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Predictors of Outpatient Mental Health Service Use by American Youth

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Abstract

Among American children and adolescents aged 1 to 17 years, the 12- to 17-year-olds represent the largest users of outpatient mental health services. This study utilizes a nationally representative sample of this age group from the 2005 National Survey on Drug Use and Health to illuminate predictors of services use from three treatment settings: day treatment programs, mental health clinics/centers, and private/in-home settings. Univariate analyses were used to calculate the percentages of the study sample that used mental health services in these settings. In bivariate analyses, the authors estimated the strength of the associations between available predisposing, need, and enabling factors and the outcomes. Multiple logistic regressions estimated the independent effects of each covariate on the outcomes. Lifetime depression, lifetime general anxiety, delinquent behaviors, drug dependence, and Medicaid were consistent predictors of services use in the three treatment settings. Several other factors were associated with services use in bivariate analyses but lost most of their statistical significance when the authors adjusted for other confounders. Interpreted in light of its potential limitations, this study has important research and policy significance.

Keywords

mental health service use; access to services; adolescent mental health; national data on mental health services

Psychiatric disorders encompass a number of mental, emotional, and behavioral problems that may impair an individual's ability to function. A report by the U.S. Department of Health and Human Services (1999) found that approximately 20% of all children and adolescents are

diagnosed with a mental disorder, and 10% suffer from an emotional disturbance that may lead to functional impairment. Despite outreach efforts to treat individuals with mental disorders, recent estimates indicate that a large proportion of youth are not receiving needed care (Cuffel, Held, & Goldman, 2002; Leaf et al., 1996;). Youth with untreated mental disorders create undo financial burden on families, communities, and the healthcare system in general. Research has documented an increased prevalence of poor academic performance, school dropout, family turmoil, substance abuse, violent behavior, early parenthood, suicide, and persistence of uncontrolled symptoms among youth who do not receive treatment during the early stages of their mental disorders (Elster & Marcell, 2003; Fergusson & Woodward, 2002; Lewinsohn, Rohde, Klein, & Seeley, 1999; Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2000).

Until the mid-20th century, mental health services were provided in an inpatient setting (Levin, Petrila, & Henessy, 2004). It was the advent of the Community Mental Health Centers (CMHCs) program in 1963 that led to a shift away from inpatient treatment in favor of decentralized, community-based services (Grob, 2001). Recent findings reflect a continued overall trend toward greater use of outpatient mental health service that now accounts for more than 59% of the nearly \$12 billion spent to treat children and adolescents with mental disorders (Ringel & Sturm, 2001a, 2001b). Among American youth, adolescents aged 12 to 17 years represent the largest users of mental health services; in 1998, treatment expenditure in this age group was approximately \$291 per person compared to \$165 per person for children aged 6 to 11 years and \$39 per person for children aged 1 to 5 years (Ringel & Sturm, 2001b). Research is needed to understand mental health service use patterns associated with this costly age group (12- to 17-year-olds). The present study utilizes a nationally representative sample of adolescents aged 12 to 17 years to illuminate predictors of outpatient mental health service use in three treatment settings: day treatment programs (DTPs), mental health clinics/centers (MHCs), and private/in-home settings (PHSs). Previous studies investigating predictors of mental health service use are generally restricted to specialized study populations within a treatment setting, and most of these studies suffer from inadequate power, narrow scope, and limited generalizability (Briggs-Gowan, Horwitz, Schwab-Stone, Leventhal, & Leaf, 2000; Cooper-Patrick, Crum, & Ford, 1994; Horwitz, Leaf, & Leventhal, 1998).

