



Gender differences in client–provider relationship as active ingredient in substance abuse treatment

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ABSTRACT

The client–provider relationship is increasingly evaluated as an active ingredient in the delivery of substance abuse treatment services. This study examines gender differences in client–provider relationship as an important treatment ingredient affecting retention in treatment and reduced post-treatment substance use. The study uses data collected for the National Treatment Improvement Evaluation Study (NTIES), a prospective, cohort study of U.S. substance abuse treatment programs and their clients. Data on individual characteristics were collected at the pre-treatment interview; on client–provider relationship and services received at treatment exit; and on post-treatment drug use at 12 months post-treatment. The analytic sample consists of 3027 clients from 59 service delivery units (1922 men and 1105 women). Structural equation modeling (SEM) was used to assess the structural relations and causal connections between relationship and service variables and treatment outcome variables. Results indicate that a positive client–provider relationship is related directly to longer duration and reduced post-treatment drug use for the total sample and for men analyzed separately. For women, a positive client–provider relationship was related directly to treatment duration and only indirectly to reduced post-treatment drug use. The findings point to the significance of including client–provider relationship in service delivery models – both as a therapeutic element as well as an element facilitative of matching services to specific client needs.

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1. Introduction

The client–provider relationship is increasingly recognized as an element of substance abuse treatment that is positively related to treatment outcomes (Meier, Barrowclough, & Donmall, 2005). Little is known, however, about how this treatment element may relate to other health and social services delivered in connection with substance abuse treatment. Recent substances abuse services research has focused on the conceptualization and operationalization of services and the ingredients of service delivery as a basis for the development of evidence-based comprehensive service approaches (Ducharme, Mello, Roman, Knudsen, & Johnson, 2007; Etheridge & Hubbard, 2000; Marsh, Cao, & Shin, 2009; Marsh, D'Aunno, & Smith, 2000). While the direction and strength of the relations among services and between services and outcomes are increasingly analyzed, the role of the client–provider relationship or therapeutic alliance as one element of comprehensive substance abuse treatment has received limited attention.

Finally, although the client–provider relationship is known to be an important factor in treatment of women (Miller & Stiver, 1998), we have insufficient evidence of the differential effects of treatment on gender subgroups.

A useful conceptualization by Finney (1995) and Moos and Finney (1995) recognizes that substance abuse treatment process research addresses (1) the basic services research question, “How does treatment work?” through the systematic analysis of mediators of treatment effectiveness, and (2) the question, “For whom does treatment work?” through the analysis of moderators of treatment effectiveness. The design and delivery of effective substance abuse services depend on systematic treatment process analyses that consider both moderators, such as gender, and mediators, such as client–provider relationship, that influence treatment effectiveness.

1.1. Service mechanisms as mediator variables

Potentially important services and service mechanisms have been identified in the analysis of comprehensive substance abuse treatment approaches where ancillary health and social services are provided along with substance abuse counseling and

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pharmacotherapy (Friedmann, Alexander, Jin, & D'Aunno, 1999; Friedmann, Hendrickson, Gerstein, & Zhang, 2004; Marsh, Cao, Guerrero, & Shin, 2009; Marsh, Cao, & Shin, 2009; McLellan et al., 1998). These service mechanisms include (1) access services designed to increase linkage to substance abuse services, (2) outcome-targeted services or substance abuse counseling, and (3) matched services, i.e., services received by clients that match their descriptions of need. Linkage or *access services*, including services like transportation, child care and outreach, are designed to increase the likelihood a client will be able to reach or obtain the service and have been shown to be related to improved outcomes (Friedmann, D'Aunno, Jin, & Alexander, 2000; McLellan et al., 1998; Smith & Marsh, 2002). Access services have been shown to be especially important for women for enabling them to remain in treatment and reduce post-treatment drug use (Marsh et al., 2000; Marsh, Cao, Guerrero, et al., 2009; Marsh, Cao, & Shin, 2009; Olmstead & Sindelar, 2004). *Outcome-targeted services* are those directly focused on the outcome of interest. In substance abuse treatment, substance abuse counseling is a service specifically designed to reduce substance use. Treatment effectiveness research provides consistent evidence of the impact of substance abuse counseling (Egertson, Fox, & Leshner, 1997). Evidence also indicates that when services are *matched* to specific client-identified needs, comprehensive services are most effectively delivered as part of substance abuse treatment (Friedmann et al., 2004; Marsh, Cao, Guerrero, et al., 2009; Marsh, Cao, & Shin, 2009; McLellan et al., 1997; Smith & Marsh, 2002). The *client-provider relationship* also has been found to be an important element in substance abuse treatment. A set of studies recently reviewed indicates that client-provider relationship is a reasonably consistent predictor of retention in treatment, but an inconsistent predictor of post-treatment substance use (Meier et al., 2005). Overall, evidence indicates each of these factors – client-provider relationship, access services, substance abuse services, and matched services – can serve as a mediator or a mechanism through which positive substance abuse outcomes are achieved. The structure of these services and service mechanisms in relation to treatment outcome is provided in Fig. 1.

1.2. Gender as a moderating variable

Gender has been studied as a moderating variable in treatment process research to assess whether treatment has a differential impact on women and men. Research on women in the substance abuse service system indicates that although women have less access to services overall (Substance Abuse and Mental Health Services Administration [SAMHSA], 1997), when they do enter treatment, they do so with more serious dependencies (Boyd & Mieczkowski, 1990; Halinkas, Crosby, Pearson, & Nugent, 1994; Kosten, T. A., Gawin, Kosten, T. R., & Rounsaville, 1993; Morgenstern & Bux, 2003; Wechsberg, Craddock, & Hubbard, 1998) and with more health and social problems than do men (Chatham, Hiller, Rowan-Szal, Joe, & Simpson, 1999; Marsh, Cao, & D'Aunno, 2004; Marsh & Miller, 1985; Wechsberg et al., 1998). Further, although women and men remain in treatment for comparable periods of time, women are more likely than men to

use services available in comprehensive programs (Ashley, Marsden, & Brady, 2003; Ducharme et al., 2007; Grella, Joshi, & Hser, 2000; Marsh et al., 2004; McLellan & McKay, 1998) and more likely to benefit from them (Greenfield et al., 2007). Although research indicates that women compared to men have greater health and social needs coming into substance abuse treatment and use more services, it is not clear whether factors affecting outcome are the same for women and men.

