Abstinence at Successful Discharge in Publicly Funded Addiction Health Services

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Abstract

Abstinence at successful discharge in substance use disorder treatment is important to reducing relapse rates and increasing long-term recovery from substance use disorders. However, few studies have examined abstinence as an essential component of successful discharge. This study examined rates and correlates of reported abstinence (nonuse of drugs 30 days prior to successful discharge) among clients attending publicly funded treatment in Los Angeles County, California. Finding show that only 36% of clients who were successfully discharged reported abstinence. Black clients were less likely than non-Hispanic Whites to report abstinence at successful discharge. Clients in methadone treatment programs were less likely than outpatient clients to report abstinence, whereas clients referred to treatment through the legal system (Proposition 36) were more likely to report abstinence compared to self-referred clients. Findings underscore the importance of systematic assessment of abstinence in determining successful discharge and provide a basis for further examination of strategies to improve abstinence and reduce relapse.

Introduction

An estimated 22.2 million Americans struggle with substance use disorders each year.[1] Between 2 and 4 million individuals receive treatment annually. Of those who receive treatment, less than

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half will successfully complete their treatment episode.[2] Treatment completion is broadly defined as successful response to drug-related issues stated in a client's treatment plan and evaluated by an addiction professional. However, successful completion of a treatment episode (henceforth referred to as successful discharge), i.e., a client's single engagement in treatment during which intake and discharge procedures were completed, requires abstinence. Abstinence is defined as a determined period (i.e., 30 days) of nonuse of any legal and illegal drugs before discharge from substance use disorder treatment.[3,4] Nonachievement of abstinence at successful discharge is often related to rates of relapse from a treatment episode, which is reported to be as high as 71%.[5] Given the requirements for improving the quality of care in the Affordable Care Act (ACA), it is especially important for treatment programs to incorporate abstinence as part of a series of measures considered when assessing if a treatment episode was successful at discharge. This is of particular relevance because the ACA is expected to increase access to treatment with the expansion of many Medicaid programs to include low-income single adults, a population evidenced to have high rates of substance use disorders.[6,7] Hence, abstinence as a potential pathway to reducing relapse and increasing long-term recovery should be systematically included in the assessment of successful discharge from a treatment episode. Yet, few studies have examined abstinence as an essential component of successful discharge. The purpose of this study was to examine rates and correlates of reported abstinence at successful discharge among clients attending publicly funded treatment in Los Angeles County, California, one of the largest treatment systems in the country.

Background

The implications of abstinence for relapse and long-term treatment outcomes among persons with substance use disorders are well established.[8–11] Few studies, however, examined abstinence as a key element of successful discharge.[12,13] Existing studies have focused on post-treatment status (i.e., relapse) or abstinence at follow-up to define the success of treatment for individuals in substance use disorder treatment.[12–15] A study of individuals who used cocaine found that 44% relapsed within 5 years of completing their first substance use treatment program.[9] Another study of individuals dependent on marijuana found that 71% relapsed within 6 months of completing an outpatient treatment program.[16] Other studies have examined baseline versus in-treatment use of drugs.[17–19] In general, abstinence rates are considerably low, with often less than half of clients reporting abstinence at 6-month follow-up.[20] The influence of expanded access to treatment, including specialty care, within the context of abstinence at successful discharge, is noteworthy, because individuals with substance use and co-occurring disorders will have increased access to insurance to support access to care. This could perhaps lead to greater numbers of clients accessing treatment, without considerable improvements in treatment outcomes. Additionally, given the ACA's focus on integrating behavioral health services and primary care, improving outcomes such as abstinence in specialty care settings remains a critical part of maintaining a strong continuum of care, which emphasizes accountability for outcomes and pay-for-performance policies.[21] Determining the proportion of clients who report abstinence at successful discharge and understanding the role of client and program factors would offer insight into approaches to improving treatment and outcomes.

