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Client retention in residential drug treatment for Latinos

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Abstract

Client drop out from treatment is of great concern to the substance abuse field. Completion rates across modalities vary from low to moderate, not ideal since length of stay has been positively and consistently associated with better client outcomes. The study explored whether client characteristics shown to be related to retention were associated with treatment completion and treatment duration for a sample of 164 Latino substance users who entered a culturally focused residential program. In-person client interviews were conducted within a week of program admission. Logistic regression analysis was used to examine research questions. Clients most likely to drop out had self-reported co-occurring psychiatric diagnoses; they were 81% less likely to complete the program, suggesting that clients with mental health problems have a more difficult time remaining in residential treatment. Clients using drugs in the three months prior to entry were three and a half times more likely to be in the shorter stay group, and clients who lived in institutions prior to program entry were three times more likely to be in the longer-stay group. Factors contributing to drop out for this Latino sample were similar to those identified in the literature for non-Latino samples. Methods for addressing the needs of clients with co-occurring disorders are discussed.

Keywords: Client retention; Residential treatment; Latinos; Dually-diagnosed clients; Co-morbid substance abuse and psychiatric problems; Culturally specific treatment; Treatment completion; Long-stay vs. short-stay clients

1. Introduction

An issue of concern to the substance abuse field is the high level of client drop out from treatment programs, especially residential treatment. A large number of clients who drop out do so in the first weeks of treatment. Completion rates vary by modality from 41% for outpatient services to 73% for short-term (30 days or less) residential or hospital admissions (SAMHSA, 2003). Such completion rates are not ideal since length of stay in treatment has been positively and consistently associated with better outcomes for substance abuse clients (Connors, Grant, Crone, & Whiteside-Mansell, 2006; De Leon, 1991, 2001; Hubbard et al., 1989; McLellan et al., 1997; Simpson, 1979, 1981; Simpson & Sells, 1982). From an extensive review of research on client attrition from substance abuse treatment, Stark (1992) concluded that, due to high initial drop out rates, only a small number of clients receive potential treatment benefits. Simpson (2004), Simpson, Joe, Fletcher, Hubbard, and Anglin (1999) and Devine, Wright, and Brody (1995) found that a minimum of 90 days in treatment was necessary to obtain any significant benefit. Beyond three months, outcomes increase in linear relation to time in treatment (Etheridge, Hubbard, Anderson, Craddock, & Flynn, 1997; Simpson, 1981) including reduced substance use, risk behaviors, and legal involvement, and improved mental health and social functioning. Further, many substance users who are in the greatest need of services continue to drop out. In fact, many addicts appear to go in and out of treatment repeatedly (Hser, Evans, Huang, & Anglin, 2004; Lee, Reif, Ritter, Levine, & Horgan, 2004; Liebman, Knezek, Coughey, & Hua, 1993)

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with relapses characterizing their time in between (Condelli & Hubbard, 1994; Grella, Hser, & Hsieh, 2003; Nealy, 1997; Simpson, 1979, 1981).

Simpson (2004) refers to retention as *stabilized recovery*, the third phase of treatment following *early engagement* and *early recovery*. Tasks of stabilized recovery include building on progress made in the two previous stages so clients can prepare for their transition out of primary treatment. He sees this as a period when clients integrate change (abstinence from alcohol and other drugs) into their lifestyle so that change "becomes the preferred habitual behavior" (p. 109). Thus, retention or stabilized recovery is seen as an essential phase of treatment.

Factors associated with client drop out and shorter stays in substance abuse treatment are many and varied. More severe drug use is associated with shorter stays and poorer treatment outcomes (Anglin & Hser, 1990; McLellan, Luborsky, Woody, O'Brien, & Druley, 1983; McLellan et al., 1994; Mertens & Weisner, 2000) as is a worse prognosis at admission (e.g., more criminal involvement, unemployment, more medical problems) (Anglin & Hser, 1990; McLellan et al., 1994; Miller, 1985). Alternatively, legal pressure is associated with longer treatment stays (Anglin & Hser, 1991) as is greater matching of treatment services to clients' expressed needs (e.g., vocational, housing) (Hser, Polinsky, Maglione, & Anglin, 1999). Higher client motivation is associated with longer stays (Anglin & Hser, 1991; Joe, Simpson, & Broome, 1999) as is a stronger client-counselor therapeutic alliance, as rated by the counselor (Meier, Donmall, McElduff, Barrowclough, & Heller, 2006). Programs that allow women to have their children with them during residential treatment have higher retention rates than programs that do not allow children (Szuster, Rich, Chung, & Bisconer, 1996), and women reporting less deviance among friends are more likely to be treatment completers (Knight, Logan, & Simpson, 2001).

The aim of the present study is to explore whether a number of client characteristics shown to be related to retention are associated with residential treatment completion and duration of treatment. We were specifically interested in whether client factors identified in the literature as affecting treatment retention in non-Latino populations would hold true for a culturally focused program, Casa Esperanza, Inc., primarily serving substance users of Puerto Rican descent.

2. Background

2.1. Latinos and substance abuse treatment

In this study, we were interested in residential treatment for Latinos residing in Massachusetts; the Latino substance abuse treatment population in Massachusetts is predominantly Puerto Rican. Massachusetts is one of three states in the mainland US with the largest percentage of admissions of Puerto Ricans for drug abuse services. In New York, Puerto Ricans account for 44% of such admissions; in Connecticut, 14%; and in Massachusetts, 13% (SAMHSA, 2002). Understanding the characteristics and treatment patterns of all groups of Latinos who use substance abuse programs is increasingly important due to the rapid rate of growth in the Latino population in the US, the serious medical and social consequences of substance abuse and HIV/AIDS in this population, and the disparities in treatment utilization of Latinos compared to other racial/ethnic groups (Amaro, Arevalo, Gonzalez, Szapocznik, & Iguchi, 2006). Studies of Latinos in residential treatment are few and difficult to compare due to differences in samples (i.e., gender, type of drugs used, Latino subgroup) and treatment designs (e.g., therapeutic community vs. recovery home). A Massachusetts study by Lundgren, Amaro, and Ben-Ami (2005), focused on 1849 Latino female drug users admitted to residential substance abuse treatment, provides some indication of characteristics of Latinas who use residential rather than outpatient or methadone programs. Two of the most important factors associated with use of residential treatment among these women were a history of mental health services use and involvement with the criminal justice system. Also a predictor of Latinas using residential programs was the number of previous entries to drug abuse treatment.

