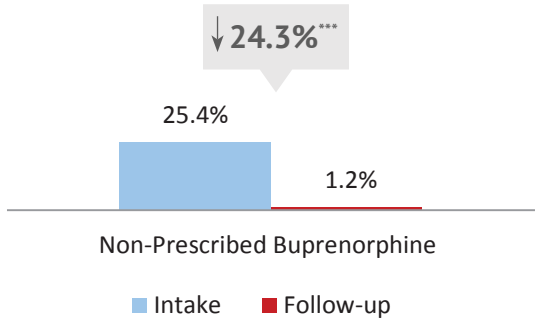
Figure 2.16. Average Number of Months Clients Used Non-prescribed Bup-nx



PAST-30-DAY NON-PRESCRIBED USE OF BUP-NX

One quarter of clients (25.4%) reported using non-prescribed bup-nx in the 30 days before entering the program (see Figure 2.17). At follow-up, only 1.2% of clients reported past-30-day use of non-prescribed bup-nx – a significant decrease of 24.3%.

Figure 2.17. Past-30-day Non-prescribed Bup-nx Use at Intake and Follow-up (n = 169)



***p < .001.

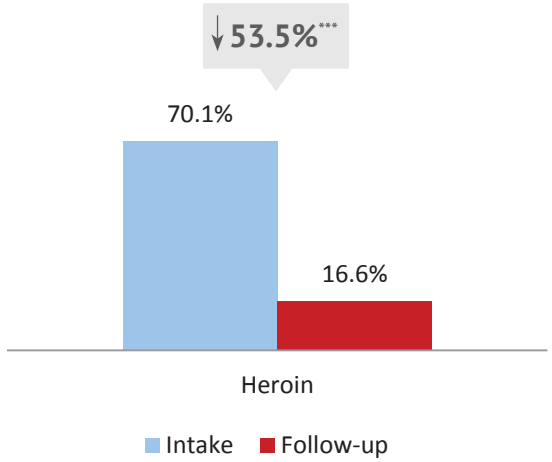
HEROIN

PAST-6-MONTH HEROIN USE

Seven out of ten clients (70.1%) reported using heroin in the 6 months before entering treatment, which significantly decreased 53.5% to 16.6% at follow-up (see Figure 2.18).

The number of clients reporting heroin use decreased by 54%

Figure 2.18. Past-6-month Heroin Use at Intake and Follow-up (n = 175)

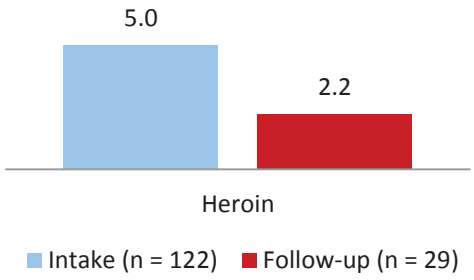


***p < .001.

Average Number of Months Used Heroin

Among the clients who reported using heroin in the 6 months before entering treatment (n = 122), they reported using heroin, on average, 5.0 months (see Figure 2.19). Among clients who reported using heroin in the 6 months before follow-up (n = 29), they reported using, on average, 2.2 months.

Figure 2.19. Average Number of Months Clients Used Heroin

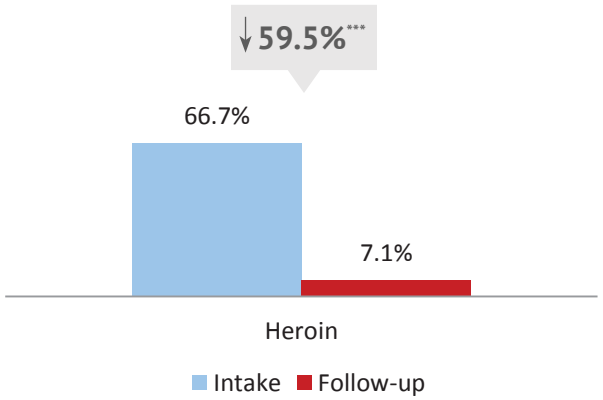


PAST-30-DAY HEROIN USE

Two-thirds of clients (66.7%) reported using heroin in the 30 days before intake. At follow-up, 7.1% reported using heroin in the past 30 days, a significant decrease of 59.5% (see Figure 2.20).

The number of clients who used heroin decreased significantly by 60%

Figure 2.20. Past-30-day Heroin Use at Intake and Follow-up (n = 169)



***p < .001.

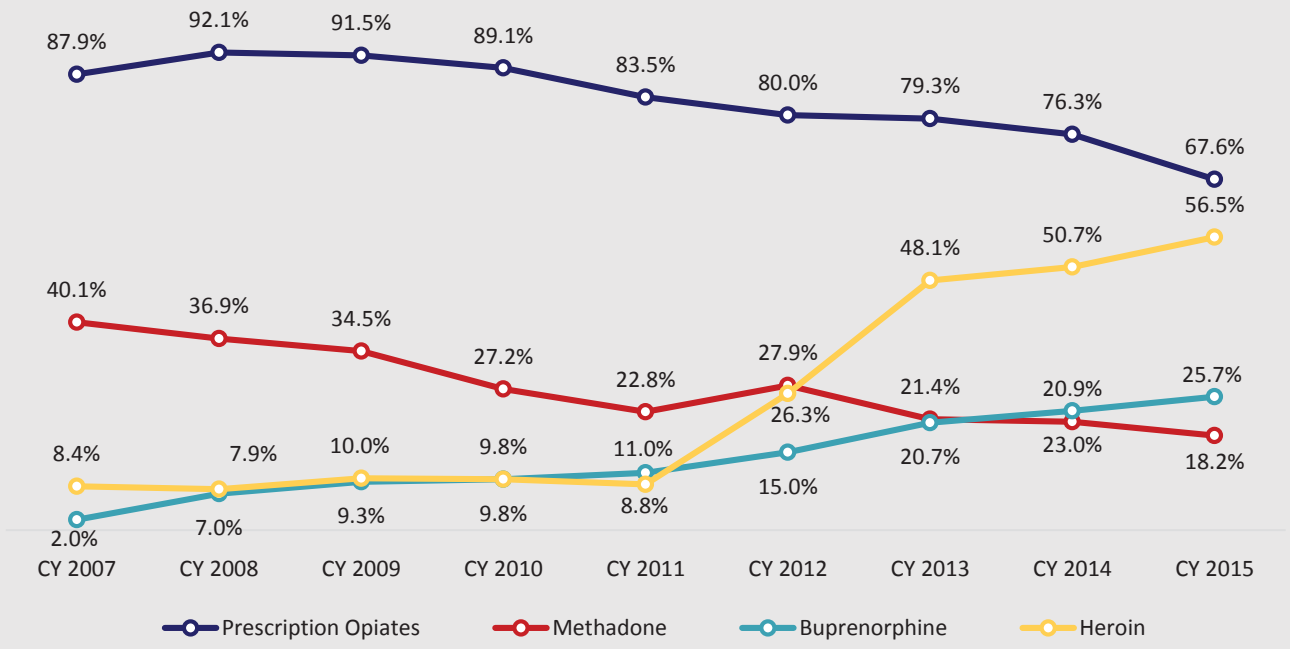
TREND REPORT

PAST-30-DAY OPIOID USE

When looking at trends over time for all clients with completed intake interviews, the percent of clients using prescription opioids peaked in calendar year 2008 and has steadily dropped. The percent of clients who reported using non-prescribed methadone before entering treatment showed a decline from calendar year 2007 to 2011 and again from 2012 to 2015. The percent of clients who reported using bup-nx remained stable from 2007 through 2011 and then increased between 2012 and 2015.

The most notable change in substance use among KORTOS clients, however, is for heroin. Small percentages of KORTOS clients reported using heroin from 2007 through 2011. Then in 2012, the percent tripled from 8.8% in 2011 to 26.3% and then nearly doubled from 26.3% in 2012 to 48.1% in 2013. The percent of KORTOS clients reporting heroin use at intake in 2014 increased again to 50.7% and further still to 56.5% in 2015. These trends are very similar when examining only those clients who were followed-up (see Appendix D).

Percent of All Clients With a Completed Intake Interview Reporting Non-Prescribed Use of Prescription Opioids, Methadone, Bup-nx, and Heroin in the 30 Days Before Entering Treatment at the OTP (N = 8,060)[29], [30]



[29] Clients who reported being in a controlled environment all 30 days before entering treatment (n = 76) were not included in this analysis.

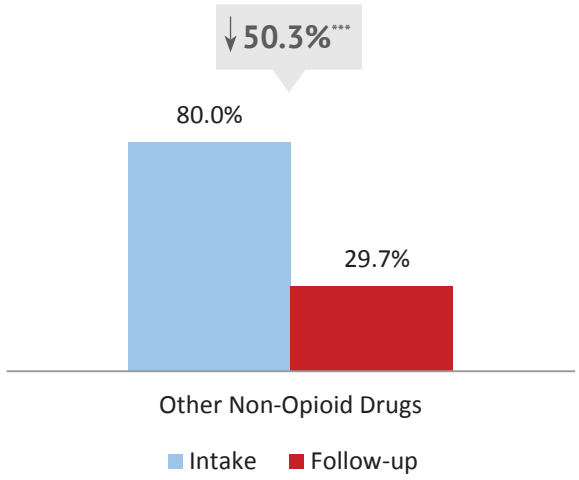
[30] Two clients in CY 2015 had missing data for past-30-day heroin use at intake.

NON-OPIOID DRUG USE

PAST-6-MONTH USE OF NON-OPIOID DRUGS

Eight in ten clients used illegal drugs other than prescription opioids, non-prescribed methadone, non-prescribed bup-nx, or heroin in the 6 months before entering the program (see Figure 2.21). Drugs in this category include marijuana, cocaine, amphetamines, tranquilizers, hallucinogens, inhalants, barbiturates, and synthetic drugs like synthetic marijuana or bath salts. The number of clients who reported use of non-opioid drugs decreased to 29.7% at follow-up (a significant decrease of 50.3%).

Figure 2.21. Past-6-month Non-opioid Drug Use at Intake and Follow-up (n = 175)

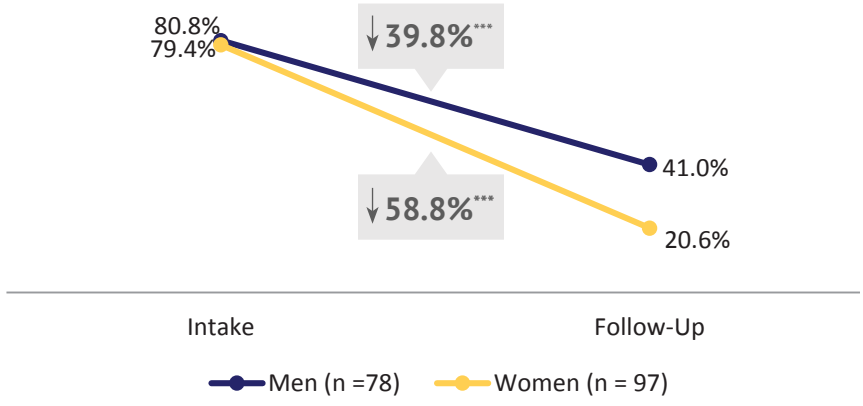


***p < .001.

Gender Difference in Past-6-month Non-opioid Drug Use

There were significant decreases for both men and women in the number reporting past-6-month non-opioid drug use, however, by follow-up nearly double the percent of men (41.0%) reported using non-opioid drugs when compared to women (20.6%).

Figure 2.22. Gender Differences in Past-6-month Non-opioid Drug Use at Intake and Follow-up[a]

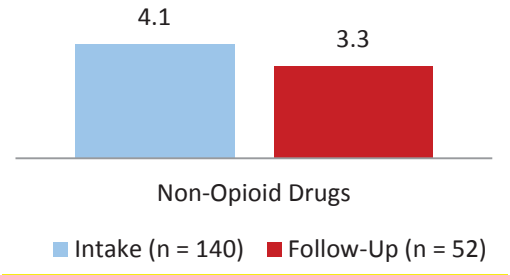


***p < .001.
a—Significant difference by gender at follow-up, p < .01.

Average Number of Months Used Non-opioid Drugs

Figure 2.23 shows the maximum number of months clients that used non-opioid drugs reported using these illegal drugs (e.g., marijuana, cocaine, amphetamine, tranquilizers, barbiturates, inhalants, hallucinogens, synthetic drugs).[31] Among the clients who reported using non-opioid drugs at intake (n = 140), the maximum number of months clients reported using any of these drugs was an average of 4.1 months. Among clients who reported using non-opioid drugs at follow-up (n = 52), the maximum average number of months clients reported using any of these drugs was 3.3 months.

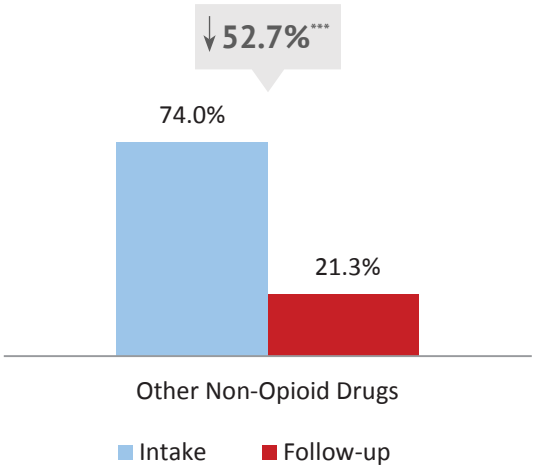
Figure 2.23. Average Maximum Number of Months Clients Used Non-opioid Drugs



PAST-30-DAY USE OF NON-OPIOID DRUGS

Nearly three out of four clients (74.0%) reported using non-opioid drugs in the 30 days before intake (see Figure 2.24). At follow-up, 21.3% of clients reported non-opioid drug use, which is a 52.7% significant decrease.

FIGURE 2.24. PAST-30-DAY NON-OPIOID DRUG USE AT INTAKE AND FOLLOW-UP (N = 169)



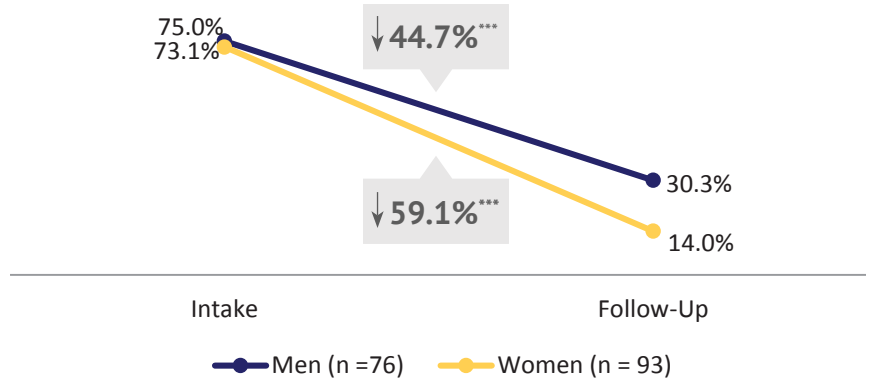
***p < .001.

[31] Because number of months of use of each class of substance was measured separately (e.g., marijuana, cocaine, amphetamines, tranquilizers, barbiturates, inhalants, hallucinogens, synthetic drugs), the value is a calculation of the maximum number of months clients used any substance class.

Gender Difference in Past-30-day Non-opioid Drug Use

Past-30-day use of non-opioid drugs significantly decreased for both men and women (see Figure 2.25), however, at follow-up, significantly more men (30.3%) reported non-opioid drug use when compared to women (14.0%).

Figure 2.25. Gender Differences in Past-30-day Non-opioid Drug Use at Intake and Follow-up[a]



***p < .001.
a—Significant difference by gender at follow-up, p < .05.

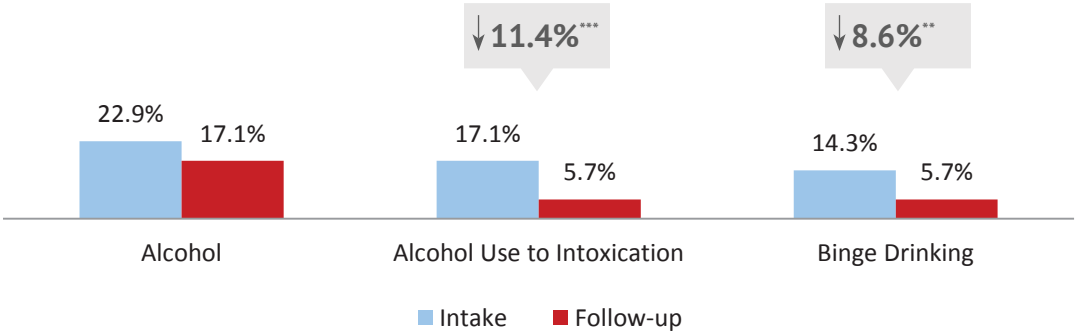
ALCOHOL USE

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 (4 or more if the client was female) alcoholic drinks in a period of about 2 hours.[32]

PAST-6-MONTH ALCOHOL USE

A little more than 1 in 5 clients (22.9%) reported using alcohol in the 6 months before entering treatment while 17.1% of clients reported alcohol use in the 6 months before follow-up (see Figure 2.26). Smaller percentages of clients reported using alcohol to intoxication (17.1%) or binge drinking (14.3%) at intake and there were significant decreases in those percentages by follow-up.

Figure 2.26. Past-6-month Alcohol Use at Intake and Follow-up (n = 175)



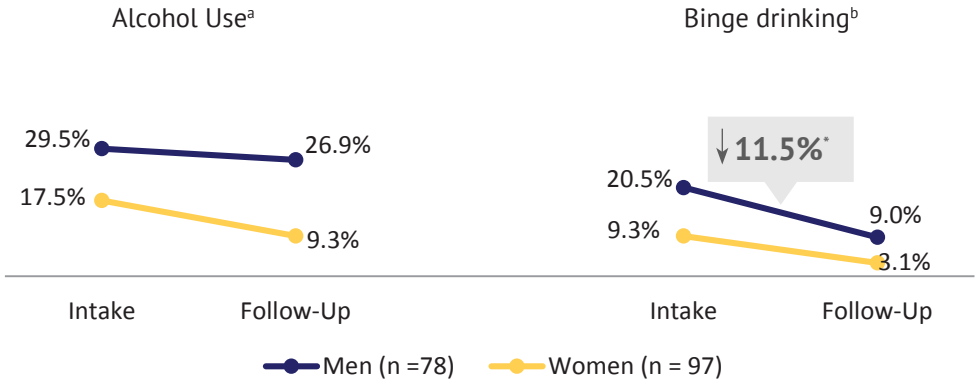
**p < .01, ***p < .001.

[32] National Institute on Alcohol Abuse and Alcoholism. (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.

Gender Differences in Past-6-month Alcohol Use and Binge Drinking

Significantly more men than women reported binge drinking in the 6 months before entering treatment and using alcohol in the 6 months before follow-up (see Figure 2.27). The number of men who reported binge drinking decreased significantly from intake (20.5%) to follow-up (9.0%).