Client factors influencing treatment outcomes

Some studies have suggested that client characteristics, rather than program characteristics, are more predictive of treatment outcomes. Factors such as psychosocial stressors (mental health and homelessness), severity of drug use, race and ethnicity, and socioeconomic status have been examined.[22–24] Comprising 40% of admissions, members of racial and ethnic minority populations are disproportionately represented in substance abuse treatment programs[1,24] and have lower rates

of treatment completion on average than White clients, most notably in outpatient programs.[1,23,25,26] Substance of choice has also been linked to treatment outcomes, including abstinence from drug use and retention in treatment. Generally, individuals whose primary substance is alcohol have better treatment outcomes,[27] whereas users of opioids and multiple substances, an estimated 15% of addicts,[2] have higher rates of attrition.[11,28]

Other client characteristics commonly cited as protective against attrition include being older than 40, a high school graduate, and employed full-time.[27,29] A recent study reported that homelessness, history of mental health issues, and history of HIV testing are associated with a lower likelihood of successfully completing treatment among Latinos in Los Angeles County, whereas referral by the criminal justice system is related to increased odds of completing treatment.[7,23] Additionally, client commitment to abstinence (for which prior treatment episodes may be a proxy) has been reported as a significant predictor of abstinence at treatment completion.[10]

Program factors influencing treatment outcomes

Program characteristics such as treatment type (e.g., residential or methadone programs), access to services, and staff factors have been shown to be predictive of treatment outcomes.[30–33] The effect of medication as an approach to treatment has also been extensively examined. Relative to treatments that do not include medication, pharmacological therapies are an effective approach to substance dependence.[34–36] A meta-analysis evaluating the effects of methadone maintenance treatment compared with treatment that did not include opioid replacement therapy found that methadone is associated with suppression of heroin use (clients are one third as likely to use heroin after treatment) and longer duration in treatment (clients are three times more likely to remain in treatment).[35] A related study reported that buprenorphine is an effective intervention in the treatment of heroin dependence[36] and promotes reduction in risk behaviors, such as injection drug use and criminal activities, associated with poor outcomes.[37,38]

There is also a general consensus in the literature that residential treatment programs have higher rates of successful discharge than outpatient programs.[8,27,30,39,40] Length of treatment, particularly increasing treatment episodes or duration, has similarly been associated with better outcomes.[30,39] However, other studies have reported that shorter treatment duration is more successful.[8,27]

Sources of referral and treatment outcomes

Referral source has also been shown to affect rates of successful completion of substance use disorder treatment. Clients mandated by the legal system to enter treatment as an alternative to incarceration have been shown to have higher rates of treatment completion.[41,42] In particular, in 2001, the state of California passed the Substance Abuse and Crime Prevention Act, known as Proposition 36, which permitted substance abuse treatment as an alternative to incarceration for drug offenders. In general, studies have found successful completion of treatment for participants of Proposition 36 programs when compared to self-referred individuals[23,43] and improved sobriety and crime-related outcomes for Proposition 36 participants when compared to individuals sentenced to incarceration.[43]

Hypotheses

Considering findings from prior research and the focus of the current analysis, abstinence at successful discharge was expected to be associated with program- and client-level factors. Three

hypothesis emphasizing client demographic factors, type of treatment, and source of referral as likely correlates of reported abstinence at successful discharge were developed.

Hypothesis 1 Client demographic factors (i.e., younger age, female, racial and ethnic minority, lower education, and unemployment) will be associated with lower odds of reported abstinence at successful discharge compared to the counter condition (older, male, non-Hispanic White, higher education, and employment).

Hypothesis 2 Treatment type, particularly methadone and residential treatment, will be associated with higher odds of reported abstinence at successful discharge relative to clients in outpatient treatment.

Hypothesis 3 Referral to treatment through the legal system, i.e., drug court and Proposition 36, will be positively associated with higher odds of reported abstinence at successful discharge compared to self-referral.

