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Posttreatment Drug Use Abstinence: Does the Majority Program Clientele Matter?

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Abstract

The current study examines differences in organizational characteristics and client posttreatment drug use abstinence in residential substance abuse treatment programs serving clients with high or low levels of legal coercion to participate in treatment. The findings show that low legal coercion programs have higher counselor caseloads ($Z = 59$, $p < .05$) than high coercion programs.

Although the results showed that programs with a large proportion of African American clients ($\beta = 14.26$, $p < .0001$) and high legal coercion programs ($\beta = 19.99$, $p < .05$) predicted longer abstinence posttreatment, the final models suggest organizational factors are the key predictors of client posttreatment abstinence.

Keywords

legal coercion; race; substance abuse treatment

INTRODUCTION

The majority of studies on substance abuse treatment primarily focus on individual-level predictors of substance use outcomes (McLellan, Chalk, & Bartlett, 2007). Only more recently are researchers examining the role of organizational factors on substance use outcomes (Ghose, 2008). Researchers have emphasized the value of multilevel statistical approaches in examining substance use outcomes (Broome, Simpson, & Joe, 1999; Heinrich & Lynn, 2002; Mayberry, Espelage, & Koenig, 2009). Although some landmark studies of legal coercion and substance use outcomes have used multilevel modeling techniques (Hiller, Knight, Broome, & Simpson, 1998; Howard & McCaughrin, 1996; Melnick et al.,

2011), few, to our knowledge, have examined race and legal coercion at both the client and program levels to better understand whether differences in outcomes exist due to program or client characteristics. The current study addresses this gap by using multilevel modeling techniques on a well-established dataset to take into account the cluster of individuals in treatment programs to examine client and program-level race and legal coercion predictors of client posttreatment substance use abstinence.

Criminal justice system referrals constitute a significant number of the clients in community-based treatment (Farabee, Prendergast, & Anglin, 1998; Polcin, 2001). Because of the considerable number of clients with some type of criminal justice system involvement in substance abuse treatment (Fletcher et al., 2009) and the majority of clients with criminal justice involvement being persons of color (Hammett, Gaiter, & Crawford, 1998), understanding the effects of legally coerced treatment on clients of color is a policy and programmatic issue (Farabee et al., 1998).

Various terms have been used to describe legally coerced treatment, such as mandated, involuntary, pressured, criminal justice system referred, and criminal justice system involved. These terms can also refer to the various justice stages at the time of entering treatment, such as being sentenced to substance abuse treatment, awaiting trial, being on probation or parole, or having some other type of involvement in the criminal justice system. The present study uses legal coercion as a composite measure to describe pretreatment legal status, urine monitoring by the criminal justice system, and perceived coercion to participate in treatment (Anglin, Brecht & Maddahian, 1989; Brecht, Anglin & Wang, 1993; Hiller et al., 1998).

Effect of Legal Coercion on Substance Abuse Treatment Outcomes

The majority of offenders have substance use histories (Arrestee Drug Abuse Monitoring Program, 2003; Karberg & James, 2005). This growing awareness of the relationships between crime, recidivism, and substance abuse has led to increased referrals to treatment by the criminal justice system (Kelly, Finney, & Moos, 2005). It is estimated that the criminal justice system provides approximately 40% of referrals to community-based treatment programs (Etheridge, Hubbard, Anderson, Craddock, & Flynn, 1997; Farabee & Leukefeld, 2001; Farabee et al., 1998; Hubbard, Collins, Rachal, & Cavanaugh, 1988; Klag, O'Callaghan, & Creed, 2005; Maxwell, 2000; McLellan, 2003; Price & D'Aunno, 1992; Weisner, 1987) and formally or informally encourages offenders to enter treatment (Anglin et al., 1989; Brecht et al., 1993; Farabee et al., 1998). Furthermore, referrals from other agencies, such as child protection, public housing, public assistance, or other governmental organizations, also place pressure on clients to enter treatment (Wallace, 2005).

The literature overwhelmingly shows a positive effect of criminal justice system referrals on retention in treatment (Condelli, 1986; Hiller et al., 1998; Hubbard et al., 1988; Joe, Simpson, & Broome, 1999; Loney, Garrett, & Banks, 1996; Schnoll, Goldstein, Antes, & Rinella, 1980; Siddall & Conway, 1988; Simpson & Sells, 1982). Nevertheless, although there is a strong relationship between retention and posttreatment outcomes, with research showing that longer retention is associated with better posttreatment outcomes (Nace et al., 2007; Simpson & Friend, 1988; Simpson, Joe, & Brown, 1997; Simpson, Joe, Rowan-Szal,

& Greener, 1997), there have been inconsistent findings on whether posttreatment outcomes are different for clients who are legally coerced to participate in treatment than for voluntary clients (Anglin et al., 1989). Some studies find either small or no differences in substance use outcomes by legal coercion status (Anglin et al., 1989; Brizer, Maslansky & Galanter, 1990; DeLeon, 1988; DeLeon & Schwartz, 1984; Holland, 1983; Simpson & Friend, 1988; Wild, Cunningham, & Ryan, 2006), whereas other studies find positive associations between better drug use outcomes and legal coercion status (Burke & Gregoire, 2007; Gregoire & Burke, 2004; Kelly et al., 2005; Mark, 1989; Perron & Bright, 2008; Salmon & Salmon, 1983).

