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Top Manager Effects on Buprenorphine Adoption in Outpatient Substance Abuse Treatment Programs

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Abstract

To examine the influence of top managers' characteristics on the adoption of buprenorphine for opioid dependence among U.S. outpatient substance abuse treatment units, this investigation analyzed a cross-sectional national study of 547 such units in the 2004–2005 wave of the Drug Abuse Treatment System Survey. Administrators reported their demographics, training, and treatment orientation, as well as features of the unit and its pattern of use of buprenorphine. Nationally, 15.8% of programs offered any buprenorphine services. Greater adoption of buprenorphine correlated with directors' younger age, longer tenure, male gender, and weaker endorsement of abstinence as the most important treatment goal. Availability of naltrexone and medical services also correlated positively with buprenorphine adoption. The authors conclude that leaders' characteristics are related to the adoption of innovative practices in addiction treatment programs. Future work should examine whether leadership development for community addiction programs might speed up the diffusion of buprenorphine and other innovative, evidence-based practices.

Introduction

Translation of innovative, empirically supported interventions into practice is a priority for health services researchers, clinicians, and policy-makers concerned about the quality of care in substance abuse treatment programs. Medication-assisted treatment enjoys strong empirical support for the treatment of opiate dependence.¹ "Medically supervised withdrawal" by substituting and tapering a long-acting full or partial agonist at the opiate mu receptor effectively decreases opiate withdrawal symptoms and short-term craving.² Although detoxification in this manner is a standard precursor to abstinence-based treatment for opioid dependence, subsequent relapse is extremely common.^{2,3} By attenuating the

reinforcing effects of opioids, pharmacological maintenance therapy produces the best outcomes,⁴ but is less accepted than detoxification in community programs.²

Buprenorphine, an innovative pharmacotherapy for opioid dependence, was marketed in the United States in early 2003. Federal law allows physicians with special qualifications or opioid treatment programs to use buprenorphine for detoxification or maintenance treatment. Prior research has examined community substance abuse treatment programs' early adoption of buprenorphine.⁵⁻⁹ For example, in a national study of 299 private and 277 public treatment centers, Knudsen and colleagues⁸ found that adoption of buprenorphine was positively associated with private for-profit status, accreditation, availability of physician services, use of naltrexone, detoxification services, and the percentage of opiate-dependent clients. The effectiveness and acceptability of buprenorphine for detoxification differs from its indication for maintenance,³ thus separate consideration of these indications is needed to understand fully buprenorphine's pattern of adoption in community addiction programs.

Other work supports that treatment programs that adopt innovative pharmacotherapy tend to have more commercial sources of payment, accreditation, physician staff, detoxification services, and more services for co-occurring conditions.¹⁰⁻¹² Although these studies have established that environmental and institutional factors influence the adoption of innovative practices in substance abuse treatment programs, limited attention has been paid to the crucial role of senior leadership in the adoption process.^{6,13,14}

A strongly held view in the organizational literature is that organizations are profoundly influenced by top managers and the decisions they make, including promoting and sustaining innovation.¹⁵⁻¹⁷ The top executive is the agent ultimately responsible for action on an organization's strategy, design, performance, and technologies. This perspective is especially compelling in relatively small community organizations, like many outpatient substance abuse treatment (OSAT) programs, where clients and staff are likely to feel the influence of top management directly and keenly.¹⁸⁻²⁰ By virtue of their loose specialization of function, simple structures, and short managerial hierarchies, small organizations are very susceptible to direct managerial control.^{19,21-23} Idiosyncratic leadership is also common in such organizations, rendering the individual attributes of the leader synonymous with the role of the top manager.^{23,24} The current study thus examines the influence of senior managers' characteristics on the adoption of buprenorphine detoxification and maintenance in a nationally representative sample survey of OSAT agencies.