Methods

Sampling frame and data collection

This study used a fully concatenated program and client dataset collected in 2010 and 2011. The sampling frame included all 408 nonprofit substance abuse treatment programs funded by the Department of Public Health in Los Angeles County, California. The client data were drawn from the Los Angeles County Participant Reporting System (LACPRS). As described elsewhere,[23] these system-wide evaluation data, collected by each provider on an ongoing basis, capture the treatment experiences and immediate outcomes of a racially and ethnically diverse client population in the largest treatment system in the USA. The response rate for the client data was 96%. Of the 141 items in the LACPRS questionnaire, more than half are standardized scales and questions related to client admission, discharge, and health derived from state (California Outcomes Measurement System) and federal (Treatment Episode Data Set) measurement systems. Client data used in this study represented 15,100 treatment episodes collected from July 1, 2010, to December 30, 2011.

Data were also collected from a random sample of 147 publicly funded and nonprofit programs from the 350 programs located in communities with a population of 40% or more Black or Latino residents or both in Los Angeles County. Clinical supervisors were key informants for program survey measures, and additional sources of data were used to cross-validate survey measures during follow-up site visits with 91% of the sample. Consistent information from at least two of the three sources of data was necessary for inclusion of each program in the analytic sample, i.e., (1) a review of program characteristics and service delivery information reported to the funding organization (Los Angeles County Department of Public Health), (2) qualitative reports from one counselor per program, and (3) a review of printed material available at each provider site (e.g., brochures, group activities, posted signs). Qualitative reports from providers included descriptions of funding, staff credentials, services provided (e.g., medication-assisted treatment), and estimates of recovery rates in the program.

Analytic sample

The final analytic sample consisted of 106 programs and 11,533 client treatment episodes with full and verified information. Ninety-two percent of clinical supervisors responded to the online

program survey. The final analytic sample decreased from 147 to 106 programs because 12 programs did not respond to the survey, 10 programs reported inconsistent data, 8 programs did not serve county clients in 2010 and 2011, and 11 programs had closed prior to survey data collection. The 41 excluded programs did not differ from the analytic sample in terms of main independent variables ($p > 0.05$). Rates of missing data for programs were less than 16% across all survey measures, whereas the rate of missing for the client administrative data was less than 2%.

Study variables

This study examined one dependent variable: reported abstinence at successful discharge. A dichotomous measure based on three questions represented whether each client met the following criteria for abstinence at successful discharge: (1) discharge status indicating whether the client successfully completed a treatment episode, (2) client-reported drug use during the previous 30 days, and (3) client-reported abstinence at discharge. Discharge status was dichotomously defined using nine different discharge codes contained in client records. Clinicians were instructed to enter the code that best described the status of participants at time of discharge. Successful discharge was represented by two discharge codes indicating that respondents had successfully completed the major goals set forth in their recovery plan, regardless of whether they needed continuing care. Unsuccessful treatment included the remaining seven discharge codes related to leaving treatment early, leaving without making satisfactory progress, or failing to complete treatment for other reasons (e.g., incarceration). This measure of status at discharge is congruent with recent regional[44,45] and national[27] studies. Additionally, this measure has been used in several previous analyses.[23,26] Although about half of providers reported during site visits that urine analysis was used to assess abstinence, the survey data did not indicate whether this approach was used systematically to assist clinician discharge assessments. A client-reported measure of abstinence is consistent with other studies that have measured abstinence based on the same period of time (e.g., 30 days) and counselors' clinical assessment.[4,10,31]

Independent variables included program and client measures. At the client level, several demographic characteristics associated with treatment outcomes, including gender, age, race and ethnicity, and education, were included. The following psychosocial factors were also included in the model: employment status, criminal history, primary drug of choice, days of drug use during the previous month, age at drug use initiation, frequency of injection drug use, mental health history, prior treatment episodes, recovery support, and homelessness status.[13,26,46–49] Program funding and regulation measures associated with treatment outcomes were also included as control variables: percentage of public funding and accreditation by the Joint Commission.[46,50,51] Consistent with other studies on treatment outcomes, this study controlled for sources of referral, staff education (having a graduate degree), and treatment modality, i.e., whether the program format was primarily outpatient, short-term methadone (referred to as methadone), or residential to account for different expectations regarding retention.[47,52,53]