This study's framework draws from a well-validated theoretical model, the Andersen's social behavioral model of healthcare use (Andersen, 1995). Previous studies have offered empirical support for the Andersen model to analyze mental health service use (e.g., Elhai & Ford, 2007; Freedenthal, 2007). The social behavioral model organizes variables into (1) predisposing factors that shape attitudes toward healthcare use, (2) need factors that encompass the individual's illness or impairment that necessitates use, and (3) enabling factors that refer to resources that promote or inhibit service use (Jerrell, 1998; Jerrell, Wieduwilt, & Macey, 2002; Kessler et al., 1999). The dataset contains several salient predisposing, need, and enabling variables. Predisposing factors are represented by age, gender, race/ethnicity, school enrollment, and city residency density (Hu, Snowden, & Jerrell, 1992; Padgett, Patrick, Burns, & Schlesinger, 1994; Rhodes, Goering, To, & Williams, 2002; Wang et al., 2005; Zwaanswijk, van der Ende, Verhaak, Bensing, & Verhulst, 2003). Need is assessed by respondents' overall health status and several psychopathological measures (lifetime depression, lifetime general anxiety, past year delinquent behaviors disorders, and substance use dependence) (Algeria, Kessler, & Bijl, 2000; Briggs-Gowan et al., 2000; Horwitz, Gary, Briggs-Gowan, & Carter, 2003; Horwitz et al., 1998; Roberts, Attkisson, & Rosenblatt, 1998). Enabling factors are represented by yearly household income and health insurance coverage (Sourander et al., 2004; Wang et al., 2005).

Based on previous findings in the literature (e.g., Bland, Newman, & Orn, 1997; Leaf et al., 1988), we hypothesize that need factors are the most important predictors of mental service

use in each of the treatment settings, while predisposing and enabling factors account for little additional variance.

Method

Data Source and Study Sample

Data source for the study is the 2005 National Survey on Drug Use and Health (NSDUH), formerly the National Household Survey on Drug Abuse (NHSDA). Conducted since 1971, the NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), an agency of the U.S. Public Health Service and a part of the Department of Health and Human Services (DHHS). The survey provides yearly national and state level estimates of alcohol, tobacco, illicit drug, and nonmedical prescription drug use in the general U.S. civilian population aged 12 and older. Beginning in 1994, the NSDUH questionnaire was redesigned to place a greater emphasis on health status and healthcare, including adding questions on mental health and access to mental health services (SAMHSA, 1995). Further emphasis on mental health was developed in the 1990s following public law 102–321 that requires states to develop and implement comprehensive mental health plans for persons with mental disorders. The law also requires SAMHSA to provide data on mental health for use by the states in their mental health programs. These data have been a useful tool for multidisciplinary studies among many fields of research (Kessler et al., 2003). NSDUH files are available for public use for selected years before 1990 and each year thereafter.

The NSDUH sampling design is a nationally stratified multistage area probability of the non-institutionalized household population in all 50 states, excluding individuals living in jails, prisons, and hospitals. Individuals who had no fixed household address were also excluded. The first stage of selection is census tracts, with an area sample frame containing one record for each census tract. If necessary, census tracts were aggregated within regions until each tract had at a minimum 150 dwelling units in urban areas, or 100 dwelling units for rural areas. These census tracts served as primary sampling units (PSUs). Systematic sampling is then used to select the allocated sample of addresses from each segment.

Nationally, the 2005 NSDUH household and eligibility and response rates were as follows: selected dwelling units: 175,958; eligible dwelling units: 146,912; completed screenings: 134,055; eligible persons: 283,054; selected persons 83,805; interviewed persons: 68,373; and completed cases: 68,308; usable cases: 55,905. The public use file contains 55,905 because of a step in the data processing procedures that established the minimum item response requirements in order for “completed cases” to become “usable cases”, that is, to be retained for further analysis. Due to various adjustments, such as those for nonresponse and poststratification, a final sample weight is provided with the public use data in order to draw statistical inferences on the population. The survey was conducted from January through December 2005. The interviews were conducted using a combination of computer-assisted personal interviewing (CAPI), with responses entered by a field interviewer, and audio computer-assisted self-interviewing (ACASI), with responses entered privately by the participant. The survey takes approximately one hour to complete. Incentive payments of \$30 were given to respondents at the end of the completed interview. Participants’ names are never recorded or associated with their answers. Additionally, the confidentiality of the responses is protected under federal law by the Confidential Information Protection and Statistical Efficiency Act of 2002.

The public use file contains 55,905 records due to a subsampling step used in the disclosure protection procedures, with 33.4% 12 to 17 years old, 33.0% 18 to 25 years old, and 33.5% older than 26 years old. The age profile of 18,678 adolescents aged 12 to 17 years that comprised the study sample was 32.2% 12 to 13 years old, 34.3% 14 to 15 years old, and 33.5%

16 to 17 years old. Gender for the study sample was almost equally distributed, with approximately 9,425 (50.5%) boys and 9,253 (49.5%) girls. The racial/ethnic distribution was 11,588 (62.0%) Whites, 2,579 (13.8%) African Americans, 2,979 (15.9%) Hispanics, and 1,532 (8.2%) other ethnic groups (Native Americans, Asians, and Pacific Islanders).