Conceptual framework

Senior managers are responsible for key decisions that dictate an organization's policies and procedures.^{17,25,26} Directors' observable attributes serve as proxies for attitudes and abilities relevant to their unit's adoption of buprenorphine. Differing norms and/or self-efficacy may lead some directors to innovate more than others.²⁷ Superior interpersonal or managerial skills will make some directors more able to implement evidence-based practices.^{6,28}

The above mechanisms notwithstanding, leaders might influence organizational innovation by creating environments that contribute to organizational learning and adoption of new practices, or conversely, organizations might attract, recruit, and select leaders to match their prevailing culture or strategy, thus reinforcing existing practices or behavior.²⁹ To understand these relationships, investigations must evaluate whether observed associations between director attributes and buprenorphine adoption remain after controlling for important characteristics of the organization and its clientele. If observed associations hold while controlling for such contextual characteristics, it suggests that leadership attributes operate independently of the organizational and environmental context. On the other hand, the disappearance of such associations after controlling for contextual characteristics

suggests that leaders with those attributes might self-select or are selected into OSAT programs with congruent culture, strategy, and practices. The current study posits that the characteristics of senior managers, like institutional and environmental factors, influence the adoption of innovative practices.^{17,25} Specifically, leaders' characteristics like tenure at the organization, training, treatment orientation, age, and gender may influence their propensity to accept and promote new ideas.^{6,28}

Tenure—Some work has suggested that, with longer tenure, directors gain experience maneuvering through institutional barriers to change and thus are more effective in promoting innovation.^{30–32} Other work suggests the converse: directors with longer tenure within the organization may be more professionally invested in the status quo and have a lower propensity to accept and promote innovation.^{25,33,34} Although both of these perspectives have merit, the first hypothesis examines whether:

H1: Longer director tenure at the agency will be negatively correlated with the adoption of buprenorphine.

Training—A leader's education and training influences their likelihood of promoting medically oriented treatments and their skill in their use.³⁵ Previous work has found that treatment program administrators with medical training are more open to pharmacological interventions.^{6,11} Conversely, directors with training as substance abuse counselors lack medical training and are more likely to be socialized to the primacy of abstinence-oriented counseling over pharmacotherapy.^{35,36}

H2: Buprenorphine adoption will be negatively correlated with the directors' licensure or certification as a substance abuse counselor.

Treatment orientation—The treatment orientation indicates the leaders' view of treatments like buprenorphine. A traditional treatment orientation views abstinence as the primary goal and may view the 12-step model (whose goal is complete abstinence) as highly effective. Such an orientation is less compatible with pharmacotherapy than one grounded in the biomedical model.

H3: Buprenorphine adoption will be negatively correlated with the directors' endorsement of complete abstinence as the most important treatment goal.

H4: Buprenorphine adoption will be negatively correlated with the directors' high rating of the extent to which the 12-step model of treatment is effective with substance abuse clients.

Effects of age and gender are more difficult to explain as predictors of buprenorphine adoption. Conventional wisdom about age has been that people tend to become less open to new practices with time. This would imply that younger unit directors would be more favorably disposed toward adoption of new technologies or practices. General management research suggests that younger managers are more receptive to innovation, more likely to accept new ideas and risk inherent in innovation, and more flexible to adapt to new ideas and procedures.^{25,33,37,38} Although Young et al.²⁵ found a negative association between administrator age and adoption of total quality management in their study of VA hospitals, another large study of US public organizations found no association.³⁸ The literature is similarly equivocal regarding the supposition that older leaders have more influence over innovation adoption because of greater store of learning and access to information networks over time.^{39,40}

As with age, theory and evidence are insufficient to make definitive directional hypotheses about how the director's gender might relate to buprenorphine use. Moore et al.⁴⁰ did not

find differences in attitudes toward treatment between substance abuse treatment opinion leaders and other counselors by gender. A survey of nonprofit executives found that male respondents were more likely to report successful interagency collaborations, but did not predict innovation adoption.⁴¹ However, because of an interest in identifying potential, identifiable leadership attributes associated with buprenorphine use, however, both age and gender are included for exploratory purposes.

