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Differences between adolescents who complete and fail to complete residential substance abuse treatment

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Abstract

This study examined the admission characteristics associated with failure to complete residential substance abuse treatment among male adolescents. Of 160 admissions, 48 (30%) completed treatment. Having commercial health insurance ($P = 0.005$), having a family history of a substance use disorder ($P = 0.05$), and living with only one biological parent ($P = 0.015$) were admission characteristics associated with non-completion. Those reporting a history of physical or sexual abuse also appeared to be at risk for non-completion ($P = 0.014$); none of these patients completed the treatment. Interventions that improve residential substance abuse treatment retention for adolescents are needed.

Keywords

substance abuse; residential treatment program; adolescents; disparities; predictors for early discharge

INTRODUCTION

The use of illicit drugs by adolescents in the United States is common. The National Institute on Drug Abuse has estimated that in 2008 the prevalence of lifetime illicit drug use was 19% among 8th graders, 35% among 10th graders, and 47% among 12th graders.¹ According to the National Household Survey in 2008, 9.3% of adolescents aged 12–17 and 19.6% of young adults aged 18–25 were current illicit drug users. The estimate for the rate of substance dependence or abuse among adolescents aged 12–17 was 7.6% and among young adults between 18 and 25 years it was 20.8% in 2008.²

Drug treatment (e.g., residential, inpatient, and outpatient programs) can be offered to adolescents with substance use disorders (SUDs); however, about half of adolescents who enter treatment fail to complete it.^{3–9} Previous research has investigated the characteristics of adolescents that are associated with failure to complete residential SUD treatment, usually defined as leaving the treatment without completing the required programs and services offered by the facility. Characteristics of failure to complete treatment include co-morbid psychiatric disorders such as major depression⁴ or attention deficit hyperactivity disorder (ADHD),⁵ a

family history of SUDs,⁷ greater severity of problems with alcohol, cannabis, and tobacco,⁸ lower socioeconomic status (SES),⁸ younger age,^{3,9} a history of arrests,^{4, 10} marijuana use,¹⁰ prior admissions to treatment,¹⁰ ethnicity other than white,¹⁰ lower education,¹⁰ and a history of being a victim of physical and sexual abuse.⁴ The details of these and other studies are summarized in Table 1.

The results of these studies are not all completely consistent. For example, one study observed that young age was associated with non-completion of outpatient treatment,³ whereas another study demonstrated that older participants were less likely to complete outpatient treatment than younger participants.¹⁰ Likewise, according to some research, *not* having a mood disorder and *not* having a psychiatric disorder was associated with non-completion of treatment among adolescents,^{6, 7} whereas other studies demonstrated an association of mood with non-completion of treatment.^{4,5} Although previous studies reported a strong association between sexual and physical abuse and substance dependence,^{11, 12, 13} research that shows that physical abuse might predict failure to complete treatment among adolescents is limited. Vourakis examined an adolescent population and found an association between failure to complete treatment and being molested by a stranger.⁴ However, according to Blood and Cornwall, adolescents reporting sexual abuse were as likely to complete treatment as those not reporting such abuse.¹²

Additional research might elucidate characteristics of adolescents that are associated with failure to complete long-term residential substance abuse treatment. Based on the previous literature discussed above, we hypothesized that the following characteristics in male adolescents on admission would be associated with failure to complete residential therapy for a drug use disorder: 1) a family history of SUDs, 2) co-existent alcohol use disorder, 3) a history of multiple drug use, 4) early age of onset of substance abuse, 5) a history of arrests, 6) low educational achievement, and 7) being a victim of sexual/physical abuse as a child.

METHODS

We conducted a cross-sectional study of adolescent patients admitted to a long-term urban residential SUD treatment program. Patients who completed the treatment (i.e., the “completers”) were compared with those who did not complete treatment (i.e., the “non-completers”) using a de-identified data set from treatment center records. The Institutional Review Board (IRB) at the University at Buffalo reviewed the study protocol and approved it as an “exempt” study.

Participants

The study consisted of a population of male adolescents, aged 12–18, who were admitted to an urban residential treatment program for SUDs and were either discharged from or left the program between February 22, 2007 and December 31, 2008.

Setting

The setting for this study was a 30-bed residential SUD treatment rehabilitation program for adolescent boys aged 12–18. This treatment program did not have a predetermined fixed length of stay, but a typical stay was about 6 months during which time medical, counseling, vocational, and educational services were provided. The patients could be referred to this program by the judicial system, their parents, other treatment programs, or social service organizations; they could also be “self-referred.”