Outcomes

Information on youth outpatient mental health was provided in a section called “Youth Mental Health Treatment.” We analyzed three measures of outpatient mental health service use dichotomized such that service use at the treatment setting of interest was coded as one and nonuse was coded as zero.

Outcome 1: DTP—“During the past 12 months, did you receive treatment or counseling at a partial day hospital or day treatment program because you had problems with your behavior or emotions that were not caused by alcohol or drugs?”

Outcome 2: MHC—“During the past 12 months, did you receive treatment or counseling at a mental health clinic or center because you had problems with your behavior or emotions that were not caused by alcohol or drugs?”

Outcome 3: PHS (from three questions)—(1) “During the past 12 months, did you receive treatment or counseling from a private therapist, psychologist, psychiatrist, social worker, or counselor for emotional or behavioral problems that were not caused by alcohol or drugs?”; (2) “During the past 12 months, did you receive treatment or counseling from an in-home therapist, counselor, or family preservation worker for emotional or behavioral problems that were not caused by alcohol or drugs?”; and (3) “During the past 12 months, did you receive treatment or counseling from a pediatrician or other family doctor for emotional or behavioral problems that were not caused by alcohol or drugs?”

Construction of Control Variables

The set of variables representing predisposing factors were coded as follows: age (12–13 years, 14–15 years, and 16–17 years), gender (male or female), race/ethnicity (White, African American, Hispanic, and other racial or ethnic groups), school enrollment (yes/no) and city residency (large Metropolitan Statistical Area (MSA)/metro, small metro, and nonmetro).¹

Need of mental health services was represented by a diagnosis of lifetime depression (yes/no), lifetime general anxiety (yes/no), past year alcohol dependence (yes/no), and past year drug dependence (yes/no), based on criteria specified in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition*, of the American Psychiatric Association (1994) (see SAMHSA, 2006). Following Wu and Howard (2007), we also included an index of delinquency based on six types of past year delinquent behaviors (none, 1–2 types, and 3–6 types). Similar to Hirschi’s scale of delinquency (Hinderlang, Hirschi, & Weis, 1981; Hirschi, 1969;), these types of delinquent behaviors were (1) “gotten into a serious fight at school or at work”; (2) “taken part in fight where group fights group”; (3) “carried a handgun”; (4) “attacked someone with the intent to harm”; (5) “sold illicit drugs; and (6) “stolen/tried to steal anything worth more than \$50”. Finally, need was assessed by overall health status coded as: excellent health, good health and poor health.

¹A Metropolitan Statistical Area (MSA)/metro is defined as an area with at least one city with 50,000 or more inhabitants or a Census Bureau-defined urbanized area (of at least 50,000 inhabitants) and a total metropolitan population of at least 100,000 persons (U.S. Census Bureau, 2006). A large metro includes 1 million or more inhabitants while a small metro has fewer than 1 million inhabitants (U.S. Census Bureau, 2006).

The two variables representing enabling factors were yearly household income (<\$20,000; \$20,000 to \$49,999; \$50,000 to \$74,999; and \$75,000 or more) and health insurance coverage (no insurance, private insurance, and Medicaid).

Data Analysis

Univariate analyses were used to estimate the percentages of adolescents in the study sample that used outpatient mental health services from each of the three treatment settings (DTP, MHC, and PHS). Bivariate analyses were used to estimate the strength of the association between the covariates and the study outcomes. Multivariable logistic regressions models were used to study the independent effects of each covariate on mental health service use from each treatment setting. These multivariable analyses were performed using weights provided in the dataset to adjust for variations in within-household probabilities of selection and for differential nonresponse. All analyses were conducted using Stata software, release 9.0 (Stata Corporation, 2005).