2.2. Residential treatment

Although three months is regarded as the minimum "retention threshold" or "length of stay in treatment needed to achieve statistically significant changes in post-treatment outcomes" for residential treatment (Simpson & Joe, 2004), the early stage of treatment may be the most difficult because it often requires that clients make the most marked adjustments in their thinking, behavior and lifestyle (Daughters et al., 2005). Further, residential treatment has particular aspects that may make it difficult for some clients to tolerate for long periods. Daughters et al. (2005) suggest that psychological distress in early treatment is common and likely grows out of the combination of "abstinence, increased structure and loss of freedom, separation from friends and family, active engagement in challenging group treatments, and ambivalence regarding the future benefits of a drug-free lifestyle" (p. 732).

2.3. Co-occurring substance abuse and psychiatric disorders

Many clients seeking substance abuse treatment and receiving services in substance abuse programs have psychiatric problems (SAMHSA, 2006). Between 40% and 64% of clients seeking such treatment have one or more co-occurring psychiatric disorders (Karageorge, 2002; Leshner, 1999; Regier et al., 1990). An illustration of the likely high rates of these clients in treatment is that, of patients with co-occurring disorders who were treated and released from emergency departments, more than 25% were referred to detoxification or other drug treatment

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programs (SAMHSA, 2006). Among patients with co-occurring disorders admitted from emergency departments to inpatient care, nearly one quarter were admitted to chemical dependency units (SAMHSA, 2006).

Clients with co-occurring psychiatric disorders have special treatment needs (Horgan, 1997; Miller, Leukefeld, & Jefferson, 1994, 1996; Ouimette, Gima, Moos, & Finney, 1999). Such clients are more difficult to assess and treat, have more complex health service needs, and often require services from a variety of systems (e.g., mental health, substance abuse, medical) that are generally not connected (Horgan, 1997). These clients are more expensive to treat (Garnick, Hendricks, Drainoni, Horgan, & Comstock, 1996) because they need more costly interventions, they relapse more frequently, and their care is more episodic (Goodman, Hankin, & Nishiura, 1997). Some research indicates that co-occurring psychiatric disorders are related to poorer treatment outcomes (health, employment and social problems) and retention (Brooner, King, Kidorf, Schmidt, & Bigelow, 1997; McLellan et al., 1983; Rounsaville & Kleber, 1985), but findings are contradictory and vary by treatment modality (Broome, Flynn, & Simpson, 1999; Joe et al., 1999; Kelly, Blacksin, & Mason, 2001; Mertens & Weisner, 2000) and measures used (Broome et al., 1999). Studies examining the relationship between co-morbidity and treatment drop out are important because they may point the way to methods for increasing treatment retention.

3. Program description: Casa Esperanza, Inc.

Casa Esperanza, Inc., was founded in 1987 in Roxbury, MA, and provides long-term residential services for Latinos, Latinas, and Latinas with their children, including pregnant and post-partum women, and women on methadone. Staff are bilingual and bicultural and come from the countries and cultures of the program's clients. For men, the program length is 4–6 months, with an ideal length of stay of 120 days or longer. For women, the program length is 6–12 months, with an ideal length of stay of 180 days or longer. Treatment includes addiction-focused individual, group, and family counseling, relapse prevention counseling in individual and group settings, case management, and trauma recovery groups linked to on-site mental health counseling. Supportive services include parenting education and coaching for women and men, childcare and child development services, job training and employment support, education referrals (e.g., GED preparation), health care referrals for adults and children, health and wellness education, tobacco education and treatment, and HIV/AIDS education and prevention—many of the services thought to produce improved outcomes in substance abuse treatment (Howell, Heiser, & Harrington, 1999; Hser et al., 1999). Consistent with Latino cultural beliefs and values, the program: (a) emphasizes family relationships by working to strengthen family ties, help families understand addiction, and help families reduce behaviors that shame or isolate the addict, (b) places value on social/communal life and informal support networks, (c) facilitates clients' links with local churches by providing transportation and arranging for special healing services for those in recovery, (d) emphasizes ways of protecting the dignity of elders, both those in the treatment program and those in the community, (e) reinforces ethnic and community pride and responsibility through cultural celebrations and program activities that "give back" to the neighborhood and local Latino community. Counseling addresses issues such identification with native culture, acculturation stress, Spanish and English literacy, and immigration status. Following residential care, services include transitional housing, relapse prevention and outpatient services, and aftercare family stabilization services. Referral agencies are correctional facilities, detoxification centers, homeless shelters, and HIV/AIDS services across Massachusetts; referral contact may be made by the prospective client, the referring institution, or a family member or friend.

4. Present study

Our objective was to assess associations between client factors and treatment success and time in treatment. Research questions were:

(1) What client factors are associated with completing treatment in a culturally focused residential drug treatment program for a sample of 164 Latino drug users?
(2) What client factors are associated with leaving treatment after a shorter vs. longer stay in residential treatment for a sample of 109 Latino drug users?

5. Methods

5.1. Outcome variables

The first dependent variable compared clients who completed the program with clients who were terminated from the program. This analysis included 164 clients. The second dependent measure compared characteristics associated with shorter stays vs. longer stays in treatment. Specifically, the dependent dichotomous variable had two groups: shorter stay clients were those in the 33rd percentile (39 days or fewer) ($n = 55$) measured in terms of number of days from day of program admission to day of program discharge. The short stay clients were compared to the long stay clients, those in the 66th percentile (100 days or more) ($n = 54$) or above. This analysis included 109 clients. Number of days between date of admission and date of discharge was also used as a dependent variable in regression modeling at the beginning stages of the analysis.

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However, we are particularly interested in the participants who had short stays and the ways they differed from those whose stays were long enough to provide the opportunity for program completion. Tertiles were chosen, given the small number of clients overall and the fact that the top third represented clients who remained in the program 100 days or more, fitting naturally with the 90 day "retention threshold" suggested by Simpson and Joe (2004). These types of dependent variables (completion and shorter vs. longer stays) have been used in previous research on treatment retention (e.g., Hser et al., 2004; Justus, Burling, & Weingardt, 2006).

5.2. Data collection

In-person interviews were conducted with 164 Latino male and female residential treatment clients at this culturally focused treatment facility. Interviewers were program staff trained in administration of the questionnaires. An application for exemption from further Institutional Review Board review was made to Boston University and accepted. An exemption was sought because the data was collected and analyzed on behalf of the agency that needed it to conduct ordinary program review.

For the analysis sample, we selected individuals who had entered treatment before August 1, 2006, to insure that all clients had the possibility of remaining in the program for at least 6 months up to the point of data analysis. In addition, all clients in the sample had been discharged from the program at the point of data analysis. After excluding four cases that were missing data on a number of key variables, the study sample was 164 clients: 33 (20.1%) of these clients had completed the program, and 131 clients (79.9%) had terminated from the program prior to completion.