1.3. Intermediate and ultimate outcomes

Time spent in treatment, i.e., treatment duration or retention, is a common intermediate outcome in social services research. A necessary condition to achieve effective outcomes is to remain in treatment long enough to benefit from service elements. A number of factors have been examined as predicting treatment duration in substance abuse treatment, including specific client characteristics such as age, gender, race, education, employment status, being pregnant, or having minor children (Choi & Ryan, 2006; Grella et al., 2000; McCaul, Svikis, & Moore, 2001; Sayre et al., 2002), as well as service number and type such as transportation, vocational training, and housing (Ashley et al., 2003; Chou, Hser, & Anglin, 1998; Hser, Polinsky, Maglione, & Anglin, 1999).

Numerous studies have shown treatment duration is a robust predictor of positive substance abuse treatment outcomes (Price, 1997; Simpson, 1979; Simpson, Joe, & Broome, 1997; Zhang, Friedmann, & Gerstein, 2003). Zhang et al. (2003) found a linear relation between duration and drug use improvement for typical treatment stays in methadone maintenance, outpatient, and long-term residential modalities. Friedmann et al. (2004) explored the relation between duration and need-service matching based on the possibility that clients whose needs are met may be inclined to stay longer in treatment. There is some support for this relation in the literature. For example, both Hser et al. (1999) and Peron and Bright (2008) found a significant relation between the proportion of needs matched and duration in a treatment program. Friedmann et al. (2004) conducted a formal mediational analysis to find that need-service matching partially mediates the relation between duration and drug use improvements, i.e., indicating the possibility that when individual needs are met, clients are more inclined to remain in treatment, thus reducing their post-treatment drug use.

1.4. Purpose of the study

The purpose of this analysis is to examine a substance abuse service delivery process model that includes client-provider relationship as a treatment element using structural equation modeling (SEM) to analyze the strength and direction among mediating and moderating service types and mechanisms related to substance abuse treatment outcomes. The differential effect of relationship among other service factors and outcomes for women and men is evaluated. Specifically, it is hypothesized that the client-provider relationship along with service mechanisms of access, substance abuse counseling and service matched to need will predict longer stays in treatment and reduced post-treatment drug use.

2. Methods

2.1. Design and sample

This study is a secondary analysis of data collected for the National Treatment Improvement Evaluation Study (NTIES) (Gerstein et al., 1997). NTIES is a longitudinal, national, multi-site study of substance abuse treatment programs serving vulnerable and underserved populations including minorities,

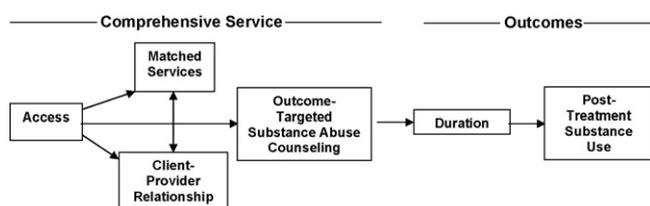


Fig. 1. Components of comprehensive service model.

pregnant women, youth, public housing residents, welfare recipients, and those involved in the criminal justice system. NTIES remains one of a very small number of treatment effectiveness studies that collected detailed information on client self-report of client–provider relationship and service receipt. NTIES employed a pre/post/follow-up panel design to measure the outcome of treatment. Data were collected at both the client and program level. At the client level, client characteristics, services, and outcomes were collected from client interviews obtained at treatment intake ($N = 6593$), treatment exit ($N = 5274$), and 12 months after treatment exit ($N = 5388$). Organizational data were collected from interviews with treatment program administrators. The data set is a multi-level data set that makes it possible to control for the influence of organizational factors on service delivery.

The sampling procedure selected treatment programs funded by the Center for Substance Abuse Treatment (CSAT) at the first stage and used probability sampling of clients within programs at the second sampling stage. The treatment organizations in the sample are not representative of the population of substance abuse treatment organizations in the U.S. As a result, although clients were selected in the study with probability sampling at the second stage, they are representative of clients entering programs funded by CSAT during a specific time period. The analytic sample for this study was a subset of the 4526 clients who completed all intake, treatment discharge, and follow-up interviews. After excluding clients from correctional facilities ($n = 1384$) and clients who reported no service need ($n = 115$), the final analytic sample consisted of 3027 clients from 59 service delivery units: 1922 men and 1105 women; and 1756 African Americans, 470 Latinos, and 801 White clients. Of those completing intake forms, 83% completed the 12-month follow-up questionnaire. Compared to other national studies, NTIES reports high response rates (Gerstein & Johnson, 2000).

In the NTIES data set, 1–15% of data were missing. Thus, a multiple imputation procedure (Rubin, 1987) was conducted to fill in the missing values by assuming the data were missing at random (Little & Rubin, 1987). In the multiple imputation procedure, each missing value was replaced with five plausible values using the Markov Chain Monte Carlo (MCMC) method (Schafer, 1997). Imputation was conducted for the organizational variables and client-level variables independently. Then, the resulting data sets for organizational and client-level data were combined to generate five two-level data sets. To utilize multiple imputation results, one specific model was fitted to the first data set, and the same model was fitted to the other four data sets. Path coefficients for the final fitted models are the averages of the five results.

