Service Needs of Clients in Outpatient Substance-Use Disorder Treatment: A Latent Class Analysis

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ABSTRACT. Objective: The purpose of this study was to determine if there are common classes of service needs among clients in outpatient substance-use disorder treatment. **Method:** Data for this study were derived from the National Treatment Improvement Evaluation Survey. This study focused on clients in outpatient treatment ($N = 2,256$). The majority of the subjects were male (74%). Latent class analysis was used to explore different class solutions. **Results:** A four-class solution exhibited the best fit with the data. Based on the features of the classes, the classes were named "multiple needs," "interpersonal needs," "financial needs," and "low needs." Validation analysis showed that psychiatric problems exhibited the strongest associations with the multiple needs class. **Conclusions:** With service needs extending beyond substance-abuse treatment problems, a classification seems to aid in characterizing the heterogeneity of this population and is suggested of the need for packaged service approaches. (*J. Stud. Alcohol Drugs* **69:** 449-453, 2008)

SUBSTANCE-USE DISORDER (SUD) treatment programs regularly treat clients with a complicated array of needs (McGovern et al., 2006). In fact, clinicians often consider the co-occurrence of substance use and psychiatric disorders to be the rule rather than the exception (Drake et al., 2001; Kessler et al., 1996; Substance Abuse and Mental Health Services Administration, 2002). Yet, additional treatment needs are not limited to the management of psychiatric symptoms. Clients presenting for SUD treatment often report additional social, medical, housing-related, employment, financial, and legal services needs (Craddock et al., 1997; Harrison and Asche, 2001; Smith and Marsh, 2002; Tiet et al., 2006). Psychiatric problems and unmet social needs place competing demands on the individual, which can interfere with, if not undermine, the treatment process (Jaen et al., 1994; Klinkman, 1997) and are associated with poor treatment compliance and outcomes (DeQuardo et al., 1994; Kertesz et al., 2003; Tsuang et al., 2003).

Clinicians and researchers have access to a variety of standardized tools to conduct structured and comprehensive service needs assessments (e.g., Center for Substance Abuse Treatment, 2005; McLellan et al., 1980). These tools combine diagnostic and disorder-specific assessments with the identification of other psychosocial and medical needs. However, not all providers use these structured assessments (McCarty et al., 2008), especially in settings where clinicians are limited to conducting brief assessments. Moreover, when providers assess for and identify multiple service needs, little guidance exists for conceptualizing and prioritizing treatment of co-occurring needs.

One approach to conceptualizing co-occurring service needs in SUD clients is to test for common sets or classes of service needs within the broader treatment population. Having an awareness of whether and which service needs cluster together can help guide service providers' understanding of common service need profiles. Greater awareness of clients' service needs could improve assessment and treatment of those service needs that extend beyond the immediate SUD treatment. More specifically, greater knowledge of the most common *classes* of service needs could improve future assessment of SUD clients' service needs. For example, if a client reports one need from a set of needs that frequently cluster together, an awareness of other potentially co-occurring needs could prompt the provider to directly ask about and address these other domains. Greater appreciation of the topography of clients' service needs also might suggest directions for integrating services in areas of overlapping needs. For example, if clients who report a housing need tend also to evidence a need for vocational assistance, then it makes sense to think about addressing these two needs concurrently.

To understand if service needs can be fruitfully characterized in this fashion, this exploratory study examined classes of service needs among a national sample of clients presenting for outpatient SUD treatment. It is intended to help characterize the heterogeneity of clients' service needs and stimulate additional research in this area.

Method

Data source

This study used a secondary data analysis of the National Treatment Improvement Evaluation Study (NTIES; Gerstein et al., 1997). The NTIES was a multisite longitudinal evaluation of publicly funded SUD treatment programs, with an intake response rate of approximately 85%. For additional details regarding sample characteristics, study design, and primary outcomes of the NTIES, refer to Gerstein et al. (1997). The present study focused specifically on clients receiving treatment in outpatient treatment settings ($N = 2,256$), which is the most common type of treatment offered.

Analytic strategy

Classes of clients sharing common configurations of service needs were identified with latent class analysis (LCA). The underlying assumption of LCA is that the relationship among a set of dichotomous indicators can be explained by a categorical latent variable. LCA was performed using Mplus (Version 4.2; Muthén and Muthén, 1998-2006) software in an exploratory fashion. A single-class model was examined first, and classes were added until no further improvements in model fit were observed. Model fit was assessed with the Bayesian Information Criterion, entropy measure, and by visual inspection of class profiles. After a class solution was selected, subjects were assigned to classes using their highest probability of class membership derived from the model. Bivariate analyses were conducted to assess associations of classes of service needs with demographic, psychosocial, and clinical characteristics.