Control variables—The institutional and environmental characteristics of substance abuse treatment organizations also influence adoption of innovations.^{6,11,42} For the current analysis, control variables include ownership, affiliation, and prior medical and pharmacological practices.⁸ Privately owned units have competitive and marketing pressures that create incentives to adopt cutting-edge practices like buprenorphine treatment.⁴³ Hospital-based programs, those with more medical staffing and a medicalized approach to addictive disorders (e.g., physical examinations, other pharmacotherapy, etc.) could adopt novel medications more readily because their experience with pharmaceutical procedures (e.g., dispensing, side effect monitoring) make them better prepared to absorb the innovation.^{6,44} Relatedly, units that already use pharmacological approaches will also be more likely to adopt a new pharmacological agent.¹¹ Furthermore, on-site medical staff could facilitate prescription and delivery of pharmacotherapy or serve as opinion leaders.^{45,46} A unit's commitment to quality care affects its propensity to provide evidence-based treatments.^{47,48} Organizations accredited by the Joint Commission on Accreditation of Health Care Organizations (JCAHO) are thus expected to be more likely to adopt buprenorphine.

Programs with uncertain or scarce resources tend to forgo innovation.⁴⁹ Hence, drug treatment organizations subject to the liabilities of “newness” and “smallness” may be less likely to adopt buprenorphine.⁵⁰ Conversely, larger units may be more likely to innovate because they face less uncertainty about their survival and have greater slack resources.^{43,51}

Finally, programs adapt their practices to the needs of the population they serve.^{52,53} Client characteristics indicative of differential need and resources include clients' gender, race, insurance status, heroin and injection drug use, and prescription drug use.⁵⁴

Methods

Sample and data collection

This study analyzed data from the sixth wave (2004–2005) of the Drug Abuse Treatment System Survey (DATSS). The DATSS was a longitudinal study of OSAT units conducted by the Institute for Social Research, University of Michigan. In the DATSS, an OSAT unit was formally defined as a physical facility with a majority of resources (>50%) dedicated to treating individuals with substance abuse problems (including alcohol and other drugs) on an outpatient basis. Programs run by the Veteran's Administration and by correctional facilities were excluded from the sample. DATSS was a telephone survey of 550 pairs of administrative directors and clinical supervisors at each unit, with the response rate of 88.3% and 87.5%, respectively. This analysis used only 547 pairs because of the deletion of units with incomplete data on buprenorphine adoption.

Experienced interviewing staff conducted the survey from the Survey Research Center at the University of Michigan. The survey was administered using computer-aided telephone interviewing system that promoted data reliability and validity. Two pretests with national representative samples of $N=20$ units each were conducted before the survey. As the data were collected, computer programs performed extensive reliability checks that notified interviewers when numbers did not sum as they should or were out of expected ranges (e.g.,

the percent of clients receiving various methadone dose levels should sum to 100%). Interviewers then worked with respondents to resolve inconsistencies.

Measures

Dependent variables—Adoption of buprenorphine was examined through three primary outcomes: any use of buprenorphine at all; any use for detoxification; and any use for opioid maintenance therapy. Clinical supervisors were asked the percentage of the unit's outpatient substance abuse clients receiving buprenorphine for opiate detoxification and the percentage that received buprenorphine for opioid maintenance therapy. Units having at least one client receiving buprenorphine for the above services were coded as yes, otherwise no. In addition, indicating overall adoption of buprenorphine was coded yes if the unit had at least one client receiving buprenorphine for either of the above services, otherwise no.

In programs that reported any use of buprenorphine, secondary outcomes examined implementation as the percentage of clients that received buprenorphine for detoxification or maintenance. Implementation levels were categorized by tertile as low (1% to 1.9% of clients), moderate (2% to 5%), or high (5% or greater).

Explanatory variables

Program leadership: The characteristics assessed of administrative directors included sex, age, tenure at the agency in years, race/ethnicity, and whether he/she possessed the license/certification as a substance abuse treatment counselor. Clinical supervisor characteristics were highly correlated with respective director characteristics, so they were excluded from the analysis to avoid multicollinearity. Supervisors were asked the extent of the treatment effectiveness of the Alcoholics Anonymous or Narcotics Anonymous 12-step model. The categories were “no extent, a little extent, some extent, a great extent, and a very great extent” (reference category). Among a list of ten treatment goals for the program, the clinical supervisors rank ordered from 1, the most, to 10, the least important priorities of the program. The units' abstinence orientation was coded as 1 when the supervisors ranked complete abstinence as the most important treatment goal and 0 otherwise; approximately 82% ranked complete abstinence as the most important treatment goal. Number of days from January 1, 2003 to the interview date approximated the time since public launch of buprenorphine in the United States and controlled for the effect of time on the individual adoption of buprenorphine.