Data Collection and Management

Drug treatment professionals at the program collected information about the patients on paper forms at the time of admission in a private location, usually the patient's room. These forms contained places to record information as either free text or lists of items that could be checked off by the clinician and were then placed in the paper medical record. Later, data were abstracted anonymously from the medical record onto paper forms by the treatment center personnel, and these data were then coded according to a standard protocol and entered into a de-identified electronic data set. This data set was then used by the study personnel for data analysis.

The outcome measure was completion of treatment, which the residential treatment program defined as the completion of all or most of the treatment goals (e.g., abstinence from substances, increased family education, and improvements in social, emotional, educational, and legal outcomes). We also examined the length of stay as an outcome of interest.

We used bivariate comparisons to analyze the differences between patients who left the residential treatment program early for any reason ($n=112$), the non-completers, and those who, according to the medical record, completed their stay ($n=48$), the completers. The variables examined for association with completion of treatment included: age at admission, legal status/type of referral, race/ethnicity, family living situation, educational attainment, type of health insurance, number of previous arrests, length of previous jail time, religion, history of psychiatric disorders, family history of a SUD, age of substance use onset, type of drug(s) used, preferred substance, number of previous treatments for detoxification, previous inpatient or outpatient rehabilitation, sexual activity in the past 6 months, and a history of physical/sexual abuse.

Data analysis was performed with SPSS Version 11.5 (SPSS, Inc., Chicago, IL). An alpha level of 0.05 was selected for all statistical tests. A two-tailed, unequal or equal (where appropriate) variance t-test was used to compare continuous variables (e.g., the mean age at admission, the mean age of substance use onset, the mean length of stay, the mean number of arrests, and the mean amount of jail time) between the two groups (i.e., completers versus non-completers). Based on the frequency distribution characteristics, patient age was recorded as a dichotomous variable (i.e., ≤ 16 , >16). Pearson chi square and unadjusted odds ratios were used to compare dichotomous variables between the two groups. We subsequently entered the statistically significant variables associated with failure to complete treatment into a stepwise logistic regression analysis. Odds ratios and 95% confidence intervals from the final model were examined to determine the risk of failure to complete treatment for each characteristic associated with non-completion, controlling for all other variables associated with failure to complete treatment.

RESULTS

Participant characteristics

Demographics—The population consisted of 160 male adolescents. Ages at admission ranged from 12–18 years with an average of 16.2 years ($SD = 1.18$). According to the information in the medical record, 134 (83.8%) admissions were white, 11 (6.9%) were African-American, 8 (5%) were Hispanics or Latino, 5 (3.1%) were Native American, and 2 (1.3%) self-reported a biracial heritage. The record documented the last full grade completed: 63 (39.4%) patients had an 8th grade education or less, whereas 97 (60.6%) finished at least the 9th grade. In response to a question about employment (i.e., “What describes your employment in the last 6 years?”), 75 (46.9%) had been employed either full-time or part-time. Ten (6.2%) patients did not have any health insurance, 46 (28.8%) had Medicaid, and 104 (65%) had a commercial insurance. Of the 160 patients, 95 (59.4%) reported that they practiced

some form of religion. Regarding the family structure, 41 (25.6%) patients reported living with both biological parents, 29 (18.1%) lived with one biological parent and one stepparent, 70 (43.8%) lived with one biological parent, and the remaining 20 (12.5%) reported a different family situation. Of the 160 patients, 147 (91.9%) reported having been sexually active in the past six months. Thirteen (8.1%) patients reported having been touched in a way that made them feel uncomfortable (physical/sexual abuse).

Family History, Behavioral Problems, and Substance Abuse—Of all patients (160), 134 (83.8%) reported a family history of substance/alcohol abuse. Seventy-six (47.5%) patients reported a psychiatric disorder or problem in their lifetime. Of these, the prevalence was greatest for 3 conditions: ADHD (46.1%), depression (25.0%), and previous suicide thoughts or attempts (25.0%). The reported mean age of substance abuse onset was 11.5 years ($SD = 2.48$). In addition to the drugs listed in Table 2, other reported drugs used included barbiturates (3.1%), codeine (2.5%), propoxyphene and acetaminophen (Darvocet) combination tablets (1.3%), fentanyl (5.6%), gasoline (1.8%), heroin (16.3%), methadone (3.8%), methamphetamine (0.6%), morphine (3.8%), opium (7.5%), over-the counter medication (25%), PCP (1.3%), oxycodone/acetaminophen (e.g., Percocet) combinations (3.1%), methylphenidate (3.8%), other sedatives (1.3%), quetiapine (2.5%), a buprenorphine/naloxone (Suboxone) combination (3.8%), and other tranquilizers (38.8%). Of all patients (160), 121 (75.6%) reported that their *preferred* drug was marijuana.

