Adolescent Psychiatry, 2019, *9*, 4-10

RESEARCH ARTICLE

Retention and Treatment Outcome of Youth with Cannabis Use Disorder Referred By the Legal System

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ARTICLE HISTORY

Received: September 02, 2018
Revised: October 19, 2018
Accepted: October 23, 2018

DOI:
10.2174/2210676608666181102145040

Abstract: ***Background*:** Youth with Substance Use Disorders (SUDs) referred to treatment from the Juvenile Justice System (JJS) account for approximately half of the treatment admissions nationwide. The objective of this paper is to report a comparison of retention and outcomes for JJS referrals to those from the general community.

***Methods*:** A total of 172 adolescents, 13-18 years of age, 83% males, 70% JJS referrals, diagnosed with DSM-IV Cannabis Use Disorder (CUD), enrolled in this outpatient, randomized, continued care study. Following a 7-session weekly motivational enhancement and cognitive behavioral therapy intervention (MET/CBT-7), only poor responders were randomized into a 10-week second phase of either an individualized enhanced CBT or an Adolescent Community Reinforcement Approach (ACRA) intervention.

***Results*:** JJS referrals' retention rates were significantly higher than those of non-JJS referrals ($X^2(1) = 11.21$, $p < .01$) at the end of Phase I (*i.e.* week 7). However, there was no difference in abstinence rates between the groups at the end of phase I or II and any of the quarterly additional follow-up assessments up to one year from treatment onset.

Conclusions: Additional research examining how to capitalize on improved retention rates among youth JJS referrals is necessary in order to advance abstinence.

Keywords: Substance use disorders, JJS, treatment, CUD, MET, CBT, ACRA.

1. INTRODUCTION

Finding an effective treatment with sustained positive outcomes of adolescent Substance Use Disorders (SUD) continues to present a considerable clinical challenge. The majority of youth are referred to outpatient settings where most studies have reported similar outcomes regardless of modality (Becker & Curry, 2008; Dennis *et al*., 2004; Kaminer, Winters, & Kelly, 2016). These findings should not come as a surprise given that traditional experimental designs have emphasized the comparison of fixed, episodic interventions for evaluating outcomes regardless of the heterogeneity of patients' personal characteristics, clinical severity or response to treatment (Waldron & Turner, 2008). The vast majority of adolescents are not motivated to enter treatment and do so because of external coercion. Probably the largest subpopulation of youth with SUD referred to treatment originate from the Juvenile Justice System (JJS) and account for approximately half of the treatment admissions nationwide (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009; SAMHSA, 2012; Yeterian, Greene, Bergman, & Kelly, 2013).

Earlier literature on the association between legal status at the onset of treatment for SUD and outcomes found no impact on retention or abstinence rates in both adults (McLellan & Druley, 1977) and adolescents (Kaminer, Tarter, Bukstein, & Kabebe, 1992). That means entry into treatment

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2210-6774/19 $58.00+.00

does not need to be voluntary to be effective (Hiller, Knight, Broome, & Simpson, 1998; Kelly, Finney, & Moos, 2005).

Positive associations between substance use and delinquency are well documented. However, many young offenders do not receive treatment unless they are mandated (Rockholz, 2011). Recent studies on court-ordered adults show that those who were mandated to attend for SUD treatment demonstrated less motivation at treatment entry yet were more likely to complete treatment compared to those who were not court-ordered to treatment (Coviello *et al*., 2013). Contrary to popular belief, involuntary treatment was designed to commit individuals into treatment as a substitute to incarceration (Cavaiola & Dolan, 2016). Mandated youth might differ from voluntary referrals in significant ways, including a tendency to be higher on defensiveness or resistance, which might affect in-session attitudes and behaviors (Logan, Kilmer, King, & Karimer, 2015).

A report by Yeterian *et al*. (2013) that mandated youth had higher percent day abstinence than non-mandated JJS referrals, may indicate that motivation is overvalued as a single pivotal mediator of retention and/or abstinence for this population. Furthermore, it challenged the term "voluntary" admission to treatment due to lack of examination of the relative importance of pressure imposed not only by the legal system but also family, friends, school or employers.

The main objective of the present study was to compare retention rates and treatment outcomes of youth with Cannabis Use Disorder (CUD) referred from JJS to those from the general community.