Program characteristics: Ownership was dummy-coded as private for-profit or private not-for-profit, with public ownership as the referent. Similarly, affiliation was dummy-coded as hospital, mental health center, or other organization, with freestanding as the referent. Methadone availability was generated from clinical supervisors' reports of whether their program provided methadone treatment. The availability of detoxification services and the use of naltrexone treatment were included in addition to methadone availability. JCAHO accreditation was a dummy variable; no accreditation served as the referent. Program age, measured as years from the year when the unit began to provide OSAT services until the year of the interview (2004), was included. Program size, measured as the number of clients per year reported by the director, was also considered. To determine the breadth of medical services available, the number of routine medical services the clinic offered was summed. The seven possible services included physical examinations, routine medical care, HIV testing, HIV/AIDS acute treatment, tuberculosis screening, sexually transmitted disease testing, and hepatitis screening.

One program measure assessed medical staffing; it was coded 1 if the program had at least one staff physician or registered nurse and zero if there was no medical staff. Another

staffing measure was the percentage of recovering alcoholic staffs in the unit. Due to skewness of the data, the variable was categorized into four levels: 0–5% recovering alcoholic staff among permanent staff, 6–20%, 21–40%, and 41–100% (reference category).

Measures of program treatment characteristics were also included. The routine use of the American Society of Addiction Medicine (ASAM) criteria was dummy-coded, with no as the referent. Whether the program conducted physical assessments for all clients at intake was also dummy-coded, with no as the referent. In addition, a measure of urine testing was coded as 1 if all clients were monitored through urine testing, otherwise 0.

Client characteristics: To assess resources and needs of the population served in these programs, explanatory variables included mean client age, as well as the percentage of clients in the past fiscal year who were: female; Hispanic/Latino; African American; uninsured and unable to pay for treatment; insured by Medicaid; heroin users; injection drug users; and over-the-counter or prescription drug users.

Data analysis—Analyses weighted to adjust for sample selection probability evaluated the characteristics of programs adoption of buprenorphine at all, adoption for opiate detoxification, and adoption for opioid maintenance therapy. In a process of manual backward selection, bivariate correlates of the three outcomes at the $P < 0.2$ level of significance [not shown] entered multivariate logistic regression models, respectively; final models retain explanatory variables with $P < 0.05$. Similar procedures were used in two exploratory ordinal logistic regression models for detoxification and maintenance, respectively, that assess the independent correlates of low (1% to 1.9%), moderate (2% to 5%), or high (5% or greater) implementation levels. All significance tests were two-tailed.

Results

Descriptive results

Of the 547 OSAT units, 28 adopted buprenorphine for opioid detoxification only, 19 adopted buprenorphine for opioid maintenance only, and 36 adopted buprenorphine for both. Table 1 presents the characteristics of the 83 programs that had any buprenorphine services, the 64 that offered any opioid detoxification, and the 55 with any opioid maintenance therapy, weighted to be nationally representative. Buprenorphine was available at 24 (15.8%) of the 152 programs that had methadone available, compared to 59 (14.9%) of the 395 nonmethadone programs. Of the 326 programs with medical staff, 19.9% had buprenorphine available, compared with 7% among programs without medical staff.

In multivariate analyses (Table 2, data column 1), programs with older and female directors were less likely to adopt buprenorphine at all. Programs whose directors ranked complete abstinence as the most important treatment goal were also less likely to adopt buprenorphine, as were programs affiliated with mental health centers compared to freestanding units. Regarding breadth of available medical services, every additional medical service was associated with an estimated 20% increase in buprenorphine services. Programs with medical staff were almost three times more likely to adopt buprenorphine and programs that use naltrexone were six times more likely. However, programs that provided physical assessments for all patients appeared to be half as likely to adopt buprenorphine. Time since public launch of buprenorphine in the United States showed no effect on the adoption of buprenorphine at all; the effect is insignificant ($P = 0.89$).

Adoption of buprenorphine for detoxification—Director age and gender had a similar effect on buprenorphine adoption for detoxification (Table 2, data column 2) as for any adoption of buprenorphine. Longer director tenure at the agency, naltrexone use, and

serving more female clients was associated with increased adoption of buprenorphine for detoxification. Program affiliation, breadth of medical services, or provision of physical assessments for all clients did not influence the adoption of buprenorphine for detoxification.