Figure 2.27. Gender Differences Past-6-month Alcohol Use and Binge Drinking at Intake and Follow-up

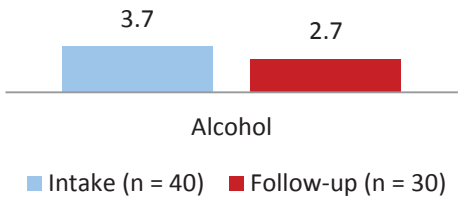


*p < .05.
a—Significant difference by gender at follow-up, p < .01.
b – Significant difference by gender at intake, p <.05.

Average Number of Months Used Alcohol

Figure 2.28 shows the average number of months alcohol users reported using alcohol at intake and follow-up. Among the clients who reported using alcohol in the 6 months before entering treatment (n = 40), they reported using alcohol, on average, 3.7 months. Among clients who reported using alcohol in the 6 months before follow-up (n = 30), they reported using an average number of 2.7 months.

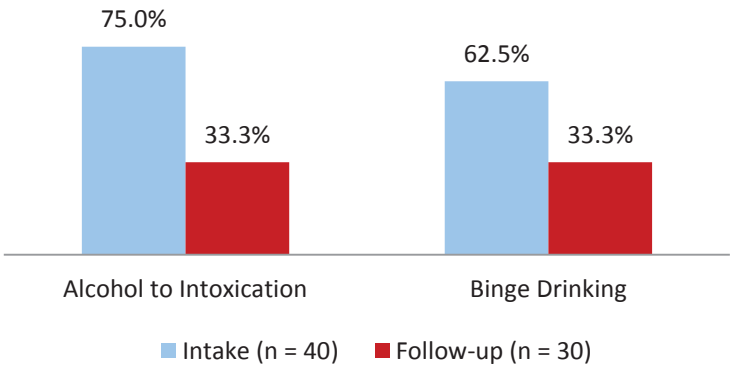
Figure 2.28. Average Number of Months of Alcohol Use



PAST-6-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL

Of the clients who used alcohol in the 6 months before entering treatment (n = 40), 75.0% used alcohol to intoxication and 62.5% reported binge drinking (see Figure 2.29). Of the clients who used alcohol in the 6 months before follow-up (n = 30), one-third of clients (33.3%) reported alcohol use to intoxication and binge drinking.

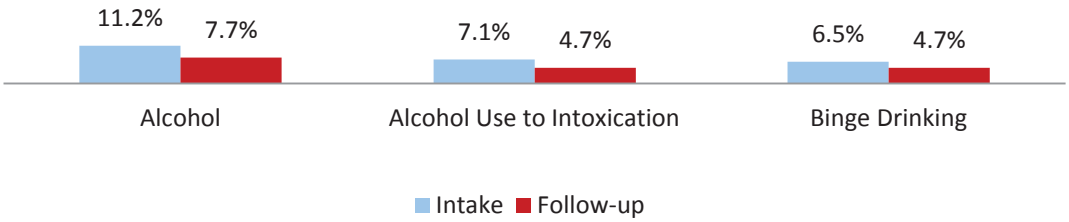
Figure 2.29. Past-6-month Alcohol Use to Intoxication and Binge Drinking at Intake and Follow-up, Among Those Reporting Alcohol Use at Each Point



PAST-30-DAY ALCOHOL USE

Small percentages of individuals reported using alcohol, alcohol use to intoxication, and binge drinking in the 30 days before intake and follow-up. There was no significant difference from intake to follow-up (see Figure 2.30).

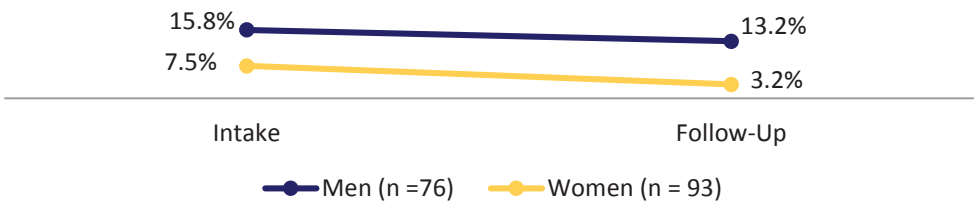
Figure 2.30. Past-30-day Alcohol Use at Intake and Follow-up (n = 169)



Gender Differences in Past-30-day Alcohol Use

Significantly more men (13.2%) than women (3.2%) used alcohol in the 30 days before follow-up (see Figure 2.31). There was no significant decrease in alcohol use from intake to follow-up for men or women.

Figure 2.31. Gender Differences in Past-30-day Alcohol Use at Intake and Follow-up[a]



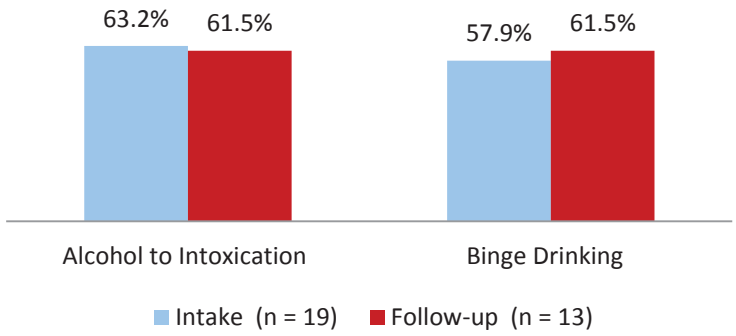
a—Significant difference by gender at follow-up, $p < .05$.

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

Of the 19 clients who used alcohol in the 30 days before intake, 63.2% used alcohol to intoxication and 57.9% binge drank in that time frame (see Figure 2.32).

Of the 13 clients who reported using alcohol in the 30 days before follow-up, 61.5% reported also using alcohol to intoxication and 61.5% reported binge drinking.

Figure 2.32. Past-30-day Alcohol Use to Intoxication and Binge Drinking at Intake and Follow-up, Among Those Reporting Alcohol Use at Each Point



SELF-REPORTED SEVERITY OF ALCOHOL AND DRUG USE

Another way to examine overall change in degree of severity of substance use is to calculate the Addiction Severity Index (ASI) composite scores for alcohol and drug use. These composite scores are computed based on self-reported severity of past 30-day alcohol and drug use, taking into consideration several issues including:

- The number of days of alcohol (or drug) use,
- Money spent on alcohol,
- The number of days individuals used multiple drugs (for drug use composite score),
- The number of days individuals experienced problems related to their alcohol (or drug) use,
- How troubled or bothered they are by their alcohol (or drug) use, and
- How important treatment is to them for their alcohol (or drug) problems (see sidebar).

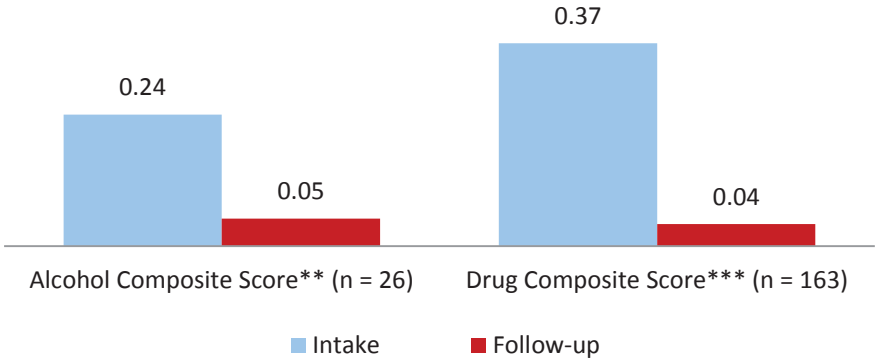
ASI Alcohol and Drug Composite Scores and Substance Dependence

Rikoon et al. (2006) conducted two studies to determine the relationship between the ASI alcohol and drug use composite scores and DSM-IV substance dependence diagnosis. They identified alcohol and drug use composite score cutoffs that had 85% sensitivity and 80% specificity with regard to identifying DSM-IV substance dependence diagnosis: .17 for alcohol composite score and .16 for drug composite score. These composite score cutoffs can be used to estimate the number of individuals who are likely to meet criteria for active alcohol or drug dependence and to show reductions in self-reported severity of substance use. In previous years we have used the ASI composite scores to estimate the number and percentage of clients who met a threshold for alcohol and drug dependence. However, recent changes in the diagnostics for substance abuse call into question the distinction between dependence and abuse. Thus, ASI composite scores that met the threshold can be considered indicative of severe substance use disorder to be compatible with current thinking about substance use disorders in the DSM-V (American Psychiatric Association, 2013), where we would have previously referred to them as meeting the threshold for dependence. Change from intake to follow-up in the severity rating has the same clinical relevance as moving from dependence to abuse in the older criteria.

Change in the average ASI composite score for alcohol and drug use was examined for clients who were not in a controlled environment all 30 days before entering treatment. Also, individuals who reported abstaining from alcohol at intake and follow-up were not included in the analysis of change for alcohol composite score. Similarly, clients who reported abstaining from drugs at both intake and follow-up were not included in the analysis of change in drug composite score.

Figure 2.33 displays the change in average composite scores from intake to follow-up. The average for the alcohol composite score significantly decreased from 0.24 to 0.05 and the average for the drug composite score decreased significantly from 0.37 to 0.04.

Figure 2.33. Average ASI Alcohol and Drug Composite Scores of Those Who Used Substances at Intake and/or Follow-up[33]



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

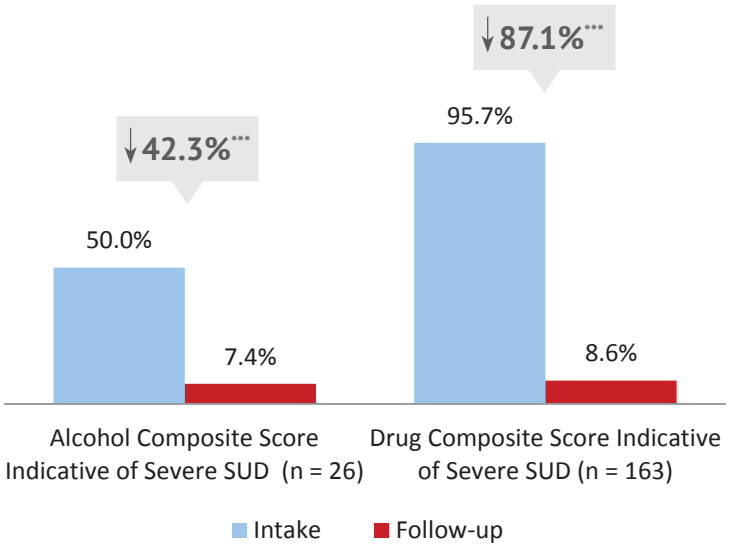
The percent of individuals who met the cutoff for severe substance use disorder for alcohol significantly decreased 42.3% from intake to follow-up (50.0% vs. 7.4%; see Figure 2.34). ASI drug composite scores that met the cutoff for severe substance use disorder (SUD) decreased significantly by 87.1% from intake (95.7%) to follow-up (8.6%).

"They care a lot about you there. They want you to succeed."

—KORTOS Follow-up Client

[33] Among clients who used alcohol in the 30 days before intake or follow-up (n = 27), one client had missing values on one of the items that is part of the calculation for the alcohol composite score at follow-up.

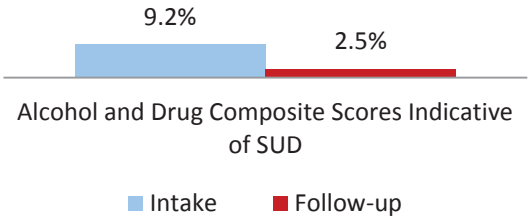
Figure 2.34. Of Those Who Used Substances, Individuals with ASI Composite Scores Meeting the Cutoff for Severe Substance Use Disorder at Intake and Follow-up



***p < .001.

Among the individuals who were not in a controlled environment all 30 days before entering the program and who reported using alcohol and/or drugs at intake and/or follow-up, 9.2% of clients had alcohol and drug composite scores that met the cutoff for severe SUD at intake (see Figure 2.35). That percent decreased slightly to 2.5% at follow-up.

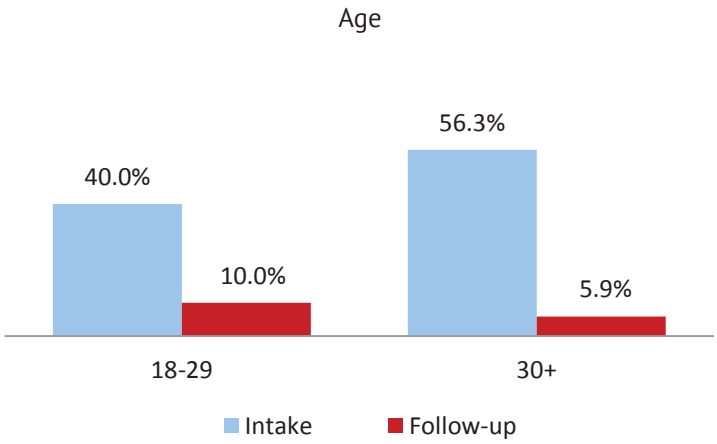
Figure 2.35. Of Those Who Used Substances, Clients with ASI Composite Scores Meeting the Cutoff for Both Alcohol and Drug Severe Substance Use Disorders at Intake and Follow-up (n = 163)



The data were examined to determine whether clients who had alcohol composite scores indicative of severe SUD at intake and follow-up differed by age (see Figure 2.36).[34] There were no differences between age groups at intake or follow-up.

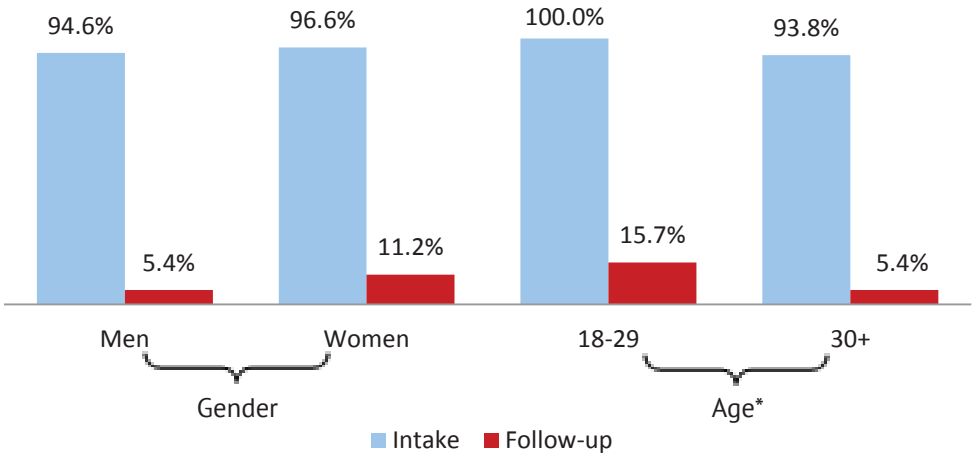
[34] Gender was not included in the analysis because there were only 8 female clients and race/ethnicity was not included in the analysis because there were only 2 clients who were considered non-white or multi-racial among alcohol-using clients.

Figure 2.36. Alcohol-using Clients with an Alcohol Composite Score Indicative of Severe SUD at Intake and Follow-up by Demographic Factors (n = 26)



Analyses were also conducted to determine if clients who had a drug composite score indicative of severe SUD at intake and follow-up differed by gender or age (see Figure 2.37).[35] There was no significant difference between men and women. However, significantly more 18-29-year-old clients had a drug composite score indicative of severe SUD at follow-up when compared to those who were 30 or older.

Figure 2.37. Drug-using Clients with a Drug Composite Score Indicative of Severe SUD at Intake and Follow-up by Demographic Factors (n = 163)



*p < .05.

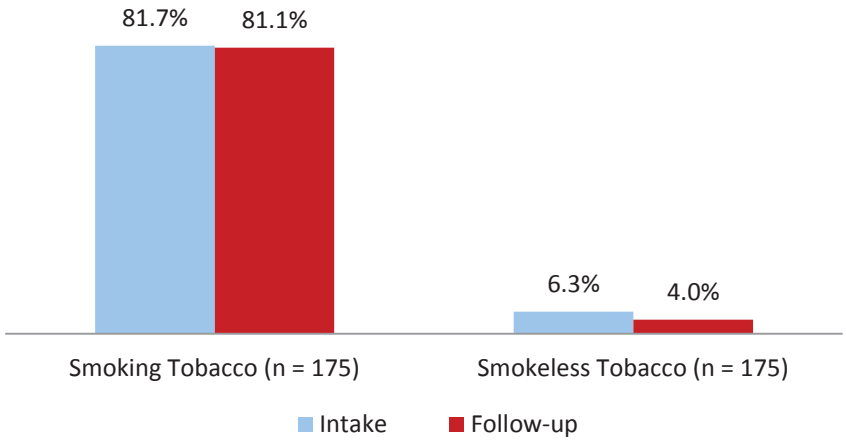
[35] Race/ethnicity was not included in the analysis because there were only 9 clients who were considered non-white or multi-racial among drug-using clients.

TOBACCO USE

PAST-6-MONTH SMOKING AND SMOKELESS TOBACCO USE

There was no change in smoking and smokeless tobacco use from intake to follow-up (see Figure 2.38). Most clients reported using tobacco in the 6 months before entering the program (81.7%) and in the 6 months before follow-up (81.1%). A small minority of clients reported using smokeless tobacco in the 6 months before intake (6.3%) and follow-up (4.0%).

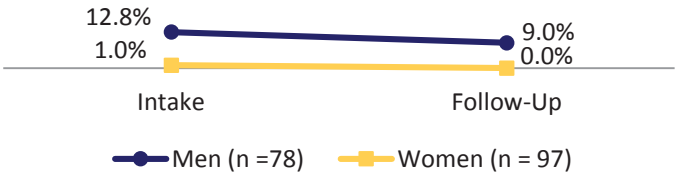
Figure 2.38. Past-6-month Tobacco Use at Intake and Follow-up



Gender Differences in Past-6-month Smokeless Tobacco Use

Even though only a small percentage of clients reported using smokeless tobacco at intake and follow-up, there was a significant difference by gender; almost all of the clients who reported using smokeless tobacco were men (see Figure 2.39).

Figure 2.39. Gender Differences in Past-6-month Smokeless Tobacco Use from Intake to Follow-upa

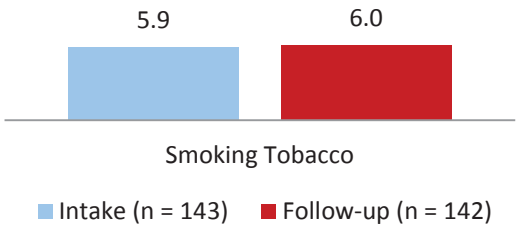


a—Significant difference by gender at intake and follow-up, $p < .01$.

Average Number of Months of Smoking Tobacco

Figure 2.40 shows that among clients who reported smoking tobacco in the 6 months before entering treatment (n = 143), they reported smoking tobacco, on average, 5.9 months. There was no change in the average number of months clients who smoked tobacco reported smoking tobacco in the 6 months before follow-up (6.0 months; n = 142).