2. METHOD

2.1. Participants

Participants were adolescents (aged 13-18 years) in an outpatient clinic. In total, there were 212 referred adolescents screened: 204 met eligibility criteria; 172 signed consent forms, and 161 engaged in at least one session of the initial treatment phase. The sample was composed of 83% males; 32% Hispanic/Latino, 16% African American and 70% were referrals from the JJS. Eligibility criteria included: (a) meeting current DSM-IV diagnosis of CUD (American Psychiatric Association [APA], 1994), (b) willing to accept aftercare and random assignment to aftercare conditions; (c) able to comprehend and read English at a fifth-grade level; (d) participant or family member willing to provide locator information for additional individuals who can serve as emergency contact persons; and (e) not planning to move out of state for at least 6 months. Adolescents were excluded if they: (a) met any substance dependence criteria other than nicotine or alcohol; (b) had a lifetime diagnosis of schizophrenia; (c) reported suicidal ideation with a plan, suicidal behavior, or self-injurious behavior in the last 30 days; or (d) had any current medical condition compromising their ability to regularly participate in the study.

Adolescents and their parent/guardian provided signatures on written informed assent and consent forms (approved by the IRB) after the purpose, procedures, risks, benefits and rights of the participants were explained and all questions answered.

2.2. Procedures

The study results are based on a secondary analysis of a two-phase, prospective, randomized continued care treatment study. The first phase consisted of a weekly MET/CBT-7 manualized intervention that includes two Motivational Enhancement Therapy (MET) individual sessions followed by five Cognitive Behavioral Therapy (CBT) group sessions (Sampl & Kadden, 2001; Webb, Scudder, Kaminer, & Kadden, 2002). Manualized therapy means that the treatment intervention is evidence-based and follows a specific written protocol. The therapist is trained to adhere to the protocol with all study participants in order to ensure consistency and prevent variability in treatment outcomes. Poor response to initial treatment was defined as failing to achieve abstinence at week seven of the initial treatment for any reason (*e.g*., positive drug urinalysis, drop out). Poor responders were randomly assigned to one of the two conditions within a 10-week adaptive treatment phase. The two treatment conditions were an enhanced individualized CBT (Garrett & Kaminer, 2009), and an Adolescent Community Reinforcement Approach (ACRA) intervention (Godley, Meyers, & Smith, 2001). Therapists were trained and supervised, on adherence to both manualized treatment interventions. The good responders, defined as those who achieved abstinence during the

MET/CBT-7, were NOT assigned to any intervention following the initial treatment phase. However, they were included in the periodic follow-up assessments starting at week 17. That is, all subjects enrolled in the initial treatment phase completed follow-up assessments at all five-time points over one year from treatment onset. For more information on the main effects of the study, see Kaminer, Ohannessian, & Burke (2017).

Table 1. Demographics.

Race	***n***	***%***
Caucasian	133	77%
Black or African American	26	15%
More than one race	8	5%
Asian	3	2%
American Indian/Alaska Native	2	1%
Gender	*n*	*%*
Male	142	83%
Female	30	17%
Ethnicity	*n*	*%*
Not Hispanic or Latino	116	67%
Hispanic or Latino	56	33%
Age	*n*	*%*
16.00 – 18.11	127	74%
Under 16	45	26%
Mean Age	16.07	
Juvenile Justice – Mandate or Referral	*n*	*%*
Yes	128	74%
No	44	26%

2.3. Measures

Demographic measures. Adolescent gender, age and ethnicity/race were used as predictors in the analysis as well as JJS referral source.

Drug use status. Urinalyses utilized in the present study were conducted at baseline and randomly during the initial treatment (Phase I) and continued care (Phase II). The substance use panel assessed cannabis, cocaine, opiates, OxyContin, amphetamines and MDMA. At each urinalysis, adolescents also reported any alcohol and other drug use. Self-reports by adolescents have been found to be highly reliable (Buchan, Dennis, Tims, & Diamond, 2002), in particular, when a legal contingency is not pending (Burleson & Kaminer, 2006). If an adolescent was positive either at urinalysis or by self-reports, they were coded as positive for drug use.

Teen Addiction Severity Index (T-ASI; Kaminer, Bukstein, & Tarter, 1991). This semi-structured interview is a standardized instrument and evaluates the severity of adolescent substance abuse and associated problem domains. The instrument assesses the severity of substance use and dysfunction in six additional domains: school, employment, family, peer-social, legal, and psychiatric. It is administered to the adolescent and to the parent (P-version only substance abuse domain) to receive collateral information about the adolescent. The T-ASI has been found to have good psychometric properties (Kaminer, Wagner, Plummer, & Seifer, 1993).