Race and Legal Coercion

In 2009, among young adults (18–24 years) identifying as Black, the criminal justice system was the primary referral source for both men and women in all substance abuse treatment modalities (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010). Despite this finding, the literature is mixed on racial differences in referral sources among all adults in substance abuse treatment. Kelly, Finney, and Moos (2005) found that of the 2095 clients in their study, 7% ($n = 141$) were mandated to treatment (32.6% African American, 67.4% White), 11% ($n = 235$) had criminal justice system involvement but were not mandated to treatment (47.2% African American, 52.8% White), and 82% ($n = 1719$) had no criminal justice system involvement (51% African American, 49% White). There were statistically significant differences among the groups on African American racial group status, with the mandated group having significantly fewer African Americans than the other two groups ($p < .001$) (Kelly et al., 2005).

A study by Marshall and Hser (2002), examining client demographic differences ($n = 565$) by criminal justice referral status in all treatment modalities, found no significant differences among the racial/ethnic groups in those who were mandated to treatment by the criminal justice system, those with system contact but were not mandated to treatment by the system, and those with no system contact. Howard and McCaughrin (1996), in one of the few studies of court mandates at the organizational level, examined the treatment effectiveness of 330 outpatient programs. The racial composition of the programs differed based on the proportion of court-mandated clients. Programs with 75% or more mandated clients had higher percentages of both non-Whites and males than those with 25% or less mandated clients (Howard & McCaughrin, 1996).

The above studies highlight the inconsistent relationship between clients with criminal justice system histories, substance use histories, referrals to community-based treatment, and race/ethnicity. Clients with criminal justice system histories also have extensive substance use histories (Arrestee Drug Abuse Monitoring Program, 2003; Karberg & James, 2005). The criminal justice system is the primary referral source to community-based treatment (SAMHSA, 2004; Treatment Episode Data Set, 2009). As a result, it is important to understand the interaction of race, legal coercion, and substance use histories to anticipate the needs of clients in community-based treatment.

MATERIALS AND METHODS

Sample

The sample was drawn from the Drug Abuse Treatment Outcomes Study (DATOS). The DATOS data were collected from 1991 to 1999 and restricted to clients entering substance abuse treatment from 1991 to 1993. Data were collected in 11 U.S. cities (Chicago, Illinois; Houston, Texas; Miami, Florida; Minneapolis, Minnesota; Newark, New Jersey; New Orleans, Louisiana; New York, New York; Phoenix, Arizona; Pittsburgh, Pennsylvania; Portland, Oregon; San Jose, California) from 96 treatment programs. Purposive sampling procedures were used to ensure that the sample reflected typical clinical approaches across treatment modalities.

Client interviews were conducted by a DATOS interviewer face-to-face at the treatment facility. Clients completed two comprehensive intake interviews to collect baseline and demographic information (intake one and intake two) approximately 1 week apart. Only clients who completed intake two were considered for additional follow-up interviews. Clients also completed in-treatment process questionnaires at 1, 3, and 6 months in treatment. The 12-month follow-up interview included many of the questions from the interview at intake one and included posttreatment drug use and functioning measures. A treatment process questionnaire was completed by 71 counselors or program directors at different agencies, representing 75% of counselors or program directors who were asked to complete the questionnaire. Program directors were mailed a self-administered survey to complete and mail back. Program directors themselves or a person he or she designated completed the questionnaire. Sampling and data collection are fully described in Flynn, Craddock, Hubbard, Anderson, & Etheridge (1997).

For the purposes of these analyses, data were restricted to adult clients in long-term residential treatment whose program director responded to the treatment process questionnaire, resulting in 630 clients and 19 programs. Long-term residential treatment included traditional therapeutic communities, modified therapeutic communities, and other programs requiring in-residence treatment. Planned treatment stays ranged from 4 months to 2 years, with most clients expected to stay at least 9 months. The current study protocol was approved by the Institutional Review Board at Columbia University Medical Center.

Measures

Dependent variable

Client posttreatment drug use abstinence. Posttreatment drug use abstinence is the self-reported number of weeks abstinent from illicit drug use twelve months posttreatment. Because of the small sample size of those using specific drugs, a combined measure of all drugs used posttreatment is utilized.