Data analysis

To test the association between independent variables and the likelihood of reported abstinence at successful discharge, multilevel logistic regression was performed. Multivariate analyses were conducted in Stata/SE version 12 using xtlogit.[54] These regression analyses relied on random intercept models to account for the hierarchical structure of the data (clients nested within a facility) to obtain more accurate estimates of standard errors,[55] as suggested in other multilevel analyses of program and client.[47] Given the large sample size, the relationships observed in the predictive multivariate logistic regression models were considered statistically significant if the 95% confidence interval (CI) did not bound 1. This approach highlighted the most meaningful

Table 1
Client ($N = 11{,}533$) and program ($N = 106$) characteristics of treatment programs

Variables	Number	$M \pm SD$ or n (%)
Client characteristics		
Reported abstinence at successful discharge	11,533	4141 (35.91)
Female	11,528	4345 (37.69)
Age		
18–28		3639 (31.55)
29–49		5624 (48.76)
50+		2270 (19.68)
Race		
White		4050 (35.12)
Black		2369 (20.54)
Latino		4488 (38.91)
Asian		626 (5.43)
Education		
Less than high school		692 (6.00)
High school		8511 (73.80)
College		2203 (19.10)
Post-graduate		127 (1.10)
Employed at admission	11,533	1280 (11.10)
Criminal history	11,533	4455 (38.63)
Primary drug		
Heroin		2355 (20.42)
Alcohol		2828 (24.52)
Methamphetamine		2599 (22.54)
Cocaine or crack		1253 (10.86)
Marijuana or hashish		1628 (14.12)
Other		870 (7.54)
Days of use during previous month		
0		3733 (32.37)
1–29		4691 (40.67)
Daily		3109 (26.96)
Age at first use		
0–12		967 (8.38)
13–18		5504 (47.72)
19–24		2632 (22.82)
25+		2430 (21.07)
Days of injection drug use	11,533	1743 (15.11)
Mental illness	11,533	3098 (26.86)
Prior treatment episodes	11,533	1.84 ± 3.69
Medication		
None		8990 (77.95)
Methadone		1035 (8.97)
Buprenorphine (Subutex)		186 (1.61)
Buprenorphine (Suboxone)		8 (0.07)
Other		1314 (11.39)
Recovery support	11,533	3.16 ± 7.78

Table 1 (continued)

Variables	Number	$M \pm SD$ or n (%)
Homeless	11,533	2279 (19.76)
Program characteristics		
Joint Commission accreditation	11,494	4226 (36.77)
Treatment type		
Outpatient		6548 (56.78)
Methadone		495 (4.29)
Residential		4490 (38.93)
Percentage of public funding		
0%–70%		2031 (17.61)
70%–90%		4654 (40.35)
90%+		4848 (42.04)
Referral source		
Self		5292 (45.89)
Community		1158 (10.04)
Proposition 36		1879 (16.29)
Drug court		542 (4.70)
Social services		2662 (23.08)
Staff members with graduate degree	11,199	20.07 ± 25.70

differences and reduced type I error inflation due to the inclusion of numerous individual and program variables.

Results

Table 1 describes client and program characteristics of treatment programs. Only 36% of clients reported being abstinent at successful discharge. Most clients were from minority population groups: 38.9% of participants were Latino and 20.5% were Black. Unemployment at admission was prevalent (88.9%), and three fourths of clients used drugs other than alcohol (e.g., heroin, crack, methamphetamine) as their primary drug. Approximately 15.1% of participants' injected drugs and 26.9% had a history of mental illness. In addition, most clients (77.95%) were not receiving any type of pharmacotherapy (i.e., methadone, Subutex, or Suboxone) as part of their treatment plan. Most treatment programs included in the analysis were not accredited by the Joint Commission (63%). A significant proportion of treatment programs (62%) received more than 70% of their funding from a public source. The most common type of referral to treatment was self-referral (45.9%), followed by referral from social services (23.1%) and Proposition 36 (16.3%).