Preliminary analyses, including data management and multiple imputation of missing values, were conducted in SAS 9.1. SEM was conducted in LISREL 8.8.

2.2. Measures

Items from the NTIES data set were selected to examine the relation of service characteristics to outcome while controlling for treatment organizational and individual characteristics. Data on individual characteristics were collected at the pre-treatment interview; data on services received, duration, and client–provider relationship were collected at treatment exit; and post-treatment drug use data were collected at 12 months after treatment exit.

2.2.1. Explanatory variables

In this study, the explanatory variables are client–provider relationship along with the service characteristics of access services, outcome-targeted services (substance abuse counseling) and

matched services (service–needs ratio). Other individual and organizational characteristics included in the modeling as control variables are race/ethnicity, age, education, treatment modality, and pre-treatment drug use. In each services category, the number of services utilized by each individual was calculated. Client–provider relationship was assessed as an index based on 10 survey items measuring client in-treatment experience with a service provider.

Access services included transportation and child care and were treated as a continuous variable ranging from 0 to 2. Substance abuse counseling services included drug/alcohol counseling, 12-step meetings, and drug prescription for alcohol/drug problems, and clients reported whether they had received each of these types of services. The number of services received was treated as a continuous variable ranging from 0 to 3. Service–needs ratio was a variable constructed from the total number of services clients said they received compared to the number they said they needed that was treated as a continuous variable ranging from 0 to 1. At treatment intake, clients had reported on the services they needed. Service-need was measured as a response to a question on the intake questionnaire as to “how important” (very, somewhat, not at all) the receipt of services would be in specific areas. “Very” and “Somewhat” were coded as 1 reflecting a need for service; “Not at all” was coded as 0. At discharge, clients reported on whether they had received services in each of these areas. In addition to access services and substance abuse counseling services, clients reported on four additional categories of services: family and life skills services (parenting, domestic violence counseling, family services, assertiveness training, life skills, family planning, non-medical pregnancy services), health services (health services, AIDS prevention services, medical pregnancy services), mental health services (mental health counseling or treatment), and concrete services (school, job skills, housing, help collecting benefits, English training, help getting alimony/child support). Service–needs ratio was the ratio of services clients reported receiving to those they reported needing in the areas of family and life skills, health, mental health, and concrete services. To create the service–needs ratio, the percentage of self-reported needs that were matched was computed. Access services and substance abuse counseling services variables were not a component of the service–needs ratio, and were included in the analysis as independent explanatory variables.

Client–provider relationship was assessed with an index constructed from 10 items measuring in-treatment experience variables. Each question used a categorical response scale. Questions asked whether clients had seen a treatment plan (range = 1–2), had helped develop the treatment plan (range = 1–3), agreed with treatment goals (range = 1–4), adhered to treatment goals (range = 1–4), whether important provider existed (range = 1–2), time spent with primary provider (range = 1–6), length of sessions with primary provider (range = 1–5), agreement with primary provider (range = 1–4), understanding by primary provider (range = 1–4), and primary provider speaks preferred language (range = 1–3). The item responses were recoded and normalized such that the maximum value was 1 for a positive relationship, and the minimum value was 0 for a less than positive relationship. An analysis of the psychometric properties of the index reveal the internal consistency reliability of the relationship index was adequate with a Cronbach’s alpha of 0.85. A factor analysis revealed the index contains two independent dimensions related to task and bonding accounted for 73% of the total item variance. The total score of the two factors was highly correlated with the simple sum of item scores (Pearson correlation $r = 0.995$). Therefore, in this analysis, the simple sum of the normalized scores for the 10 items were recoded and rescaled so the maximum value was 1.

2.2.2. Outcome variables

Treatment duration served as an intermediate outcome and was measured at discharge as a continuous variable indicating the

length of treatment in weeks between first and last day of treatment. *Post-treatment drug use* served as the ultimate outcome and was measured during 12 months post-treatment exit by summing the number of days in the last 30 that each respondent reported using the five most frequently used substances: alcohol, marijuana, crack cocaine, cocaine powder, and heroin. The ultimate outcome variable was the sum of the number of days respondents reported using the five drugs. This overall measure reflects the significant polydrug use in this sample combining information on the five most frequently used substances. Half of all respondents in the NTIES sample reported using more than one primary substance and the majority mentioned using at least one of five included in the outcome variable.

2.2.3. Control variables

Individual characteristics evaluated in model development included demographic information, such as gender with as the reference category), age, race/ethnicity (Hispanic, Black, and other, where other was the reference category, and education (years of schooling). Respondents also reported on psychosocial characteristics: health status (a dichotomous variable, “yes” or “no” response to question whether health limits the work they can do), domestic violence (“yes” or “no” response to question whether they had ever been beaten), and mental health status (measured in terms of 24-h psychiatric visits in the last year). They also reported on previous alcohol or drug treatment experience and their pre-treatment drug use. The pre-treatment drug use variable was constructed exactly the same way as the ultimate outcome variable, post-treatment drug use, by summing the number of days in the last 30 days that each respondent used the five most frequently use substances: alcohol, marijuana, crack cocaine, cocaine powder, and heroin. Respondents also were asked to describe their source of payment for services: private, public, or uninsured.

The *treatment organization characteristics* evaluated in the model were derived from administrative interviews and included accreditation, modality, ownership, on-site service availability, and frequency of counseling. For accreditation, administrators reported whether their program was Joint Commission on Accreditation of Healthcare Organizations (JCAHO)-accredited. Lack of accreditation was the referent category. For treatment modality, treatment programs were dichotomized into residential or non-residential facilities. Being a non-residential program was the referent category. Ownership was a dichotomous variable in which administrators indicated whether a facility was private (either private for-profit or private not-for-profit) or public (local, state, federal, or tribal government), where public was the referent category. On-site service availability measures the number of on-site services (academic training, vocational training, medical, psychiatric, or pregnancy services) provided by the treatment center. Because counseling is a staff intensive activity, frequency of counseling reported by the treatment organization was considered a measure of resource allocation in which the administrator indicated whether the typical client is scheduled to receive individual counseling or therapy less than once per week, once per week, or more than once a week. Less than once per week was the referent category. Integer scores of 1, 2, and 3 were assigned to the three categories.