Measurement

Service needs. Seven domains of service needs were assessed at intake into outpatient SUD treatment: medical, mental health, family, employment, social relations, financial, and housing. Each subject was asked, "Right now, how important is help with [service need domain]? Would you say not at all important, somewhat important or very important?" Responses to each item were dichotomized ("not at all" vs "somewhat" or "very important").

Validation measures. A set of measures was included to validate the latent class model. These included demographic measures (gender, age, education [years], and race [black, Hispanic, white]) and two substance-use measures (primary substance used and severity of substance use). Substance-use severity was an index computed by summing use of alcohol and each drug included in the survey (i.e., marijuana, crack, cocaine, heroin, other narcotics, uppers, downers) over the 30 days preceding the assessment. The response categories for each substance were measured on a 6-point scale (0 days, 1 day, 2-5 days, 6-10 days, 11-20 days, >20 days). Three measures of dichotomously scored (present/absent) current psychiatric problems were also included. These problems included depressed mood (i.e., loss of interest or feeling very sad/depressed), suicidality (i.e., thoughts about suicide or suicide attempt), and anxiety (i.e., sudden feelings of fright/nervousness when not the center of attention or when not in danger).

Results

The majority of subjects were male (71.4%) and unmarried (81.5%), with a mean (SD) education of 11.2 years (2.0). Additionally, 59.1% of subjects were non-Hispanic black, 24.5% were white, and 16.4% were Hispanic. The majority of the subjects received treatment for either alcohol-use disorders (36.4%) or cocaine-use disorders (37.6%). Substance-use severity scores ranged from 0 to 25 (mean = 2.7 [3.23]). In the sample, 58.7% had depressed mood, 31.1% had anxiety symptoms, and 11.5% had suicidality. The proportion of the sample reporting service needs was as follows: family discord, 65.1%; financial problems, 63.8%; medical conditions, 61.0%; employment, 59.4%; housing, 59.1%, mental health, 56.6%; and social relations, 55.1%. The mean number of service needs was 4.2 (2.1), and 88% of subjects reported two or more service needs. Intercorrelations among the needs ranged from $\Phi = .20$ to .47.

Five LCA models were tested. A four-class solution exhibited the best empirical fit with the data (Bayesian Information Criterion = 19,192; entropy = .71) and had a clearly distinguished set of classes that were conceptually plausible. Figure 1 shows the estimated probability of endorsing a particular service need for each class. The distinguishing features of each class were used for selecting the following class names: "multiple service needs," "interpersonal service needs," "financial service needs," and "low service needs." The multiple service needs class was the largest class, representing approximately 47.0% of the overall sample. Less frequently observed classes were the interpersonal needs class (20.1%), financial needs class (16.6%), and low service needs class (16.2%).