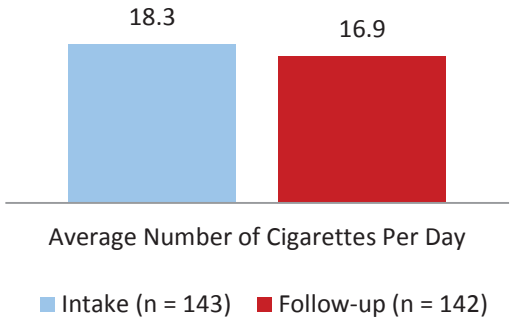
Figure 2.40. Average Number of Months of Smoking Tobacco Use



Average Number of Cigarettes Smoked

The average number of cigarettes clients reported smoking decreased slightly over time (see Figure 2.41). Of those who smoked tobacco at intake, clients reported smoking an average of 18.3 cigarettes per day. At follow-up, among clients who reported smoking tobacco, they reported smoking an average of 16.9 cigarettes per day.

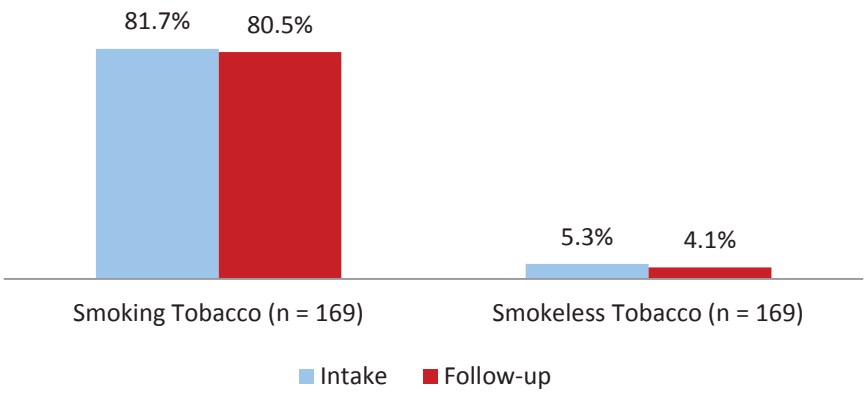
Figure 2.41. Number of Cigarettes Smoked in an Average Day Among Clients Who Smoked Tobacco



PAST-30-DAY TOBACCO USE

Similar to the past 6 months, the number of clients who reported any smoking or smokeless tobacco use in the past 30 days did not change from intake to follow-up (see Figure 2.42).

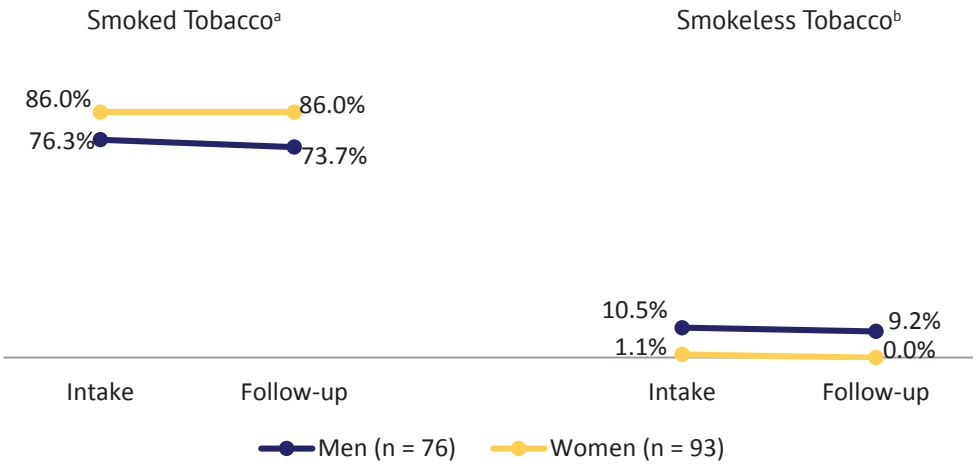
Figure 2.42. Past-30-day Tobacco Use at Intake and Follow-up



Gender Differences in Past-30-day Tobacco Use

In the 30 days before follow-up, significantly more women than men smoked tobacco (86.0% vs. 73.7%; see Figure 2.43). Only a small percentage of clients reported using smokeless tobacco, however, there was a significant difference by gender at intake and follow-up, with more men using smokeless tobacco.

Figure 2.43. Gender Differences in Past-30-day Tobacco Use from Intake to Follow-up



a—Significant difference by gender at follow-up; $p < .05$.
b – Significant difference by gender at intake and follow-up; $p < .01$.

Section 3.
MENTAL HEALTH

This section examines changes in mental health from intake to follow-up. Specifically, this section examines: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, and (4) suicidal ideation and attempts. The mental health questions on the KORTOS intake and follow-up interviews were self-report measures.

DEPRESSION SYMPTOMS

To assess depression, participants were first asked two screening questions:

1. "Did you have a two-week period when you were consistently depressed or down, most of the day, nearly every day?" and
2. "Did you have a two-week period when you were much less interested in most things or much less able to enjoy the things you used to enjoy most of the time?"

Study Criteria for Depression

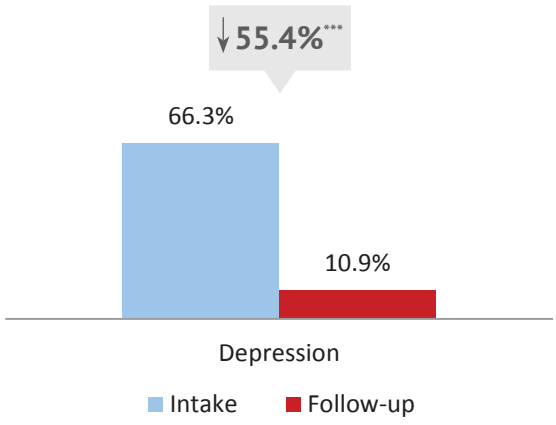
To meet study criteria for depression, clients had to say "yes" to at least one of the two screening questions and at least 4 of the other 7 symptoms. Thus, minimum score to meet study criteria: 5 out of 9.

If participants answered "yes" to at least one of these two screening questions, they were then asked seven additional questions about symptoms of depression (e.g., sleep problems, weight loss or gain, feelings of hopelessness or worthlessness).

Two-thirds of clients (66.3%) met study criteria for depression in the 6 months before they entered treatment (see Figure 3.1). At follow-up, 10.9% met study criteria for depression—a significant decrease of 55.4%.

The percent of clients meeting study criteria for depression decreased significantly by 55% from intake to follow-up

Figure 3.1. Meeting Study Criteria for Depression at Intake and Follow-up (n = 175)

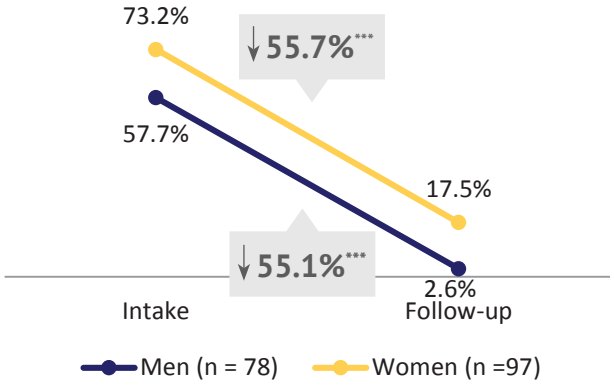


***p < .001.

GENDER DIFFERENCES IN DEPRESSION SYMPTOMS

Significantly more women met study criteria for depression at intake and follow-up compared to men (see Figure 3.2). The number of women who met study criteria for depression decreased significantly by 55.7% while the number of men decreased significantly by 55.1%.

Figure 3.2. Gender Differences in Percentage of Clients Meeting Study Criteria for Depression[a]



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

ANXIETY SYMPTOMS

To assess for generalized anxiety symptoms, participants were first asked:

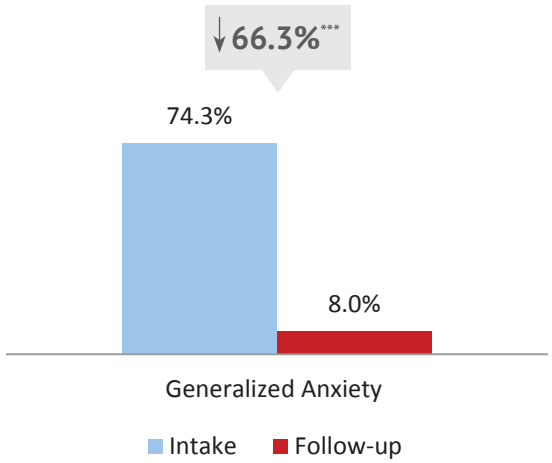
"In the 6 months before you entered this program, did you worry excessively or were you anxious about multiple things on more days than not for all 6 months (like family, health, finances, school, or work difficulties)?"

Participants who answered "yes" were then asked 6 additional questions about anxiety symptoms (e.g., felt restless, keyed up or on edge, have difficulty concentrating, feel irritable).

Study Criteria for Generalized Anxiety

To meet study criteria for depression, clients had to say "yes" to one screening question and at least 3 of the 6 symptoms. Thus, minimum score to meet study criteria: 4 out of 7.

Figure 3.3. Clients Meeting Study Criteria for Generalized Anxiety at Intake and Follow-up (n = 175)

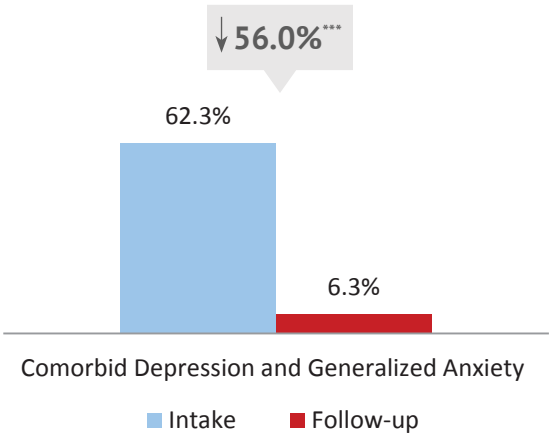


***p < .001.

COMORBID DEPRESSION AND ANXIETY SYMPTOMS

Figure 3.4 shows that at intake, 62.3% of clients met study criteria for both depression and generalized anxiety. There was a significant decrease of 56.0% to 6.3% at follow-up.

Figure 3.4. Clients Meeting Study Criteria for Comorbid Depression and Generalized Anxiety at Intake and Follow-up (n = 175)



***p < .001.

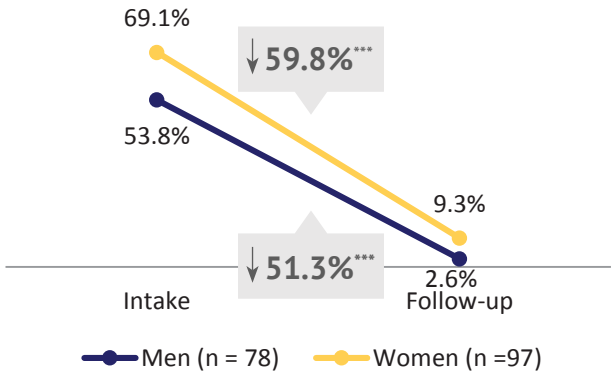
GENDER DIFFERENCES IN COMORBID DEPRESSION AND ANXIETY SYMPTOMS

At intake, significantly more women met study criteria for comorbid depression and anxiety when compared to men (see Figure 3.5). At follow-up, the percent of women and men meeting study criteria for both depression and anxiety significantly decreased to 9.3% and 2.6%, respectively.

"I love everything. It has changed my life. I just got custody of my daughter."

—KORTOS Follow-up Client

Figure 3.5. Gender Differences in Percent of Clients Meeting Study Criteria for Comorbid Depression and Anxiety[a]



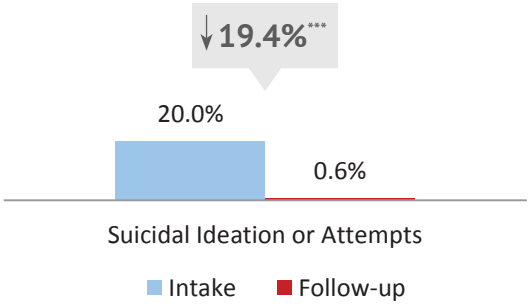
a—Statistical difference by gender at intake; $p < .05$.
***$p < .001$.

SUICIDAL IDEATION AND/OR ATTEMPTS

Suicidal ideation and attempts were measured with self-reported questions about thoughts of suicide and actual attempts to commit suicide in the past 6 months. There was a significant 19.4% decrease in the number of clients reporting suicidal ideation and attempts from intake (20.0%) to follow-up (0.6%; see Figure 3.6).

The percent of clients reporting suicidal ideation and/or attempts decreased 19% at follow-up

Figure 3.6. Clients Reporting Suicidal Ideation and/Or Attempts at Intake and Follow-up (n = 175)



***$p < .001$.

Section 4.
CRIMINAL JUSTICE SYSTEM INVOLVEMENT

This section describes change in client involvement with the criminal justice system during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) the number of times arrested, among clients with any arrests, (3) any incarceration, (4) the number of days incarcerated among clients with any incarceration, and (5) criminal justice supervision status.

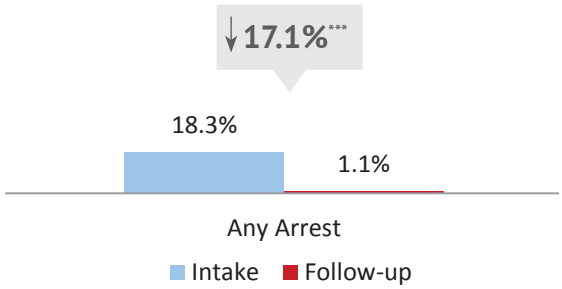
ARRESTS

ANY ARRESTS IN THE PAST 6 MONTHS

Less than one-fifth of clients (18.3%) reported any arrests in the 6 months before entering treatment and an even smaller percentage reported any arrests in the 6 months before follow-up (1.1%; see Figure 4.1).

The percent of clients reporting any arrest significantly decreased 17% at follow-up

Figure 4.1. Past-6 Month Arrests at Intake and Follow-up (n = 175)



***p < .001.

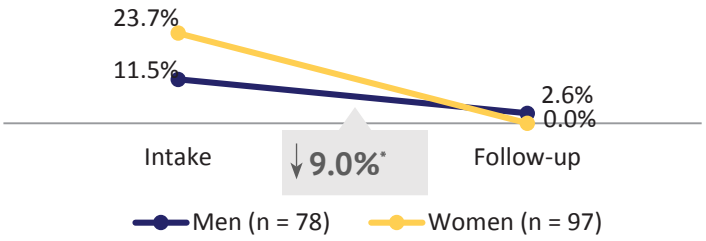
Gender Difference in Past-6-month Arrests

Significantly more women reported an arrest at intake when compared to men (see Figure 4.2). By follow-up there was no difference in arrests by gender.

"I like the staff and I like that they have counseling there. I like the one-on-one counseling. The medicine is good, it keeps me from using drugs."

—KORTOS Follow-up Client

Figure 4.2. Gender Differences in Past-6-month Arrests at Intake and Follow-up[a, b]

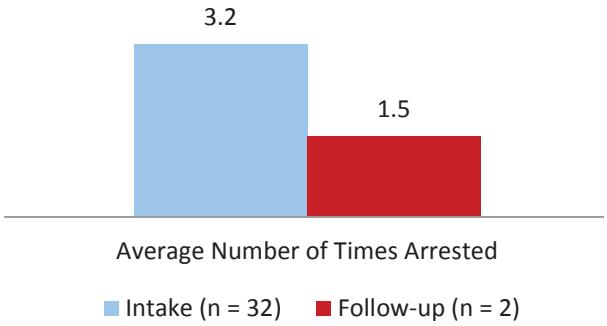


a—Significant difference by gender at intake, $p < .05$.
b – No measure of association could be computed for the crosstabulation because there was a value of 0 for the variable, Past-6-month Arrests, for women at follow-up.
*$p < .05$

Average Number of Arrests

Among clients who reported at least one arrest in the 6 months before entering the program (n = 32), the average number of times they were arrested was 3.2 (see Figure 4.3). Among clients who reported at least one arrest in the 6 months before follow-up (n = 2), the average number of times they were arrested was 1.5.

Figure 4.3. Average Number of Times Arrested at Intake and Follow-up, Among Clients Arrested During Each Period



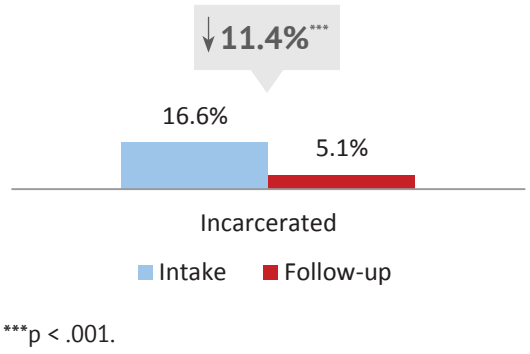
INCARCERATION

INCARCERATION IN THE PAST 6 MONTHS

One in six clients (16.6%) reported they had spent at least one night in jail or prison at intake. At follow-up, only 5.1% of clients reported they had spent at least one night in jail or prison in the past 6 months. The percent of clients reporting any incarceration decreased significantly by 11.4% (see Figure 4.4).

The number of clients who spent at least one day incarcerated decreased by 11%

Figure 4.4. Clients Reporting Incarceration at Intake and Follow-up (n = 175)

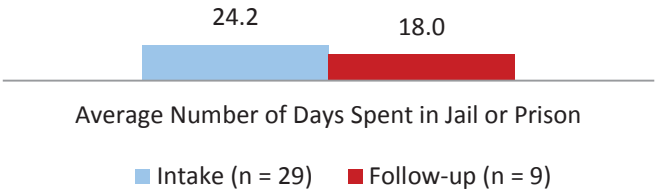


***p < .001.

AVERAGE NUMBER OF DAYS SPENT INCARCERATED, AMONG CLIENTS WHO REPORTED INCARCERATION

Figure 4.5 shows that among clients who reported incarceration, the average number of days incarcerated was 24.2 at intake (n = 29) and 18.0 at follow-up (n = 9).

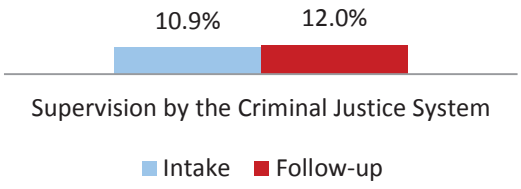
Figure 4.5. Average Number of Days Incarcerated, for Clients Who Were Incarcerated at Each Period



CRIMINAL JUSTICE SYSTEM SUPERVISION

The number of clients who self-reported they were under criminal justice system supervision (e.g., drug court, probation, or parole) did not change significantly from 10.9% at intake to 12.0% at follow-up (see Figure 4.6).