Adoption of buprenorphine for maintenance—Older director age, female gender, and endorsement of abstinence as the most important treatment goal were associated with a lower likelihood of adopting buprenorphine for opioid maintenance (Table 2, data column 3). Naltrexone use and breadth of medical services were again associated with greater adoption of buprenorphine for opioid maintenance. No other variables emerged as correlates of the adoption of buprenorphine for maintenance therapy services.

Implementation of buprenorphine—Very few patients received buprenorphine in these programs. For example, in the 83 units that adopted buprenorphine at all, a mean of $6.3 \pm 13.6\%$ [median, 2%; range 0–85%] of clients received it for opioid detoxification and $6.6 \pm 16.3\%$ [median, 2%; range 0–100%] of clients received it for maintenance. In ordinal logistic regression models, only JCAHO accreditation ($OR=7.0$; 95% $CI=2.2$ to 22 ; $P<0.001$), offering naltrexone ($OR=2.6$; 95% $CI=0.9$ to 7.1 ; $P<0.07$), and serving more female clients ($OR=1.0$ per 10% increase; 95% $CI=1.0$ to 1.1 ; $P<0.08$) were associated with increased implementation of buprenorphine detoxification. No correlates were detected of implementation of buprenorphine for maintenance therapy.

Discussion

Although directional hypotheses regarding age and gender were not specified, this nationally representative sample survey of OSAT programs found that programs most likely to have adopted buprenorphine in 2004 had younger and male administrators whose orientation was least orthodox regarding complete abstinence, even controlling for other leadership characteristics, institutional variables, and client variables. One potential explanation is that greater age and female gender might be associated with more risk-averse attitudes toward innovation. For example, conventional wisdom has been that people tend to become more risk-averse with time. This would imply that, in general, older unit directors would be less favorably disposed toward novel practices. There may also be a historical effect, such that individuals who were trained a long time ago will be less open to treatment practices that differ philosophically from their accustomed models for appropriate substance abuse treatment. Indeed, a traditional, abstinence-only treatment orientation is a well-documented factor in the acceptability and use of medications, especially agonist or partial agonist substitution therapy, to treat addictive disorders.⁵⁵ Recent initiatives in training and staff development thus might make younger leaders more accepting of pharmacotherapies and innovative approaches.⁵⁶

Controlling for age, however, administrators with longer tenure might have the experience and bonafides to successfully change the organization's policies and procedures. Directors with more experience in their units are also likely to understand the staff, clients, and context better than less experienced directors, and thus, have stronger implementation skills. In addition, long-tenured directors should have developed influence with supervisors and staff over time, further enhancing the likelihood of successful adoption. An awareness of these assets should make adoption as well as implementation more likely, given greater optimism about success,²⁷ though the evidence to date has been mixed. Indeed, a recent meta-analysis found a positive overall association between leader tenure and organizational innovation.⁵⁷

It is uncertain why the current study detected no effect of private ownership, accreditation, or percentage of opiate-dependent patients. The reasons for the finding regarding female leaders are equally obscure. The literature suggests that gender effects may differ somewhat in health care compared to other sectors. For example, although women in nonhealth care organizations tend to rate their own leadership qualities and effectiveness less highly than men, this difference is attenuated in health care organizations.⁵⁸ Similarly, the “glass ceiling” phenomenon within senior management teams is thought to be less pronounced in health care than in other industries.^{59,60} Thus, the finding that units led by women directors are less likely to be adopters should be considered exploratory.

Like a recent analysis of the National Treatment Center Study,⁸ medical services and staffing and current use of naltrexone correlated with adoption of buprenorphine. These findings are consistent with the notion that a medical-oriented cultural consensus within the program facilitates adoption of innovative pharmacological treatments.⁶¹

Several limitations warrant mention. Because of its cross-sectional design, this study cannot determine causal direction, although many of the explanatory variables were relatively fixed structural characteristics. Only a limited number of measures of the organizational environment could be examined—other influential factors undoubtedly exist. Furthermore, although organizational-level reports in DATSS have been compared against client-level responses for some measures,⁶² reports of buprenorphine adoption have not been specifically validated. The possibility remains that an affirmative response regarding buprenorphine availability could have been the result of availability from outside sources rather than true adoption within the program. Organizational scholars have also criticized studies that use observable attributes such as education and tenure in place of the social–psychological factors they are believed to represent, assuming that these attributes affect organizational outcomes through unmeasured and, thus, untestable mediators and yielding only prediction without explanation about why such patterns might exist.⁶³ Given the very early stage of leadership research in substance abuse treatment, however, it is appropriate to begin with tests of association between observable attributes, leaving future research to probe how and why identified patterns emerged.