Bivariate analyses indicated that females, black, and depressed or anxious clients were more likely to be in the multiple service needs class or financial service needs class than the other classes (Table 1). Clients who used cocaine
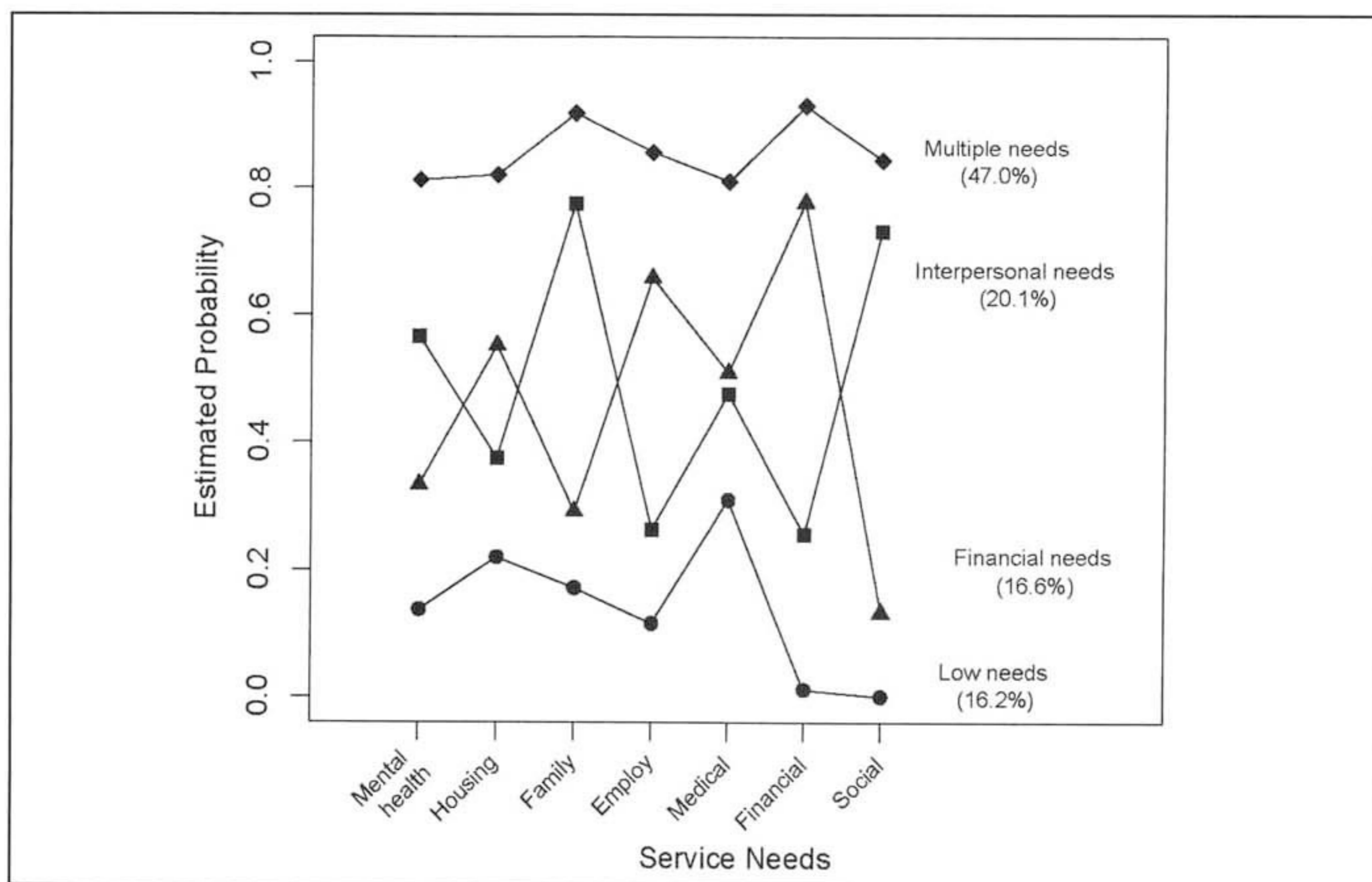
FIGURE 1.   Four-class solution representing probability of service need, by class

as their primary substance were more likely to be in the multiple needs class, whereas respondents who primarily used marijuana were more likely to be in the low service needs class. Statistically significant age differences across the classes were observed ($F = 9.2$, 3/2,252 df, $p < .001$), but the effect size was small ($\eta^2 = .01$). Substance-use severity, education, and marital status were not associated with class membership.

TABLE 1.   Demographic and clinical characteristics of class assignment

Measure	Multiple service needs ($n = 1,062$)	Interpersonal service needs ($n = 453$)	Financial service needs ($n = 375$)	Low service needs ($n = 366$)	Test statistic	Effect size
Male, %	66.3	76.2	69.9	81.7	$\chi^2 = 38.3$,‡ 3 df	$V = .13$
Age, mean (SD)	32.4 (8.4)	31.4 (9.2)	30.3 (10.3)	29.9 (10.4)	$F = 9.2$,‡ 3/2,252 df	$\eta^2 = .01$
Race, %						
White	19.2	23.0	34.7	31.1	$\chi^2 = 54.1$,‡ 6 df	$V = .11$
Hispanic	16.0	15.5	17.1	18.0		
Black	64.8	61.6	48.3	50.8		
Education, mean (SD)	11.2 (1.9)	11.1 (2.0)	11.2 (2.0)	11.3 (2.1)	$F = 1.1$, 3/2,252 df	$\eta^2 = .00$
Married, %	18.5	17.0	19.8	19.5	$\chi^2 = 1.4$, 3 df	$V = .03$
Substance-use severity[a]	0.93 (0.91)	1.0 (0.87)	0.85 (0.84)	0.97 (0.83)	$F = 2.6$, 3/2,252 df	$\eta^2 = .00$
Primary drug, %						
Alcohol	33.8	38.6	39.4	45.7	$\chi^2 = 129.8$,‡ 9 df	$V = .14$
Cocaine	49.1	35.0	30.4	22.2		
Marijuana	7.2	13.6	17.3	21.6		
Other	10.0	12.7	12.8	10.5		
Depressed mood, %	68.5	46.8	64.8	39.1	$\chi^2 = 132.1$,‡ 3 df	$V = .24$
Suicidality, %	14.0	6.8	13.9	7.4	$\chi^2 = 24.5$,‡ 3 df	$V = .10$
Anxiety, %	39.7	22.5	32.5	15.6	$\chi^2 = 94.0$,‡ 3 df	$V = .20$