Results

DTP

The univariate and bivariate results for DTP are presented in the second column of Table 1. The results indicate that 1.91% ($N = 357$) of youths in the sample visited a DTP for emotional/behavioral problems in the prior year. DTP visits were associated with two predisposing factors, including age, $\chi^2(2) = 7.22$; $p < .027$, and school enrollment, $\chi^2(1) = 6.98$; $p < .008$. There were strong associations between DTP visits and all of the need factors including lifetime depression, $\chi^2(1) = 461.54$, $p < .001$; lifetime general anxiety, $\chi^2(1) = 374.16$, $p < .001$; alcohol dependence, $\chi^2(1) = 65.40$, $p < .001$; drug dependence, $\chi^2(1) = 111.00$, $p < .001$; delinquency behaviors, $\chi^2(2) = 142.88$, $p < .001$; and overall health status, $\chi^2(2) = 35.11$, $p < .001$. DTP visits were also associated with the enabling factors that were comprised of yearly household income, $\chi^2(3) = 24.79$, $p < .001$, and health insurance, $\chi^2(2) = 46.36$, $p < .001$.

The adjusted odds ratios (ORs) from the logistic regression analyses of DTP are presented in the second column of Table 2. These results indicate that relative to survey respondents who were 6 to 17 years old, those aged 12 to 13 years were 2.18 times (OR = 2.18; 95% confidence interval [CI] = 1.60–2.97) as likely to use DTP and those aged 14 to 15 years were 1.77 times (OR = 1.77; 95% CI = 1.32–2.38) as likely to use DTP for emotional or behavioral problems in past year. Youth diagnosed with lifetime depression were 3.62 times (OR = 3.62; 95% CI = 2.76–4.74) as likely to use DTP as youth with no lifetime depression. Those with lifetime anxiety disorders were 3.80 times (OR = 3.80; 95% CI = 2.73–5.30) as likely to use DTP as those with no lifetime anxiety. Alcohol-dependent adolescents were 1.56 times (OR = 1.56; 95% CI: 1.02–2.40) as likely to use DTP as those who were not alcohol dependent. Drug-dependent adolescents were 1.61 times (OR = 1.61; 95% CI = 1.09–2.37) as likely to use DTP as those who were not drug dependent. A dose-response relationship was detected between DTP and number of delinquent behaviors. Compared to adolescents who reported no type of delinquent behavior, adolescents with 1 to 2 types of delinquent behaviors were 2.20 times (OR = 2.20; 95% CI = 1.78–2.72) as likely to use DTP, and adolescents with 3 to 6 types of delinquent behaviors were 3.56 times (OR = 3.56; 95% CI = 2.64–4.81) as likely to use DTP. Youths from households earning over \$75,000 per year were 0.65 times (OR = 0.65; 95% CI = 0.46–0.91) as likely to use DTP as those from households earning less than \$20,000 per year. Medicaid increased the odds of using DTP by 1.71 times (OR = 1.71; 95% CI = 1.10–2.67) relative to no insurance.

MHC

The univariate and bivariate results for MHC are presented in the third column of Table 1. The results indicate that 2.89% ($N = 540$) of adolescents in the study sample visited a MHC for emotional or behavioral problems in the prior year. MHC visits were associated with three of the predisposing factors, including age, $\chi^2(2) = 32.25, p < .001$; gender, $\chi^2(1) = 22.44, p < .001$; and city residency, $\chi^2(2) = 7.40, p < .025$. There were strong associations between MHC visits and all of the need factors including lifetime depression, $\chi^2(1) = 1,400.03, p < .001$; lifetime general anxiety, $\chi^2(1) = 687.33, p < .001$; alcohol dependence, $\chi^2(1) = 38.90, p < .001$; drug dependence, $\chi^2(1) = 115.46, p < .001$; delinquent behaviors, $\chi^2(2) = 97.61, p < .001$; and overall health status, $\chi^2(2) = 64.48, p < .001$. MHC visits were also associated with the enabling factors that were comprised of yearly household income, $\chi^2(3) = 24.12, p < .001$; and health insurance, $\chi^2(2) = 74.75, p < .001$.