Figure 4.6. Clients Reporting Criminal Justice System Supervision at Intake and Follow-up (n = 175)



Section 5.
QUALITY OF LIFE

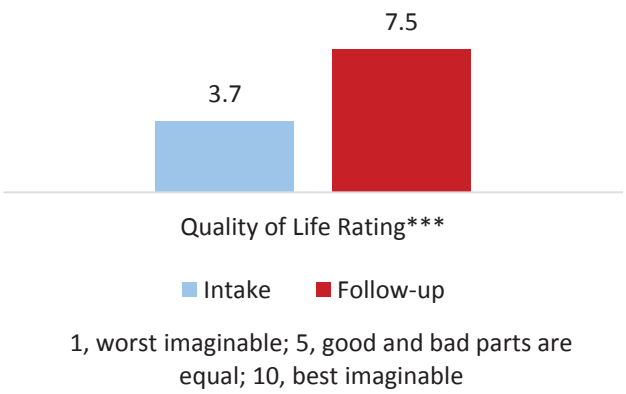
This section describes change in client quality of life and satisfaction with life during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) quality of life rating, (2) positive and negative feelings, and (3) satisfaction with life rating.

QUALITY OF LIFE RATINGS

At intake and follow-up, clients were asked to rate their quality of life at the time of the interview. Ratings were from 1 = 'Worst imaginable' to 5 = 'Good and bad parts were about equal' to 10 = 'Best imaginable'. KORTOS clients rated their quality of life as a 3.7 at intake (see Figure 5.1). The average quality of life rating significantly increased to 7.5 at follow-up.

Average rating of quality of life significantly increased from 3.7 at intake to 7.5 at follow-up

Figure 5.1. Perception of Quality of Life at Intake and Follow-up (n = 175)



***p < .001.

POSITIVE AND NEGATIVE FEELINGS

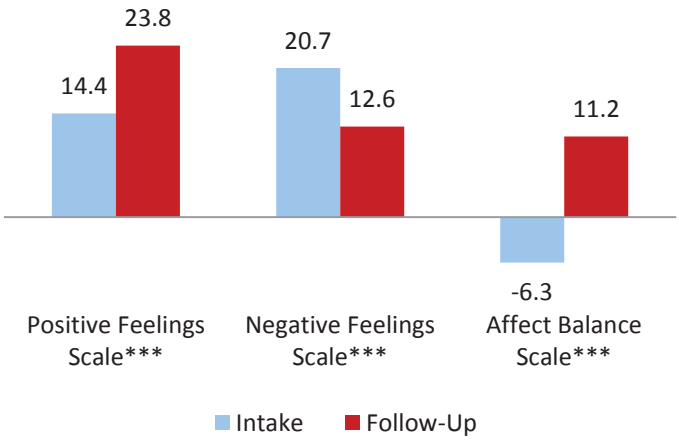
At both time frames, clients were asked a set of questions about how often they experienced 6 positive and 6 negative emotions/states in the past month (Scale of Positive and Negative Experience [SPANE][36]). Clients answered using a scale with 1 representing "Very rarely or never" to 5 "Very often or always." The responses were then added for the 6 positive items, yielding a Positive Feelings Score, and the 6 negative items, for the Negative Feelings Score. The lowest possible score is 6 and the highest possible score is 30. Low scores on the Positive Feelings Scale indicate the client rarely or infrequently experienced the six positive emotions/states. A high score

[36] Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi. D., Oishi, S., & Biswas-Diener, R. (2009). New measures of well-being: Flourishing and positive and negative feelings. *Social Indicators Research, 39*, 247-266.

on the Positive Feelings Scale indicates the client very often or frequently experienced the six positive emotions/states. To determine the overall affect balance (or the balance of negative and positive feelings about one's life), the score derived from the negative feelings score is subtracted from the positive feelings score (with -24 being the minimum and unhappiest to 24 being the happiest). Thus, a client with a high affect balance score reports that he/she rarely experiences negative feelings and very often has positive feelings.

Figure 5.2 shows that clients' positive feelings increased significantly and their negative feelings decreased significantly from intake to follow-up. Further, the affect balance score also increased significantly from intake to follow-up.

Figure 5.2. Positive and Negative Feelings at Intake and Follow-up (n = 175)



***p < .001.

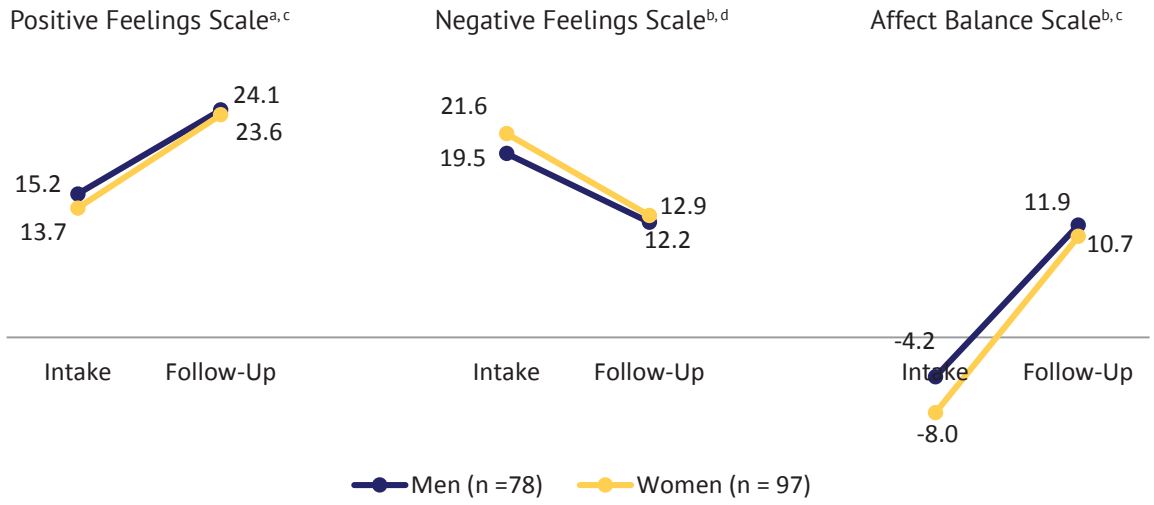
GENDER DIFFERENCES IN POSITIVE AND NEGATIVE FEELINGS

At intake, women reported a significantly lower average score on the positive feelings scale and the affect balance scale when compared to men (see Figure 5.3). Women also had higher average scores on the negative feelings scale at intake and follow-up. For both men and women, there was a significant increase in average scores on the affect balance scale over time.

"They're there for you, they care about you and give you information to better your life. I have been clean for a while. The staff there is really caring."

—KORTOS Follow-up Client

Figure 5.3. Gender Differences Positive and Negative Feelings at Intake and Follow-up

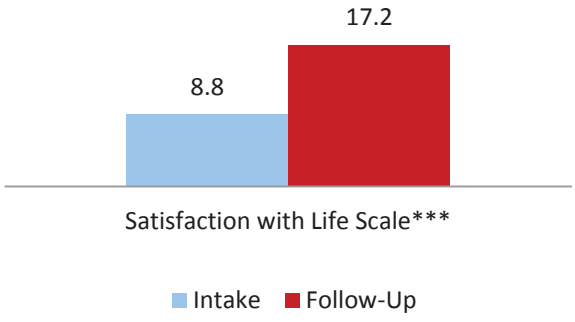


a – Significant difference by gender at intake; $p < .05$.
b – Significant difference by gender at intake ($p < .01$) and follow-up ($p < .05$).
c – Significant increase for men and women from intake to follow-up; $p < .001$.
d – Significant decrease for men and women from intake to follow-up; $p < .001$.

SATISFACTION WITH LIFE RATING

At both time frames, clients were presented with five statements and asked to respond how much they agreed or disagreed with each statement, using a scale with 1 representing "Strongly disagree" and 5 representing "Strongly agree".[37] Each statement is a positively worded aspect of high satisfaction with one's life. One statement, for example, is "In most ways my life is close to my ideal." The values assigned to each response are added to create a life satisfaction score. The lowest possible score is 5 and the highest possible score is 25. Lower scores indicate lower satisfaction and higher scores represent higher satisfaction. Figure 5.4 shows that clients' scores on the satisfaction with life scale increased significantly from intake (8.8) to follow-up (17.2).

Figure 5.4. Satisfaction with Life at Intake and Follow-up (n = 175)



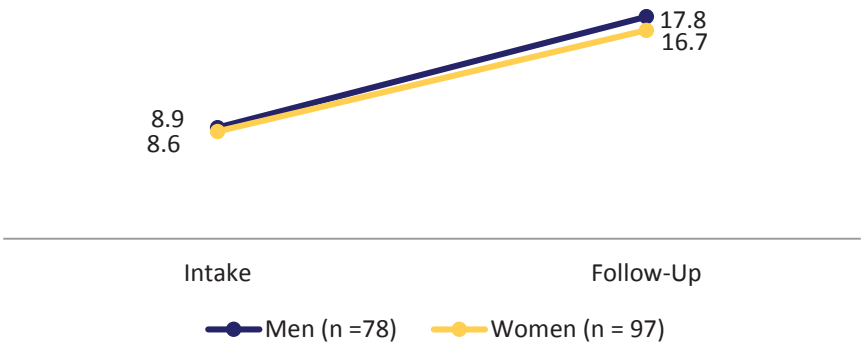
***$p < .001$.

[37] Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71-75.

GENDER DIFFERENCES IN SATISFACTION WITH LIFE SCALE

Men reported a significantly higher satisfaction with life score at follow-up when compared to women. Scores for both men and women increased significantly over time (see Figure 5.5).

Figure 5.5. Gender Differences in Satisfaction with Life at Intake and Follow-up[a, b]



a—Significant difference by gender at follow-up, $p < .05$.
b – Significant increase for men and women from intake to follow-up; $p < .001$.

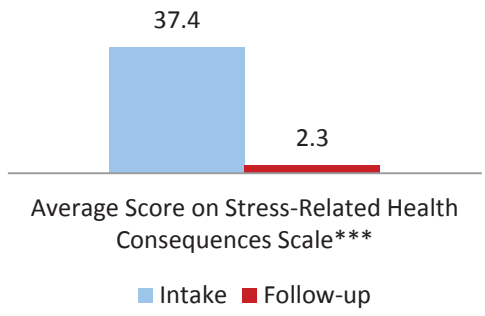
Section 6.
HEALTH STATUS

This section describes change in client physical health status during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) stress-related health consequences, (2) perceptions of physical and mental health, (3) chronic pain, and (4) body mass index.

STRESS-RELATED HEALTH CONSEQUENCES

Clients were asked about physiological symptoms often associated with higher stress with questions from the Stress-Related Health Consequences Scale.[38] The scale contains 15 symptoms and clients indicated how often they experienced those symptoms in the past 7 days (e.g., experienced unexplained aches and pains, slept poorly, experienced an increased heart rate). Higher scores on the scale indicate higher stress and greater physiological indicators of stress. The minimum score is 0 and the maximum score is 45. For the overall sample, scores decreased significantly from 37.4 at intake to 2.3 at follow-up (see Figure 6.1).

Figure 6.1. Average Scores on the Stress-related Health Consequences Scale at Intake and Follow-up (n = 77)[39]



***p < .001.

PERCEPTIONS OF PHYSICAL AND MENTAL HEALTH

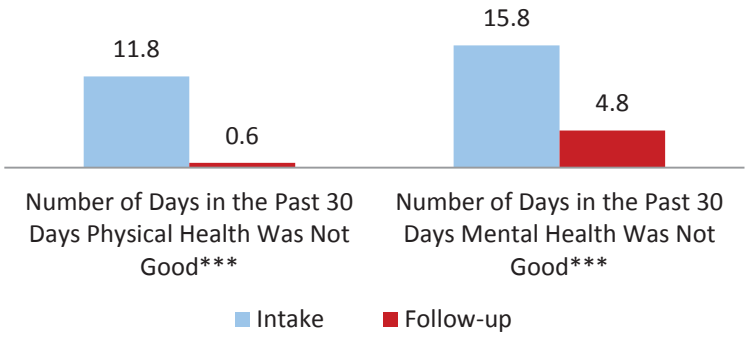
Clients were asked how many days in the past 30 days their physical and mental health were not good at intake and follow-up (see Figure 6.2). The number of days clients reported their physical health was not good decreased significantly from an average of 11.8 days to 0.6 days. The number of days clients' mental health was not good also decreased significantly from intake (15.8) to follow-up (4.8).

The average number of days clients' physical and mental health was not good decreased

[38] For full description of measure, see Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016), Evidence Base for the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) Assessment and Methods. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

[39] On July 20th, 2015, the response options for this scale were changed. Clients who completed an intake interview before that date (n = 98) were not included in the analysis due to response option discrepancies.

Figure 6.2. Perceptions of Poor Physical Health and Mental Health in the Past 30 Days at Intake and Follow-up (n = 175)

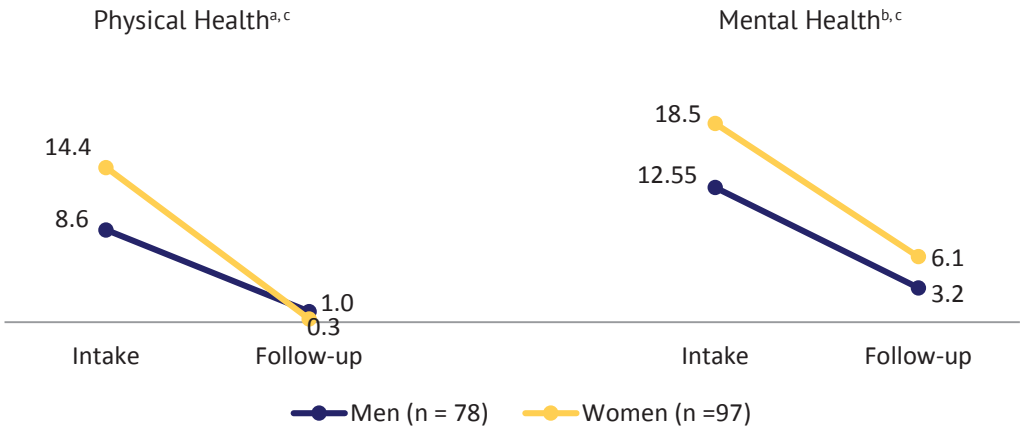


***p < .001.

GENDER DIFFERENCES IN PERCEPTIONS OF PHYSICAL AND MENTAL HEALTH

When compared to men, women reported a significantly higher average number of days their physical (14.4) and mental health (18.5) was not good at intake (see Figure 6.3). By follow-up, there was no gender difference in the average number of days of poor physical health; however, the average number of days of poor mental health was still significantly higher for women.

Figure 6.3. Gender Differences in Perceptions of Physical and Mental Health at Intake and Follow-up

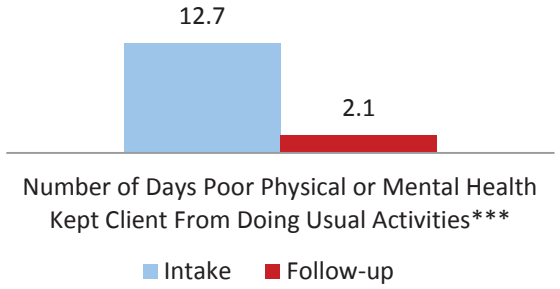


a—Statistical difference by gender at intake; p < .01.
b – Statistical difference by gender at intake (p < .01) and follow-up (p < .05).
c – Significant decrease for men and women from intake to follow-up; p < .001.

PERCEPTIONS OF POOR PHYSICAL OR MENTAL HEALTH LIMITING ACTIVITIES

Clients were also asked to report the number of days in the past 30 days poor physical or mental health had kept them from doing their usual activities. The number of days clients reported their physical or mental health kept them from doing their usual activities decreased significantly from 12.7 days at intake to 2.1 days at follow-up (see Figure 6.4).

Figure 6.4. Perceptions of Poor Physical Health and Mental Health Limiting Activities in the Past 30 Days at Intake and Follow-up (n = 175)

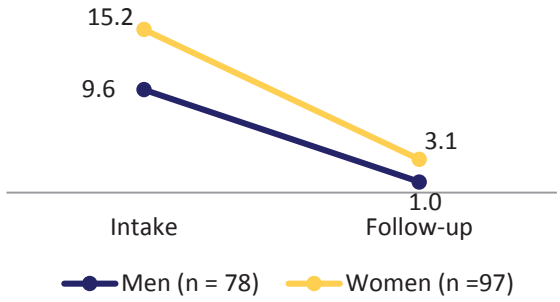


***p < .001.

GENDER DIFFERENCES IN PERCEPTIONS OF POOR PHYSICAL AND MENTAL HEALTH LIMITING ACTIVITIES

Women reported a significantly higher average number of days poor physical and mental health limited their activities at intake and follow-up when compared to men (see Figure 6.5).

Figure 6.5. Gender Differences Perceptions of Poor Physical Health and Mental Health Limiting Activities in the Past 30 Days at Intake and Follow-up[a, b]



a—Statistical difference by gender at intake (p < .01) and follow-up (p < .05).
b – Significant decrease for men and women from intake to follow-up; p < .001.

PHYSICAL HEALTH ISSUES

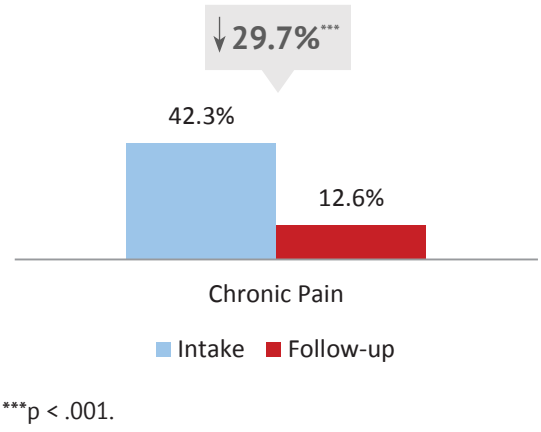
CHRONIC PAIN

The percent of clients who reported chronic pain that was persistent and lasted at least 3 months decreased significantly from intake to follow-up by nearly 30% (see Figure 6.6). At intake, 42.3% of clients reported chronic pain and that number dropped to 12.6% by follow-up.

"It completely changed my outlook on life. My physical health has gotten better."

—KORTOS Follow-up Client

Figure 6.6. Clients Reporting Chronic Pain at Intake and Follow-up (n = 175)



***p < .001.

Prescription Opioid Misuse and Chronic Pain

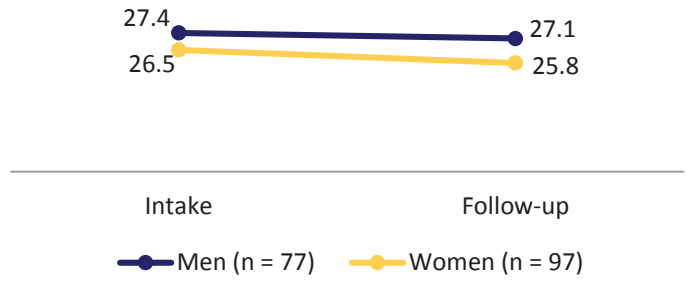
Of those who misused prescription opioids at intake (n = 126), 44.4% reported chronic pain in the 6 months before entering the program and 11.1% experienced chronic pain at follow-up, which was a significant decrease of 33.3%.

Additionally, of those who reported misusing prescription opioids and experiencing chronic pain at intake (n = 56), 21.4% (n = 12) reported chronic pain in the past 6 months at follow-up and only 12.5% (n = 7) reported past-6-month misuse of prescription opioids.