5.3. Measures

Within a week of program admission, clients completed in-person interviews. Interview questionnaires included both the tool referred to as GPRA SAIS (Government Performance and Regulatory Act developed by the Service Accountability Information Service (SAMHSA, 2005)) and an Outcome Evaluation Questionnaire developed by the Boston University School of Social Work, Center for Addictions Research and Services. All analysis variables were from these two questionnaires.

5.4. Variables

Gender was originally a categorical variable (male, female, transgender) but since only the male and female categories were selected, it was used as a dichotomous variable. *Education* was measured as number of years of education. At the time of treatment entry, clients were asked about *employment* in the past 30 days including a number of unemployment answer choices (e.g., unemployed, looking for work; unemployed, disabled; unemployed not looking for work). Answers were dichotomized to employed in any capacity/not employed.

Housing was measured with a question asking where the client had been living most of the time in the past 30 days. For analysis purposes, a categorical variable with three categories was used to measure housing status: homeless (shelter or streets), institution (e.g., jail, halfway house, hospital, residential treatment), or housed. *History of incarceration* was measured as a yes/no variable examining whether the client had ever, in his or her lifetime, spent time in jail or prison.

Drug use was measured in a number of ways. Alcohol use and illegal drug use (as a group, and 21 individual illegal drugs) in the past 30 days was initially measured as number of days used, and was dichotomized to "used in the past 30 days, yes or no." Alcohol use and illegal drug use in the past 3 months were each asked as a yes/no question. Another question asked about injecting drugs in the past 30 days, and was followed by a question about sharing needles or other drug paraphernalia in the past 30 days. In addition, overdose history in the past year was asked. Given that Casa Esperanza, Inc., is a residential facility requiring that referred clients be abstinent, and that over one-third of referred clients came to Casa Esperanza, Inc., from another institution, for this analysis, we used drug use in the past three months to measure "recent" drug use history.

Mental health status was first measured using a continuous variable based on the Addiction Severity Index (McGahan, Griffith, Parente, & McLellan, 1986; McLellan, Luborsky, Cacciola, & Griffith, 1985; McLellan, Luborsky, Woody, & O'Brien, 1980; McLellan et al., 1992). The total psychiatric symptom score included nine items about mental health symptoms experienced in the past 30 days (depression, anxiety, hallucinations, trouble concentrating, control of violent behavior, thoughts of suicide, suicide attempts, having been prescribed medication for mental health problems, and importance of treatment for these problems). We note that multidimensional mental health measures of current symptoms have been found to be more relevant than lifetime measures for predicting treatment retention (Broome et al., 1999).

In terms of *mental health treatment*, clients were asked to state the number of times in the *past five years* they had been in a hospital or used outpatient mental health care for treatment for psychological or emotional problems, and how many times in the *past year* had they had been in the hospital or used outpatient mental health care for psychological or emotional problems. The four answers were collapsed to a summary variable measuring whether the client had had mental health treatment either in the past five years or the past year.

Several questions about *acculturation* were included in the questionnaire including whether the client was born in

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the United States (yes/no), Puerto Rico (yes/no), or another country (yes/no).

6. Data analysis

Univariate statistics were conducted to describe the characteristics of the participants in the program. Next, chi-square test and the one-way ANOVA test were used to test for differences between independent variables and each of the two dichotomous dependent variables.

Multivariate analyses included a standard multiple regression using a continuous variable measuring the number of days from date of admission to date of discharge. Only psychiatric diagnosis contributed significantly to explaining the variance in the number of days in the program, with a standardized Beta coefficient of $-.242$ ($p<.01$, 95%CI -60.49, -12.87); the model had an adjusted R^2 of .129 (results not shown).

In addition, two binomial logistic regression models were used to explore factors associated with two measures of success in a culturally focused residential treatment facility. The two binomial logistic regression models examined the associations between independent and dependent variables. The first model identify factors associated with completion of the program. The second logistic regression model was used to identify factors associated with having a shorter stay (39 days or fewer) in the program. In the logistic regression models, the variables were entered in a single block.

Independent variables in the final multivariate analyses included:

- Client self-report of a psychiatric diagnosis.
- Substance use occurring within the three months prior to treatment entry.
- Demographic characteristics (gender, age, education, housing status, birthplace—for short vs. long stay model).

7. Results

7.1. Client characteristics

The sample was 31.1% women ($n = 51$) and 98.2% Latino ($n = 161$). Clients who identified as Latino were asked to identify with one or more ethnic groups: 87.6% identified themselves as Puerto Rican, 1.9% reported being Central American, 2.5% said Dominican, 1.2% said South American, 6.2% said their ethnic group was "Other", and no clients chose Cuban or Mexican as their ethnic group. Ninety-eight of the 164 clients were born in Puerto Rico (59.8%), 55 were born in the United States (33.5%) and 11 were born in another country (6.7%).

Mean age was 35.2 years (SD = 8.5). At admission, 92.0% (with one individual refusing to answer) of clients reported being unemployed in the past 30 days, and 8.0% reported having either full or part-time employment. The sample had a mean of 10 years of education.

Thirty-five people (21.3%) reported living most of the time in the streets or in a shelter, 37.2% ($n = 61$) reported living in an institution of some kind (30 reported living in a jail, hospital or nursing home; 29 reported living in a residential treatment facility; and two reported living in a half-way house), and 41.5% ($n = 68$) reported living in their own home, in someone else's home, or in some other kind of housing. Very few clients in this sample had children living with them in the treatment setting. In spite of referrals from institutions, over two-thirds of clients (68.9%, $n = 113$) reported having used illegal drugs in the past three months and one-third (38.4%, $n = 63$) of clients reported having used alcohol during that time.

The mean for the total psychiatric symptom score was .4 (SD = .2) with scores ranging from 0 to .9, meaning that respondents reported an average of four psychiatric distress symptoms in the past 30 days. The majority of clients (59.5%) reported at least one day of depression in the past 30 days, 65.0% reported anxiety, and 61.1% reported having trouble concentrating or remembering. In addition, 11.7% reported hallucinations on at least one day in the past 30 days, 28.2% reported having trouble controlling violent behavior, 12.9% had serious thoughts of suicide, 5.5% of clients had attempted suicide in the past 30 days, and 24.5% had been prescribed medications for psychiatric problems in the past 30 days. Finally, all clients were asked if they had ever been diagnosed by a psychiatrist or a psychologist and 41.5% ($n = 68$) reported that they had received a psychiatric diagnosis. Over one-third, 40.2% ($n = 66$) of clients reported that they had had inpatient or outpatient mental health treatment either in the past five years or the past year.