2.3. Structural equation modeling

Structural equation modeling was used to assess both strength and direction of relations among variables. The prospective nature of NTIES data justifies the causal hypotheses in the analysis. Specifically, data on receipt of services and relationship were collected at discharge, and data on post-treatment drug use was collected 12 months post-treatment. Although causal hypotheses can be rejected statistically using SEM, they cannot be confirmed

since important variables may be missing from the model. However, reasonably strong conclusions can be drawn when the model is theoretically derived and fits the empirical data. Additionally, the graphical representation of SEM results in path diagrams that provide enhanced information on complex relations among variables.

A distinctive character of NTIES data is that the client-level data are nested within organizational-level data as a result of multi-stage cluster sample design. There are two approaches to handling possible clustering effects of complex survey sample data in SEM. One method, termed “aggregated analysis,” computes the usual parameter estimates but adjusts standard errors and goodness-of-fit model testing. The other method, termed “disaggregated analysis,” includes a new set of parameters reflecting the complex sample structure. Although it has been found that both methods work well (Muthen & Satorra, 1995), in this analysis we used “aggregate analysis” approach that is available in LISREL. LISREL 8.8 calculates the conventional chi-square goodness of fit, and then adjusts the chi-square with an adjustment factor (du Toit, S. H. C., du Toit, M., Mels, & Cheng, 2005). The LISREL approach is consistent with the method used in survey sampling field for correct variance estimation (Rao & Scott, 1981).

3. Results

3.1. Exploratory factor analysis

We used a common two-stage approach in SEM (Kline, 1998). The first step was to specify a measurement model in which multiple measures were tested as indicators of possible latent variables using factor analysis. In the second step, we tested the fit of the theoretical model to the empirical data, examining the relationships among variables. In the first step, we searched for an unmeasured latent factor related to individual predisposing characteristics using all the observed manifest variables of individual characteristics (gender, race/ethnicity, age, education, health status, ever beaten, mental health status, pre-treatment drug use, prior treatment, and health insurance). We also specified a measurement model with a latent organizational factor using the observed organizational-level variables (JCAHO-accreditation, modality, ownership, on-site services, and frequency of counseling). We were unable, in the modeling effort, to find satisfactory latent variables and concluded that the individual and organizational latent factors were multi-dimensional. As a result, measured variables were used to assess latent constructs. To simplify the SEM modeling, we used observed control variables of race/ethnicity, age, education, pre-treatment drug use, and treatment modality as well as observed explanatory and control variables. We also used the client-provider relationship index constructed for the analysis in the SEM.

3.2. Path analysis

In the second step, we compared our proposed service delivery model with the empirical data assessing both direction and strength of the relation among variables. The closeness of the hypothetical model to the data was evaluated through goodness-of-fit statistics, the chi-square, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). Chi-square ranges between 0 and infinity and measures the distance between observed and fitted data. A large *p*-value for the chi-square statistic indicates a perfect fit of the specified model to the observed data. The CFI ranges between 0 and 1 and compares the improvement in fit of a hypothesized model to a model of complete independence among the fitted variables. Values close to 1.0 are considered a good fit for the CFI. The RMSEA is a measure of fit per degrees of freedom that controls for sample size. Values less than 0.06

Table 1
Means (percents) and standard deviations of the variables used in the initial models.

| Variable | All | | Men | | Women | |
|--|-------|-------|-------|-------|-------|-------|
| | Mean | SD | Mean | SD | Mean | SD |
| Explanatory variables | | | | | | |
| Client–provider relationship | 7.13 | 2.40 | 7.12 | 2.40 | 7.13 | 2.40 |
| Access services | 0.00 | 1.00 | −0.10 | 0.93 | 0.18 | 1.10 |
| Substance abuse counseling services | 0.00 | 1.00 | −0.10 | 1.01 | 0.18 | 0.95 |
| Family and life skills services | 0.04 | 1.00 | −0.08 | 0.90 | 0.24 | 1.12 |
| Health services | −0.02 | 0.98 | −0.08 | 0.99 | 0.09 | 0.94 |
| Mental health services | 0.00 | 1.00 | −0.02 | 0.99 | 0.04 | 1.02 |
| Concrete services | −0.01 | 1.00 | −0.08 | 0.94 | 0.13 | 1.10 |
| Service–needs ratio | 0.43 | 0.27 | 0.43 | 0.28 | 0.44 | 0.26 |
| Outcome variables | | | | | | |
| Treatment duration in weeks | 15.75 | 14.79 | 15.77 | 14.51 | 15.70 | 15.29 |
| Post-treatment drug use | 8.23 | 13.33 | 8.68 | 13.38 | 7.44 | 13.22 |
| Control variables | | | | | | |
| % Male | 64.26 | 47.93 | | | | |
| % Hispanic | 15.47 | 36.17 | 16.79 | 37.39 | 13.09 | 33.74 |
| % Black | 57.67 | 49.42 | 53.39 | 49.90 | 65.36 | 47.60 |
| Age in years | 32.28 | 8.64 | 32.51 | 9.22 | 31.87 | 7.47 |
| Education (years of schooling) | 11.26 | 1.98 | 11.25 | 2.01 | 11.27 | 1.94 |
| % Work limited by health | 33.03 | 47.04 | 32.58 | 46.88 | 33.84 | 47.34 |
| % Ever beaten | 22.48 | 41.75 | 9.50 | 29.33 | 45.82 | 49.85 |
| Mental health status (24-h psychiatric visits) | 0.31 | 0.86 | 0.29 | 0.85 | 0.36 | 0.88 |
| Pre-treatment drug use | 15.51 | 17.71 | 15.90 | 18.01 | 14.83 | 17.14 |
| % Prior treatment | 61.73 | 48.61 | 61.22 | 48.74 | 62.65 | 48.39 |
| % Private source of payment | 25.92 | 43.83 | 28.87 | 45.32 | 20.62 | 40.48 |
| % Public source of payment | 68.26 | 46.55 | 66.21 | 47.31 | 71.95 | 44.94 |
| % Uninsured | 7.78 | 26.79 | 7.23 | 25.91 | 8.76 | 28.29 |
| % JCAHO accredited | 15.91 | 36.42 | 15.31 | 35.97 | 16.97 | 36.80 |
| % Residential | 48.76 | 49.99 | 43.73 | 49.62 | 57.79 | 49.41 |
| % Private ownership | 80.45 | 39.59 | 79.99 | 39.97 | 81.26 | 38.73 |
| Number of on-site services | 2.18 | 1.29 | 2.17 | 1.29 | 2.20 | 1.30 |
| Frequency of counseling | 2.06 | 0.64 | 2.08 | 0.62 | 2.02 | 0.68 |