BODY MASS INDEX

Body mass index (BMI) was calculated from clients' self-reported height and weight at intake and follow-up (see Figure 6.7). Because their overall body size is larger, the BMI for men was calculated separately from women to get a more accurate picture of the BMI of KORTOS clients. There was no significant difference in men's and women's average BMI from intake to follow-up.

Figure 6.7. Body Mass Index Based on Self-reported Height and Weight at Intake and Follow-up (n = 174)[40]



[40] One case had missing data for one variable that goes into computing BMI at follow-up.

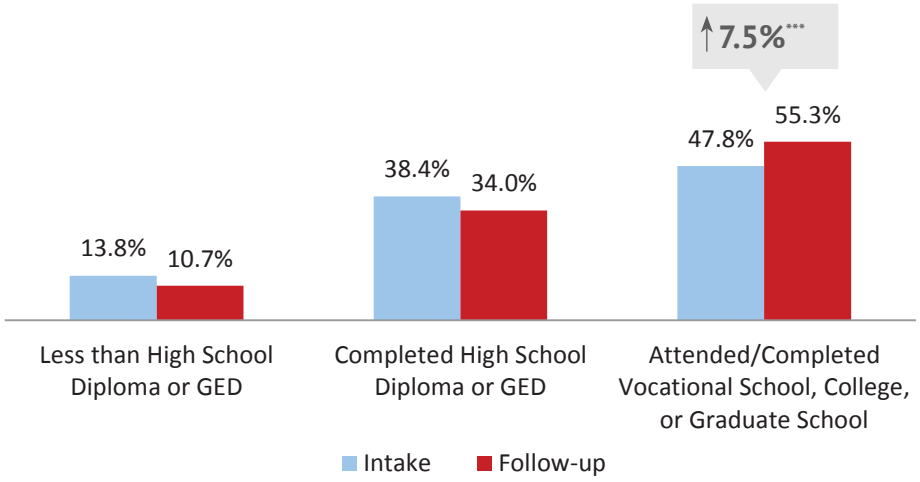
Section 7.
EDUCATION, ECONOMIC STATUS, AND LIVING CIRCUMSTANCES

This section examines changes in education, economic status, and living circumstances from intake to follow-up including: (1) highest level of education completed, (2) the percent of clients who worked full-time or part-time, (3) the number of months clients were employed full-time or part-time, (4) hourly wage, (5) homelessness, (6) living situation, and (7) economic hardship.

EDUCATION

The average highest level of education increased significantly from intake (13.1) to follow-up (13.4), where 12 = High school diploma or GED (not depicted in a figure). Another way to examine change in education is to examine change in the number of clients who reported different levels of education. There was a significant increase in the percent of clients who reported attending or completing vocational school, college, or graduate school from intake to follow-up (see Figure 7.1).

Figure 7.1. Highest Level of Education Completed at Intake and Follow-up (n = 159)[41]



a – Significance tested with the Stuart-Maxwell Test of Overall Marginal Homogeneity ($p < .001$)
*** $p < .001$.

EMPLOYMENT

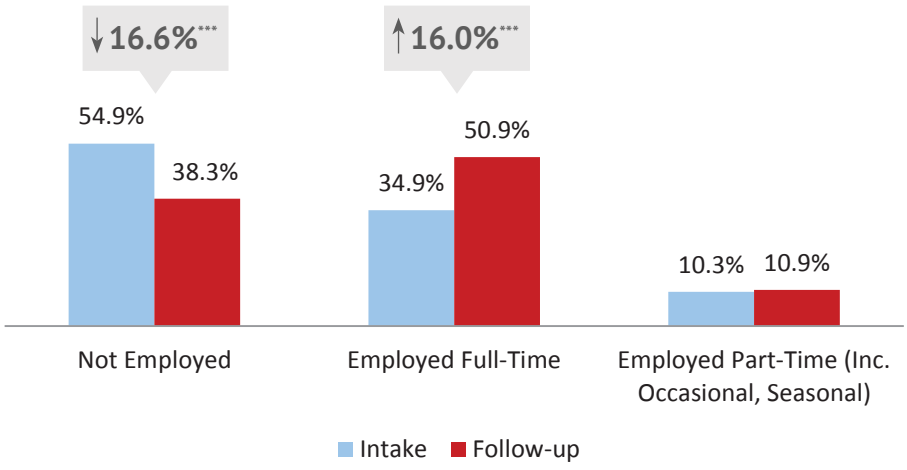
CURRENT EMPLOYMENT STATUS

At intake, over half of clients were not employed (see Figure 7.2). The number of clients who were not employed significantly decreased 16.6% by follow-up. Additionally, the number of clients who

[41] Sixteen cases had missing values for education because of inconsistencies in data from intake to follow-up.

were employed full-time significantly increased 16.0%, from 34.9% at intake to 50.9% at follow-up.

Figure 7.2. Current Employment Status at Intake and Follow-up (n = 175)[a]



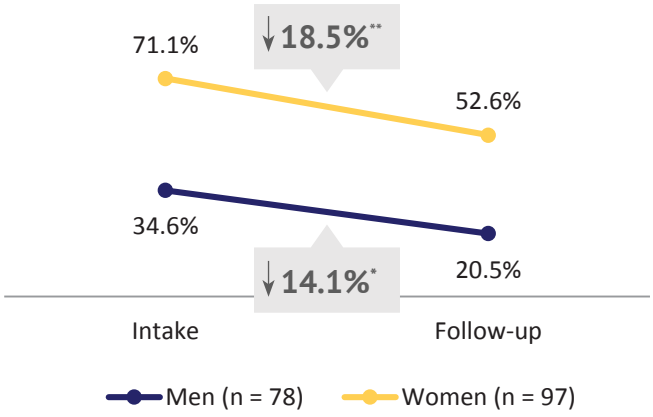
a – Significance tested with the Stuart-Maxwell Test of Overall Marginal Homogeneity ($p < .001$)
*** $p < .001$.

Gender Differences in Current Employment Status

Currently Unemployed

Significantly more women at intake and follow-up reported that they were currently unemployed compared to men: 71.1% vs. 34.6% at intake and 52.6% vs. 20.5% at follow-up. The number of women who were currently unemployed decreased significantly 18.5% and the percent of men unemployed decreased 14.1% (see Figure 7.3).

Figure 7.3. Gender Differences in Unemployment Status at Intake and Follow-up[a]

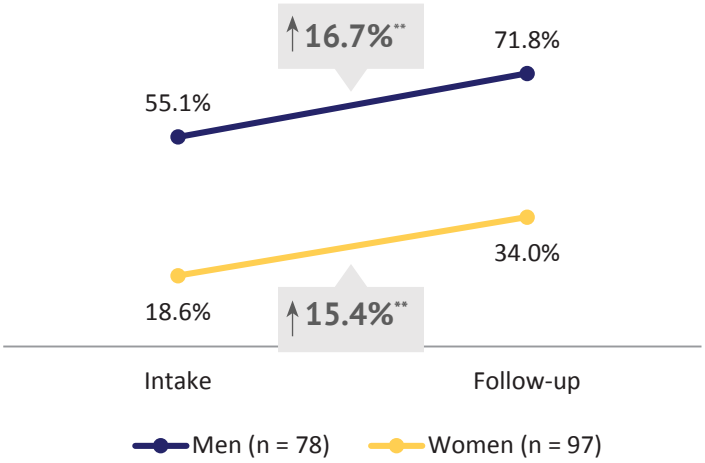


a—Significant difference by gender at intake and follow-up, $p < .001$.
*$p < .05$, **$p < .01$.

Currently Employed Full-time

The number of men who reported they were employed full-time was 3 times higher than the number of women at intake (55.1% vs. 18.6%). At follow-up the number of men who were employed full-time was more than double the number of women (71.8% vs. 34.0%; see Figure 7.4). The number of both men and women who reported full-time employment significantly increased from intake to follow-up (16.7% and 15.4% respectively).

Figure 7.4. Gender Differences in Current Full-time Employment Status at Intake and Follow-up[a]

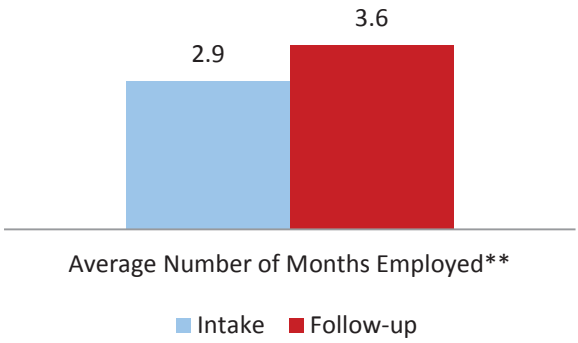


a—Significant difference by gender at intake and follow-up, $p < .001$.
** $p < .01$.

Average Number of Months Employed

At both intake and follow-up, clients were asked to report the number of months they were employed full-time or part-time. Figure 7.5 shows there was a significant increase over time in the average number of months clients reported they were employed.

Figure 7.5. Average Number of Months Employed at Intake and Follow-up (n = 175)

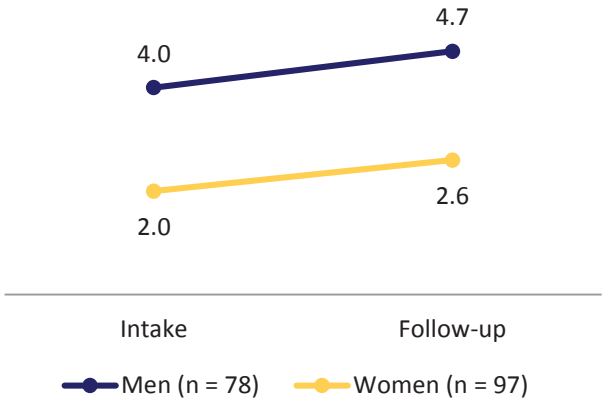


**$p < .01$.

Gender Differences in the Number of Months Employed

Men reported working significantly more months at both periods compared to women (intake, 4.0 vs. 2.0 and follow-up, 4.7 vs. 2.6). There was a significant increase in the number of months employed from intake to follow-up for both men and women (see Figure 7.6).

Figure 7.6. Gender Differences in Number of Months Employed at Intake and Follow-up[a, b]

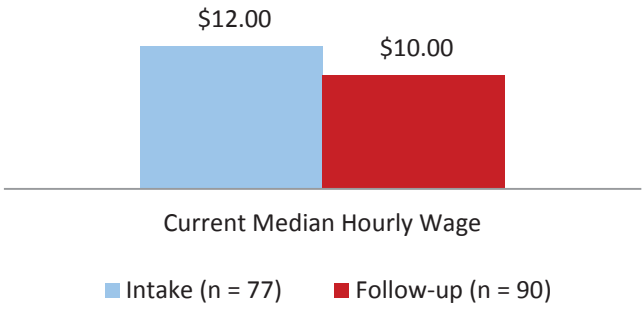


a—Significant difference in number of months worked at intake and follow-up by gender; $p < .001$.
b – Significant increase for men and women from intake to follow-up; $p < .05$.

HOURLY WAGE

Of those clients who were employed at intake (n = 77), the median hourly wage was $12.00. Of those employed at follow-up (n = 90), the median hourly wage was $10.00 (see Figure 7.7).

Figure 7.7. Current Median Hourly Wage at Intake and Follow-up, Among Employed Clients[42]



Gender Differences in Hourly Wage

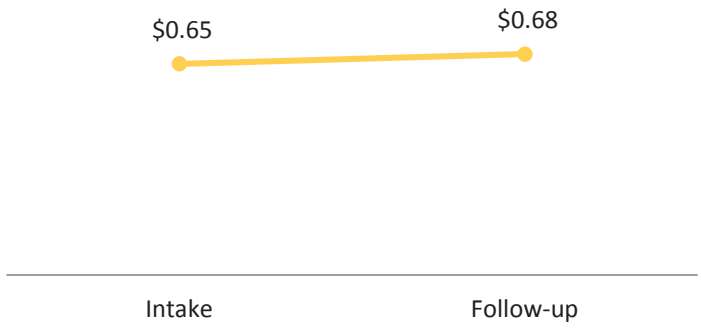
Among employed clients, there was a significant difference in median hourly wage between men and women at intake; employed women made $0.65 for every $1 men made ($13.50 for men and $8.75 for

At follow-up, employed women made only $0.68 for every $1 employed men made

[42] Two clients at intake and 18 at follow-up had missing or invalid data for hourly wage.

women). At follow-up, employed men again reported a significantly higher hourly wage than employed women ($12.50 vs. $8.50; see Figure 7.8).

Figure 7.8. Median Hourly Wage Employed Women Make for Every Dollar Employed Men Make at Intake and Follow-up[a]



a—Significant difference in median hourly wage at intake ($p < .01$) and follow-up by gender ($p < .001$).

Gender Differences in Occupation Type

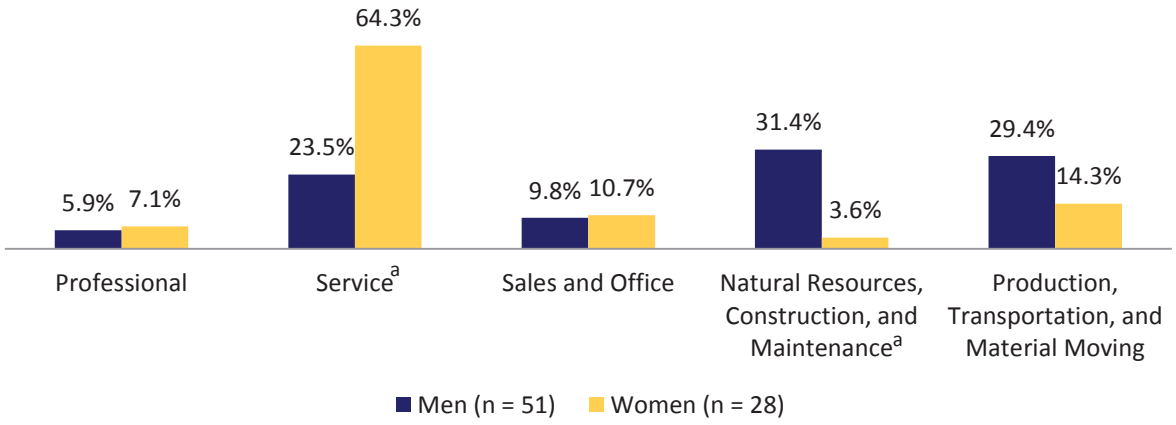
At least part of the reason for the marked difference in hourly wages between men and women is due to the significant difference in occupation type by gender for employed individuals.[43] At intake, two-thirds of employed women (64.3%) reported having a service job (e.g., waiter/waitress, child care, housekeeping, hair stylist, etc.) while only one-quarter of employed men (23.5%) reported having a service job (see Figure 7.9a). Significantly more men reported working natural resources, construction, and maintenance jobs (e.g., mining, logging, farming, mechanic, heating/air conditioning tech, etc.) than women (31.4% vs. 3.6%), which tend to be higher paying than service jobs.

At follow-up, the difference in occupation type was even more pronounced. Over half of employed women (58.7%) reported having a service job whereas only 16.1% of employed men had a service job (see Figure 7.9b). One-fifth of employed women (21.7%) had sales and office jobs (e.g., administrative support, cashier, retail sales, telemarketer, bank teller, etc.) while only 1.6% of employed men reported working similar jobs. Similar to intake, more employed men reported having a natural resources, construction, or maintenance job compared to women (38.7% vs. 0.0%). Production, transportation, and material moving jobs (e.g., factory production line, power plant, bus driver, welder, sanitation worker, etc.) were reported by one-third of employed men (32.3%) and only 15.2% of employed women.

At intake and follow-up, among employed individuals, more women had service jobs and more men had natural resources, construction, and maintenance jobs, which tend to be higher paying than service jobs

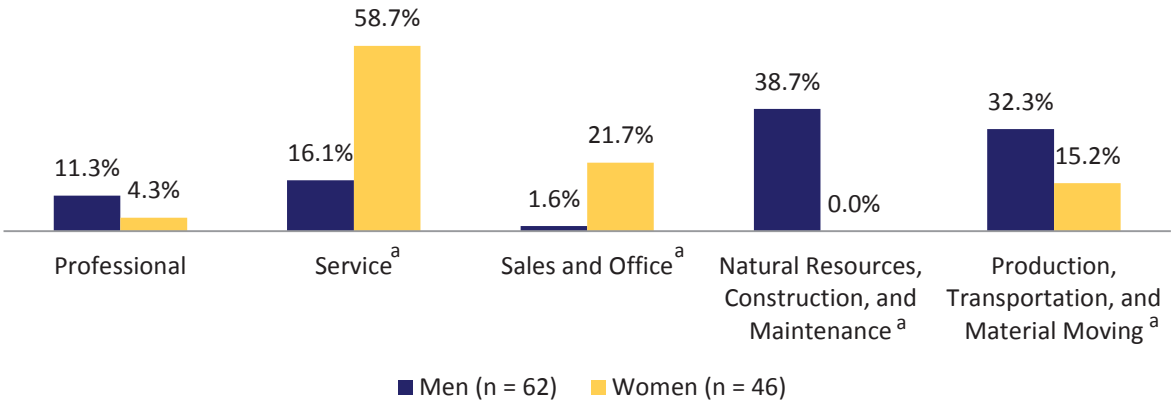
[43] Occupation type was asked only of individuals who reported they were currently employed at intake and at follow-up.

Figure 7.9a. Among Employed Individuals, Type of Occupation by Gender at Intake (n = 79)**



a – Significant difference by gender.
**p < .01

Figure 7.9b. Among Employed Individuals, Type of Occupation by Gender at Follow-up (n = 108)***



a – Significant difference by gender.
***p < .001

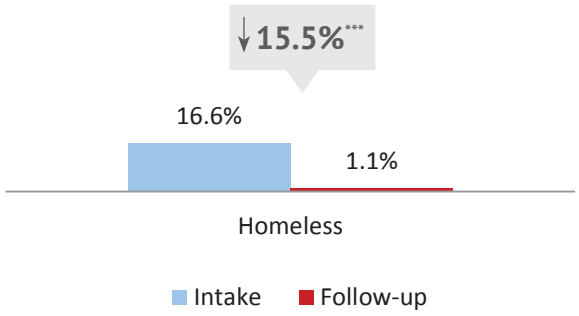
LIVING CIRCUMSTANCES

HOMELESSNESS

One in 6 clients (16.6%) reported at treatment intake they were homeless at some point in the past 6 months. At follow-up, only 1.1% of clients reported they had been homeless at some point in the past 6 months (see Figure 7.10).