The results of the multivariable logistic models for MHC are reported in the third column of Table 2. Interesting to note, none of the predisposing factors were significant in these logistic models. Most of the need factors continued to hold their statistical significance. A lifetime history of depression increased the odds of using MHC by 7.18 times ($OR = 7.18$; 95% $CI = 5.81-8.88$) while a lifetime history of anxiety increased the odds of using MHC in the prior year by 3.20 times ($OR = 3.20$; 95% $CI = 2.42-4.24$). Drug-dependent adolescents were 1.49 times ($OR = 1.49$; 95% $CI = 1.04-2.12$) as likely to use MHC as adolescents who were not drug dependent. Relative to adolescents who reported no delinquent behaviors, adolescents with 1 to 2 types of delinquent behaviors were 1.74 times ($OR = 1.74$; 95% $CI = 1.45-2.08$) as likely to use MHC, and those with 3 to 6 types of delinquent behaviors were 2.63 times ($OR = 2.63$; 95% $CI = 2.00-3.45$) as likely to use MHC. Adolescents in poor health were 1.54 times ($OR = 1.54$; 95% $CI = 1.10-2.18$) as likely to use MHC as their counterparts in excellent health. Among the enabling factors, only Medicaid continued to hold its significance in the multivariable logistic regressions for MHC, increasing the odds of using MHC by 2.40 times ($OR = 2.40$; 95% $CI = 1.57-3.66$) relative to no insurance.

PHS

Univariate and bivariate results for PHS visits are presented in the last column of Table 1. The results indicate that 10.84% ($N = 2,025$) of youths in the sample visited a PHS for emotional and/or behavioral problems in the prior year. With the exception of school enrollment, PHS visits were associated with all of the predisposing factors, including age, $\chi^2(2) = 8.87, p < .012$; gender, $\chi^2(1) = 122.33, p < .001$; race/ethnicity, $\chi^2(3) = 32.56, p < .001$; and city residency, $\chi^2(2) = 6.51, p < .039$. There were strong associations between PHS visits and all of the need factors including lifetime depression; $\chi^2(1) = 1,700.21, p < .001$; lifetime general anxiety, $\chi^2(1) = 888.04, p < .001$; alcohol dependence, $\chi^2(1) = 66.78, p < .001$; drug dependence, $\chi^2(1) = 185.73, p < .001$; delinquent behaviors, $\chi^2(2) = 207.84, p < .001$; and overall health status, $\chi^2(2) = 64.48, p < .001$. Among the two enabling factors, PHS visits were associated only with health insurance, $\chi^2(2) = 32.25, p < .001$.

The ORs from the logistic regression models for PHS as the outcome of interest are presented in the last column of Table 2. Contrary to the bivariate results for DTP and MHC, in which many or all of the predisposing factors failed to remain statistically significant, most of the predisposing factors continued to be significant predictors of using PHS even after controlling for multiple covariates. The results indicate that individuals aged 12 to 13 years were 1.32 times ($OR = 1.32$; 95% $CI = 1.07-1.63$) as likely to use PHS as individuals aged 16 to 17 years. Girls were 1.54 times ($OR = 1.54$; 95% $CI = 1.40-1.71$) as likely to use PHS as boys. Compared to Whites, African Americans were 0.72 times ($OR = 0.72$; 95% $CI = 0.61-0.84$) as likely to use PHS and Hispanics were 0.82 times ($OR = 0.82$; 95% $CI = 0.70-0.95$) as likely to use PHS. Youth living in large metros were 1.51 times ($OR = 1.51$; 95% $CI = 1.25-1.82$) as likely to use

PHS as youth residing in nonmetros. With the exception of alcohol dependence, the need factors continued to significantly predict PHS use, even after controlling for multiple covariates. Youth diagnosed with a lifetime depression were 6.11 times (OR = 6.11; 95% CI = 5.26–7.12) as likely to use PHS as those with no depression. Youth with lifetime general anxiety were 3.94 times (OR = 3.94; 95% CI = 3.15–4.92) as likely to use PHS as those with no history of general anxiety. Drug-dependent adolescents were 1.71 times (OR = 1.71; 95% CI = 1.34–2.19) as likely to use PHS as nondrug dependent adolescents. Relative to adolescents with no delinquent behaviors, adolescents with 1–2 types of delinquent behaviors were 1.62 times (OR = 1.62; 95% CI = 1.45–1.80) as likely to use PHS, and those with 3–6 types of delinquent behaviors were 2.44 times (OR = 2.44; 95% CI = 2.04–2.93) as likely to use PHS. Relative to adolescents in excellent health, adolescents in good health were 1.12 times (OR = 1.12; 95% CI = 1.00–1.25) as likely to use PHS and those in poor health were 1.34 times (OR = 1.34; 95% CI = 1.06–1.70) as likely to use PHS. Compared to no insurance coverage, private insurance increased the odds of using PHS by 1.53 times (OR = 1.53; 95% CI = 1.20–1.94), and Medicaid increased the odds of using PHS by 1.80 times (OR = 1.80; 95% CI = 1.41–2.30).