indicate a relatively good fit between the hypothesized model and observed variables (Hu & Bentler, 1999).

All explanatory, control, and outcome variables were included in the initial model. At each model fitting, non-significant covariates and paths were trimmed until only significant parameters remained.

Table 1 shows the means and standard deviations for female, male and total samples used in the final models. Each estimate in Table 1 is an average of the five estimates from the five imputed datasets.

Fig. 2 presents the final substance abuse treatment model for the total sample (men and women). The coefficients shown in

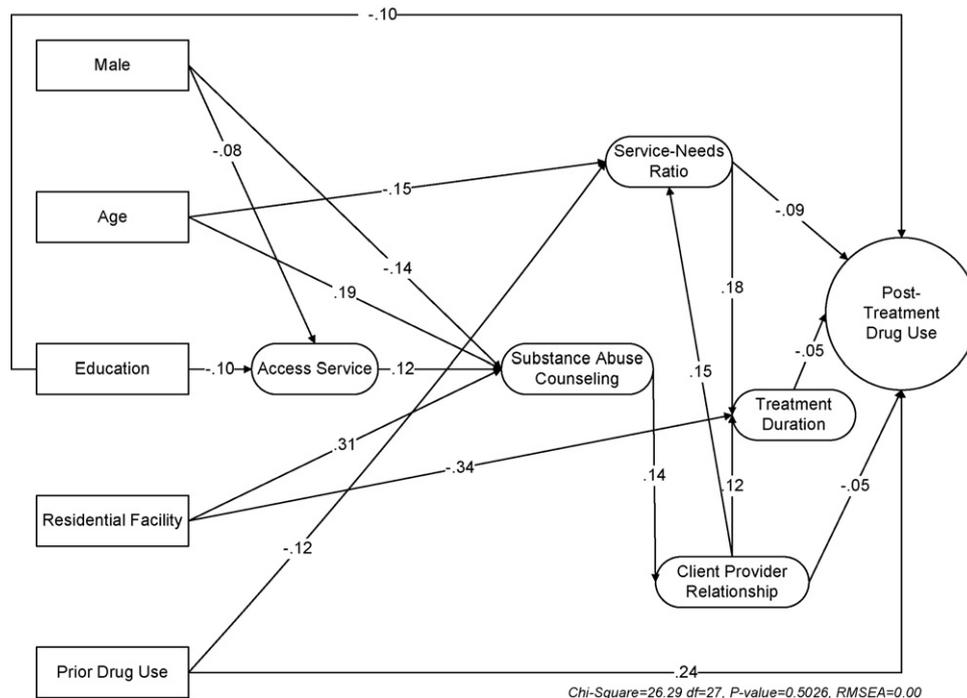


Fig. 2. Model for substance abuse treatment for men and women.

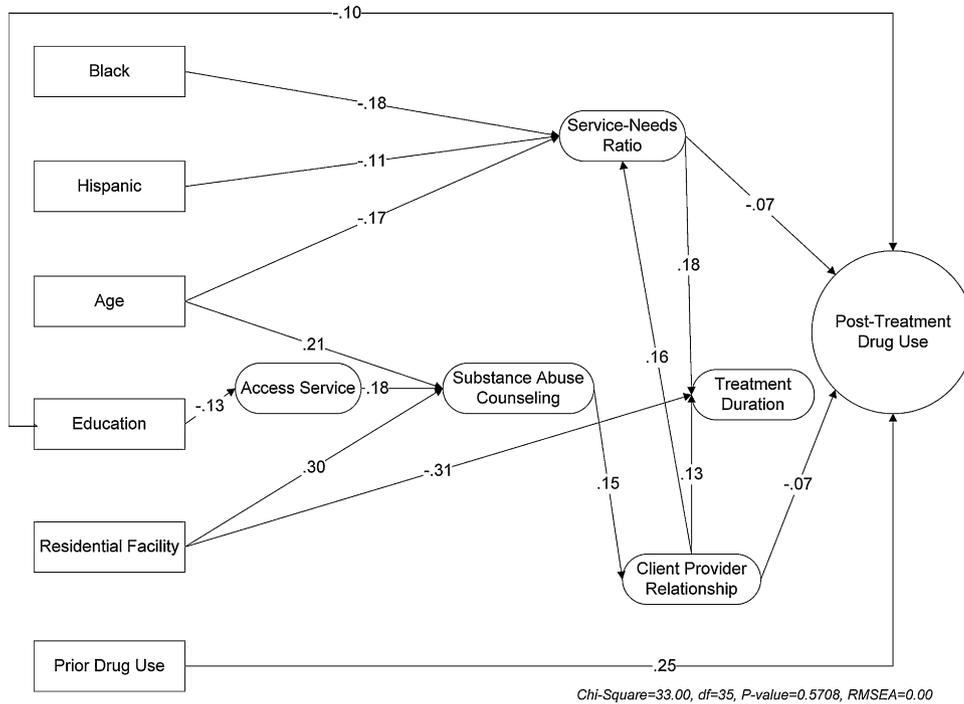


Fig. 3. Model for substance abuse treatment for men.