Independent variables

Program director tenure. Average program director tenure is often used as a proxy for leadership experience (Heinrich & Lynn, 2002). It is likely that those with more leadership experience are better at creating a professional work environment (James & James, 1989;

James & McIntyre, 1996), which is conducive to client engagement in treatment (Louis, Kruse, & Bryk, 1995) and, in turn, longer retention in treatment and better posttreatment outcomes. Program director tenure is a categorical self-report measure of how long program directors worked at their current substance abuse treatment agency. Longer tenure at a particular facility can be helpful in building rapport with clients and staff, and directors may have a better understanding of the norms of the treatment facility. Response options included the following: less than 1 year, 1 to 2 years, 3 to 5 years, 6 to 10 years, and more than 10 years. For the purposes of these analyses and due to the sample size of program directors responding, responses were dichotomized to 10 or fewer years and more than 10 years.

Counselor caseload. Programs with a large number of clients (capacity) or larger counselor caseloads have been associated with poorer treatment outcomes (McCaughrin & Price, 1992; Moos, King, Burnett, & Andrassy, 1997) and reduced client time with staff (D'Aunno, Vaughn, & McElroy, 1999; Lemak, Alexander, & Campbell, 2003). Broome, Flynn, Knight, and Simpson (2007) noted that increased caseloads can lead to a more efficient use of labor but that reduced social interactions may arise. With increased caseloads and reduced social interactions, it is likely that clients will not receive adequate attention from counselors (Broome et al., 2007) and may not remain in treatment. Counselor caseload is a continuous measure of the average number of clients a substance abuse treatment counselor is assigned, as reported by the program director. Caseloads ranged from 4 to 24.

Client capacity. Client capacity is the program's client capacity at the time the program director completed the survey. This number represents the number of slots the facility has allocated for substance abuse treatment. Client capacity ranged from 16 to 250.

Staff/client matching. Matching clients to staff can have positive effects on client treatment outcomes, in particular when matching on specific treatment needs (Marsh, Cao, & D'Aunno, 2004; Marsh, Cao, Guerrero, & Shin, 2009; McLellan & McKay, 1998; Smith & Marsh, 2002) and is related to increased treatment effectiveness (Friedmann, Henderickson, Gerstein, & Zhang, 2004; Hser, Polinsky, Maglione, & Anglin, 1999; Smith & Marsh, 2002). Program directors were asked whether clients were systematically matched with treatment counselors based on specific characteristics. Sample size prevented analysis by specifically matching characteristics. For the purposes of these analyses, staff/client matching reflects matching on any program director specified characteristic, such as race, gender, drug use history, mental health needs, pregnancy status, therapist style, therapist area of expertise, and age.

Count of services offered at the facility. Many clients present to substance abuse treatment with a host of other problems that affect morbidity and mortality (Scott, Dennis, Laudet, Funk, & Simeone, 2011). Offering additional services may help these clients. Program directors indicated whether the facility offered the following services on site: medical, psychological, educational, vocational, financial, legal, family, continuing education/aftercare, additional services/activities, and other. A facility was assigned a one for each service offered. Therefore, the range of services offered is 0 to 10. The program directors also rated several other program characteristics that included the following: staff

turnover, counselor salary, family involvement in treatment, and financial information. These additional characteristics were also included in analyses to compare program types and to determine predictors of client abstinence post treatment.

Covariates

Motivation.: The Circumstances, Motivation, Readiness and Suitability scale, developed by DeLeon, Melnick, Kressel, and Jainchill (1994), was adapted for use in DATOS. The DATOS reconfiguration of the Circumstances (external motivation), Motivation (internal motivation), Readiness (for treatment), and Suitability scale consists of 20 items from the 42-item scale. Previous DATOS analyses examined each component of the motivation scale. Joe, Simpson, and Broome (1998) reported an alpha of 0.71 for the problem recognition scale, 0.81 for desire for help, and 0.71 for treatment readiness. The alpha for the entire motivation scale for this analysis is 0.878. Motivation is measured at intake two. The measure used a 3-point response scale (1 = not at all; 2 = agree somewhat; 3 = agree very much). Higher scores indicated higher motivation.

Sex.: Interviewer observed or client self-identified sex, if the interviewer could not determine, was measured at intake one.

Age.: Client self-reported age and date of birth was measured at intake one.

Client pretreatment drug use.: Client self-report of drug use in the month prior to admission to treatment was measured at intake one. Client pretreatment drug use is a dichotomous measure of any drugs used in the month prior to admission to treatment.

Client mental health status.: Intake two contains assessment modules based on standard clinical instruments. The Symptom Checklist-90 (SCL-90) was administered to clients. The measures of current depression and hostility of the SCL-90 proved to be a significant predictor of retention (Broome et al., 1999) and thus will be used for this investigation. Scores on the SCL-90 sections for hostility, depression, and anxiety are used as a measure of psychological functioning. Individually, these scales yielded coefficient reliability estimates of 0.903, 0.919, and 0.891 for anxiety, depression, and hostility, respectively. The combined scale yielded a coefficient of 0.945. Because this high alpha coefficient equals or exceeds the values of the individual scales coupled with high intercorrelations between the scales, there was sufficient justification for combining the scales into a single measure.