The number of clients who reported homelessness decreased 16% from intake to follow-up

Figure 7.10. Clients Reporting Current Homelessness at Intake and Follow-up (n = 175)



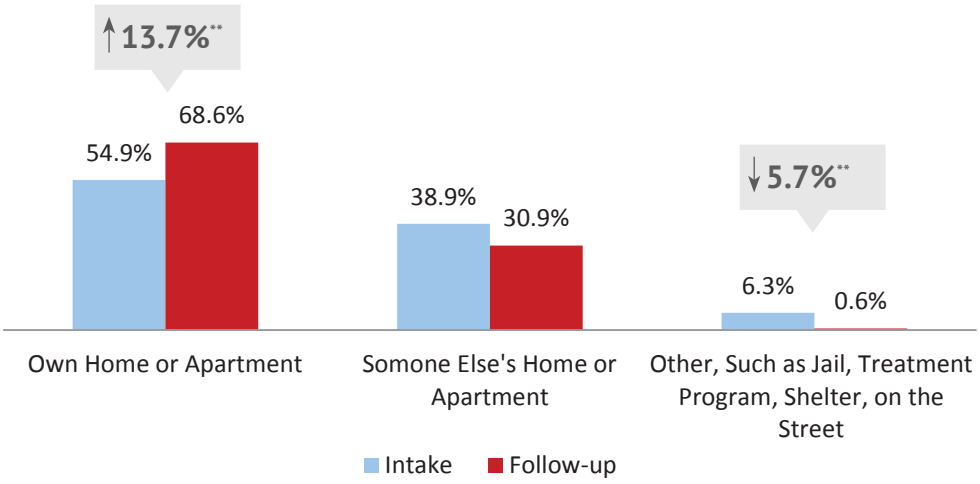
***p < .001.

LIVING SITUATION

Figure 7.11 shows that there was a significant increase in the number of clients who reported they were living in their own home or apartment in the past 6 months at follow-up while the number of clients who lived in jail, a treatment center, shelter, or on the street significantly decreased 5.7%.

Significantly fewer clients reported they were living in jail, treatment program, shelter, or on the street at follow-up

Figure 7.11. Type of Typical Residence in the Past 6 Months at Intake and Follow-up (n = 175)[a]



a – Significance tested with the Stuart-Maxwell Test of Overall Marginal Homogeneity (p < .001)
**p < .01.

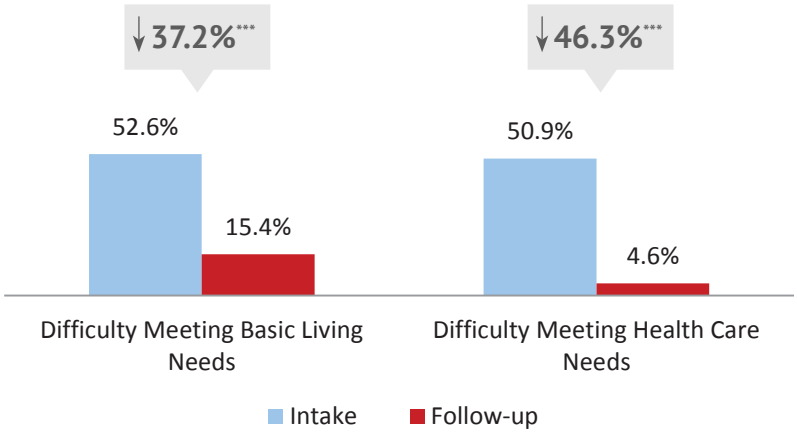
DIFFICULTY MEETING LIVING AND HEALTH CARE NEEDS FOR FINANCIAL REASONS

Clients were asked eight items, five of which asked about the clients' difficulty meeting basic living needs such as food, shelter, utilities, and telephone, while three items asked about the clients' difficulty obtaining health care for financial reasons.

Percentage of clients reporting difficulty meeting basic living needs decreased 37%

The number of clients reporting difficulty meeting basic living needs (e.g., shelter, utilities, phone, food) significantly decreased by 37.2% from 52.6% to 15.4% (see Figure 7.12). The number of clients who reported difficulty meeting health care needs (i.e., doctor visits, dental visits, and prescription medications) for financial reason decreased by 46.3% from intake to follow-up.

Figure 7.12. Difficulty Meeting Basic Living Needs and Health Care Needs for Financial Reasons at Intake and Follow-up (n = 175)



***p < .001.

Section 8.
RECOVERY SUPPORTS

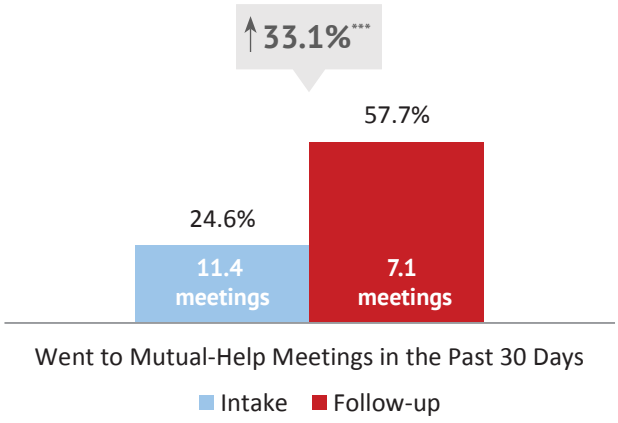
This section focuses on four main changes in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) the number of people the client said they could count on for recovery support, (3) what will be most useful to the client in staying off drugs/alcohol, and (4) clients' perceptions of their chances of staying off drugs/alcohol.

MUTUAL HELP RECOVERY GROUP MEETING ATTENDANCE

At intake, only 24.6% of 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, there was a significant increase of 33.1%, with 57.7% of clients reporting they had gone to mutual help recovery group meetings.

Among clients who had attended mutual help recovery group meetings at intake (n = 43), they reported attending an average of 11.4 meetings. Among clients who attended mutual help recovery group meetings at follow-up (n = 101), they reported attending an average of 7.1 meetings.

Figure 8.1. Clients Reporting Mutual Health Recovery Group Attendance at Intake and Follow-up (n = 175)

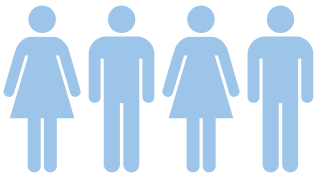


***p < .001.

NUMBER OF PEOPLE CLIENT CAN COUNT ON FOR RECOVERY SUPPORT

The average number of people clients reported they could count on for recovery support significantly increased by from intake (4.2) to follow-up (7.3; see Figure 8.2).

Figure 8.2. Average Number of People Client Could Count on for Recovery Support at Intake and Follow-up (n=175)***



4
average number of people client could count on for recovery support at intake

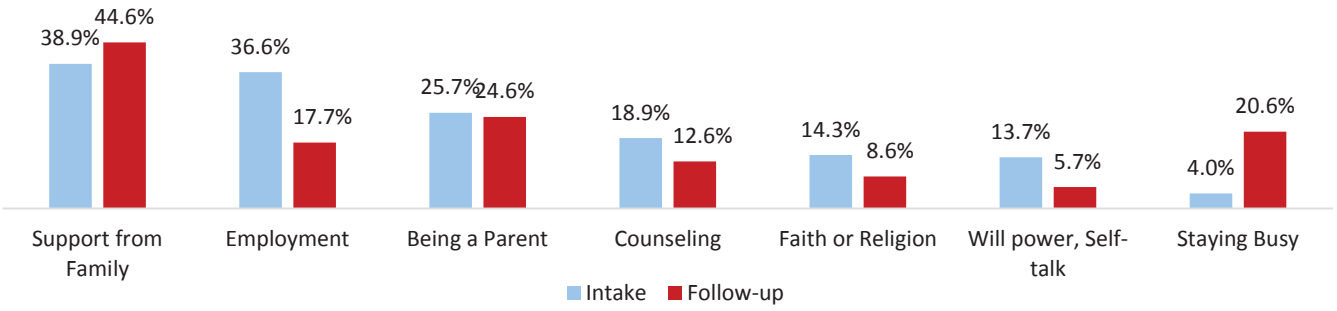
7
average number of people client could count on for recovery support at follow-up

***p < .001.

WHAT WILL BE MOST USEFUL IN STAYING OFF DRUGS/ ALCOHOL

At intake and follow-up, clients were asked what, other than medication-assisted therapy, they believed would be most useful in helping them quit or stay off drugs/alcohol. Rather than conduct analysis on change in responses from intake to follow-up, responses that were reported by 10% of clients or more are presented for descriptive purposes in Figure 8.3. The most common responses at intake were support from family, employment, and being a parent. At follow-up, the most common responses were similar: support from family, being a parent, and staying busy.

Figure 8.3. Clients Reporting What Will Be Most Useful in Staying Off Drugs and/Or Alcohol (n = 175)



CHANCES OF STAYING OFF DRUGS/ALCOHOL

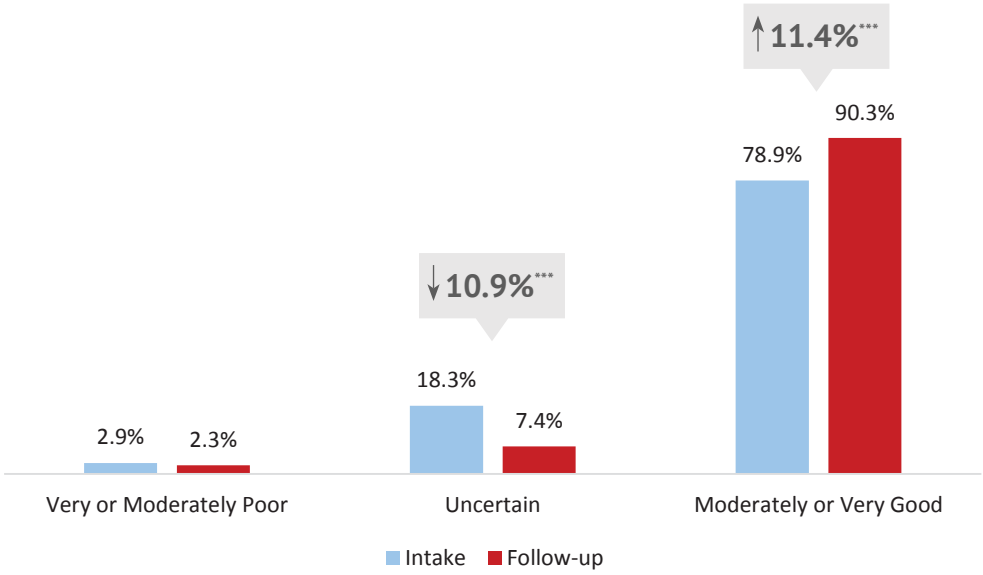
Clients were asked, based upon their situation, how good they believed their chances were of getting off and staying off drugs/alcohol using a scale from 1 (Very poor) to 5 (Very good). Clients rated their chances of getting off and staying off drugs/alcohol as a 4.2 at intake and a 4.5 at follow-up, which was a significant increase (not depicted in figure). Overall, 78.9% of clients believed

"They care about you. They don't treat you like a drug addict, they treat you like a person."

—KORTOS Follow-up Client

they had moderately or very good chances of staying off drugs/alcohol at intake with a significant increase of 11.4% at follow-up (90.3%; see Figure 8.4).

Figure 8.4. Clients Reporting their Chances of Getting Off and Staying Off Drugs/Alcohol at Intake and Follow-up (n = 175)[a]



a – Significance tested with the Stuart-Maxwell Test of Overall Marginal Homogeneity ($p < .01$)
***$p < .001$.

Section 9.

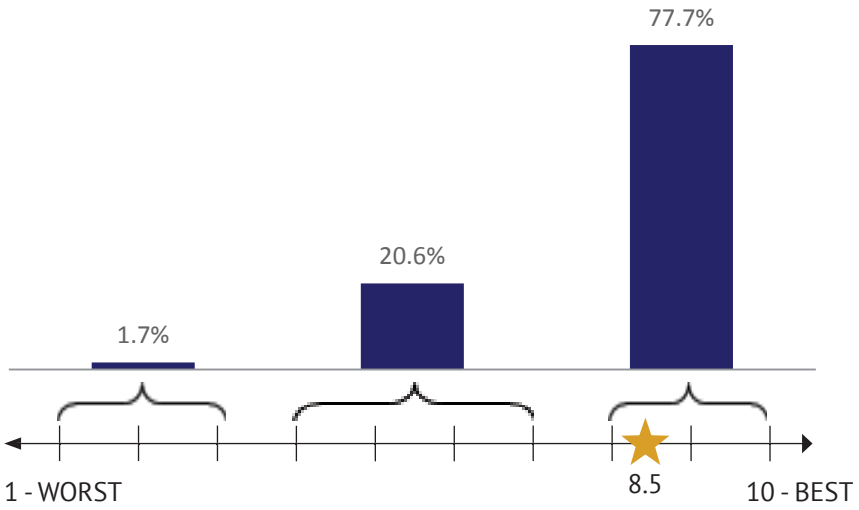
CLIENT SATISFACTION WITH OPIOID TREATMENT PROGRAMS

At the beginning of the follow-up interview, clients were asked to give their opinions and feedback regarding their program experience. The items measured in this report include: (1) overall client satisfaction with the program, (2) clients' ratings of program experiences, and (3) positive and negative aspects of program participation.

OVERALL CLIENT SATISFACTION

At the beginning of the follow-up interview, clients were asked to rate their experience at the program on a scale from 1 representing the worst possible experience to 10 representing the best possible experience. The average rating given by clients in the follow-up sample was 8.5, with 77.7% of clients giving a highly positive rating of 8 through 10 (see Figure 9.1).

Figure 9.1. Rating of Experience at the Program (n = 175)



CLIENT RATINGS OF PROGRAM EXPERIENCES

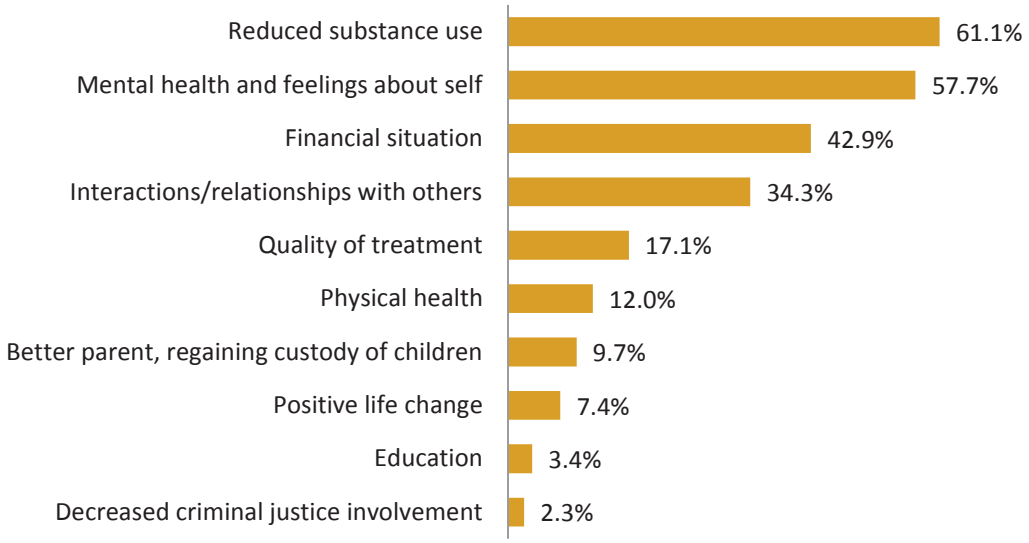
When asked a series of program satisfaction questions, most clients indicated each aspect of their experience was positive (see Figure 9.2). Clients reported that they were treated with respect, understood the expectations of the program, felt better about themselves, and got the services needed to get better at the program.

Figure 9.2. Percent of Clients That Agreed or Strongly Agreed with Statements About their Program Experience (n=175)

POSITIVE AND NEGATIVE ASPECTS OF PROGRAM

Clients were asked to identify the three most positive aspects of their participation in the program (Figure 9.3). Three in five (61.1%) reported that reduction in substance use was a positive outcome and 57.7% stated that improved mental health and feelings about self was a positive aspect. Over two-fifths of clients (42.9%) reported changes in their financial situation and employment while one-third (34.3%) said interactions and relationships with others was a positive aspect. Around 17% said the quality of treatment was a positive aspect. Other positive outcomes were changes in physical health, becoming a better parent or regaining custody of their children, positive life changes, education, and decreased criminal justice involvement.

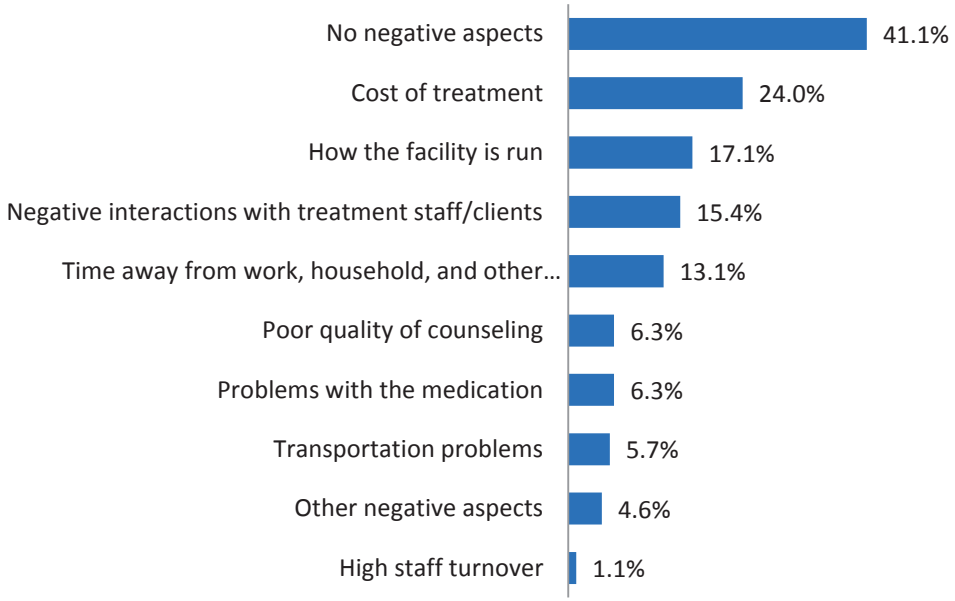
Figure 9.3. Percent of Clients Reporting Positive Aspects of the Program (n = 175)



Aspects of treatment that clients identified as problematic or needing improvement are displayed in Figure 9.4. The negative aspects of the program suggest barriers that clients must overcome to participate in the program including the cost and time investment. Specifically, cost of the program (24.0%), how the facility is run (e.g., wait time, rules being too strict; 17.1%), negative interactions with staff or other clients (15.4%), and time away from work, household, or other responsibilities (13.1%), were most frequently mentioned as negative aspects. Other areas of difficulty included the quality of counseling (e.g., not enough counseling; 6.3%), problems with the methadone itself (6.3%), transportation problems (5.7%), and other negative aspects (4.6%). Just 1.1% of clients mentioned high staff turnover as negative aspects of their program experience.

Two-fifths of clients did not report any negative aspects of the program

Figure 9.4. Percent of Clients Reporting Negative Aspects of the Program (n = 175)



Section 10.
IMPLICATIONS AND CONCLUSIONS

The KORTOS 2016 Annual Follow-Up Report describes characteristics of clients who had completed intake interviews (N = 517) and outcomes for 175 clients who participated in opioid treatment programs during calendar year 2015 and then completed a follow-up telephone interview 6 months after the intake interview was completed.

Overall, of the clients with intake interviews (N = 517), over half were male and 42.7% were female with ages 18 to 66 (average age 35 years old). Most were White and 50% were unemployed in the six months before intake. About 15% had been arrested and 12.0% spent at least one night in jail six months before the intake was completed.