the model are the standardized path coefficients that were statistically significant ($p < 0.05$). Standardized path coefficients indicate the relative size of the effect of each explanatory variable on the outcome variable. It is the expected change in the outcome variable of a unit change (standard deviation) in the explanatory variable. The goodness-of-fit chi-square statistic is 26.29 with 27 degrees of freedom, and the RMSEA is 0.00. The CFI is 1.00. A large p -value (0.5026) for the chi-square, a CFI of 1.0, and the small RMSEA of 0.00 all indicate that the model fits the data well. The path diagram with nodes and arrows in Fig. 2 represents structural relationships among variables. All the

paths shown with standardized coefficients indicate significant effects.

To verify the model for groups of men and of women analyzed separately, we fit the same model used for the total sample for men and women separately. We did not find an adequate fit using the same model and were unable to find a single model that worked for both groups. Therefore, a separate model was fitted for each group. Fig. 3 shows the final service delivery model for men. The goodness-of-fit chi-square statistic is 33.00 with 35 degrees of freedom. A larger p -value of 0.56492 for the chi-square, a CFI of 1.0, and a smaller RMSEA of 0.00 indicate that the model fits the data.

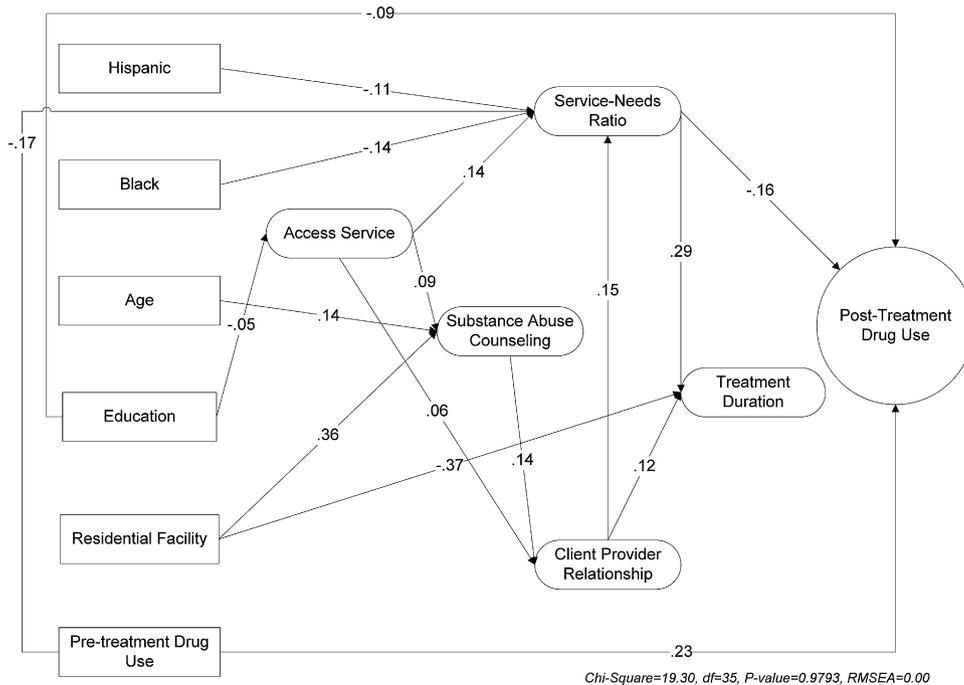


Fig. 4. Model for substance abuse treatment for women.

Fig. 4 shows the final service delivery model for women. The goodness-of-fit chi-square statistic is 19.30 with 35 degrees of freedom. A larger p -value of 0.9798 for the chi-square and a smaller RMSEA indicate that the model fits the data well. Statistical significance of each coefficient was evaluated at the $\alpha = 0.05$ level with the exception of paths from/to access services in the model for women. The paths associated with access services were evaluated at the $\alpha = 0.10$ level based on considerations of the theoretical significance of access services for women (see Section 1). Thus, the path diagram with nodes and arrows in Figs. 2–4 represents the structural relationship among variables, including the direct and indirect effects. All paths with standardized coefficients indicate significant effects.

3.2.1. Predictors of treatment duration and post-treatment drug use for total sample

Given the salience of treatment duration as an important intermediate outcome in social services research, it is valuable to examine service factors directly predictive of remaining in treatment. For the total sample shown in Fig. 2, remaining in treatment was positively predicted by the quality of the client–provider relationship and by the proportion of service needs that were met. The causal service chain identified by the model indicates access services (transportation and child care) results in receipt of more types of substance abuse counseling, which in turn results in a more positive client–provider relationship that leads the client to remain in treatment longer.

Confirming a relationship that is robust in the literature, remaining in treatment is related to reduced post-treatment substance use for the total sample. The other factors directly predicting reduced post-treatment drug use are the quality of the client–provider relationship and whether clients report that service needs were met. The causal chain of services predicting reduced post-treatment substance use begins with receipt of access (transportation and child care) services, resulting in more sessions of substance abuse counseling services, resulting in a higher quality of client–provider relationship which, in turn, predicts reduced post-treatment substance use. The causal service chain identified by the model indicates access services (transportation and child care) result in more types of substance abuse counseling, which in turn result in a more positive client–provider relationship that leads the client to remain in treatment longer. A more positive client–provider relationship also leads to longer duration by leading directly to a higher needs-service ratio which directly results in remaining in treatment longer. The only individual or organizational factors directly related to reduced post-treatment substance use are, as expected, pre-treatment substance use and education.