Results from multivariate logistic regression showed associations between program and individual factors and the odds of a client reporting abstinence at successful discharge. These results partially supported the hypotheses (Table 2).

Partial support was found for hypothesis 1; some key demographic characteristics of clients were not related to reported abstinence at successful discharge (sex and education), whereas other characteristics (age, race, and employment at admission) had statistically significant associations with reported abstinence at successful discharge. Adjusting for potential confounders, analyses showed that clients aged 50 or older were more likely than younger clients, aged 18 to 28, to report

Table 2
Logistic regression of reported abstinence at successful discharge

	OR	SE	95% CI
Client characteristics			
Female	0.903	0.058	0.796, 1.025
Age[a]			
29–49	1.072	0.063	0.957, 1.202
50+	1.347**	0.129	1.116, 1.626
Race[b]			
Black	0.707***	0.077	0.571, 0.875
Latino	0.865	0.065	0.746, 1.004
Asian	0.946	0.059	0.838, 1.069
Education[c]			
High school	0.955	0.102	0.774, 1.178
College	1.016	0.111	0.820, 1.259
Post-graduate	1.370	0.329	0.856, 2.193
Employed at admission	1.485***	0.127	1.256, 1.757
Criminal history	0.968	0.064	0.850, 1.102
Primary drug[d]			
Alcohol	1.597***	0.110	1.395, 1.829
Methamphetamine	1.141	0.106	0.951, 1.369
Cocaine or crack	1.119	0.099	0.941, 1.330
Marijuana or hashish	1.224	0.127	0.999, 1.500
Other	1.247***	0.075	1.109, 1.402
Days of use during previous month	0.841	0.136	0.612, 1.155
Age at first use	1.056*	0.026	1.006, 1.109
Days of injection drug use	0.851*	0.070	0.725, 0.999
Prior treatment episodes	1.010	0.006	0.999, 1.021
Medication[e]			
Methadone	4.796***	0.884	3.341, 6.883
Subutex	7.629***	1.347	5.398, 10.782
Suboxone	3.689*	2.011	1.268, 10.736
Other	4.694***	1.107	2.956, 7.454
History of mental illness	0.720**	0.089	0.565, 0.917
Recovery support	1.015**	0.005	1.004, 1.025
Homeless	0.909	0.068	0.785, 1.052
Program characteristics			
Joint Commission accreditation	1.233	0.190	0.912, 1.667
Treatment type[f]			
Methadone	0.015***	0.005	0.007, 0.030
Residential	1.804***	0.304	1.296, 2.510
Referral source[g]			
Community	0.810	0.117	0.611, 1.075
Proposition 36	1.630***	0.191	1.296, 2.051
Drug court	0.914	0.186	0.614, 1.361
Social services	0.995	0.077	0.855, 1.159

Table 2 (continued)

	OR	SE	95% CI
Public funding[h]	1.191*	0.098	1.013, 1.400
Staff members with graduate degree	1.005**	0.002	1.002, 1.009

Wald $\chi^2(36) = 3070.41$; $p < 0.0001$
CI confidence interval, *OR* odds ratio, *SE* standard error
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
[a]Age of 18–28 is the reference group
[b]White is the reference group
[c]Less than high school is the reference group
[d]Heroin is the reference group
[e]None is the reference group
[f]Outpatient treatment is the reference group
[g]Self is the reference group
[h]Categorized as 1 = 0%–70%, 2 = 70%–90%, and 3 = 90%–100%

abstinence at successful discharge (odds ratio (OR) = 1.35, 95% CI = 1.11, 1.62). Participants from racial and ethnic minority backgrounds were associated with a decreased likelihood of reported abstinence at successful discharge. Relative to White clients, Black clients were significantly less likely to report abstinence at successful discharge (OR = 0.71, 95% CI = 0.57, 0.87). Clients who were employed at admission (OR = 1.49, 95% CI = 1.25, 1.75) were also more likely to report abstinence at successful discharge.