Treatment history—According to the information in the medical record, 127 (79.4%) patients were referred to the treatment program via the criminal justice system; the remaining 33 (20.6%) were referred by other sources (e.g., parents, self check-in, other organizations). In addition, 146 (91.3%) patients reported to previously have been in an inpatient or outpatient rehabilitation program for substance abuse.

Outcomes

Treatment Completion—Of the 160 admitted patients, 30% ($n=48$) completed treatment, whereas 70% ($n=112$) failed to complete treatment. Non-completion of the treatment program was described in the records as leaving against medical advice (34.4%), disciplinary dismissal (21.9%), absence without leave (8.8%), therapeutic leave (3.1%), dropping out of drug court (0.6%), medical discharge (0.6%), or incarceration (0.6%).

Length of stay—Of the 160 admissions, the mean length of stay was 93.9 days ($SD = 74.92$). The frequency distribution of the length of stay was bimodal with a failed-to-complete treatment peak around 40 days and a completed treatment peak around 140 days (data not shown). There was also a bimodal distribution among those in the non-completion group; those leaving “against medical advice” tended to leave earlier than those who were dismissed for “disciplinary” reasons. These distributions are shown in Figure 1. More specifically, the mean length of stay was 47.1 days ($SD = 47.57$) for those leaving “against medical advice,” 54.4 days ($SD = 50.76$) for those “absent without leave,” 68.8 days ($SD = 87.63$) for therapeutic leave (graph not shown), 83.9 days ($SD = 71.2$) for those who had a disciplinary dismissal, and 170.4 days ($SD = 45.47$) for those who completed treatment successfully. The two-sided t-test revealed a significant difference of length of stay between leaving against medical advice and disciplinary dismissal ($P = 0.009$), leaving against medical advice and completion of treatment ($P < 0.001$), disciplinary dismissal and completion of treatment ($P < 0.001$), and completion of treatment and absence without leave ($P < 0.001$).

Comparison between completion of treatment and failure to complete treatment

Patients who completed treatment were compared with those who failed to complete treatment. The results of these comparisons are displayed in Table 2. Those who failed to complete

treatment were significantly more likely to have commercial insurance, to have a family history of SUDs, to be living with only one biological parent, and to report previous physical/sexual abuse compared to those who completed treatment. Other demographics (e.g., age, education, employment), co-occurring psychiatric disorder, age of onset of substance use, previous inpatient or outpatient rehabilitation, and previous hospital detoxification failed to differ significantly between the two groups.

Logistic Regression Analysis

Of the significant characteristics listed above, commercial insurance was retained as a significant characteristic associated with failure to complete treatment in the logistic regression model. Specifically, the odds of treatment non-completion for patients with commercial health insurance were 2.8 times greater compared to patients with other insurance. Previous sexual/physical abuse could not be tested in the model because the denominator was 0 (i.e., none of the patients who reported a history of sexual/physical abuse completed treatment). Patients with a family history of SUDs and those living with one biological parent had greater odds of failure to complete treatment, but these characteristics became marginal when controlling for the other characteristics. Table 3 summarizes the net effect of each of the variables associated with failure to complete treatment (excluding previous physical/sexual abuse), controlling for all the others in the model.

DISCUSSION

Having commercial health insurance, having a family history of a substance use disorder, living with only one biological parent, and having a history of physical or sexual abuse were admission characteristics associated with failure to complete treatment in this population. None of those reporting a history of physical or sexual abuse completed treatment.

Commercial insurance might be an indicator of SES. Our finding that commercial health insurance was associated with failure to complete the residential treatment program is surprising because previous literature suggests that lower SES predicts failure to complete treatment.^{6, 14} Friedman et al. reported that type of health insurance affected retention in treatment, but did not explain this result in more detail because it accounted for less than 1% of the variance.¹⁰ In our study, the staff of the residential treatment facility noted another likely explanation for the association of commercial insurance with failure to complete treatment: limits on insurance coverage. It was unusual for commercial insurance to pay for more than a few weeks of treatment. Patients appeared to stay in treatment only as long as their health insurance would cover the costs associated with treatment.