Discussion

This study sought to identify predictors of outpatient mental health service use for adolescent behavioral and emotional problems in three treatment settings in the United States: DTP, MHC, and PHS. The findings support the hypothesis that need factors are the most crucial predictors of youth's outpatient mental health service use in these treatment settings. When we controlled for other covariates, predisposing factors failed to explain why youth used mental health services from DTP or MHC. Conversely, several of these factors were significant predictors of mental health service use from PHS. This is in line with the literature indicating that the associations between mental health service use and predisposing factors such as a child's age, gender, race/ethnicity, school enrollment and residency are not consistent across studies (e.g., Bland et al., 1997; Cohen & Hesselbart, 1993; Zahner & Daskalakis, 1997).

As expected, lifetime depression, lifetime general anxiety, and youth delinquent behaviors were predictors of mental health service use in each of the mental care settings. Drug dependence was also a predictor of mental health service use in all of the three settings, but alcohol dependence was associated with only DTP. Previous studies also found that while drug dependence consistently increased a youth's mental health services use, results are inconsistent for the effect of alcohol dependence on service use (e.g., Booth, Cook, Blow, & Bunn, 2002; Cooper-Patrick et al., 1994; Horgan, 1986). Poor health status increased the likelihood of using mental health services at MHC or PHS, but no association was found between poor health and mental health service use from DTP. This result suggests that individuals with co-morbid physical conditions have opportunities to receive care in less intensive outpatient medical settings such as MDC and PHS as compared to DTP (e.g., Ormel et al., 1990).

The enabling factors (household income and health insurance coverage) were associated with mental health service use in all of the three settings in the bivariate analysis; however, those covariates decreased or lost their statistical significance altogether when we adjusted for other covariates. We found that private health insurance was associated only with PHS in the multivariate analyses. This is consistent with the literature that has emphasized the need to investigate the type of treatment received to reveal the true impact of private health insurance coverage on mental health service use (Glieb, Hoven, Moore, Garrett, & Regier, 1997; Kataoka, Zhang, & Wells, 2002; Wu et al., 2001). As found in other studies, Medicaid was a significant predictor of youth mental health service use in all of the treatment settings indicating that Medicaid as a means of payment is an important policy tool for increasing access to mental health services for adolescents (e.g., Barbara et al., 1997; Sturm, & Wells, 2000).

Results from this study should be interpreted in light of its limitations. First, we investigated mental health services used in three “formal” outpatient settings, but it has been suggested that youth, particularly African American and Hispanic youth, frequently seek help for emotional and behavioral problems from nonprofessional sectors, such as church and family (Chalfant et al., 1990; McMiller & Weisz, 1996). Second, the study used the “explicit mental healthcare” utilization concept, a relatively restricted definition of use that includes only those services directly related to youth behavioral/emotional problems (Olfson & Pincus, 1994). Third, as with all self-report studies, there is the possibility of recall bias. Furthermore, the study is based on cross-sectional data and thus it is difficult to conclude that factors associated with using mental health services in a particular setting are related causally. Future study with longitudinal data is needed to better inform mental health policy. Above all, findings from this study will add insight into the profile of adolescents who use mental health services in the treatment settings investigated and will help identify and address potential barriers to these services. The results will also help inform mental health planners and policymakers who routinely rely on utilization data in their efforts to identify factors associated with providing mental health services.