Race and legal coercion variables

Client race/ethnicity.: Clients were asked their racial classification. Clients were then asked to identify whether they are of Hispanic or Spanish origin or descent and to identify the Hispanic ethnic group to which they belong. Clients who identified as being of Hispanic or of Spanish origin were classified as such regardless of their racial category previously indicated. Clients who identified their racial category as Black or African American, White or Caucasian, those who identified their ethnicity as Hispanic or Spanish, and those who were classified as other were included in the analysis.

Program race/ethnicity composition.: Program race was derived from the client/ethnicity race measure. Program race is the proportion of African American clients in the program. This variable was measured at intake one. A program with 50% or more African American clients and less than 50% of any other one racial/ethnic group was classified as a predominantly African American program. A program with less than 50% African American clients was classified as a predominantly non-African American program, resulting in 9 predominantly African American programs and 10 predominantly non-African American Programs. The small sample size prevented the creation of White programs, Hispanic programs, or other racial group programs.

Client legal coercion.: Legal coercion has a positive effect on client retention (Condelli, 1986; Hiller et al., 1998; Hubbard et al., 1988; Joe et al., 1999; Loneck et al., 1996; Schnoll et al., 1980; Siddall & Conway, 1988; Simpson & Sells, 1982) and longer retention is associated with better posttreatment outcomes (Simpson & Friend, 1988; Simpson, Joe, & Brown, 1997; Simpson, Joe, & Rowan-Szal, et al., 1997). Legal coercion status is a composite variable measured at intake one. Measures included client selfreport of (a) pretreatment legal status, (b) urine monitoring by the criminal justice system, and (c) an indication that legal problems were a primary or secondary reason for entering treatment (Anglin et al., 1989; Anglin & Hser, 1990; Brecht et al., 1993; Hiller et al., 1998). For pretreatment legal status, clients reported whether they did or did not have an official legal status at the time of entry. Clients indicated by yes or no whether their urine tests were monitored by the criminal justice system. Clients responded yes or no to indicate whether the legal system was their primary or secondary reason for enrolling in substance abuse treatment. The composite variable combines responses from all three measures and separates clients into groups based on their responses. Groups ranged from 1 (no reported legal coercion) to 6 (highly coerced). Group 1 are clients who reported no legal status at admission, no urine monitoring, and did not report legal problems as a primary or secondary reason for entering treatment. Group 2 are clients who reported no legal status at admission, no urine monitoring, and legal status as a primary or secondary reason for entering treatment. Group 3 are clients who reported a legal status at admission, no urine monitoring, and did not report legal programs as a primary or secondary reason for entering treatment. Group 4 are clients who reported a legal status at admission, no urine testing, and legal problems as a primary or secondary reason for entering treatment. Group 5 are clients who reported a legal status at admission, urine monitoring, and did not report legal problems as a primary or secondary reason for entering treatment. Group 6 are clients who reported a legal status at admission, urine monitoring, and legal problems as a primary or secondary reason for entering treatment. See Table 1 for the legal coercion measure (Anglin et al., 1989; Brecht et al., 1993; Hiller et al., 1998).

Program level legal coercion.: Program legal coercion is derived from client legal coercion measure. Programs with the majority of their clients in groups 3, 4, 5, or 6 on the client-level legal coercion status measure were classified as highly coerced. Programs with the majority of their clients in groups 1 or 2 on the client-level status measure were classified as lowly coerced. The sample size precluded having a moderate program legal coercion group or comparing only programs with the absolute lowest (group 1) or highest (group 6) levels of

program legal coercion. This resulted in 14 high legal coercion programs and 5 low legal coercion programs. See Table 2 for the client race and client legal coercion composition of the African American/non-African American programs and high/low legal coercion programs.

Analytic strategy.: Wilcoxon exact test or the Cochran Mantel-Haenszel chi-square was performed to determine whether there were differences in organizational characteristics by program type (high legal coercion program or low legal coercion program). Multilevel modeling procedures were done to account for the differences in the levels of the data (individual and program) and to control for possible confounders when examining predictors of client posttreatment abstinence. In this analysis, two levels of hierarchy were considered: one based on individual responses and the other on program-level information. Multilevel modeling is appropriate when modeling data at different levels of hierarchy. The generalized estimating equation (GEE) approach is appropriate when considering a multilevel model in which at least one variable from the program-level dataset has been used as a predictor. For multilevel modeling, the GEE produces reasonably accurate standard errors (Hanley, Negassa, Edwardes, & Forrester, 2003). In these data, individuals within a program were likely to be more correlated with each other than with individuals from another program. The GEE method does not explicitly model between-program variation. The GEE models the within-program similarity of residuals and this is then used to re-estimate the regression parameters and to calculate the standard errors (Hanley et al., 2003). The strengths of a GEE model in this context are the following: (a) client- and program-level independent variables can be considered simultaneously; and (b) cross-level interaction effects can be considered.