Implications for Behavioral Health

Adoption of evidence-based medication-assisted therapies is important as community addiction treatment programs address the problem of early attrition of opioid-dependent patients.⁶⁴ Despite buprenorphine’s safety and efficacy, its adoption has been relatively delayed compared to many innovations in health care. Leadership appears key to the adoption of buprenorphine in addiction treatment programs. That said, leaders in behavioral health care often face inconsistent or conflicting demands.⁶⁵ Many of these demands stem from strong, but fragmented, institutional and market forces.⁶⁶ Leaders feel pressure to improve both quality and access to services but, at the same time, reduce costs. This situation makes the decision as to what technologies to adopt a critical leadership issue.

Another challenge derives from uncertainty surrounding the work of behavioral health care organizations. As a human service, behavioral health care entails great variability in the nature of the “inputs” and uncertain means–ends causal relationships in production, which, in turn, creates problems in defining and measuring organizational outcomes.⁶⁷ Despite this uncertainty, OSAT leaders must decide the optimal mix of services, treatment practices, and staffing that they think will result in the best outcomes for their clients

Finally, leaders in the behavioral health sector must deal with a mix of professional and nonprofessional providers who continue to dominate day-to-day work in substance abuse treatment care organizations. Providers of all types have ambivalent relationships with

organizations and may resist practices that are not consistent with established norms or experience. For example, the substance abuse field and its largely recovering workforce still struggle with the normative legacy of the 12-step movement's insistence on abstinence and suspicion of medication-assisted treatment. Although the articulation of standards for competent practice will help,^{56,68} the challenge of influencing norms within these organizations is a primary task for effective local leadership.

This study's findings suggest that leaders less ideologically grounded in the "abstinence-only" approach are more likely to promote innovative practices like buprenorphine. Other characteristics of leaders, such as age, also influence adoption. Consistent with previous findings,⁸ an established medical culture, including on-site medical services, staffing, and current use of other medications for addictive disorders, also facilitate adoption of buprenorphine. Further study is needed to determine whether initiatives in leadership development for community addiction programs might speed up the diffusion of buprenorphine and other innovative, evidence-based practices.

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Table 1
National estimates of clinic and client characteristics of facilities associated with buprenorphine treatment

	Offer any buprenorphine		Offer buprenorphine detoxification		Offer buprenorphine maintenance	
	No	Yes	No	Yes	No	Yes
Overall national estimates (%)	84.2	15.8	85.9	14.1	91.0	9.0
Program leadership						
Director age, mean years (SD)	50.8 (30.0)	44.2 (27.9) ****	50.8 (30.0)	43.7 (30.1) ****	50.0 (31.7)	46.9 (19.5) **
Director tenure at agency (per 10 years)	10.7 (28.1)	9.4 (23.7)	10.6 (27.7)	9.5 (25.6)	10.6 (28.1)	8.5 (19.9) *
Director sex						
Male	82.0	18.0 ****	84.0	16.0 ****	87.7	12.3 ****
Female	87.9	12.1 ****	89.0	11.0 ****	96.1	3.9 ****
Director race						
White	82.4	17.6 ****	84.2	15.8 ****	89.8	10.2 ****
Black	95.9	4.1 ****	97.1	2.9 ****	97.6	2.4 ****
Other	94.7	5.3 ****	95.0	5.0 ****	97.8	2.2 ****
Director ethnicity						
Hispanic	94.7	5.3 ****	95.2	4.8 ****	97.3	2.7 ****
Non-Hispanic	83.8	16.2 ****	85.5	14.5 ****	90.6	9.4 ****
Director licensed or certified as substance abuse counselor						
Yes	86.7	13.3 ****	88.2	11.8 ****	2.0	8.0 ****
No	79.5	20.5 ****	81.5	18.5 ****	89.0	11.0 ****
Complete abstinence as most important treatment goal						
Yes	84.7	15.3 *	86.3	13.7 *	92.9	7.1 ****
No	82.3	17.7 *	84.1	15.9 *	83.9	16.1 ****
Extent that 12-step model of treatment effective with substance abuse clients						
No extent	96.0	4.0 ****	100.0	0.0 ****	96.0	4.0 ****
A little extent	53.5	46.5 ****	53.5	46.5 ****	54.5	45.5 ****
Some extent	86.8	13.2 ****	89.0	11.0 ****	95.3	4.7 ****
A great extent	92.5	7.5 ****	94.0	6.0 ****	95.3	4.7 ****