Clients who completed the program stayed an average of 190 days in the program, while clients who dropped out stayed an average of 58 days in the program. Reasons for leaving the program included: (a) involuntarily discharged due to a violation of rules (30.5%), (b) left program on their own against staff advice and *without* satisfactory progress (37.4%), (c) left program on their own against staff advice and *with* satisfactory progress (19.8%), and (d) other reasons (e.g., transfer).

The results of bivariate analyses of key variables are shown in Table 1. A number of client characteristics associated in the literature with treatment retention (for example, child custody, family relationships, desire for help, time in jail, HIV testing and HIV status, motivation for help, prior residential treatment) were initially examined at the bivariate level. Variables that were not significant at the bivariate level were not considered for the multivariate analysis, however some variables, including gender, age and years of education, were included as controls of clinical interest. In addition, as shown in Table 1, there were several variables measuring very similar constructs (having a psychiatric diagnosis, having used mental health services, psychiatric score) that were

Table 1
Bivariate statistics

Client characteristics	Completed the program or dropped out of the program ($n = 164$)		Comparison of shorter stays in treatment to longer stays in treatment ($n = 109$)	
	Completed the program % or mean (SD)	Dropped out from the program % or mean (SD)	33rd percentile/number of days in program % or mean (SD)	66th percentile/number of days in program % or mean (SD)
Mean age in years	37.4 (10.6)	34.6 (7.9)	34.6 (8.1)	35.5 (9.8)
Gender				
Male	22.1	77.9	46.6	53.4
Female	15.7	84.3	58.3	41.7
Number of years of education	9.3 (3.1)	10.1 (2.5)	10.4 (2.5)	9.6 (2.8)
Housing status				
Streets or shelter	14.3	85.7	**56.5****	**43.5**
Institution (e.g., hospital, jail, residential treatment, halfway house)	27.9	72.1	**26.3**	**73.7**
Own home, someone else's home, other	16.2	83.8	**66.7**	**33.3**
Employed				
Yes	15.4	84.6	72.7	27.3
No	20.7	79.3	48.5	51.5
Ever been in jail				
Yes	18.1	81.9	52.4	47.6
No	28.6	71.4	39.1	60.9
Any alcohol in the past 3 months				
Yes	15.9	84.1	**65.2****	**34.8**
No	22.8	77.2	**39.7**	**60.3**
Any illegal drugs in the past 3 months				
Yes	16.8	83.2	**62.2*****	**37.8**
No	27.5	72.5	**25.7**	**74.3**
History of mental health treatment—past 5 years				
Yes	**10.6****	**89.4**	**69.0****	**31.0**
No	**26.5**	**73.5**	**38.8**	**61.2**
Ever been diagnosed by a psychiatrist or psychologist				
Yes	**7.4*****	**92.6**	**72.7*****	**27.3**
No	**29.2**	**70.8**	**35.4**	**64.6**
Psychiatric status—experienced symptoms in the past 30 days				
Depression yes/no	14.4/28.8*	85.6/71.2	58.1/40.4	41.9/59.6
Anxiety or tension yes/no	17.0/26.3	83.0/73.7	54.4/43.9	45.6/56.1
Hallucinations	15.8/20.8	84.2/79.2	61.5/49.0	38.5/51.0
Trouble concentrating, remembering	17.2/25.4	82.8/74.6	52.9/46.3	47.1/53.7
Trouble controlling violent behavior	15.2/22.2	84.8/77.8	60.7/46.9	39.3/53.1
Serious thoughts of suicide	9.5/21.8	90.5/78.2	72.7/48.0	27.3/52.0
Attempted suicide	.0/21.4	100.0/78.6	100.0/48.1*	.0/51.9
Been prescribed medication for psychiatric/emotional problem	12.5/22.8	87.5/77.2	62.5/47.1	37.5/52.9
Psychiatric composite score	**.27 (.21)***	**.38 (.23)**	**.40 (.25)***	**.29 (.20)**
Acculturation				
Born in Puerto Rico	22.4	77.6	**42.2***	**57.8**
Not born in Puerto Rico	16.7	83.3	**62.2**	**37.8**
Number of days in the program	**191.9(72.4)*****	**56.0 (44.6)**	NA	NA

Bold numbers are significant.
*$p \leqslant .05$, **$p \leqslant .01$, ***$p \leqslant .001$.

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significant at the bivariate level. When two variables measuring similar constructs were both available for multivariate analysis, variables were chosen to develop the most parsimonious models, that is, those with the fewest variables, and with the strongest associations with the dependent variable.

Mental health variables including client self-report of a psychiatric diagnosis, history of prior mental health treatment, and the psychiatric score based on the Addiction Severity Index psychiatric measure were each significantly associated with completion of the program and amount of time spent in the program. Gender, age, number of years of education, employment at time of treatment entry, and history of incarceration were not significant at the bivariate level for either of these dichotomous dependent variables. Results of the bivariate analysis are shown in Table 1.

7.2. Logistic regression models

Table 2 shows the results from the first logistic regression model. Criterion categories among the categorical independent variables are indicated, as well as the adjusted odds ratio results and a 95% confidence index for each variable. With respect to the first model, after controlling for gender, age, number of years of education and housing status prior to entering residential treatment, clients who reported a psychiatric diagnosis were 81% less likely to complete the program. This was the only significant factor in this model. The C-statistic (area under receiver–operator curve) is an indicator of the discriminatory power of the logistic equation (area under receiver–operator curve). In this model the C-statistic was .727, indicating that the model has a "fair" ability to accurately discriminate.

Table 2
Logistic regression model

Characteristics associated with program completion in residential treatment	Completed treatment compared to dropped out from treatment ($n = 164$)	
Client characteristics	Odds ratio	(95%CI: lower, upper)
Age	1.03	(.99, 1.08)
Gender		
Female	1.17	(.43, 3.23)
Number of years of education	.94	(.80, 1.10)
Housing type		
Streets or shelter	.79	(.24, 2.64)
Institution (e.g., hospital, jail, residential treatment, halfway house)	1.47	(.58, 3.73)
Own home, someone else's home, other[a]	1.00	
Ever diagnosed by a psychiatrist or psychologist	.19**	(.06, .56)
	Model chi-square $\chi^2 = 18.51$ df = 6, $p < .005$ Nagelkerke $R^2 = .17$	

*$p < .05$, **$p < .01$, ***$p < .001$.
[a]Reference group.