Several nondemographic attributes of clients were also associated with reported abstinence at successful discharge. Recovery support (attending peer support groups; OR = 1.01, 95% CI = 1.01, 1.02) and use of medications such as methadone (OR = 4.79, 95% CI = 3.34, 6.88), Suboxone (OR = 3.69, 95% CI = 1.28, 10.74), and Subutex (OR = 7.63, 95% CI = 5.39, 10.78) were associated with higher odds of reported abstinence. Having a primary drug of choice other than heroin and being older at first use of primary drug were also positively associated with reported abstinence at successful discharge. In contrast, psychosocial conditions, such as mental health disorders (OR = 0.72, 95% CI = 0.56, 0.92) and more days of injection as a method of drug use during treatment (OR = 0.85, 95% CI = 0.72, 0.99), were associated with lower odds of reported abstinence at successful discharge.

Findings partially supported hypothesis 2. Although clients of methadone programs (OR = 0.02, 95% CI = 0.00, 0.03) were less likely to report abstinence at successful discharge, clients in residential programs (OR = 1.80, 95% CI = 1.29, 2.51) were more likely to report abstinence at successful discharge, compared to clients in outpatient treatment programs. Hypothesis 3 was also partially supported. Significant differences were found by referral source. Although referral to treatment through drug court was not statistically significantly different, clients referred through Proposition 36 (OR = 1.63, 95% CI = 1.29, 2.05) reported an increased likelihood of reporting abstinence at successful discharge, compared to self-referral. Several program factors were associated with reporting abstinence at successful discharge, including a higher percentage of public funding (OR = 1.19, 95% CI = 1.01, 1.40) and having staff members with graduate degrees (OR = 1.01, 95% CI = 1.00, 1.01).

Discussion

The results of this study show that distinct client and program factors play an important role in reporting abstinence at successful discharge and are congruent with the few prior studies that examined abstinence or successful discharge.[9,10] Results indicate that only 36% of clients entering substance use disorders treatment reported abstinence at successful discharge. This rate of successful discharge is consistent with other reported rates in regional studies,[1] although it is difficult to compare rates of reported abstinence at discharge given the limited research in this area.

Specifically, client factors, including Black race, were associated with a lower likelihood of reported abstinence at successful discharge. The finding regarding racial disparities in abstinence at successful discharge is in line with other studies that reported that not only are minorities disproportionately represented in substance use disorder treatment programs, they also have worse outcomes on average, including lower rates of successful discharge, compared to White clients.[23,25,27,39,56] One study reported that racial and ethnic disparities in treatment completion are associated with differences in socioeconomic status, unemployment, and housing instability.[24] Another study found that treatment neighborhood disadvantages account for a considerable proportion of racial and ethnic differences.[44] These findings are particularly troubling because they suggest that completion rates for Black clients, which are already lower compared to White clients, may be overestimated because they do not account for abstinence at successful discharge. A recent study on racial and ethnic disparities in treatment completion highlighted the importance of a holistic approach to addressing the disparities issue in treatment programs, noting that the contribution of individual and systemic factors must be considered when addressing these disparities.[56]

To put these findings in context, it is particularly critical to examine the mechanisms at play in publicly funded treatment programs in Los Angeles County that may enable achievement of abstinence at successful discharge, especially among racially and ethnically diverse clients, individuals in need of mental health services, and individuals who inject drugs. Results showed that several factors were associated with increased likelihood of reported abstinence at successful discharge: older age, receiving pharmacotherapy, being employed at admission, and receiving recovery support. These findings highlight the importance of sustaining systems that support facilitators (e.g., coordination of services, linkages to social services) that promote abstinence at successful discharge.