When looking at referral to treatment, the largest categories were self-referred (47.5%) and referred by a family member, partner or friend (37.3%), and not formal referrals through community agencies. The majority of adults who completed an intake interview reported using illegal drugs (95.6%) and smoked tobacco (79.9%) while over one-quarter of clients reported using alcohol (27.4%) in the 6 months before intake. The drug classes reported by the greatest number of clients were prescription opioids (70.7%), heroin (58.9%), marijuana (53.5%), and tranquilizers (36.9%).

Results for those who were followed-up show that clients made substantial improvements from intake to follow-up in all four core components, including significant reductions in illegal drug and alcohol use, mental health problems, criminal justice system involvement, and a significant increase in quality of life. Improvements were also found for three supplemental areas: health status, economic and living circumstances, and recovery supports.

KORTOS follow-up clients (n = 175) had significant reductions in drug use as well as self-reported substance use severity. Seven in 10 clients reported misusing prescription opioids at intake, whereas only 14.9% of clients reported prescription opioid misuse at follow-up. Seven out of 10 followed-up clients also reported heroin use at intake and that number significantly decreased to 16.6%. The percent of clients using non-prescribed methadone and bup-nx also decreased significantly. Not only did clients' use of opioids decrease significantly, but their use of non-opioid drugs (such as marijuana, tranquilizers, benzodiazepines, stimulants) also decreased by half. Additionally, the number of KORTOS clients with ASI composite scores indicating severe drug use disorder or alcohol use disorder decreased significantly.

Clients' mental health also showed significant improvements. Fewer clients had symptoms of depression, generalized anxiety, comorbid depression and anxiety, and suicidal ideation or attempts at follow-up compared to intake. A minority of KORTOS clients reported criminal justice system involvement at intake and the number of clients reporting being arrested or incarcerated was significantly lower at follow-up.

Further, clients rated their quality of life as significantly higher after participating in the program. At follow-up, clients had significantly more positive feelings and fewer negative feelings and their satisfaction with life rating had significantly increased.

Stress and physical health was better for clients at follow-up. Specifically, clients reported significantly reduced stress-related health consequences, number of days of poor physical and mental health, and number of days their physical or mental health problems limited their daily activities at follow-up when compared to intake. In addition, significantly fewer clients reported they had experienced chronic pain in the 6 months before follow-up.

KORTOS clients showed improvements in economic and living circumstances from intake to follow-up. Half of clients were employed full-time at follow-up and they reported working significantly more months. In addition, the number of clients who reported they were homeless at some point in the past 6 months decreased significantly from intake to follow-up as did the number of clients who reported living in a controlled environment. At follow-up, fewer clients reported having economic hardship in terms of difficulty meeting basic living needs (such as food, shelter, and utilities) and health care needs (i.e., doctor visits, dental visits, and prescription medications) because of financial problems.

Compared to intake, significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up. Also at follow-up, clients reported having significantly more people they could count on for recovery support. Over 90% of clients stated they thought they had a moderately or very good chance of staying off drugs or alcohol at follow-up.

Finally, clients reported high levels of satisfaction with their OTP experience. Specifically, the majority of clients agreed that treatment helped them get better and feel better about themselves, program staff treated them with respect, and clients understood their treatment plan and what staff expected of them in the program. In addition, clients reported many positive aspects of their participation in the program including decreased substance use, improved mental health and their feelings about themselves, improved financial situation, and improved relationships with others.

AREAS OF CONCERN

While there were many positive outcomes overall, there are also potential opportunities to make even more significant improvements in clients' functioning after they begin treatment.

- **Drug Use.** Continued drug use during medication assisted treatment has been associated with early program termination[44,45] and longer treatment retention has been associated with more positive outcomes.[46,47] Forty-four percent of KORTOS clients reported using illegal drugs in the 6 months before follow-up. Of those 77 clients, over one-third (37.7%) reported non-prescribed opioid use (including prescription opioids, methadone, and bup-nx) and 37.7% reported heroin use. White et al. found that screening positive for just one non-

[44] Davstad, I., Stenbacka, M., Leifman, A., Beck, O., Kormaz, S., & Romelsjö, A. (2007) Patterns of illicit drug use and retention in a methadone program: A longitudinal study. *Journal of Opioid Maintenance 3*(1), 27–34.

[45] White, W., Campbell, M., Spencer, R., Hoffman, H., Crissman, B., & DuPont, R. (2014). Patterns of abstinence or continued drug use among methadone maintenance patients and their relation to treatment retention. *Journal of Psychoactive Drugs, 46*(2), 114-122.

[46] Hubbard, R., Craddock, S., & Anderson, J. (2003). Overview of 5-year followup outcomes in the drug abuse treatment outcome studies (DATOS). *Journal of Substance Abuse Treatment, 25*, 125-134.

[47] Gibson, A., Degenhardt, L., Mattick, R., Ali, R., White, J., & O'Brien, S. (2008). Exposure to opioid maintenance treatment reduces long-term mortality. *Addiction, 103*, 462-468.

prescribed drug doubled a client's dropout rate and screening for multiple drugs quadrupled it. Of the KORTOS clients reporting drug use at follow-up, 10.4% (n = 8) reported they had dropped out of their program within the past 30 days.

- **Smoking rates.** Smoking rates were high for clients at intake and remained high at follow-up. Smoking has been associated with increased mental health symptoms and physical health problems.[48, 49] There is a commonly held belief that individuals should not attempt to quit smoking while in substance abuse treatment, because smoking cessation can endanger their sobriety. This belief has been refuted by recent empirical research studies.[50] Voluntary smoking cessation during substance abuse treatment has been associated with lower relapse. Because tobacco use is associated with increased mental health symptoms as well as well-known physical health problems, including increased mortality, and smoking cessation has been associated with lower alcohol and drug relapse.[51]

- **Financial issues.** Meeting basic needs including health, stable living arrangements, having a purpose with daily meaningful activities, and recovery community are the four key dimensions to recovery.[52] While the number of participants reporting a difficulty meeting basic needs for financial reasons decreased at follow-up, 15% of clients still reported at follow-up having difficulty meeting basic living needs. Similarly, while the number of clients reporting full-time employment increased significantly, 39% of clients remained unemployed at follow-up. The resulting financial strain from these economic factors could lead to increased substance use to alleviate the stress.[53] Providing referrals and support for these factors may help improve basic living situations for many clients and support continued recovery living for long-term positive results after treatment.

- **Gender Issues.** There were several gender differences in targeted factors. Significantly more men reported using alcohol and/or illegal drugs in the past 6 months and past 30 days at follow-up as well as past-6-month illegal drug use at follow-up. More men also reported using non-opioid drugs (e.g., marijuana, cocaine, amphetamines, tranquilizers, hallucinogens, inhalants, barbiturates, and synthetic drugs) at follow-up. Significantly more men reported using smokeless tobacco at intake and follow-up. In addition, more men reported alcohol use at follow-up and binge drinking at intake.

  Women had more symptoms of depression at intake and follow-up and comorbid depression and anxiety at follow-up compared to men. Women reported a higher average number of days of poor physical health at intake and poor mental health at intake and follow-up. A higher percentage of women also reported an arrest in the 6 months before intake when

---

[48] Patton, G., Coffey, C., Carlin, J., Sawyer, S., & Wakefield, M. (2006). The course of early smoking: A population-based cohort study over three years. *Addiction, 93*, 1251-1260.

[49] Kalman, D., Morissette, S., & George, T. (2005). Co-morbidity of smoking in patients with psychiatric and substance use disorders. *American Journal of Addictions, 14*(2), 106-123

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

[51] Proschaska, J. (2010). Failure to treat tobacco use in mental health and addiction treatment settings: A form of harm reduction? *Drug and Alcohol Dependence, 110*, 177-182.

[52] http://blog.samhsa.gov/2012/03/23/defintion-of-recovery-updated/

[53] Shaw, B. A., Agahi, N., & Krause, N. (2011). Are Changes in Financial Strain Associated With Changes in Alcohol Use and Smoking Among Older Adults? *Journal of Studies on Alcohol and Drugs, 72*(6), 917-925.

compared to men.

More women were currently unemployed at both intake and follow-up and they reported working fewer months at intake and follow-up when compared to men. Among individuals who were currently employed, men had a significantly higher median hourly wage than women at both intake and follow-up. At intake, employed women made only $0.65 for every dollar employed men made and at follow-up, the gap in median hourly wages was still large, with employed women making only $0.68 for every dollar employed men made.

STUDY LIMITATIONS

The study findings must be considered within the context of the study's limitations. First, because there is no appropriate group of opioid dependent individuals who would like treatment but do not receive it to compare with the KORTOS individuals who participate in treatment, one cannot attribute all changes from intake to follow-up to opioid replacement treatment. Second, because not all clients agree to participate in the 6-month follow-up interview, it is unclear how generalizable the findings are to the entire client population that completes an intake interview. Analysis comparing those individuals who completed a follow-up interview with those who did not complete a follow-up interview for any reason (for example, they did not agree to be in the follow-up study, they were not selected into the follow-up sample, or they were not successfully contacted for the follow-up interview) found some significant differences between the two groups – several of which were likely due to the fact that significantly more females were followed up than were not followed up. For example, more of the clients who completed a follow-up interview reported they had depression, generalized anxiety, a chronic medical problem, and difficulty meeting basic living needs and health care needs for financial reasons in the 6 months before treatment intake when compared to clients who were not followed up. However, there were some differences that may not be due to gender differences in the follow-up sample. For example, significantly more clients who were followed up reported using non-prescribed bup-nx, non-prescribed methadone, heroin, and stimulants compared to clients who did not complete a follow-up interview. Although there were selected significant differences between those followed up, compared to those not followed up, the differences suggest those followed up had more challenges associated with more difficult recovery.

Third, data included in this report was self-reported by clients. There is reason to question the validity and reliability of self-reported data, particularly with regard to sensitive topics, such as illegal behavior and stigmatizing issues such as mental health and substance use. However, recent research has supported findings about the reliability and accuracy of individuals' reports of their substance use.[54, 55, 56, 57] Earlier studies found that the context of the interview influences reliability.[58] During the informed consent process for the KORTOS follow-up study, interviewers

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

[55] Harrison, L., Martin, 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). Rickville, MD: Substance Abuse and Mental health Services Administration, Office of Applied Studies.

[56] Shannon, E., Mathias, C., Marsh, D., Dougherty, D., & Liguori, A. (2007). Teenagers do not always lie: Characteristics and correspondence of telephone and in-person reports of adolescent drug use. *Drug and Alcohol Dependence, 8*(90), 288-291.

[57] Rutherford, M., Cacciola, J., Alterman, A., McKay, J., & Cook, T. (2000). Contrasts between admitters and deniers of drug use. *Journal of Substance Abuse Treatment, 18*, 343-348.

[58] Babor, T., Stephens, R., & Marlatt, A. (1987). Verbal report methods in clinical research on alcoholism: Response bias and its

tell participants that the research team operates independently from the opioid treatment programs, responses will be reported in group format and will not be identifiable at the individual level, and that the research team has a Federal Certificate of Confidentiality. These assurances of confidentiality and lack of affiliation with the data collectors may minimize individuals' concern about reporting stigmatizing or illegal behavior or conditions.

CONCLUSION

The 2017 KORTOS evaluation indicates that opioid treatment programs in Kentucky have been successful in facilitating positive changes in clients' lives in a variety of ways, including decreased substance use, decreased severity of substance use, decreased mental health symptoms, decreased economic hardship, and decreased involvement with the criminal justice system. Results also show that clients appreciate and value their experiences in treatment programs, have an improved quality of life, and more support for recovery after participating in treatment. Overall, KORTOS clients had significant improvements in their lives that have been shown to be key factors that facilitate recovery: meeting basic needs, stable living arrangements, having a purpose with daily meaningful activities, and recovery community.[59]

minimization. *Journal of Studies on Alcoholism, 48*, 410-424.

[59] http://blog.samhsa.gov/2012/03/23/defintion-of-recovery-updated/

Appendix A.
METHODS

The KORTOS intake and follow-up interview instruments are modeled after the Kentucky Treatment Outcomes Study (KTOS) assessment and is based on theory and research about substance use-related comorbidities relevant to substance use among clients in opioid treatment programs. The assessment's four core components (e.g., substance use, mental health, criminal justice involvement, and quality of life) and three supplemental components (e.g., (1) health status, (2) education, economic status, and living circumstances, and (3) recovery supports have demonstrated validity and reliability[60] and have been developed in collaboration with key stakeholders to consider the context of Kentucky opioid treatment programs.

KORTOS intake interviews were conducted by a clinician or staff person at the OTP using a web-based interview tool, in which identifying data were encrypted and submitted to the master database on the UK CDAR secure server. At the end of the intake interview, clinicians explained the follow-up study to clients and gave them the opportunity to volunteer to participate. Clients who were interested gave electronic consent to be contacted by UK CDAR BHOS staff members about 6 months later. Follow-up interviews were conducted via telephone using a questionnaire with items and questions similar to the questions in the intake interview.

The target month for the follow-up interview was 6 months after the intake interview was completed. In other words, if a client completed an intake interview in December 2015, the target month for the follow-up interview was June 2016. The window for completing a follow-up interview with an individual selected into the follow-up sample began one month before the target month and spanned until two months after. Therefore, if the target month for a follow-up was June 2016, interviewers began working to locate and contact the individual in May and could work the file until the end of August.

Of the 517 clients who completed an intake interview in 2015, 268 (51.7%) agreed to be contacted for the follow-up study. From this group of clients who voluntarily agreed to be contacted for the follow-up study, the research team pulled the follow-up sample by first identifying clients who had provided the minimum amount of contact information (e.g., two phone numbers or one phone number and one mailing address), and then selecting clients by intake month (n = 233).

Of the 233 clients included in the follow-up sample, 25.6% were no longer involved with an OTP at the time of follow-up, 3.9% were incarcerated, and 1.3% were in a residential treatment program. In total, 25 were ineligible for participating in the follow-up interview, which left 208 clients eligible at the time of the follow-up. Of these clients, 175 completed a follow-up interview (see Table AA.1). Thus, the follow-up rate was 84.1%. The remaining clients were never successfully contacted, or if contacted they never completed the follow-up interview (15.9%).

[60] Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016), *Evidence Base for the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

Table AA.1. Final Case Outcomes for Follow-up Efforts (n = 233)

	Number of Records	Percent (n = 233)
Ineligible for follow-up interview	25	10.7%
	Number of cases eligible for follow-up (n = 208)	
Completed follow-up interviews	175	
Follow-up rate is calculated by dividing the number of completed interviews by the number of eligible cases and multiplying by 100		84.1%
Expired cases (i.e., never contacted, did not complete the interview during the follow-up period)	33	
Expired rate ((the number of expired cases/eligible cases)*100)		15.9%
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 interviews + refusals)	200	
Percent of cases accounted for ((# of cases accounted for/total number of records in the follow-up sample)*100)		85.8%

Clients were considered ineligible for follow-up if they were living in a controlled environment during the follow-up period or were no longer in an OTP (see Table AA.2). Of the 25 cases that were ineligible for follow-up, the majority (52.0%) were ineligible because they were no longer receiving treatment at an OTP during the follow-up period. Thirty-six percent of clients were ineligible because they were incarcerated at the time of follow-up and a small number of clients were ineligible because they were in residential treatment (12.0%).

Table AA.2. Reasons Clients Were Ineligible for Follow-up (n = 25)

	Number	Percent
Not in treatment at OTP	13	52.0%
Incarcerated	9	36.0%
Residential treatment	3	12.0%

Appendix B provides detailed information on the locating efforts for the 2015 KORTOS follow-up sample.

Appendix C presents analysis on comparisons between clients who completed a follow-up interview and clients who did not complete a follow-up interview for any reason on key variables included in the intake interview.

Appendix B.
LOCATING EFFORTS FOR THE 2015 KORTOS FOLLOW-UP STUDY

Project interviewers documented their efforts (e.g., mailings, phone calls, Internet searches, etc.) to locate each participant included in the sample of individuals to be followed up from July 2013 to June 2014 (n = 350), which is the follow-up period corresponding to the KORTOS 2015 report. All the locator files were examined and used to extract information about the efforts project interviewers made to locate and contact participants as well as the type of contact information provided by participants in the original locator information when the intake interview data was submitted to UK CDAR. A subsample of records was randomly selected and independently examined to check that the procedures for extracting data were reliable and valid. The extraction sheets were compared between the two raters for interrater reliability, which was high (96.1%). The following information is based on the data collected during this review of locator files.

For all 350 records, a total of 2,182 phone calls were made to client phone numbers and 773 calls to contact persons' phone numbers. As Table AB.1 shows, project interviewers made an average of about 6.2 calls to client phone numbers and 2.4 calls to contact persons' phone numbers. Fewer than 40% of clients called in at any point and only 4.3% called-in to complete the interview after receiving the initial mailing without project interviewers putting additional effort into contacting the clients. That means 95.7% of clients took considerable effort to try to locate, contact, and complete follow-up interviews.

A total of 649 mailings were sent to client addresses and 26 mailings were sent to contact persons, an average of 1.9 mailings to clients and 0.1 mailings to contact persons. The research team received returned mail for 12.3% of clients that received mailings to client addresses and 1.4% of clients that received mailings to contact addresses.

In cases where the client contact information was incorrect (i.e., mail was returned, phone number was disconnected), online public directory databases were used to try to verify that we had correct or updated information for the client. Because it had been six months since they provided contact information, we would like to be sure we are not calling or sending mailings to someone other than the client. Therefore, verifying the correct contact information is a critical interim step in the follow-up process to protect confidentiality. For 92.3% of the clients, the interviewers used public searches/directories to verify contact information. If the client information could not be verified, interviewers also used social media and more detailed public directory databases to find updated contact information (52.9%). In cases where very little contact information was given or clients were not successfully located in the ways listed above, more in-depth searching methods were used (28.9%). As a last resort, in the few cases where the client was not successfully located in any of the ways described above, interviewers worked to reach client contacts provided by them at intake (6.7%).

Table AB.1. Locating Efforts for All Files (n = 350)

LOCATING EFFORTS	% OF CLIENT RECORDS	AVERAGE PER CLIENT
Number of total phone calls made to reach client		6.2
Number of phone calls made to contact persons (n= 326)		2.4
Clients who called in	38.9%	
Clients who called in and completed interview	20.3%	
Clients who called in and completed interview after receiving the initial client mailing	4.3%	
Contact persons who called in	8.0%	
At least one text message was sent to client	4.3%	
At least one text message was sent to contact person	0.6%	
Number of mailings sent to client		1.9
Handwritten note was sent	14.0%	
Returned mail from client's address	12.3%	
Number of mailings sent to contact persons		0.1
Returned mail from contact person's address	1.4%	
Client level of searching:		
Light (verification, VINE, Whitepages)	92.3%	
Medium (Facebook, Ancestry, USsearch, etc.)	52.9%	
In-depth (other in-depth databases)	28.9%	
Contact searched in any way	6.7%	

Because of study inclusion criteria, a complete client phone number was listed on 100.0% of the records. Less than half of these were working numbers for the client (46.3%), 9.7% were working numbers for a contact who knew the client, and 4.9% were working numbers but the contact did not know the client (i.e., wrong number). Over one-fifth of the phone numbers (22.3%) listed never resulted in contact (e.g., voicemail, busy signal, not receiving incoming calls, etc.) and 8.0% were disconnected. The majority of records also listed one unique, complete address for the client (87.4%; see Table AB.2).