With respect to the second logistic regression model (see Table 3), factors significantly associated with having stayed 39 or fewer days in residential treatment compared to having stayed 100 or more days were: having a psychiatric diagnosis, using illegal drugs in the past three months, and living in an institutional facility prior to entering residential treatment. Clients with a psychiatric diagnosis were five times more likely to be in the shorter stay group, and clients who had used illegal drugs in the past three months were 3.5 times more likely to be in the shorter stay group. Clients who had been living in an institutional setting prior to entering residential treatment were 66% *less likely* to be in the shorter stay group. The C-statistic for this model was .800, indicating that the model has "good" power to discriminate.

8. Lessons learned: implications for program planning

8.1. Co-occurring psychiatric disorders

Clients *most likely to drop out* of the program were those with self-reported co-occurring substance abuse and psychiatric diagnoses and they were 81% less likely to complete the program. These findings suggest that clients with mental health problems have a more difficult time remaining in residential treatment to the point of completion. Substance abuse treatment providers need to adapt their programs to better meet the needs of clients with mental health problems and improve treatment retention, and thus, treatment outcomes. Across domains of health and mental health care, efforts are being made to identify high-severity and low-severity clients in order to target resources more effectively (Chen, Barnett, Sempel, & Timko, 2006). This has implications for providers of standard-intensity residential programs such as Casa Esperanza, Inc. Chen et al. (2006), studying residential substance abuse programs that treated clients with co-occurring disorders, defined these clients as high severity and found that they did better (on substance abuse and psychiatric outcomes) in high-intensity (e.g., providing additional psychotherapy or pharmacotherapy) than in low-intensity programs. Our findings give further weight to the mounting evidence that dually diagnosed clients, in contrast to substance abusers without co-occurring psychiatric disorders, should be viewed as high-severity clients needing higher-intensity program enhancements. Enhancements found to improve retention for dually diagnosed and/or singly diagnosed clients have included: on-site psychiatric services for clients agitated with hostility (Broome et al., 1999), senior professional staff inducting new clients into residential programs (De Leon, 2001), and frequent counseling sessions in the early days after

Table 3
Logistic regression model

Characteristics associated with duration of stay in residential treatment	33rd percentile (39 or fewer days) compared to 66th percentile (100 or more days in treatment) ($N = 109$)	
Client characteristics	Odds ratio	(95% CI: lower, upper)
Age	.99	(.94, 1.04)
Gender		
Female	.76	(.23, 2.49)
Number of years of education	1.00	(.83, 1.22)
Housing type		
Streets or shelter	.60	(.19, 1.90)
Institution (e.g., hospital, jail, residential treatment, halfway house)	.32*	(.11, .94)
Own home, someone else's home, other[a]	1.00	
Ever diagnosed by a psychiatrist or psychologist	5.06**	(1.81, 14.19)
Born in Puerto Rico	.46	(.17, 1.24)
Any illegal drug in the past 3 months	3.67*	(1.22, 11.05)
	Model chi-square $\chi^2 = 34.87$ df $= 8$, $p < .000$ Nagelkerke $R^2 = .37$	

*$p < .05$, **$p < .01$, ***$p < .001$.
[a]Reference group.

admission focusing less on drugs and more on health and psychosocial issues such as access to housing and employment (Joe et al., 1999). Availability of dual diagnosis groups and more staff with dual diagnosis certification have also been found to improve outcomes (Grella & Stein, 2006). Of great importance is the way staff members work to increase engagement at the very earliest points (Joe et al., 1999). Findings also have implications for staff recruitment, training and supervision in such programs. Staff need to be equipped to address both psychiatric and substance-related disorders, yet may lack the advanced training that would allow them to do so.

Distress tolerance/intolerance (Daughters et al., 2005) was mentioned earlier as a potentially important concept relative to clients in residential programs because some clients become distressed from the combined pressures of newly established abstinence, increased structure, loss of independence, separation from a support system, and high demands for interpersonal interaction, among others. Daughters et al. (2005), testing specially designed cognitive tasks to measure distress tolerance, found that distress tolerance was predictive of drop out from residential substance abuse treatment. If similar findings occur from larger, more controlled studies, this could provide substantial guidance for residential programs in developing interventions for those at high risk for dropping out. Alternatively, such findings could help in the design of pre-residential interventions to prepare prospective clients for the rigors of such a group-oriented, highly structured and abstinence-oriented treatment setting. Interestingly, treatment methods such as Dialectical Behavior Therapy, often used on an outpatient basis for substance abusing clients with co-morbid psychiatric disorders, teaches specific skills for distress tolerance (Rosenthal, Lynch, & Linehan, 2005).

8.2. Recent use of drugs and living in an institutional setting

It is not difficult to see why clients who used drugs in the three months prior to program entry were three and a half times more likely to be in the shorter stay group. Recent use of drugs may be a proxy for drug problem severity and severity has repeatedly been found to be inversely related to retention (Anglin & Hser, 1990; McLellan et al., 1983, 1994). Alternatively, recent use may indicate that clients were suffering from a protracted abstinence syndrome with subtle disturbances of mood and sleep including fatigue, dysphoria, irritability, craving and difficulty concentrating (Kleber, 1999). This is likely to interfere with full participation and engagement in a treatment program. Methods to address this could include: (a) more careful screening to ensure that clients who are accepted are physically and cognitively stable and, if they are not, advocating that the referring agency hold them for a few more days; and/or (b) ensuring that cognitive and emotional tasks expected of these clients are moderate to minimal during their initial days in the residence. The findings by McKellar, Kelly, Harris, and Moos (2006) may be especially relevant for this subgroup of clients and clients with co-occurring disorders: when clients perceived their residential programs to be low in staff support or high in staff control, they were more likely to drop out. The researchers suggest that moderate structure that is not perceived as restrictive might strengthen motivation for continuing in treatment.

The finding that clients who lived in institutional settings prior to entering residential treatment were three times more likely to be in the longer-stay group is also consistent with previous studies. Prior stays in institutional settings suggest that these clients were homeless. Lundgren, Schilling, Ferguson, Davis, and Amodeo (2003) found that homeless individuals compared to those with housing were more likely to use residential treatment. Exploring this possibility in our sample, we compared those who had their own housing with the rest of the sample and found that those who had their own housing were *less likely* to be in the long stay group, giving weight to the speculation that homelessness is related to longer stays.