Program factors such as receiving treatment in a methadone program were associated with a decreased likelihood of reported abstinence at successful discharge, whereas other program characteristics, including residential programs, high rates of referral from Proposition 36, and having staff members with graduate degrees, increased rates of reported abstinence at successful discharge. Although inconsistent with the hypotheses, the finding regarding methadone programs is consistent with some studies and indicates that type of program is an important correlate of but does not necessarily promote abstinence. Albeit conjectural, the lower abstinence rates may be due to the type of short-term stabilization orientation of the methadone treatment programs included in this sample. Clients served by these programs may have not been able to sustain a drug-free lifestyle for at least 30 days prior to meeting other discharge criteria.

The expected finding of higher odds of reported abstinence among clients in residential programs may be explained by limited exposure to elements that may facilitate access to drugs. These clients may have been subjected to mandatory or more frequent drug testing, which may have served as a deterrent to drug use. For instance, one study found that a majority of individuals receiving outpatient methadone maintenance treatment continued to use substances throughout treatment,[57] whereas another study reported that clients who received residential treatment were more likely to complete treatment.[39] Similarly, studies have reported that reductions in relapse rates were associated with long-term stays in recovery or sober-living houses, where continued support

and guidance helped clients maintain or achieve abstinence.[27,58–60] Although methadone treatment programs were associated with a decreased likelihood of reported abstinence at successful discharge in the current study, clients with methadone prescriptions were more likely to report abstinence at the end of treatment. Perhaps service delivery processes, rather than type of program only, may help explain this finding and should be further examined.

Referral source was also associated with abstinence at successful discharge. Clients who were referred to treatment by the criminal justice system, specifically via Proposition 36, were more likely to report abstinence at successful discharge than self-referred clients. However, drug court referral was not significantly associated with abstinence. Probation supervision and additional public funding may be incentives associated with completing treatment via Proposition 36. Additionally, Proposition 36 clients who complete treatment can have their criminal arrest and conviction expunged from their record.[13] The program has also been associated with reductions in racial and ethnic disparities in completion of treatment for Latino clients, although a similar effect was not observed for Black clients.[23] Other studies have reported that Proposition 36 clients were more likely to have successfully completed treatment at discharge, but that recidivism after 12 months was higher relative to drug court referrals.[43] Similarly, clients receiving care from programs with a higher proportion of public funding and professionalization (staff members with graduate education) were more likely to achieve sobriety at discharge. These measures of program capacity are potentially critical to improving standards of care in substance abuse treatment[51] in the current health-care reform environment.[61]

Overall, our finding that only 36% of clients who were successfully discharged reported abstinence must be considered with some context. Approaches to treatment, including the content of treatment plans, as well as how goals are set and measured, may be a factor. It may be that clients who continue to use drugs and/or alcohol while in treatment may have been successfully discharged because they met the requirements of their treatment episode, which may not have had a particular focus on abstinence. Additionally, addiction has been defined as a chronic, relapsing, progressive, and compulsive disease[62–65] and requires considerable exposure to addiction health services, i.e., *practice*, in order to successfully abstain from substance use and abuse. Comprehensive approaches to addiction treatment, such as the chronic disease model, which targets physiological and behavioral aspects of disease, have been suggested and may present a viable approach to improving rates of abstinence at successful discharge.[66]

Study limitations

There are several limitations of this study that should be considered when interpreting its results. First, the LACPRS did not focus on the treatment process and did not provide a comprehensive assessment of the availability of treatment services or the level of care (outpatient vs. intensive outpatient). This prevented the analysis of the influence of availability of ancillary services, capacity to provide services, and quality and intensity of care on abstinence at successful discharge. Specifically, information on the type and intensity of services (e.g., psychological, social, and behavioral) provided to clients would have allowed an examination of whether some elements of treatment were associated with abstinence at the end of treatment.[59] Psychosocial services, in addition to drug-abuse-related issues, are a very important component of addiction disorder treatment in Los Angeles County[67] and therefore require extensive consideration in future analyses. Second, the LACPRS data did not permit causal assessments of the relationships between key covariates and abstinence at the end of treatment. Clients referred through Proposition 36 may have had access to additional services and criminal justice oversight that positively influenced their abstinence status at successful discharge. Also, the current study did not include interactions between client characteristics (e.g., race and ethnicity and gender) and outcomes to examine baseline relationships. Third, findings regarding differences in outcomes by treatment type could