SAS PROC GENMOD has a limited capability explore multivariate relationships (Bhudia et al., 2004). To identify variables for the multilevel analysis, variables were screened using ordinary logistic regression with the assumption of independence of the observations with liberal entry ($p < .2$) and retention ($p < .12$) criteria. These variables and their transformations of scale were entered both individually and simultaneously into the multilevel model (Bhudia et al., 2004). Variables of theoretical importance were also considered. For continuous measures, the method of centering was considered and tested. The centering did not change the results; centering was not used for reporting purposes in the final model.

All of the analyses were completed using SAS version 9.1 software. The SAS procedure GENMOD was used to take into account the correlation between clients within programs. Unstructured correlations were used in all of the analyses, and p values were used to determine the significance of the predictor. All models used sex, race, age, pretreatment mental health status, motivation, and pretreatment drug use history as covariates. For the final model, an alpha of .05 indicated statistical significance.

RESULTS

Organizational Characteristics of High and Low Legal Coercion Programs

Organizational characteristics differ depending on the norms or culture of the program (Campbell, 2009). The results (shown in Table 3) indicate that there were few statistically

significant differences in organizational characteristics comparing high and low legal coercion programs. Substance abuse treatment counselors in low legal coercion programs have significantly higher counselor caseloads than counselors in high legal coercion programs ($Z = 59, p < .05$). Although not statistically significant, the data show that low legal coercion programs have higher program capacity than high legal coercion programs ($Z = 55, p < .1$), suggesting that although low legal coercion programs have a higher capacity, there may not be more staff for the increased number of clients.

Effects of Client and Program Race and Legal Coercion on Client Posttreatment Drug Use Abstinence

A mixed model analysis was performed to determine the relative contributions of race and legal coercion at the program and client levels on client post-treatment abstinence. Other racial group status consistently predicted longer abstinence posttreatment and Latino ethnicity, with the addition of program race, predicted shorter periods of abstinence posttreatment ($\beta = -1.29, p = .05$) (see Table 4). When independently adding program racial composition, client legal coercion, and program legal coercion to a mixed model, controlling for client race, sex, age, motivation, pretreatment drug use history, and pretreatment history of depression, anxiety, and hostility, none were shown to be statistically significant predictors of posttreatment drug use abstinence. Furthermore, including combinations of race and legal coercion in the same model (program race and individual legal coercion, program race and program legal coercion, program race and individual legal coercion, and program legal coercion and client race) was not statistically significant (data not shown). Furthermore, the interaction of program legal coercion and client race and the interaction of program race and program legal coercion were also not significant. However, the data show statistically significant interaction effects of individual legal coercion and race. Those in the Other racial group with high levels of legal coercion had longer periods of posttreatment abstinence ($\beta = 13.31, p < .01$) and Latinos with high levels of legal coercion had shorter periods of abstinence ($\beta = -5.13, p < .05$) as compared with Whites.

Organizational Predictors of Client Posttreatment Drug Use Abstinence

All of the organizational characteristics listed in Table 2 were screened with logistic regression for possible inclusion in a multilevel model as predictors for client posttreatment abstinence. Program director tenure, the number of individual and group counseling sessions, program emphasis, trial period before admission, program morale, discharge goals included in the treatment plan, 12-Step meeting focus, and use of prescribed drugs were also considered because of theoretical relevance despite statistical significance. Due to the small sample size of the program-level variables and the high correlations between some of the variables, the statistically significant program level variables were separated into multilevel models by topic area (staffing related and program related). Table 3 shows the staffing-related model, controlling for client race, sex, age, motivation, pretreatment drug use history, pretreatment depression, anxiety and hostility, program racial composition, and program legal coercion status. The results showed that all of the independent staffing-related variables were statistically significant predictors of client posttreatment drug use abstinence. Program directors who had been at the facility for more than 10 years ($\beta = 4.74, p < .05$), programs with larger counselor caseloads ($\beta = 0.50, p < .0001$), and programs that utilize staff and

client matching on any characteristics ($\beta = 5.21, p < .0001$) predicted longer drug use abstinence posttreatment. Furthermore, the results also showed that African American programs ($\beta = 14.26, p < .0001$) and high legal coercion programs ($\beta = 19.99, p < .05$) predicted longer drug use abstinence posttreatment. The program-related model included the mean number of services offered and client capacity. The results showed that programs offering fewer services ($\beta = -1.39, p < 0.01$) and programs with smaller client capacity ($\beta = -0.06, p < 0.0001$) predicted longer posttreatment abstinence.