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Table 1

Sociodemographic and Clinical Characteristics of Outpatient Mental Health Service Users Among 12- to 17-Year-Olds in the 2005 National Survey on Drug Use and Health ($N = 18,678$)

	Day treatment program (DTP)			Mental health clinic/center (MHC)			Private/in-home services (PHS)		
	% (N)	χ^2 (df)	p	% (N)	χ^2 (df)	p	% (N)	χ^2 (df)	p
Full sample	1.91 (357)			2.89 (540)			10.84 (2,025)		
Age		7.22 (2)	.027		32.25 (2)	<.001		8.87 (2)	.012
12–13 years old	2.11 (126)			2.43 (145)			10.05 (599)		
14–15 years old	2.12 (135)			2.91 (185)			11.72 (745)		
16–17 years old	1.54 (96)			3.38 (210)			10.95 (681)		
Gender		1.91 (1)	.167		22.44 (1)	<.001		122.33 (1)	<.001
Male	1.79 (167)			2.33 (218)			8.41 (786)		
Female	2.06 (190)			3.50 (322)			13.48 (1,239)		
Race/ethnicity		3.42 (3)	.332		0.61 (3)	.894		32.56 (3)	<.001
White	1.83 (211)			2.98 (344)			11.89 (1,370)		
African-American	2.16 (55)			2.82 (72)			8.48 (216)		
Hispanic or Latino	2.24 (66)			2.74 (81)			9.65 (285)		
Other racial/ethnic groups	1.65 (25)			2.83 (43)			10.17 (154)		
School enrollment		6.98 (1)	.008		2.01 (1)	.156		0.0023 (1)	.961
In school	1.89 (344)			2.89 (526)			10.93 (1,989)		
Not in school	3.89 (13)			4.20 (14)			10.84 (36)		
Residency		2.10 (2)	.350		7.40 (2)	.025		6.51 (2)	.039
Large metro	1.78 (137)			2.52 (194)			11.32 (871)		
Small metro	2.08 (186)			3.23 (289)			10.94 (978)		
Nonmetro	1.80 (34)			3.01 (57)			9.28 (176)		
Lifetime depression		461.54 (1)	<.001		1,400.03 (1)	<.001		1,700.21 (1)	<.001
Depressed	1.40 (245)			1.80 (316)			8.63 (1,511)		
Not depressed	10.85 (112)			21.79 (224)			49.95 (514)		
Lifetime anxiety		374.16 (1)	<.001		687.33 (1)	<.001		888.04 (1)	<.001
Anxious	1.61 (291)			2.39 (432)			9.83 (1,775)		
Not anxious	14.01 (66)			22.98 (108)			53.30 (250)		
Alcohol dependence		65.40 (1)	<.001		38.90 (1)	<.001		66.78 (1)	<.001
Alcohol dependent	1.80 (326)			2.79 (506)			10.63 (1,925)		

	Day treatment program (DTP)			Mental health clinic/center (MHC)			Private/in-home services (PHS)		
	% (N)	χ^2 (df)	p	% (N)	χ^2 (df)	p	% (N)	χ^2 (df)	p
Not alcohol dependent	7.23 (31)	111.00 (1)	<.001	7.91 (34)	115.46 (1)	<.001	23.26 (100)	185.73 (1)	<.001
Drug dependence									
Drug dependent	1.75 (315)			2.69 (485)			10.40 (1,875)		
Not drug dependent	8.25 (42)			10.81 (55)			29.53 (150)		
Number of delinquent behaviors	142.88 (2)		<.001	97.61 (2)		<.001	207.84 (2)		<.001
None	1.09 (130)			2.07 (246)			8.67 (1,031)		
1-2	3.06 (169)			4.08 (225)			13.93 (768)		
3-6	5.12 (58)			6.11 (69)			19.95 (226)		
Health status		35.11 (2)	<.001		64.48 (2)	<.001		73.05 (2)	<.001
Excellent health	1.16 (70)			1.87 (113)			8.59 (518)		
Good health	2.21 (260)			3.20 (376)			11.71 (1,376)		
Poor health	3.60 (27)			6.69 (50)			17.36 (130)		
Household income		24.79 (3)	<.001		24.12 (3)	<.001		1.45 (3)	.694
Less than \$20,000	2.95 (98)			3.98 (132)			10.86 (360)		
\$20,000 to \$49,999	1.87 (121)			3.12 (202)			10.82 (700)		
\$50,000 to \$74,999	1.70 (62)			2.28 (83)			10.59 (386)		
\$75,000 or more	1.49 (76)			2.41 (123)			11.35 (579)		
Health insurance		46.36 (2)	<.001		74.75 (2)	<.001		32.25 (2)	<.001
No insurance	0.88 (11)			1.44 (18)			6.66 (83)		
Private insurance	1.59 (192)			2.36 (285)			10.86 (1,311)		
Medicaid	3.06 (144)			4.68 (220)			12.28 (577)		

Note. Statistically significant if $p < .05$.