	Offer any buprenorphine		Offer buprenorphine detoxification		Offer buprenorphine maintenance	
	No	Yes	No	Yes	No	Yes
A very great extent	72.2	27.8 ****	73.7	26.3 ****	84.9	15.1 ****
Program characteristics						
Ownership (%)						
Private for-profit	90.8	9.2 ****	93.2	6.8 ****	93.1	6.9 ****
Private not-for-profit	76.6	23.4 ****	77.5	22.5 ****	87.7	12.3 ****
Public	95.7	4.3 ****	97.9	2.1 ****	96.7	3.3 ****
Affiliation (%)						
Hospital	65.2	34.8 ****	69.4	30.6 ****	89.5	10.5 ****
Mental health	98.0	2.0 ****	98.2	1.8 ****	99.2	0.8 ****
Other organization	80.0	20.0 ****	81.8	18.2 ****	86.8	13.2 ****
Freestanding	91.6	8.4 ****	92.7	7.3 ****	94.1	5.9 ****
Methadone available						
Yes	87.0	13.0 *	92.4	7.6 ****	91.5	8.5
No	83.8	16.2 *	84.8	15.2 ****	90.9	9.1
Offers detoxification services						
Yes	66.0	34.0 ****	71.2	28.8 ****	71.0	29.0 ****
No	86.9	13.1 ****	88.0	12.0 ****	93.8	6.2 ****
Offers naltrexone treatment						
Yes	57.8	42.2 ****	64.8	35.2 ****	80.3	19.7 ****
No	88.8	11.2 ****	89.4	10.6 ****	92.7	7.3 ****
JCAHO accredited						
Yes	77.2	22.8 ****	80.6	19.4 ****	92.1	7.9
No	86.1	13.9 ****	87.3	12.7 ****	90.8	9.2
Breadth of medical services provided, mean (SD)	3.5 (8.2)	4.5 (7.3) ***	3.5 (8.1)	4.3 (8.0) **	3.4 (8.1)	5.5 (5.2) ****
Has medical staff						
Yes	76.7	23.3 ****	80.5	19.5 ****	90.9	9.1
No	90.3	9.7 ****	90.3	9.7 ****	91.2	8.8