This study also indicated that certain family characteristics are associated with failure to complete residential treatment. Results suggested that adolescents who had a family history of SUDs were less likely to complete the residential treatment program. This finding is consistent with previous studies.⁵ It also corroborates research¹⁵ and theory¹⁶ that highlights the significant influence of family factors (e.g., parental attitudes about drug use, religious beliefs, modeling of behavior, parental monitoring) on adolescent substance use. If several family factors are present that encourage substance use, there is little motivation or support for adolescents to abstain from use and remain in treatment. Furthermore, this study indicates that living with only one biological parent is associated with failure to complete treatment. There is little research that has investigated the effect of the living situation of the family on completion of substance abuse treatment in adolescents. According to Vourakis, adolescents who lived with both biological parents were more likely to complete substance abuse treatment, but this result was marginal.⁴ Studies that examine family structure and adolescent substance use problems have found that adolescents from single-parent families are at greater risk for substance use problems than adolescents that come from mother-father families, and that this

increased risk is due to lower perceived support, increased exposure to stress and trauma, and increased emphasis placed on friends who use and approve of substance use.¹⁷ Therefore, coming from a home with only one biological parent may expose adolescents to factors that encourage substance use and interfere with treatment goals (e.g., treatment completion).

Previous research is consistent with our finding that adolescents who report physical and sexual abuse are more likely to fail to complete treatment.⁴ However, ambiguous findings exist in the literature. Some authors have reported an association between adolescents' failure to complete treatment and being molested by a stranger,⁴ whereas other authors have not.¹² In our study, none of the adolescents that reported physical and sexual abuse completed treatment, suggesting that this variable might have an important impact on clinical practice and intervention. However, more research would be required to determine the relationship between physical/sexual abuse and completion of residential substance use treatment. Until then, claims about any cause and effect relationships cannot be made. A history of abuse might complicate the treatment of a co-existent, but independent, SUD.

There were several limitations to this study. The study design was not particularly innovative and, given the nature of cross-sectional studies in general, cause and effect relationships between patient characteristics and failure to complete the treatment program cannot be determined. We used a population of consecutive discharges and treatment terminations that was derived from the treatment center's quality improvement study over a limited period of time (about 2 years). Thus, we did not use a random sample of all patients. This could have introduced a selection bias. In addition, the majority of the sample was white and male (female adolescents were not included because the specific residential treatment facility only enrolled male adolescents), and therefore the results may not be generalizable to other adolescent residential treatment populations. Furthermore, while the sample was larger than others in the literature, it had relatively low power in order to detect significant differences in patient characteristics between adolescents who completed treatment and those who failed to complete treatment. The study also was a retrospective study and the clinical outcomes of these participants after they left treatment are not known. Since we received de-identified data from the residential treatment program, we do not know whether patients in our study had been admitted to this treatment program previously or more than once during the study sample time period.

Despite the limitations of this study, we conclude that clinicians at residential treatment programs can utilize the results of this study at admission to predict which adolescents are at risk for failure to complete treatment and, in turn, implement early intervention at the time of admission. Specifically, patients that report previous sexual/physical abuse or come from family backgrounds that confer risk for substance use at the time of admission might benefit from additional therapy aimed at prevention of treatment attrition (e.g., family therapy, individual cognitive-behavioral therapy). However, research is needed on interventions that would improve residential substance abuse treatment retention for adolescents.

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A. Leaving against medical advice

B. Absent without leave

C. Disciplinary dismissal

D. Completed treatment

Figure 1.

Length of stay. The histograms with the normal curves of the length of stay of the discharge groups “leaving against medical advice” (A), “absent without leave” (B), “disciplinary dismissal” (C), and “completed treatment” (D) are shown. Note that the time frames labeled at the x-axes are not consistent among graphs. Details of statistical analyses are provided in the text.

Table 1
Studies reporting predictors for failure to complete substance abuse or other psychiatric treatment in adolescents

Authors Date [reference]	Patient population Age	Location	No. of participants	Rate of failure to complete treatment	Setting	Characteristic predicting failure to complete treatment
Feigelman 1987 [3]	Adolescents 12–20	Nassau County, New York	184 participants	52 %	Outpatient program	Younger age, Protestant or Catholic identification, Italian heritage, lower level of profession of father, having siblings, depression, lack of family support
Vourakis 2005 [4]	Adolescents 14–18	West Coast, USA	50 male 36 female participants	58 %	Inpatient and outpatient residential treatment	Major depression, arrest record, molested by a stranger (Overall rates of failure to complete the program were estimated to be 75–90 %.)
White et al. 2004 [5]	Adolescents Mean age: 16	Durham, North Carolina	50 male 9 female participants	49 %	Outpatient program	Depression, ADHD, family history of substance use
Pelkonen et al. 2000 [6]	Adolescents 12–22	Helsinki, Finland	143 male 154 female participants	11 %	Psychiatric Outpatient Clinic	Low parental SES, not having a mood disorder, not receiving psychotropic medication, older age
Stark & Campbell 1988 [7]	Adults Mean age: 26	Portland, Oregon, USA	65 male 35 female admissions	74 %	Outpatient Drug Treatment Center	Not being court mandated, being employed, having low scores on MCMI scales
Blood & Cornwall 1994 [8]	Adolescents 13–20	Halifax, Nova Scotia	93 male 39 female admissions	42 %	Inpatient or Day Treatment Program	For males: lower severity of problems with alcohol and other drugs, higher self-esteem, lower degree of internalizing problems; no predictors found for females
Fickenscher et al. 2006 [9]	American Indian Adolescents 13–18	Southeast, USA	58 male 31 female participants	46 %	Residential Treatment Program	Younger age, no legal concerns, lower treatment readiness
Friedman et al. 1986 [10]	Adolescents 13–19	USA	5789 participants	NR	30 Outpatient Programs	Older age, lower school grade completed, higher number of prior admissions, marijuana