Table 2
 Logistic Regressions (Odds Ratios) for Outpatient Mental Health Service Users
 Among 12- to 17-Year-Olds in the 2005 National Survey on Drug Use and Health
 (N = 18,678)

Variable	Day treatment program (DTP)	Mental health clinic/center (MHC)	Private/in-home services (PHS)
Age (referent: 16–17 years old)			
12–13 years old	2.18 (1.60–2.97) ***	1.01 (0.80–1.27)	1.32 (1.07–1.63) ***
14–15 years old	1.77 (1.32–2.38) **	0.98 (0.79–1.23)	1.21 (0.99–1.50)
Gender (referent: male)			
Female	0.95 (0.78–1.15)	1.12 (0.94–1.33)	1.54 (1.40–1.71) ***
Race/ethnicity (referent: White/Caucasian)			
African American	1.29 (0.97–1.71)	1.03 (0.80–1.34)	0.72 (0.61–0.84) ***
Hispanic or Latino	1.21 (0.92–1.59)	0.96 (0.75–1.23)	0.82 (0.70–0.95) **
Other ethnic groups	1.16 (0.82–1.65)	1.13 (0.83–1.52)	0.89 (0.74–1.07)
School enrollment (referent: not in school)			
In school	0.66 (0.38–1.17)	1.51 (0.84–2.1)	1.43 (0.96–2.12)
Residence (referent: nonmetro)			
Small metro	1.21 (0.82–1.78)	1.17 (0.88–1.60)	0.96 (0.73–1.27)
Large metro	1.05 (0.70–1.57)	0.97 (0.69–1.34)	1.51 (1.25–1.82) ***
Lifetime depression (referent: no depression)			
Ever depressed	3.62 (2.76–4.74) ***	7.18 (5.81–8.88) ***	6.2 (5.26–7.12) ***
Lifetime anxiety (referent: no anxiety)			
Ever anxious	3.80 (2.73–5.30) ***	3.20 (2.42–4.24) ***	3.94 (3.15–4.92) ***
Alcohol dependence (referent: not alcohol dependent)			
Alcohol dependent	1.56 (1.02–2.40) *	0.94 (0.61–1.43)	1.06 (0.80–1.40)
Drug dependence (referent: not drug dependent)			
Drug dependent	1.61 (1.09–2.37) *	1.49 (1.04–2.12) *	1.71 (1.34–2.19) ***
Number of delinquent behaviors (referent: none)			
1–2	2.20 (1.78–2.72) ***	1.74 (1.45–2.08) ***	1.62 (1.45–1.80) ***
3–6	3.56 (2.64–4.81) ***	2.63 (2.00–3.45) ***	2.44 (2.04–2.93) ***
Health status (referent: excellent health)			
Good health	1.20 (0.95–1.50)	1.08 (0.88–1.31)	1.12 (0.98–1.20)
Poor health	1.30 (0.85–1.96)	1.55 (1.10–2.18) *	1.34 (1.06–1.70) *
Family income (referent: <\$20,000)			
\$20,000 to \$49,999	0.77 (0.60–1.00)	0.96 (0.77–1.20)	1.04 (0.88–1.27)
\$50,000 to \$74,999	0.76 (0.54–1.07)	0.73 (0.54–1.00)	0.98 (0.82–1.18)
≥\$75,000	0.72 (0.46–1.01)	0.77 (0.57–1.04)	1.06 (0.88–1.27)
Health insurance (referent: no insurance)			
Private insurance	1.34 (0.86–2.10)	1.45 (0.94–2.22)	1.53 (1.20–1.94) **
Medicaid	1.71 (1.10–2.67) *	2.40 (1.57–3.66) ***	1.80 (1.41–2.30) ***

Note. 95% confidence interval in brackets.

* Statistically significant $p < .05$.

** Statistically significant $p < .01$.

*** Statistically significant $p < .001$.