DISCUSSION

This study contributes to a growing body of literature on the importance of multilevel modeling techniques in substance abuse treatment research. It shows the value of using statistical techniques that are now more widely used on well-established datasets. With race and legal coercion as important individual-level variables often examined in the substance abuse treatment field, the current study highlights the value of examining race and legal coercion as important organizational characteristics. Programs with high levels of legal coercion are distinct and differences in client-level outcomes have been observed in programs with differing levels of program-level legal coercion (Hiller et al., 1998; Howard & McCaughrin, 1996).

The current study addresses the influence of differences in organizational characteristics based on the level of legal coercion the majority of the clients in the treatment program experience and the influence of race and legal coercion on the number of weeks clients are abstinent from any drug use posttreatment. These findings show that highly coerced programs differ on only a few characteristics from that of low coercion programs. However, the results suggest that highly coerced programs have characteristics helpful for engagement in treatment (DeLeon, 1988; Hubbard et al., 1989; Kelly et al., 2005) and ultimately may contribute to clients remaining abstinent longer. This is encouraging because the criminal justice system provides the majority of referrals to community-based treatment (Maxwell, 2000; McLellan, 2003) and the data presented here show that clients in high legal coercion programs appear to have longer periods of drug use abstinence posttreatment. It is important for treatment facilities to determine the characteristics of their client population and assess their organization's characteristics to ensure organizational norms and structures are aligned to meet the needs of their clients.

A statistically significant positive association between program director tenure and client abstinence was observed. This suggests that directors who have served for more than 10 years predicted longer periods of abstinence. It is possible that directors with more experience know what does and does not work for those in treatment, are more in-tune with good managerial practices (McConnell, Hoffman, Quanbeck, & McCarty, 2009), and help foster a professional work environment, which has been shown to produce a better treatment environment (Louis et al., 1995). A significant positive association between counselor caseload and abstinence was observed. This suggests that larger caseloads predict longer posttreatment abstinence. This finding is counterintuitive, and the literature overwhelmingly shows that larger counselor caseloads are associated with poorer posttreatment outcomes (McCaughrin & Price, 1992; Moos et al., 1997). However, larger caseloads in the current

study are associated with higher percentages of voluntary clients and lower percentages of legally coerced clients. Legally coerced clients are known to have more problems than voluntary (Marshall & Hser, 2002), and the current findings may be due the greater number of problems and lower levels of social capital (e.g., stable family and living conditions, educational levels, and employment) among clients in programs with lower counselor caseloads. Thus, additional research is needed to better understand this counterintuitive finding.

There was a significant positive association between matching staff and clients on specific characteristics (such as race, gender, drug use history, mental health needs, pregnancy status, therapist style, therapist area of expertise, and age) and abstinence. Because of the limited sample size, matching in general was examined rather than specific types of matching. It is likely that only a few client/staff matching characteristics predicted client abstinence. The lack of analyses on specific client/staff matching characteristics is a limitation of this study. Previous research shows that client/staff matching on specific characteristics has positive effects on client outcomes (Marsh et al., 2004, 2009; McLellan & McKay, 1998; Smith & Marsh, 2002). However, matching clients and staff on various demographic characteristics has previously proven to be less important than matching clients on treatment needs, service needs, and severity (DeLeon, Melnick, & Cleland, 2008; Gottheil, McLellan, & Druley, 1981; Marsh et al., 2009; McLellan et al., 1997; Miller & Hester, 1986; Smith & Marsh, 2002; Thornton, Gottheil, Weinstein, & Kerachsky, 1998).

The mean number of services offered and the client capacity were included in the program-related variables model. The literature shows that services offered at the facility may be helpful for clients (Olmstead, White, & Sindelar, 2004). It was hypothesized that more services offered would be positively associated with client posttreatment abstinence. The results show a significant negative association between the mean number of services offered and client abstinence. This result is surprising, but not unknown in the literature. Smith and Marsh (2002) report that when clients were connected to other services such as housing, job training, and legal services, client satisfaction increased, but clients did not necessarily reduce substance use. Thus, receipt of services does not necessarily relate to positive treatment outcomes (Smith & Marsh, 2002). In the present study, a significant negative association was also observed for client capacity. It should also be noted that, as in the case with counselor caseload, both fewer services and larger program capacity were associated with lower levels of legal coercion, indicating that clients in programs offering more services and having a lower capacity may have more problems. These findings point to the need for additional research to determine the effects of the level of client problems, race/ethnicity and coercion on treatment.

Data Limitations

These findings must be interpreted within the context of several limitations. Missing data on the organizational variables were a considerable concern. Some organizational variables could not be included in the analysis because the response rates were below 50%. Furthermore, because of the low response rates for some questions, multiple item measures were created. For example, a single measure of client/staff matching was used to indicate

whether a treatment organization matched clients and staff on characteristics. Low response rates prevented the use of the specific type of matching in the analysis. Similarly, a count of all ancillary services was used rather than including each specific such service.