8.3. Limitations

The data presented here are preliminary results from years 1 and 2 of a 5-year project. It is possible that complete data from the 5 years of the project may show different associations. Data were collected from Latino

residential substance abuse treatment clients in one program in the city of Boston, MA, thus findings may not be generalizable to other programs and other populations. The sample is small and it is possible that with a larger sample other factors might be significant. However, it should be noted that several other studies have had findings similar to ours in terms of the influence of psychiatric symptoms and/or diagnoses, and severity of drug use, on program completion and length of stay. Since these prior studies were not necessarily conducted with Latinos, our findings contribute to the literature on Latinos in residential treatment. The psychiatric symptom measures come from client self-report, which can be viewed as a limitation but is common in research of this kind. We did not assess specifically for post-traumatic stress disorder, but some of the symptoms reported by clients may have reflected this. The literature indicates that the presence of this diagnosis is high among drug abusers (Brady, Killeen, Saladin, Dansky, & Becker, 1994; Najavits, 2004; Zweben, Clark, & Smith, 1994) and that clients with trauma and associated symptoms have worse treatment adherence and outcomes (Ouimette et al., 1999).

9. Future research: planning residential treatment programs for Latino drug users

Current large-scale studies such as the California Drug and Alcohol Treatment Assessment and the National Treatment Improvement Evaluation Study, with significant samples of Latinos, are likely to provide valuable information on factors affecting retention of Latinos in drug abuse treatment (Alegria et al., 2006). This information is badly needed by programs interested in implementing best practices for this population. Some best practices in outpatient treatment of Latino adolescents (Szapocznik, Lopez, Prado, Schwartz, & Pantin, 2006) and adults (Amaro et al., 2006) have been identified but it is not clear to what extent such treatments could be used effectively in residential programs.

Key to understanding treatment retention and factors that bolster or undermine it, on the path to understanding treatment effectiveness, is research examining the interrelationships among patient, process and environment (Lamb, Greenlick, & McCarty, 1998; Simpson & Joe, 2004). This type of holistic approach is needed to capture factors particularly relevant to research on residential programs such as: organizational climate, staff attributes and counseling skills, and clients' relationships with family members, peers in and out of treatment, and others who can provide social support (Simpson & Joe, 2004).

Alegria et al. (2006) take this recommendation a step further in advocating for a social action oriented, multilevel approach to problems in which the community is an active developer of the intervention rather than the recipient of it. In such a model, religious institutions and small businesses such as beauty parlors and bodegas (Delgado, 1996, 1997) are enlisted in remediation of the problem. Alegria et al. (2006) call for testing of the effectiveness of such models as well as research on community reinforcements that might reduce the risk that individuals will develop substance use disorders.

10. Conclusion

This study furthers our understanding of Latinos in residential treatment—factors contributing to drop out and retention for this Latino sample were similar to those identified by other researchers for non-Latino samples. The fact that co-morbidity was such a powerful factor related to drop out indicates that substance abuse programs must alter their services and staffing, if they wish to retain these clients. Future research on effective treatment models for Latinos will require collaboration across disciplines and the application of varied research methods such as ethnographic and qualitative studies, community surveys, secondary data analysis of databases from courts, police, hospitals and other such institutions, and longitudinal studies of clients' utilization of treatment within various service systems (Warner et al., 2006). A comprehensive approach such as this to conducting needed research would be a respectful response to the complex and urgent drug abuse problems facing Latino communities.

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References

Alegria, M., Page, J. B., Hansen, H., Cauce, A. M., Robles, R., Blanco, C., et al. (2006). Improving drug treatment services for Hispanics: Research gaps and scientific opportunities. *Drug and Alcohol Dependence*, *84*(1), S76–S84.

Amaro, H., Arevalo, S., Gonzalez, G., Szapocznik, J., & Iguchi, M. Y. (2006). Needs and scientific opportunities for research on substance abuse treatment among Hispanic adults. *Drug and Alcohol Dependence*, *84*(1), S64–S75.

Anglin, M. D., & Hser, Y.-I. (1990). Treatment of drug abuse. In M. Tonry, & J. Q. Wilson (Eds.), *Drugs and crime* (pp. 393–460). Chicago: University of Chicago Press.

Anglin, M. D., & Hser, Y-I. (1991). Criminal justice and the drug abusing offender: Policy issues of coerced treatment. *Behavioral Sciences & the Law*, *9*, 243–267.

Brady, K. T., Killeen, T., Saladin, M. D., Dansky, B., & Becker, S. (1994). Comorbid substance abuse and posttraumatic stress disorder. *American Journal on Addictions*, *3*, 160–164.

Broome, K. M., Flynn, P. M., & Simpson, D. D. (1999). Psychiatric comorbidity measures as predictors of retention in drug abuse treatment programs. *Health Services Research*, *34*(3), 791–806.

Brooner, R. K., King, V. L., Kidorf, M., Schmidt, C. W. J., & Bigelow, G. E. (1997). Psychiatric and substance use comorbidity among treatment-seeking opioid abusers. *Archives of General Psychiatry*, *54*(1), 71–80.

Chen, S., Barnett, P. G., Sempel, J. M., & Timko, C. (2006). Outcomes and costs of matching the intensity of dual-diagnosis treatment to patients' symptom severity. *Journal of Substance Abuse Treatment*, *31*, 95–105.

Condelli, W. S., & Hubbard, R. L. (1994). Relationship between time spent in treatment and client outcomes from therapeutic communities. *Journal of Substance Abuse Treatment*, *11*(1), 25–33.

Connors, N., Grant, A., Crone, C., & Whiteside-Mansell, L. (2006). Substance abuse treatment for mothers: Treatment outcomes and the impact of length of stay. *Journal of Substance Abuse Treatment*, *31*(4), 447–456.

Daughters, S. B., Lejuez, C. W., Bornovalova, M. A., Kahler, C. W., Strong, D. R., & Brown, R. A. (2005). Distress tolerance as a predictor of early treatment dropout in a residential substance abuse treatment facility. *Journal of Abnormal Psychology*, *114*, 729–734.

De Leon, G. (1991). Retention in drug-free therapeutic communities. In R. W. Pickens, C. G. Leukefeld, & C. R. Schuster (Eds.), *Improving drug abuse treatment. NIDA research monograph*, Vol. 106 (pp. 218–244). Rockville, MD: National Institute on Drug Abuse.

De Leon, G. (2001). A commentary on "Retention in substance dependence treatment: The relevance of in-treatment factors". *Journal of Substance Abuse Treatment*, *20*, 263–264.

Delgado, M. (1996). Religion as a caregiving system for Puerto Rican elders with functional disabilities. *Journal of Gerontologic Social Work*, *26*(3/4), 129–145.

Delgado, M. (1997). Role of Latina-owned beauty parlors in a Latino community. *Social Work*, *42*(5), 445–454.