	Offer any buprenorphine		Offer buprenorphine detoxification		Offer buprenorphine maintenance	
	No	Yes	No	Yes	No	Yes
Percentage of recovering staff						
0-5	94.4	5.6 ****	96.3	3.7 ****	96.6	3.4 ****
6-20	72.8	27.2 ****	74.7	25.3 ****	84.8	15.2 ****
21-40	78.4	21.6 ****	79.1	20.9 ****	94.4	5.6 ****
41-100	87.3	12.7 ****	88.8	11.2 ****	88.6	11.4 ****
Program age, mean years (SD)	16.4 (36.3)	20.5 (41.0) **	16.6 (36.1)	20.2 (44.8) *	17.2 (37.5)	15.6 (35.4)
Program size, mean no. clients per year (SD)	505 (3246)	1823 (11077) ***	510 (3208)	1920 (12486) **	712 (5336)	779 (6680)
Routinely use ASAM criteria						
Yes	86.5	13.5 ****	88.5	11.5 ****	90.2	9.8
No	80.7	19.3 ****	82.0	18.0 ****	91.4	8.6
Conduct physical assessment at intake						
Yes	83.2	16.8 ****	84.8	15.2 *	90.3	9.7
No	85.1	14.9 ****	86.8	13.2 *	91.5	8.5
All clients' progress monitored through urine testing						
Yes	76.2	23.8 ****	77.9	22.1 ****	89.6	10.4 **
No	90.2	9.8 ****	91.8	8.2 ****	91.9	8.1 **
Client characteristics						
Weighted client mean age, mean years (SD)	35.6 (17.6)	36.3 (17.6)	35.6 (17.6)	36.0 (17.5)	35.6 (17.5)	36.0 (18.4)
Percent female, mean (SD)	33.0 (63.2)	43.5 (56.4) ****	32.9 (62.4)	45.3 (58.4) ****	33.8 (63.7)	41.5 (55.7) **
Percent Hispanic/Latino, mean (SD)	16.4 (67.1)	20.3 (47.9) *	16.3 (66.6)	21.0 (46.8) *	16.7 (66.3)	20.3 (47.2)
Percent African American, mean (SD)	24.0 (95.1)	20.5 (68.6)	23.9 (93.9)	20.6 (73.2)	23.5 (93.5)	22.9 (73.0)
Uninsured clients admitted						
Yes	84.1	15.9 ****	85.6	4.4 ****	9.8	10.2 ****
No	91.7	8.3 ****	93.3	6.7 ****	94.1	5.9 ****
Medicaid clients admitted						
Yes	80.7	19.3 ****	83.0	17.0 ****	88.9	11.1 ****
No	90.3	9.7 ****	91.5	8.5 ****	92.2	7.8 ****

	Offer any buprenorphine		Offer buprenorphine detoxification		Offer buprenorphine maintenance	
	No	Yes	No	Yes	No	Yes
Percent clients use heroin, mean (SD)	16.6 (94.7)	23.4 (72.4) *	16.9 (93.9)	22.9 (75.4) *	17.2 (94.2)	22.6 (69.2)
Percent clients use drug involved injection with needles, mean (SD)	16.1 (79.9)	21.6 (59.4) *	16.2 (78.8)	21.7 (64.8) *	16.3 (79.0)	24.5 (58.1) **
Percent clients use over-the-counter or prescription drugs, mean (SD)	8.4 (50.0)	16.7 (59.4) ****	8.7 (50.7)	16.0 (58.2) ****	9.2 (51.4)	15.4 (57.2) *

Proportions, means, and standard deviations were based on a stratified sample of 547 units weighted to be representative of 6,339 units nationally

* $P < 0.05$;

** $P < 0.01$;

*** $P < 0.001$;

**** $P < 0.0001$

Table 2

Multivariate correlates of buprenorphine use in outpatient substance abuse treatment programs

	Odds ratio estimate (95%CI)		
	Offer any buprenorphine	Offer buprenorphine detoxification	Offer buprenorphine maintenance
Program leadership			
Director tenure at agency (per 10 years)	—	1.5 (1.0, 2.3) *	—
Complete abstinence as most important treatment goal	0.4 (0.2, 0.9) *	—	0.5 (0.2, 0.9) *
Director age (per 10 years)	0.6 (0.4, 0.9) **	0.6 (0.4, 0.8) **	0.6 (0.4, 0.9) *
Male director	1.8 (1.0, 3.3) *	2.0 (1.1, 3.8) *	2.1 (1.1, 4.0) *
Program characteristics			
Affiliation			—
Hospital	1.2 (0.5, 2.7)	—	—
Mental health	0.2 (0.1, 0.7) *	—	—
Other organization	0.8 (0.4, 1.5)	—	—
Freestanding	Referent	—	—
Offers naltrexone	6.0 (3.3, 11.0) ****	7.0 (3.7, 13.3) ****	6.1 (3.2, 11.4) ****
Breadth of medical services provided	1.2 (1.1, 1.4) **	—	1.2 (1.0, 1.4) *
Has medical staff	2.8 (1.4, 5.7) **	—	—
Physical exams for all clients	0.5 (0.3, 0.9) *	—	—
Client characteristics			
Percent female clients (per 10%)	—	1.3 (1.1, 1.5) **	—

From multivariate logistic models

* $P < 0.05$;** $P < 0.01$;*** $P < 0.001$;**** $P < 0.0001$