Notes: All percentages are reported as column percentages. [a]Log transformed values used because of high skew. Effect sizes reported as Cramer's V (V) or eta-squared (η^2).
‡$p < .001$.

Discussion

Past research has repeatedly demonstrated the multifaceted nature of the needs of clients presenting to SUD treatment programs (Harrison and Asche, 2001; Tiet et al., 2006). Preliminary evidence supports the assertion that addressing additional treatment needs is associated with superior outcomes, compared with addressing only substance-related problems (Friedmann et al., 1997; McLellan et al., 1997). However, this line of research does not provide guidance about how to conceptualize multiple, non-substance-related needs or how to combine services to address multiple co-occurring needs.

The current study builds on this research by characterizing the heterogeneity of service needs. Specifically, this study shows that service needs are highly interrelated, and almost all clients report more than one additional need at treatment entry. Despite the fact that clients report a high number of needs across multiple, seemingly disparate, domains, the present results also indicate that service needs clustered together to form four distinct classes. Approximately one of every two clients in publicly funded outpatient treatment presents with multiple, non-substance-specific treatment needs. Approximately one third of clients have relatively circumscribed non-substance-related problems, such as financial problems or interpersonal treatment needs.

Assuming future replication of these results, treatment providers could offer services in four "packages" and fit clients into these available packages, depending on the specific needs they report at intake. Besides having a comprehensive set of services, two additional packages could be available that focus primarily on interpersonal problems and financial problems, which would be targeted toward the large segment of the population that does not fit within the multiple service needs class. Providing services in packages could help clinicians address these needs in a more systematic and streamlined fashion, ensuring that clients receive services that they require without covering other unnecessary domains. This could help treatment programs streamline delivery of services and more readily address the needs of the majority of clients.

Bivariate analyses also supported the assertion that clients with more psychiatric problems are those who need the greatest number of additional services. Many existing interventions for clients with co-occurring disorders are designed to integrate SUD and psychiatric treatments to improve outcomes of dually diagnosed clients (Drake et al., 2004). However, as many proponents of integrated dual diagnosis treatments note (Drake et al., 2001; Laudet et al., 2000), these problems are clearly not limited to the management of psychiatric symptoms, and an effective approach to treating these high needs clients must address their broad array of needs. This suggests that all treatment programs, not just programs serving the most severe segment of the client population, need some type of service delivery infrastructure that can help address the full range of needs of this class.

Limitations of the present research should be noted. Foremost, all analyses are exploratory. Although our final set of analyses provides some validation of the groups identified in the LCA, this analysis was cross-sectional, and the extent to which client characteristics—such as psychiatric comorbidity—*caused* the elevated profile of needs is unknown. Our assessments also used multiple, single-item measures of need severity. A more comprehensive and multifaceted scale designed specifically to identify treatment needs may have yielded differing results. Service needs were assessed via self-report and scored dichotomously, yet clinical evaluation or use of continuous variables for the severity of service needs may yield different results. Future research is needed to examine if alternate measurement strategies would yield different results. Finally, measurement of psychiatric problems and substance-use severity could have been enhanced with stronger measures that were not part of the NTIES survey. This measurement limitation may explain the nonsignificant differences in substance-use severity across the service need groups.

Despite the limitations, this study has offered a unique strategy to conceptualizing service needs among the SUD treatment population. It is intended to promote the conceptualization and characterization of service needs. Additionally, it demonstrates the use of an analytic strategy that may be useful for advancing this line of research.

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