Authors Date [reference]	Patient population Age	Location	No. of participants	Rate of failure to complete treatment	Setting	Characteristic predicting failure to complete treatment
as primary drug of abuse						

Abbreviations: ADHD: Attention Deficit Hyperactivity Disorder, MCMI: Millon Clinical Multiaxial Inventory, SES: socioeconomic status, USA: United States of America

Table 2

Characteristics of participants

Characteristic	Treatment completed (n=48)	Treatment not completed (n=112)	<i>p</i> ^a
Age:			
mean (SD)	16.5 (1.1)	16.1 (1.2)	0.090
≤ 16, No. (%)	23 (48)	59 (53)	0.581
Caucasian, No. (%)	40 (83)	95 (85)	0.812
Education ≤ 8 th grade, No. (%)	16 (33)	47 (42)	0.306
Employed, No. (%)	25 (52)	50 (45)	0.387
Commercial Insurance, No. (%)	9 (19)	47 (42)	0.005 ^a
Religion, ^b No. (%)	29 (60)	66 (59)	0.861
Any psychiatric disorder, No. (%)	21 (44)	55 (49)	0.534
ADHD, No. (%)	6 (13)	29 (26)	0.060
Family history of SUD, No. (%)	36 (75)	98 (88)	0.050 ^a
Court mandated, No. (%)	42 (88)	85 (76)	0.096
Arrested in life time, No. (%)	39 (81)	79 (71)	0.158
Age of onset, mean (SD)	11.6 (2.5)	11.4 (2.5)	0.637
Substance Use:			
Alcohol use, No. (%)	47 (98)	110 (98)	0.899
Nicotine use, No. (%)	45 (94)	99 (88)	0.301
Drug Abuse: ^c			
Amphetamine use, No. (%)	20 (42)	36 (32)	0.247
Cocaine use, No. (%)	30 (63)	59 (53)	0.252
Hallucinogens use, No. (%)	27 (56)	51 (46)	0.214
Hydrocodone use, No. (%)	33 (69)	60 (54)	0.075
Marijuana use, No. (%)	46 (96)	109 (97)	0.620
“OxyContin” ^d use, No. (%)	18 (38)	38 (34)	0.664
Tranquilizer use, No. (%)	17 (35)	45 (40)	0.571
Family: 1 biological parent, No. (%)	14 (29)	56 (50)	0.015 ^a
Trauma (physical/sexual abuse), No. (%)	0 (0)	13 (12)	0.014 ^a

Abbreviations: ADHD: Attention Deficit Hyperactivity Disorder, SD: Standard Deviation, SUD: Substance Use Disorder

^a) Significant difference at $\alpha \leq 0.05$.

^b) Participants indicated a religious preference.

^c) Details related to preference drug are described in the text.

^d) “OxyContin” is a brand name for an extended release oxycodone tablet.

Table 3

Participant characteristics associated with failure to complete treatment

Characteristic	Treatment completed n=48	Treatment not completed n=112	unadjusted			adjusted		
			O.R.	95% CI	P	O.R.	95% CI	P
Commercial Insurance, No. (%)	9 (19)	47 (42)	3.13	1.39–7.09	0.005*	2.80	1.21–6.45	0.016*
Family history of SUD, No. (%)	36 (75)	98 (88)	2.33	0.99–5.56	0.050*	2.17	0.89–5.26	0.091
Family: 1 biological parent, No. (%)	14 (29)	56 (50)	2.44	1.18–5.00	0.015*	2.04	0.97–4.35	0.061

Abbreviations: SUD: Substance Use Disorder

* Significant difference at $\alpha \leq 0.05$