3.2.2. Predictors of treatment duration and post-treatment drug use for men

As shown in Fig. 3, for men, the service factors predicting the intermediate outcome of treatment duration are quality of client–provider relationship and having received needed services. The causal service chain identified by the model indicates access services (transportation and child care) result in more types of substance abuse counseling, which in turn result in a more positive client–provider relationship that directly leads to longer treatment duration. A more positive client–provider relationship leads indirectly to longer treatment duration by leading directly to a higher need–service ratio which directly results in clients remaining in treatment longer.

Fig. 3 also shows the robust relation between remaining in treatment and reduced post-treatment drug use disappears when other service factors are included in the model for men. As with the total sample, the other factors directly predicting reduced post-

treatment drug use are the quality of the client–provider relationship and whether clients report that other service needs were met. The causal chain of services predicting reduced post-treatment substance use begins with receipt of access (transportation and child care) services, resulting in more types of substance abuse counseling services, resulting in a higher quality of client–provider relationship which, in turn, predicts reduced post-treatment substance use. As with the total sample, a more positive client–provider relationship also indirectly affects post-treatment drug use by directly affecting a higher need–service ratio which directly leads to lower post-treatment drug use.

3.2.3. Predictors of treatment duration and post-treatment drug use for women

Fig. 4 shows the treatment process model for women. For women, the same two factors, i.e., quality of client–provider relationship and needs-service ratio, predict the intermediate outcome of treatment duration. Access services (transportation and child care) result in more sessions of substance abuse counseling, which in turn result in a more positive client–provider relationship that directly leads to longer treatment duration. The causal service chain also indicates that a more positive client–provider relationship leads indirectly to longer treatment duration by leading directly to a higher need–service ratio which directly results in clients remaining in treatment longer.

As shown in Fig. 4, for women, the robust relation between remaining in treatment and reduced post-treatment drug use disappears when other service factors are included in the model. The other factors directly predicting reduced post-treatment drug use are the quality of the client–provider relationship and whether clients report service needs were met. The causal chain of services predicting reduced post-treatment substance use begins with receipt of access (transportation and child care) services, resulting in more sessions of substance abuse counseling services, resulting in a higher-quality client–provider relationship which, in turn, predicts reduced post-treatment substance use. As with men and the total sample, a more positive client–provider relationship also indirectly affects post-treatment drug use by directly affecting a higher need–service ratio which directly leads to lower post-treatment drug use.

The model also reveals a unique role for access services (transportation and child care) for women where a probability level of $p < 0.10$ is used for the significance test. We relaxed the criterion for the test from $p < 0.05$ to $p < 0.10$ considering the significance of access for women in the services research field (Ashley et al., 2003; Marsh et al., 2000; Olmstead & Sindelar, 2004; Zweban, 2003). With the relaxed criterion, access services not only result in more types of substance abuse counseling, but also they directly predict a higher-quality client–provider relationship and higher need–service ratio for women. It should be noted that a relaxed criterion does not change the significance of the relation of access services to other service variables for men.

4. Discussion

Our analysis evaluates the role of client–provider relationship in the context of a service delivery model. As hypothesized, both client–provider relationship and service delivery factors of access, counseling and matched services are either directly or indirectly related to the outcomes of treatment duration and reduced post-treatment substance use. The nature of the causal chains in the model shed light on the substance abuse treatment process revealing the role of relationship and of specific service types and treatment experiences that result in remaining in treatment and reducing post-treatment substance use. Several major connections among the variables in the model have implications for the design of substance abuse treatment services.

The connection of client–provider relationship to the receipt of specific services and to outcomes is a primary focus of this analysis. The results illuminate several questions related to the role of client–provider relationship in substance abuse treatment. An initial question is whether client–provider relationship is causally connected to service receipt and positive outcome or whether receiving services and remaining in treatment contributes to a better client–provider relationship. By using structural equation modeling to check the causal direction of the relationships, results show a positive client–provider relationship consistently predicts higher-quality service experience (as reflected in matched services) and longer treatment duration but not the other way around. The implication for treatment is that, when providers develop a constructive relationship with clients, they are able to more effectively identify and meet service needs and to encourage clients remain in treatment. These findings are consistent with a recent review showing that in substance abuse treatment client–provider relationship is a consistent predictor of retention in treatment and an inconsistent predictor of substance use outcomes (Meier et al., 2005).

A second and related question is whether relationship is therapeutic in its own right or whether it is primarily a vehicle for enhancing access to and impact of specific services. Again, structural equation modeling enabled us to address this question by examining the direct and indirect connections of relationship with matched services and with outcome. Overall, results indicate relationship is both a therapeutic mechanism as well as a facilitative mechanism that enhances the delivery of quality services. Findings from the analysis show that client–provider relationship is directly connected to reduced post-treatment drug use. They also show relationship works indirectly by predicting greater need–service matching and longer treatment stays, which in turn are related to reduced post-treatment drug use.

The analyses of client–provider relationship, services and outcome show that these relations differ for gender groups. Specifically, client–provider relationship is directly therapeutic for the total sample and for men, but not for women. For women, service-need matching appears to mediate the relation between client–provider relationship and reduced post-treatment drug use, in that receipt of needed services is a stronger predictor of outcome than relationship for women. Perhaps because women enter treatment with more service needs, having needs met, or matched services, represents an especially important service strategy for women. However, given the emphasis placed on relationships as an integral part of the therapeutic process for women more than men (Miller & Stiver, 1998), this is an unexpected finding.