Devine, J. A., Wright, J. D., & Brody, C. J. (1995). An evaluation of an alcohol and drug treatment program for homeless substance abusers. *Evaluation Review*, *19*(6), 620–645.

Etheridge, R., Hubbard, R., Anderson, J., Craddock, S., & Flynn, P. (1997). Treatment structure and program services in the Drug Abuse Treatment Outcome Study (DATOS). *Psychology of Addictive Behaviors*, *8*, 244–260.

Garnick, D. W., Hendricks, A. M., Drainoni, M., Horgan, C. M., & Comstock, C. (1996). Private sector coverage of people with dual diagnoses. *Journal of Mental Health Administration*, *23*(3), 317–328.

Goodman, A. C., Hankin, J. R., & Nishiura, E. (1997). Drug abuse treatment costs: An interpretive essay. In J. A. Egertson, D. M. Fox, & A. I. Leshner (Eds.), *Treating drug abusers effectively* (pp. 159–186). Malden, MA: Blackwell Publishers.

Grella, C. E., Hser, Y., & Hsieh, S. (2003). Predictors of drug treatment re-entry following relapse to cocaine use in DATOS. *Journal of Substance Abuse Treatment*, *25*, 145–154.

Grella, C. E., & Stein, J. A. (2006). Impact of program services on treatment outcomes of patients with co-morbid mental and substance use disorders. *Psychiatric Services*, *57*(7), 1007–1015.

Horgan, C. (1997). Need and access to drug abuse treatment. In J. A. Egertson, D. M. Fox, & A. I. Leshner (Eds.), *Treating drug abusers effectively* (pp. 75–97). Malden, MA: Blackwell Publishers.

Howell, E. M., Heiser, N., & Harrington, M. (1999). A review of recent findings on substance abuse treatment for pregnant women. *Journal of Substance Abuse Treatment*, *16*, 195–219.

Hser, Y-I., Evans, E., Huang, D., & Anglin, D. M. (2004). Relationship between drug treatment services, retention, and outcomes. *Psychiatric Services*, *55*(7), 767–774.

Hser, Y-I., Polinsky, M. L., Maglione, M., & Anglin, M. D. (1999). Matching clients' needs with drug treatment services. *Journal of Substance Abuse Treatment*, *16*(4), 299–305.

Hubbard, R. L., Marsden, M. E., Rachal, J. V., Harwood, H. J., Cavanaugh, E. R., & Ginzburg, H. M. (1989). *Drug abuse treatment: A national study of effectiveness*. Chapel Hill: University of North Carolina Press.

Joe, G. W., Simpson, D. D., & Broome, K. M. (1999). Retention and patient engagement models for different treatment modalities in DATOS. *Drug and Alcohol Dependence*, *57*, 113–125.

Justus, A. N., Burling, T. A., & Weingardt, K. R. (2006). Client predictors of treatment retention and completion in a program for homeless veterans. *Substance Use & Misuse*, *41*, 751–762.

Karageorge, K. (2002). *Identification of clients with co-occurring disorders in the substance abuse and mental health treatment systems.* NEDS Fact Sheet 148. Retrieved January 14, 2005, from 〈http://www.icpsr.umich.edu/SAMHDA/NTIES/NTIES-PDF/SHEETS/148_identification.pdf〉.

Kelly, P. J., Blacksin, B., & Mason, E. (2001). Factors affecting substance abuse treatment completion for women. *Issues in Mental Health Nursing*, *22*, 287–304.

Kleber, H. D. (1999). Opioids: Detoxification. In M. Galanter, & H. D. Kleber (Eds.), *Textbook of substance abuse treatment* (2nd ed., pp. 251–269). Washington, DC: American Psychiatric Press.

Knight, D. K., Logan, S. M., & Simpson, D. D. (2001). Predictors of program completion for women in residential substance abuse treatment. *American Journal of Drug and Alcohol Abuse*, *27*(1), 1–18.

Lamb, S., Greenlick, M. R., & McCarty, D. (Eds.). (1998). *Bridging the gap between practice and research: Forging partnerships with community-based drug and alcohol treatment*. Washington, DC: National Academy Press.

Lee, M. T., Reif, S., Ritter, G., Levine, H. J., & Horgan, C. M. (2004). *Alcohol and drug services study phase II: Client record abstract report.* Rockville, MD: Schneider Institute for Health Policy (DHHS Publication No. SMA 04-3974).

Leshner, A. (1999). Drug abuse and mental disorders: Comorbidity is reality. *NIDA Notes*, *14*(4) Retrieved January 2005 from: 〈http://www.drugabuse.gov/NIDA_notes/NNvol14N4/DirRepVol14N4.html〉.

Liebman, J., Knezek, L. D., Coughey, K., & Hua, S. (1993). Injection drug users, drug treatment, and HIV risk behavior. In B. S. Brown, & G. M. Beschner (Eds.), *Handbook on risk of AIDS: Injection drug users and sexual partners* (pp. 355–373). Westport, CT: Greenwood Press.

Lundgren, L., Amaro, H., & Ben-Ami, L. (2005). Factors associated with drug treatment entry patterns among Hispanic women injection drug users seeking treatment. *Social Work Practice in the Addictions*, *5*(1/2), 157–174.

Lundgren, L., Schilling, R. F., Ferguson, F., Davis, K., & Amodeo, M. (2003). Examining drug treatment program entry of injection drug users: Human capital and institutional disaffiliation. *Evaluation and Program Planning*, *26*(2), 123–132.

McGahan, P. L., Griffith, J. A., Parente, R., & McLellan, A. T. (1986). *Addiction severity index: Composite scores manual*. Philadelphia, PA: The University of Pennsylvania, Veterans Administration Center for Studies of Addiction.

McKellar, J., Kelly, J., Harris, A., & Moos, R. (2006). Pretreatment and during treatment risk factors for dropout among patients with substance use disorders. *Addictive Behaviors*, *31*, 450–460.

McLellan, A. T., Alterman, A. I., Metzger, D. S., Grissom, G. R., Woody, G. E., Luborsky, L., et al. (1994). Similarity of outcome predictors across opiate, cocaine, and alcohol treatments: Role of treatment services. *Journal of Consulting and Clinical Psychology*, *62*(6), 1141–1158.

McLellan, A. T., Kushner, H., Metzger, D., Peters, R., Smith, I., Grisson, G., et al. (1992). The fifth edition of the addiction severity index. *Journal of Substance Abuse Treatment*, *9*, 199–213.

McLellan, A. T., Luborsky, L., Cacciola, J., & Griffith, J. E. (1985). New data from the addiction severity index: Reliability and validity in three centers. *Journal of Nervous and Mental Disease*, *173*, 412–423.