not be elucidated. The data did not indicate whether clients in residential treatment had more frequent drug tests, had access to the community, or had greater exposure to counselors and other providers. However, qualitative data suggested that some providers rely on drug tests and evidence-based practices (e.g., contingency management) to promote abstinence. Fourth, the dependent variable was mostly client-reported. In this case, overreporting of abstinence at successful discharge, possibly due to social desirability, would be expected. However, given the low rate of abstinence at successful discharge and similar rates in other studies,[19,20] the use of this measure may be less problematic. Also, a drawback of our large sample size is identifying statistically significant relationships that were close to null in magnitude. But the benefit of this large dataset is to identify relationships among ethnic minority groups that are generally limited or small in other regions of the country. Although findings are not generalizable to treatment systems generally found in mainly non-Hispanic White regions of the country, they represent large metropolitan and culturally diverse areas of the country.

Last, measuring the causal effects of key factors would require panel data, which were not available for the current study. Despite these limitations, study findings offer insight into the potential need for the inclusion of abstinence in the classification of client treatment completion status. Additionally, this study highlights the implications of how treatment completion is defined in the context of relapse and long-term treatment success. There is a clear need for measures and refined definitions that facilitate changes in treatment processes and promote abstinence at successful discharge.

Conclusions

Only 36% of clients entering treatment reported abstinence at successful discharge. Unfortunately, the existing research on treatment completion and relapse has not systematically considered abstinence at successful discharge as a precursor of treatment success or its ultimate effect on relapse rates. There is therefore a need for approaches to treatment that not only effectively address low rates of completion, but also focus on accurately measuring and promoting abstinence at successful discharge for each treatment episode. Understanding the role of client and program factors is an essential component of achieving this goal. A careful examination of abstinence as a concept important to successful discharge would provide valuable insight into relapse and factors that promotes wellness for individuals struggling with addiction. A more holistic understanding of the multifaceted correlates of wellness, abstinence, and recovery is an important first step to addressing the challenges of treatment, demonstrating effectiveness, and facilitating sustainable improvements for all clients.[68]

Implications for Behavioral Health

Findings from this analysis have implications for practice and policies relevant to behavioral health care. First, the identification of client and program factors associated with a client's likelihood of reporting abstinence at successful discharge from a given treatment episode is important for the development of targeted strategies that promote abstinence. For example, at the program level, efforts may focus on designing treatment interventions to measure and ensure abstinence among high-risk populations—Black men and individuals experiencing unemployment, mental health issues, or homelessness. Further efforts that focus on the particular needs of minority patients and circumstances that adversely influence abstinence at treatment completion may also offer opportunities for improvement.

Second, discharging clients from a treatment episode without systematic consideration of the role of abstinence has important implications for their continuum-of-care plan and need to engage in recovery services. The systematic evaluation of abstinence during each treatment episode would

provide insight into how programs help clients refrain from using drugs during treatment and assess coping strategies with other co-occurring life challenges. Improving drug testing and reporting is essential. This shift is critical not only for program development, management, and improved client outcomes in general but also specifically for reductions in relapse and long-term abstinence.

Findings from this study also have implications for policy. In the current health-care environment, which has placed a greater emphasis on a payment model that rewards performance (i.e., pay-for-performance system), treatment programs must offer evidence-based psychosocial and pharmacological treatments that are more likely to improve patient outcomes.[69] Treatment programs must therefore invest in mechanisms that reduce rates of relapse, readmission, and ultimately cost. Policy makers should examine the development of service delivery processes, frameworks, and interventions that consider new expectations for payment (e.g., public insurance) and service delivery (evidence-based care) and determine their impact on access to high standards of care in addiction treatment and the current low rate of abstinence at successful discharge. In sum, these findings highlight the importance of increasing the proportion of clients who are abstinent at successful discharge, reducing relapse rates, and increasing long-term sustained abstinence and recovery.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

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