The analysis also illuminates the role of other services in a process of service delivery. It shows the treatment process in which access services of transportation and child care lead to more substance abuse counseling services which predict a higher-quality client–provider relationship. These results indicate that access services of transportation and child care are a necessary pre-condition for receiving more substance abuse counseling services. And, it is through the substance abuse counseling services that clients have the opportunity to connect with a provider and to work on treatment goal-setting, planning and bonding. Then, having a good connection with a provider means clients are more likely to achieve a high need–service ratio which is directly related to remaining in treatment longer and, for the total sample and for men, to reducing post-treatment drug use. Thus, the causal connections in the model provide insights into the mechanisms through which post-treatment substance use outcomes are achieved. Specifically, they indicate that specific access services in the form of transportation and child care are pre-conditions to the use of counseling services. They indicate that receiving needed services directly predicts both remaining in treatment and reduced

post-treatment substance use. And, they indicate that a good client–provider relationship consistently enables clients to receive needed services and to remain in treatment and only inconsistently predicts reduced post-treatment drug use.

Access services were identified in the model as a valuable service mechanism, especially for women. It is conjectured that numerous barriers to treatment entry experienced by women – such as lack of transportation and problems with child care – explained the fact that fewer women receive treatment who actually need it (Marsh & Miller, 1985; Marsh et al., 2000). Further, when they do enter treatment (SAMHSA, 1997), they do so with greater addiction severity and more co-occurring problems than men (Greenfield et al., 2007). The findings from this analysis, where the provision of transportation and child care predicted receipt of substance abuse counseling services, matched services, and a better client–provider relationship, support the value of providing access services, such as transportation and child care, as a strategy to bring more women into treatment and to facilitate a higher-quality treatment experience.

Remaining in treatment for more than three months has been considered a robust predictor of reduced post-treatment substance use in the services research literature. The analysis conducted here begins to unpack this relation. In a model that places the relation between treatment duration and outcome in the context of other clearly operationalized and measured service variables, the relation between time in treatment and outcome disappears for samples of women and men analyzed separately. When a service-need matched variable is included in the model, it appears to mediate the relation between the intermediate outcome of duration and the ultimate outcome of post-treatment drug use. This finding is consistent with the mediational analysis reported in Friedmann et al. (1999). That is, when samples of men and women are analyzed separately, need–service matching is a powerful predictor of both retention in treatment and reduced post-treatment substance use, and retention no longer predicts reduced post-treatment substance use. Implications for substance abuse treatment research are that duration may serve as a proxy for receipt of services in some studies of substance abuse treatment effectiveness such that when duration and a sensitive measure of service receipt, such as matched services, is measured along with duration, the importance of remaining in treatment is reduced.

Limitations as well as strengths of this study derive from the NTIES data set. NTIES is one of a small number of large-scale, observational follow-up studies that have been developed in the U.S. to estimate the effects of specific services on substance abuse treatment outcomes. Among follow-up studies, NTIES is known for its prospective design, high follow-up response rate, multiple measures of service delivery, including measures of client–provider relationship, as well as treatment outcome. However, a primary limitation of NTIES is the restricted capacity to generalize due to sample selection procedures that sampled, in the first stage of sampling, a set of programs funded by Center for Substance Abuse Treatment, and in the second stage, individuals from a universe who had been admitted to a treatment program during a given period of time. This sampling procedure limits capacity to generalize findings on the impact of treatment on a non-treatment population as discussed by Gerstein and Johnson (2000). Despite limitations related to the sampling procedure, NTIES investigators report that this sample is largely comparable (e.g., in terms of distribution by gender, educational levels, prior drug treatment experience, criminal justice referrals) with other large scale treatment follow-up studies, except that NTIES oversampled for African Americans and Latinos (Gerstein et al., 1997). They conclude that the findings from NTIES studies are relevant to public sector programs that serve lower-income groups, but may not be as informative about programs serving upper income groups.

A further limitation of the data relates to the fact that data were collected between 1993 and 1995 and became publicly available in 1997. We know that service delivery patterns have changed in the last decade and health and social services are less frequently available in substance abuse treatment, especially for women (Campbell et al., 2007; Kimberly & McLellan, 2006). In this study, this limitation is mitigated by the fact that primary inferences drawn pertain to the relations among a set of treatment process and outcome variables and to differences between women and men. The inferences drawn in the study are relevant to the specific sample participating in the NTIES study. At the same time, they are relevant to the development of differential service delivery strategies for women and men.

A final limitation derives from the path model developed. In structural equation modeling, causal hypotheses can be rejected in the model but cannot be confirmed, since important variables could be missing from the model. Further, while the prospective nature of the data strengthens causal assumptions between the service and ultimate outcome of reduced service use at 12 months post-treatment, the fact that most service variables were measured at discharge (e.g., including access services, substance abuse counseling services, matched services, and client–provider relationship) limits the possibility of making strong causal assumptions among service variables.

This study provides several valuable lessons that seek to identify the role of client–provider relationship in the provision of effective treatment for women and men. While evidence of the overall effectiveness of substance abuse treatment continues to grow, evidence of the impact of specific services mechanisms – evidence that is so critical to the design and delivery of effective treatment that can be tailored to specific groups – is sorely needed. This study identifies several services and service delivery mechanisms – client–provider relationship, access services, substance abuse counseling services, and matched services – that individually and collectively contribute to retention in treatment and reduced post-treatment substance use. Together these service variables represent a potentially effective model of service provision. While mechanisms affecting outcome are fundamentally the same for men and women, access services are particularly important for women, and the beneficial effects of a positive client–provider relationship are directly related to outcome for men and only indirectly for women. Overall, the findings point to the value of including measures of client–provider relationship in the development of evidence-based models of service delivery.

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