McLellan, A. T., Luborsky, L., Woody, G. E., & O'Brien, C. P. (1980). An improved diagnostic evaluation instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous and Mental Disease*, *168*, 26–33.

McLellan, A. T., Luborsky, L., Woody, G. E., O'Brien, C. P., & Druley, K. A. (1983). Predicting response to alcohol and drug treatment: Role of psychiatric severity. *Archives of General Psychiatry*, *40*, 620–625.

McLellan, A. T., Woody, G. E., Metzger, D., McKay, J., Durell, J., Alterman, A. I., et al. (1997). Evaluating the effectiveness of addiction

treatments: Reasonable expectations, appropriate comparisons. In J. A. Egertson, D. M. Fox, & A. I. Leshner (Eds.), *Treating drug abusers effectively*. Malden, MA: Blackwell Publishers.

Meier, P. S., Donmall, M. C., McElduff, P., Barrowclough, C., & Heller, R. F. (2006). The role of the early therapeutic alliance in predicting drug treatment dropout. *Drug and Alcohol Dependence*, *83*, 57–64.

Mertens, J. R., & Weisner, C. M. (2000). Predictors of substance abuse treatment retention among women and men inan HMO. *Alcoholism—Clinical and Experimental Research*, *24*(10), 1525–1533.

Miller, W. R. (1985). Motivation for treatment: A review with special emphasis on alcoholism. *Psychological Bulletin*, *98*, 84–107.

Miller, T. W., Leukefeld, C., & Jefferson, B. (1994). Dual diagnosis: Clinical issues in substance abuse treatment. *Journal of Contemporary Psychotherapy*, *24*(3), 169–178.

Miller, T. W., Leukefeld, C., & Jefferson, B. (1996). Dual diagnosis: Clinical issues in the treatment of substance abuse, and affective, personality, and psychotic disorders. *Journal of Contemporary Psychotherapy*, *26*(1), 73–82.

Najavits, L. M. (2004). Assessment of trauma, PTSD, and substance use disorder: A practical guide. In J. P. Wilson, & T. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 446–491). New York: Guilford Press.

Nealy, E. C. (1997). Early intervention with active drug and alcohol users in community-based settings. *Journal of Chemical Dependency Treatment*, *7*(1/2), 5–20.

Ouimette, P. C., Gima, K., Moos, R. H., & Finney, J. W. (1999). A comparative evaluation of substance abuse treatment. IV: The effect of comorbid psychiatric diagnosis on amount of treatment, continuing care, and 1-year outcomes. *Alcoholism—Clinical and Experimental Research*, *23*, 552–557.

Regier, D. A., Farmer, M., Rae, D., Locke, B. Z., Keith, S. J., Judd, L. L., et al. (1990). Comorbidity of mental disorders with alcohol and other drug abuse: Results from the epidemiologic catchment area (ECA) Study. *Journal of the American Medical Association*, *264*, 2511–2518.

Rosenthal, M. Z., Lynch, T. R., & Linehan, M. M. (2005). Dialectical behavior therapy for individuals with borderline personality disorder and substance use disorders. In R. J. Frances, S. I. Miller, & A. H. Mack (Eds.), *Clinical textbook of addictive disorders* (3rd ed, pp. 615–636). New York: The Guilford Press.

Rounsaville, B. J., & Kleber, H. D. (1985). Untreated opiate addicts: How do they differ from those seeking treatment? *Archives of General Psychiatry*, *42*, 1072–1077.

Simpson, D. D. (1979). The relation of time spent in drug abuse treatment to posttreatment outcome. *American Journal of Psychiatry*, *136*, 1449–1453.

Simpson, D. D. (1981). Treatment for drug abuse: Follow-up outcomes and length of time spent. *Archives of General Psychiatry*, *38*, 875–880.

Simpson, D. D. (2004). A conceptual framework for drug treatment process and outcomes. *Journal of Substance Abuse Treatment*, *27*, 99–121.

Simpson, D. D., & Joe, G. W. (2004). A longitudinal evaluation of treatment engagement and recovery stages. *Journal of Substance Abuse Treatment*, *27*, 89–97.

Simpson, D. D., & Sells, S. B. (1982). Effectiveness of treatment for drug abuse: An overview of the DARP research program. *Advances in Alcohol and Substance Abuse*, *2*(1), 7–29.

Simpson, D. D., Joe, G. W., Fletcher, B. W., Hubbard, R. L., & Anglin, M. D. (1999). A national evaluation of treatment outcomes for cocaine dependence. *Archives of General Psychiatry*, *56*, 507–514.

Stark, M. (1992). Dropping out of substance abuse treatment: A clinically oriented review. *Clinical Psychology Review*, *12*, 93–116.

Substance Abuse and Mental Health Services Administration, (2002). *Drug and alcohol services information system (DASIS) report,* Office of Applied Studies, US Department of Health and Human Services. Available at 〈http://www.samhsa.gov/oas.dasis.htm〉.

Substance Abuse and Mental Health Services Administration. (2003). *Drug and alcohol services information system (DASIS) report*: *Treatment completion in the treatment episode data set (TEDS)*. Office of Applied Studies, US Department of Health and Human Services. Available at 〈http://www.oas.samhsa.gov/2k3/TXcompleters/TXcompleters.pdf〉.

Substance Abuse and Mental Health Services Administration. (2005). *Government Performance and Regulatory Act (GPRA). Service Accountability Information Service*. Washington, DC: Office of Applied Studies, Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2006). *Emergency department visits involving patients with co-occurring disorders*. The New DAWN *Report* (Issue 15, pp. 1–4). Washington, DC: Office of Applied Studies, Substance Abuse and Mental Health Services Administration.

Szapocznik, J., Lopez, B., Prado, G., Schwartz, S. J., & Pantin, H. (2006). Outpatient drug abuse treatment for Hispanic adolescents. *Drug and Alcohol Dependence*, *84*(1), S54–S63.

Szuster, R., Rich, L., Chung, A., & Bisconer, S. (1996). Treatment retention in women's residential chemical dependency treatment: The effect of admission with treatment. *Substance Use & Misuse*, *31*, 1001–1014.

Warner, L. A., Valdez, A., Vega, W. A., de la Rosa, M., Turner, R. J., & Canino, G. (2006). Hispanic drug abuse in an evolving cultural context: An agenda for research. *Drug and Alcohol Dependence*, *84*(1), S8–S16.

Zweben, J. E., Clark, W. H., & Smith, D. E. (1994). Traumatic experiences and substance abuse: Mapping the territory. *Journal of Psychoactive Drugs*, *26*(4), 327–344.

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