There were high correlations between the client- and program-level race and legal coercion variables. Eliminating the need to aggregate data by asking program directors to report these data could possibly reduce the high correlation between the client- and program-level variables.

CONCLUSION

It is appropriate for researchers to examine the role of legal coercion in treatment because the criminal justice system provides the majority of referrals to community-based treatment (Klag et al., 2005; Maxwell, 2000). Furthermore, because of the well documented relationship between race/ethnicity and the criminal justice system (Lichtenstein, 2009), legal coercion may help explain possible racial effects in other client-level outcomes in substance abuse treatment. The current analysis demonstrated that legal coercion can be helpful for client abstinence but failed to explain possible racial effects. Despite this, organizational factors were shown to predict client abstinence.

Many organizations do not have much control over referral sources, especially publically funded treatment programs. These organizations likely have more control over practices within their facilities. Organizational change can be a slow and challenging process (Taxman, Young, Wiersema, Rhodes, & Mitchell, 2007). However, it is much easier to try to change something an organization has control over rather than characteristics they cannot, such as whether a client feels coerced to participate in treatment. However, understanding the characteristics and needs of clients can help facilities make decisions as to which organizational characteristics are most important. Incorporating innovations specifically tailored to the clientele will improve both client-level outcome measures and measures of organizational performance and quality indicators.

The limitations notwithstanding, the results suggest legal coercion and organizational factors are important determinants in improving client abstinence posttreatment. Research that includes both individual and program level variables have the potential to make important contributions to substance abuse treatment policies.

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TABLE 1

Legal Coercion Measure Defined

	Pretreatment legal status	Urine testing	Most important or second reason for enrolling in treatment	% of Sample
	<i>Must indicate at least one of the following to score "yes" to this question:</i> (1) Probation (2) Parole (3) In jail/detention awaiting trial (4) In jail/detention awaiting sentencing (5) In jail/detention serving sentence (6) Case pending on bail awaiting trial (7) Case pending on bail awaiting sentencing (8) Case pending and released on own recognizance (9) Other case-pending status	Criminal (juvenile) justice system testing for drug use and reviewing results of drug tests	<i>Must indicate at least one of the following to score "yes" to this question:</i> (1) Legal system other than probation or parole (2) Probation and parole (3) Prison system	
Group				
1	No	No	No	33
2	No	No	Yes	1
3	Yes	No	No	19
4	Yes	No	Yes	10
5	Yes	Yes	No	20
6	Yes	Yes	Yes	18

TABLE 2

Client Race and Client Legal Coercion Composition of Programs

Program type	No. of Programs	No. of Clients	Percent range of african american clients in the program	Percent range of clients in the program in groups 3 or higher on the client legal coercion measure
African American program	9	302	54.3–87.0	–
Non-African American program	10	328	13.5–48.5	–
High legal coercion program	14	510	–	57.6–88.2
Low legal coercion program	5	120	–	26.1–46.3
Total	19	630	–	–

TABLE 3
Comparing Organizational Characteristics in High Legal Coercion and Low Legal Coercion Programs

Organizational characteristics	High legal coercion program ^a (n = 14)	Low legal coercion program ^a (n = 5)	Chi-square or Z Score	Cochran Mantel-Haenszel chi-square p-value	Wilcoxon exact test p-value
<i>Organizational characteristics^b</i>					
Program Director characteristics					
Program director tenure (been at the program more than 10 years)	21% (3/14)	40% (2/9)	.62	.43	—
<i>Program characteristics</i>					
Average program capacity	74 clients (10 programs)	102 clients (5 programs)	55.00	—	.07
Chemical dependency/12-Step program orientation	34% (4/13)	40% (2/5)	.13	.72	—
No trial period before admission	57% (8/14)	60% (3/5)	.01	.91	—
Facility participates in evaluation activities	80% (8/10)	100% (5/5)	1.08	.30	—
Average & high program morale	71% (10/14)	50% (2/4)	.61	.43	—
State license required to operate facility	100% (10/10)	100% (5/5)	—	—	—
<i>Staffing</i>					
Percentage of staff in recovery	61% (8 programs)	75% (5 programs)	4.00	—	.50
Average FTE substance abuse counselor salary	\$22,620 (9 programs)	\$21,200 (2 programs)	11.50	—	.98
Average counselor caseload	10 clients (14 programs)	15 clients (4 programs)	59.00	—	<.05
<i>Client profile</i>					
Percentage clients with co-occurring mental and substance use disorders	28% (10 programs)	13% (3 programs)	21.50	—	.98
<i>Services offered</i>					
Offers academic program at facility	64% (9/14)	80% (4/5)	.40	.53	—
Average number of ancillary services offered at facility	5 services (14 programs)	6 services (5 programs)	63.00	—	.24
Aftercare provided	93% (13/14)	80% (4/5)	.61	.43	—
<i>Treatment characteristics</i>					
Discharge goals included in treatment plan	50% (7/14)	20% (1/5)	1.29	.26	—
Average client-planned duration of stay	303 days (14 programs)	416 days (5 programs)	67.50	—	.11
Group counseling offered more than once per week/once per day/more than once per day	85% (11/13)	50% (2/4)	1.92	.17	—
Individual Counseling offered more than once per month/once per week	79% (11/14)	100% (5/5)	1.21	.27	—
Individualized treatment emphasized to a great/very great extent	43% (6/14)	80% (4/5)	1.93	.16	—
12-Step meetings encouraged to a great/very great extent	86% (12/14)	100% (5/5)	.76	.38	—