Most of the clients provided the name of at least one other person that they thought would know how to get in touch with them in the next six months (90.9%). In addition, one-quarter also provided a unique and complete address and most (75.1%) provided a unique phone number for that person.

Table AB.2. Quality of Contact Information for All Files (n = 350)

QUALITY OF CONTACT INFORMATION	% OF RECORDS	AVERAGE PER CLIENT
Client Contact Information		
Client phone number listed	100.0%	
Client phone number was:		
Working number for client	46.3%	
Working number, person knew client	9.7%	
Working number, but no one knew the client	4.9%	
Working number for a facility or clinic	0.3%	
Called but did not reach a person (e.g., voicemail, busy signal, not receiving incoming calls)	22.3%	
Disconnected	8.0%	
Never called	8.0%	
Complete client address listed	87.4%	
Locator Contact Information		
Number of contact persons listed		1.0
0	9.1%	
1	78.6%	
2	12.3%	
Number of unique, complete addresses listed for contact persons		0.3
0	71.4%	
1	25.1%	
2	3.4%	
Number of unique, complete phone numbers listed for contact persons		0.9
0	16.3%	
1	75.1%	
2	8.6%	

Appendix C.
CLIENT CHARACTERISTICS AT INTAKE FOR THOSE WHO COMPLETED A FOLLOW-UP INTERVIEW AND THOSE WHO DID NOT COMPLETE A FOLLOW-UP INTERVIEW

Clients who completed a follow-up interview are compared in this section with clients who did not complete a follow-up interview for any reason (e.g., did not agree to be contacted for the follow-up interview, not selected into the follow-up sample, ineligible for follow-up, not successfully located for the follow-up).

DEMOGRAPHICS

The majority of the sample for this annual report was White and male; however, significantly more clients who completed a follow-up interview were female compared to clients who did not complete a follow-up interview (see Table AC.1). There were no significant differences on other demographics between clients who completed a follow-up interview and those who did not. The average client age for both groups was around 35.

Table AC.1. Comparison of Demographics for Clients Who Were Followed Up and Clients Who Were Not Followed Up

	FOLLOWED UP	
	NO n = 342	YES n = 175
AGE	34.7 years	34.7 years
GENDER***		
Female	36.2%	55.4%
Male	63.6%	44.6%
Transgender	0.3%	0.0%
RACE		
White	97.1%	94.9%
African American	0.9%	1.7%
Other or Multiracial	2.0%	3.4%
MARITAL STATUS		
Never married	45.5%	50.3%
Married	25.9%	21.1%
Separated or divorced	27.1%	25.7%
Widowed	1.5%	2.9%

***p < .001.

SUBSTANCE USE AT INTAKE

Use of illegal drugs in the 6 months before entering treatment is presented by follow-up status in Table AC.2. The most frequently reported illegal drugs used in the 6 months before entering treatment were prescription opioids/opioids, heroin, and marijuana. Significantly more clients who were followed up reported using heroin (70.1% vs. 53.2%) and non-prescribed methadone (27.4% vs. 17.2%) compared to clients who did not complete a follow-up interview. More than one-third of clients reported using CNS depressants and stimulants and nearly 30% reported non-prescribed buprenorphine-naloxone (bup-nx) use in the 6 months before intake. Around 6% of clients reported using hallucinogens, inhalants, and synthetic drugs in the 6 months before entering the program.

Table AC.2. Percent of Clients Reporting Illegal Drug Use in the 6 Months Before Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 175
Any illegal drug	95.3%	96.0%
Prescription opioid (illegal use)	70.0%	72.0%
Heroin***	53.2%	70.1%
Marijuana	54.5%	51.4%
CNS depressants	36.7%	39.4%
Stimulants (cocaine, amphetamines, methamphetamine, prescription stimulants)	32.1%	38.3%
Non-prescribed bup-nx	28.0%	29.7%
Non-prescribed methadone**	17.2%	27.4%
Other illicit drugs (hallucinogens, inhalants, synthetic drugs)	6.1%	5.7%

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

Less than one-fourth of clients who completed a follow-up and 29.7% of those who did not reported alcohol use in the 6 months before entering treatment. Smaller percentages of clients in both groups reported alcohol use to intoxication and binge drinking in the 6 months before entering treatment (see Table AC.3).

Table AC.3. Percent of Clients Reporting Alcohol Use in the 6 Months Before Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 175
Alcohol	29.7%	22.9%
Alcohol to intoxication	18.1%	17.1%
Binge drank alcohol (i.e., drank 5 or more [4 for women] drinks in 2 hours	14.9%	14.3%

In the 6 months before entering the program, the majority of clients reported smoking tobacco products, with no difference between those who completed a follow-up interview and those who did not (see Table AC.4). There was also no significant difference between groups on smokeless tobacco use.

Table AC.4. Percentage of Clients Reporting Tobacco Use in the 6 Months Before Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 175
Smoked tobacco	79.0%	81.7%
Smokeless tobacco	7.6%	6.3%

Self-reported severity of alcohol and drug use was measured with Addiction Severity Index (ASI) alcohol and drug composite scores. Alcohol and drug composite scores are presented in Table AC.5 for those clients who were not in a controlled environment all 30 days before entering treatment.[61] The highest composite score is 1.0 for each of the two substance categories.

The majority of clients who were not in a controlled environment all 30 days met or surpassed the Addiction Severity Index (ASI) composite score cutoff for alcohol and/or drug severe SUD with no difference by follow-up status. The average score for the drug severity composite score was .36 for both clients who did not complete a follow-up interview and for followed-up clients. These average cutoff scores include clients with scores of 0 on the composites.

Table AC.5. Severity of Substance Use Disorder at Intake

Recent substance use problems among clients who were….	Not in a controlled environment all 30 days before entering treatment	
	FOLLOWED UP	
	NO n = 340	YES n = 169
Percentage of clients with ASI composite score equal to or greater than cutoff score for …		
Severe alcohol or drug use disorder	92.6%	94.1%
Severe alcohol use disorder	8.8%	10.6%
Severe drug use disorder	92.6%	93.5%
Average composite score for alcohol use[a]	.06	.06
Average composite score for drug use[b]	.36	.36

[a] Score equal to or greater than .17 is indicative of severe alcohol use disorder.
[b] Score equal to or greater than .16 is indicative of severe drug use disorder.

Almost two-thirds of clients reported ever having been in substance abuse treatment in their lifetime, with no significant difference by follow-up status (see Table AC.6). Among clients who

[61] Clients who were in a controlled environment all 30 days before intake were not included in this analysis because being in a controlled environment limits one's access to substances.

reported a history of substance abuse treatment, the average number of lifetime treatment episodes was 2.9 for those who did not complete a follow-up and 3.5 for those that did; however, this was not a statistically significant difference.

Table AC.6. History of Substance Abuse Treatment in Lifetime

	FOLLOWED UP	
	NO n = 342	YES n = 175
Ever been in substance abuse treatment in lifetime	70.0%	74.3%
Among those who had ever been in substance abuse treatment in lifetime,	(n = 239)	(n = 130)
Average number of times in treatment	2.9	3.5

MENTAL HEALTH AT INTAKE

The mental health questions included in the KORTOS intake and follow-up interviews are not clinical measures, but instead are research measures. A total of 9 questions were asked to determine if they met study criteria for depression, including at least one of the two leading questions: (1) "Did you have a two-week period when you were consistently depressed or down, most of the day, nearly every day?" and (2) "Did you have a two-week period when you were much less interested in most things or much less able to enjoy the things you used to enjoy most of the time?". Significantly more clients who completed a follow-up interview than clients who did not complete a follow-up interview reported symptoms that met criteria for depression: 66.3% vs. 46.9% (see Table AC.7).

A total of 7 questions were asked to determine if clients met study criteria for generalized anxiety, including the leading question: "In the 6 months before entering this program, did you worry excessively or were you anxious about multiple things on more days than not for all 6 months (like family, health, finances, school, or work difficulties)?" Significantly more clients who completed a follow-up interview than clients who did not complete a follow-up interview reported symptoms that met criteria for generalized anxiety: 74.3% vs. 54.2%.

Two questions were included in the intake interview that asked about thoughts of suicide and attempted suicide in the 6 months before clients entered treatment. A minority of clients reported suicidal ideation or attempts, with no difference by follow-up status (see Table AC.7).

Table AC.7. Percent of Clients Reporting Mental Health Problems in the 6 Months Before Entering the Program

	FOLLOWED UP	
	NO n = 342	YES n = 175
Depression***	46.9%	66.3%
Generalized Anxiety***	54.2%	74.3%
Suicidality (e.g., thoughts of suicide or suicide attempts)	13.4%	20.0%

***p < .001.

PHYSICAL HEALTH AT INTAKE

To give an idea of the physical health of clients when they entered treatment, Table AC.8 presents the percent of the follow-up sample that reported health problems at intake. Overall, about 2 in 5 clients were experiencing chronic pain (i.e., pain that lasted more than 3 months) at intake with no difference between groups. Clients were asked at intake if a doctor had ever told them they had any of the 12 chronic medical problems listed (e.g., asthma, arthritis, cardiovascular disease, diabetes, chronic obstructive pulmonary disease [COPD], tuberculosis, severe dental disease, cancer, Hepatitis B, Hepatitis C, HIV, and other sexually transmitted diseases). Significantly more clients who were followed up reported they had been told by a doctor that they had at least one of the chronic medical problems compared to clients who were not followed up (53.7% vs. 44.3%). The most commonly reported chronic medical problems are presented in Table AC.8: Hepatitis C, arthritis, severe dental disease, asthma, and cardiovascular disease.

Table AC.8. Physical Health Status at Intake

	FOLLOWED UP	
	NO n = 342	YES n = 175
Chronic pain (lasting at least 3 months)	43.4%	42.3%
Ever told by a doctor that client had one of the 12 chronic medical problems listed*	44.3%	53.7%
Hepatitis C**	18.2%	31.1%
Arthritis	16.1%	16.9%
Severe dental disease	11.6%	17.9%
Asthma	11.5%	14.1%
Cardiovascular disease	10.7%	8.2%

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

SOCIOECONOMIC INDICATORS

Table AC.9 describes clients' level of education when entering treatment. There were no significant differences between groups: about one-fifth of clients who did not completed a follow up and 13.8% of clients who completed a follow up reported less than a high school diploma or GED at intake. Around two-fifths reported having a GED or high school diploma while 40.8% of those not followed-up and 47.8% of those who completed a follow-up attended vocational school or higher.

Table AC.9. Clients' Highest Level of Education Completed at Intake[62]

	FOLLOWED UP	
	NO n = 342	YES n = 159
HIGHEST LEVEL OF EDUCATION COMPLETED		
Less than GED or high school diploma	19.0%	13.8%
GED or high school diploma	40.2%	38.4%
Vocational school to graduate school	40.8%	47.8%

[62] Sixteen cases that completed a follow-up had missing data for education level.

There were no significant differences between groups on employment status in the 30 days before entering treatment (see Table AC.10).

Table AC.10. Employment in the 30 Days Before Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 175
EMPLOYMENT		
Not currently employed	46.6%	54.9%
Full-time	39.7%	34.9%
Part-time	10.5%	6.9%
Occasional	3.2%	3.4%

About three in five clients reported that their usual living arrangement in the 6 months before entering the program was living in their own home or apartment (see Table AC.11). Over one-third were living in someone else's home or apartment. Less than four percent of those who did not complete a follow up and 6.3% of those who were followed-up reported that they lived in an institutional facility, such as jail, prison, or a hospital, a hotel, or on the street. There were no differences between the groups on the number of clients who considered themselves homeless at intake.

Table AC.11. Living Situation of Clients Before Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 175
USUAL LIVING ARRANGEMENT IN THE 6 MONTHS BEFORE ENTERING THE PROGRAM		
Own home or apartment	62.4%	54.9%
Someone else's home or apartment	33.5%	38.9%
Institutional facility, hotel or on the street	4.1%	6.3%
HOMELESSNESS		
Consider themselves to be currently homeless	14.9%	16.6%

Measures of economic hardship may be better indicators of the actual day-to-day stressors clients face than a measure of income. Therefore, the intake interview included several questions about clients' ability to meet expenses for basic needs and food insecurity (SIPP). Clients were asked eight items, five of which asked about difficulty meeting basic needs such as food, shelter, utilities, and telephone, and three items asked about difficulty obtaining needed health care for financial reasons.

Table AC.12 shows that there was no difference in the percent of clients who had difficulty meeting basic living needs such as shelter, utilities, phone, and food but significantly more clients in the follow-up sample reported they were unable to receive needed health care for financial reasons compared to those who were not followed-up (50.9% vs 28.6%).

Table AC.12. Difficulty Meeting Basic Needs in the 6 Months Before Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 159
Had difficulty meeting basic living needs (e.g. shelter, utilities, phone, food)	44.0%	52.6%
Had difficulty obtaining needed health care for financial reasons***	28.6%	50.9%

***p < .001.

CRIMINAL JUSTICE SYSTEM INVOLVEMENT AT INTAKE

About 10% of clients who completed a follow up interview and 7.0% of clients who did not complete a follow up interview were under supervision by the criminal justice system when they entered the program (e.g., probation, parole, drug court), with no significant difference by follow-up status (see Table AC.13).

There was no difference in the number of clients who were arrested for any charge in the 6 months before entering the program by follow up status (13.4% vs 18.3%). Of those who had been arrested, however, the clients who completed a follow-up interview reported a higher number of arrests (3.2) than those who did not complete a follow up interview (1.3).

In addition, significantly more followed-up clients were incarcerated at least one night in the 6 months before entering the program (16.6%) compared to those not followed-up (9.6%). Of those who had been incarcerated, there were no significant differences in the average number of nights spent in jail with clients who completed a follow-up interview reporting an average of 24.2 nights and clients who did not complete a follow-up interview reporting an average of 16.4 nights.

Table AC.13. Criminal Justice System Involvement When Entering Treatment

	FOLLOWED UP	
	NO n = 342	YES n = 159
Currently under supervision by the criminal justice system	7.0%	10.9%
Arrested for any charge in the 6 months before entering treatment	13.4%	18.3%
Of those arrested	n = 46	n = 32
Average number of arrests*	1.3	3.2
Incarcerated in the 6 months before the program*	9.6%	16.6%
Of those incarcerated	n = 33	n = 29
Average number of nights in jail	16.4	24.2

*p < .05.

Most of the significant differences between clients who were followed up and those who were not may be due to gender differences between the two groups, wherein more of the followed-up clients were female compared to the clients who did not complete a follow-up interview. Specifically, more of the clients who completed a follow-up interview reported they had depression, generalized anxiety, had a chronic medical problem, and had difficulty meeting health care needs for financial reasons in the 6 months before treatment intake when compared to clients who were not followed up. However, there were some differences that may not be due to gender differences in the follow-up sample. For example, significantly more clients who were followed up reported a higher number of average arrests and being incarcerated in the 6 months before treatment, as well as using non-prescribed methadone and heroin when compared to clients who did not complete a follow-up interview.

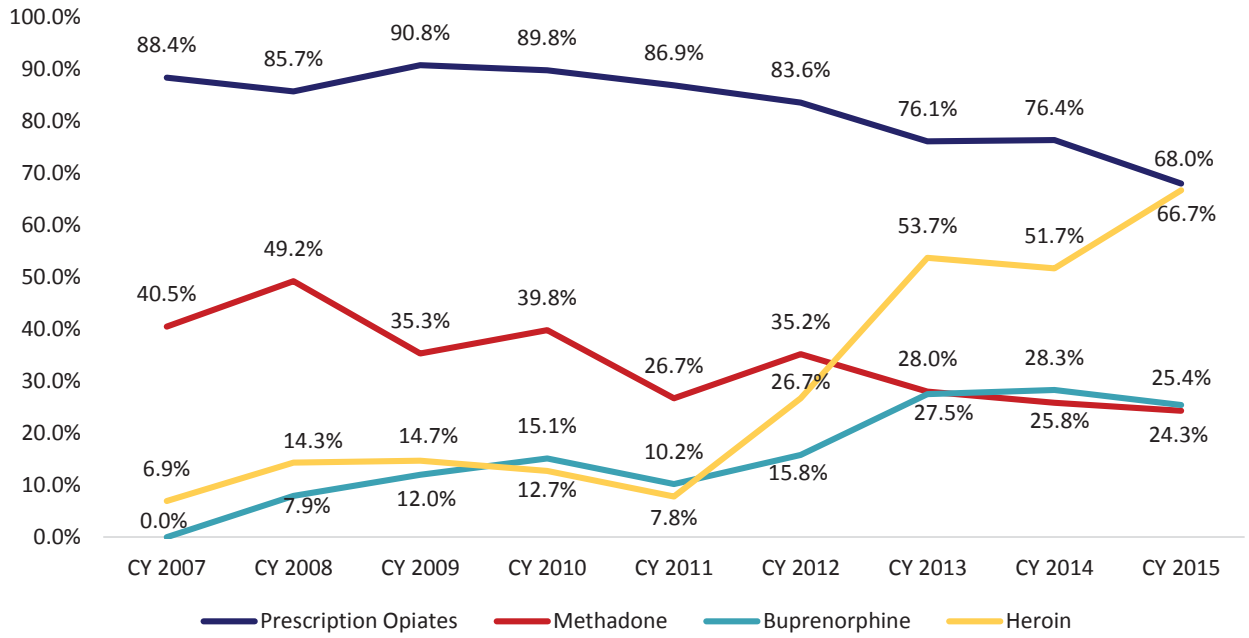
Appendix D.

TRENDS IN PRESCRIPTION OPIOID, METHADONE, BUP-NX, AND HEROIN USE AMONG KORTOS CLIENTS WITH A COMPLETED FOLLOW-UP INTERVIEW

Looking at trends over time for all clients with completed follow-up interviews, the percentage of clients using prescription opioids peaked in calendar year 2009 and has steadily dropped. Similarly, the percentage of clients who reported using non-prescribed methadone in the 30 days before entering treatment has declined since calendar year 2008. The percentage of clients who reported using bup-nx slowly increased from 2007 through 2010, dipped slightly in 2011, and then dramatically increased in 2013 and had remained stable since.

The most notable change in substance use among KORTOS clients is for heroin. Small percentages of KORTOS clients reported using heroin in the 30 days before entering treatment from 2007 through 2011. The percentage tripled from 2011 (7.8%) to 2012 (26.7%) and then the percentage doubled from 26.7% in 2012 to 53.7% in 2013. While the number of clients reporting heroin use decreased slightly in 2014, it remained relatively high. In 2015 the number has increased again with two-thirds of KORTOS clients (66.7%) reporting heroin use in the 30 days before intake.

Figure AD.1. Percentage of Followed-up Clients Reporting Non-prescribed Use of Prescription Opioids, Methadone, Bup-nx, and Heroin in the 30 Days Before Entering Treatment at the Program (n = 1,577)[63], [64]



[63] Clients who reported being in a controlled environment all 30 days before entering treatment (n = 76) are not included in this analysis.

[64] One client who completed a follow-up interview had missing data for past-30-day heroin use at intake.