Organizational characteristics	High legal coercion program ^a (n = 14)	Low legal coercion program ^a (n = 5)	Chi-square or Z Score	Cochran Mantel-Haenszel chi-square p-value	Wilcoxon exact test p-value
Trust, self-confidence, understanding emphasized to a great/very great extent	71% (10/14)	80% (4/5)	.13	.72	—
Drugs are prescribed at facility	57% (8/14)	80% (4/5)	.78	.38	—
Use of client/staff matching	71% (10/14)	60% (3/5)	.21	.65	—
Clients help with treatment plan	86% (12/14)	100% (5/5)	.76	.38	—
Family involvement in treatment	0% (0/14)	20% (1/5)	2.8	.09	—
Peer pressure used to induce clients to conform to program rules to a great/very great extent	86% (12/14)	100% (5/5)	.76	.38	—

FTE = Full Time Equivalent.

^aHigh legal coercion is a group classification of 3, 4, 5, or 6 on the legal coercion measure. Low legal coercion is a group classification of 1 or 2 on the measure.

^bThe percentage is column percentage for program type. Fraction in parentheses in the high legal coercion and low legal coercion columns represents number of programs responding to variable divided by number of programs with information on variable. The text in parentheses represents number of programs with valid data for variable. Only variables with response rates of at least 50% by program type are reported and variables of theoretical importance are also reported.

TABLE 4
Results of Multilevel Models of Client Post-Treatment Drug Use Abstinence and Race and Legal Coercion

Variables in the model	Covariates			Effect of program race			Effect of client legal coercion			Effect of program legal coercion			Effect of interaction of client race & individual legal coercion			Effect of staffing-related organizational variables			Effect of program-related organizational variables		
	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	
African American	0.01	.98	-0.38	.59	-0.33	.55	-0.09	.88	-0.06	.82	-0.96	.14	-0.62	.38							
Latino	-1.36	.56	-1.29	.052	-1.13	.13	-1.34	.057	2.44	.25	0.88	.20	-0.99	.19							
Other racial group	8.58	<.01	8.93	<.01	8.74	<.05	8.55	<.01	-2.37	.22	6.41	<.05	5.61	.11							
Female	0.03	.96	0.05	.92	0.04	.95	0.07	.89	0.05	.92	1.15	<.01	-0.48	.35							
Age	-0.02	.56	-0.01	.72	-0.03	.28	-0.02	.57	-0.04	.19	-0.00	.99	-0.05	.27							
Mean client motivation	6.15	<.0001	6.15	<.001	5.88	<.0001	6.11	<.001	6.32	<.0001	5.45	<.0001	3.89	<.0001							
Pretreatment drug use history	2.09	<.01	1.90	<.05	2.21	<.05	1.95	<.01	2.20	.01	1.66	<.01	2.85	<.0001							
Pretreatment history of depression, anxiety, hostility	-0.31	.46	-0.31	.49	-0.36	.35	-0.30	.47	-0.37	.30	-0.34	.35	-1.79	<.0001							
Program race	-	-	2.77	.51	-	-	-	-	-	-	14.26	<.0001	14.39	<.05							
Client legal coercion	-	-	-	-	0.23	.72	-	-	0.80	.45	-	-	-	-							
Program legal coercion	-	-	-	-	-	-	-2.05	.63	-	-	19.99	<.05	1.89	.81							
Client legal coercion * African American	-	-	-	-	-	-	-	-	-0.29	.84	-	-	-	-							
Client legal coercion * Latino	-	-	-	-	-	-	-	-	-5.13	<.05	-	-	-	-							
Client legal coercion * Other	-	-	-	-	-	-	-	-	13.31	<.01	-	-	-	-							
Program director tenure	-	-	-	-	-	-	-	-	-	-	4.74	<.05	-	-							
Counselor caseload	-	-	-	-	-	-	-	-	-	-	0.50	<.0001	-	-							
Staff/client matching	-	-	-	-	-	-	-	-	-	-	5.21	<.0001	-	-							
Mean No. services offered	-	-	-	-	-	-	-	-	-	-	-	-	-1.39	<.01							
Client capacity	-	-	-	-	-	-	-	-	-	-	-	-	-0.06	<.0001							

Bold values indicate statistical significance at *p* 0.05.