Diagnostic Interview Scale for Children (DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The DISC-IV is a family of highly structured psychiatric interviews with parent and child versions. It includes most common child/adolescent mental disorders. It covers DSM-IV (APA, 1994) diagnostic criteria and is the most extensively tested child and adolescent diagnostic interview. It is important to evaluate psychiatric diagnosis due to their potential impact on treatment outcomes (Kaminer, 2016).

Attendance/engagement. Engagement to treatment conditions was determined by the number of sessions attended during the first and second phase of the study.

2.4. Statistical Analyses

All analyses were conducted with SPSS version 23 (SPSS, Inc.; Armonk, NY). As a first step, Chi Square tests were conducted to examine demographic differences between the JJS and the non-JJS subsamples. In addition, Chi Square tests were conducted to examine subgroup (JJS and non-JJS) differences in comorbid substance use and psychiatric disorders, and abstinence. Independent samples *t*-tests were used to examine mean subgroup

(JJS versus non-JJS) differences in the severity of cannabis use disorder**.** Demographic and subgroup differences in treatment completion were examined with Chi Square tests.

3. RESULTS

3.1. Descriptive Statistics

The JJS and the non-JJS subsamples were compared for demographic differences. The subsamples differed by gender ($X^2(1) = 8.49$, $p < .05$). As shown in Table **2**, the JJ subsample included a greater percentage of males than the non-JJ subsample (87% and 68%, respectively). The subsamples did not differ by age ($t(169) = .76$, $p = .45$ or by race ($X^2(1) = .18$, $p = .67$).

Based on the DISC-IV, approximately one-quarter of the sample (26%) had a comorbid substance use disorder, mostly Alcohol Use Disorder (AUD). In addition, 47% and 65% of the adolescents had a co-occurring internalizing or externalizing disorder respectively. A Chi-square test was performed to examine the relationship between JJ status and co-occurring internalizing and externalizing disorders. Non-JJ youth were more likely to report both internalizing disorders, ($X^2(1) = 6.70$, $p < .05$), and externalizing disorders than JJ youth, ($X^2(1) = 6.35$, $p < .05$).

Baseline Drug Severity: Based on the Teen Addicted Severity Index (T-ASI), the severity of cannabis use disorder at baseline was considered to be a moderate problem, with some treatment indicated (M = 2.28, SD = 1.04). There was a statistically significant effect for JJ status; $t(170) = 4.54$, $p < .01$, with a higher severity rating for Non-JJS youth (M=2.86, SD=0.91) than JJS youth (M=2.09, SD=1.00).

3.2. Abstinence

As reported in the main effects outcome paper (Kaminer *et al*., 2017), 61% of the entire study sample were abstinent at the end of Phase I (week 7), while only 20% achieved abstinence at the end of Phase II (week 17). Chi-square tests were used to compare abstinence (self-reported and urinalysis for all substance use in the past 30 days) at the end

Table 2. Demographics by Juvenile Justice (JJ) involvement.

Race	***Non JJ***		***JJ***	
	n	***%***	***n***	***%***
Caucasian	33	75%	100	78%
Black or African American	5	11%	21	16%
More than one race	4	9%	4	3%
Asian	1	2%	2	2%
American Indian/Alaska Native	1	2%	1	1%
Gender	*n*	*%*	*n*	*%*
Male	30	68%	112	87%
Female	14	32%	16	12%
Ethnicity	*n*	*%*	*n*	*%*
Not Hispanic or Latino	29	66%	87	68%
Hispanic or Latino	15	34%	41	32%
Age	*n*	*%*	*n*	*%*
16.00 – 18.11	30	68%	97	76%
Under 16	14	32%	31	24%
Mean Age	16.08		16.07	

of Phase I between JJS referrals and non-JJS referrals. The X^2 was not statistically significant ($X^2(1) = 1.82$, $p = .18$), with abstinence rates of 57% for JJS youth and 42% for non-JJS youth. Similarly, at the end of Phase II, the X^2 was not statistically significant ($X^2(1) = 2.34$, $p = .13$), with abstinence rates of 15% for JJS youth and 29% for non-JJS youth.

3.3. Treatment Completion

Of the entire study population, 77% completed Phase I and 35% completed Phase II. Treatment completion was defined as attending at least the first and last session of each phase. Chi-square tests were conducted to examine whether there were demographic differences concerning treatment completion. There was a statistically significant difference for ethnicity, ($X^2(1) = 4.25$, $p < .05$) with Non-Hispanic youth more likely than Hispanic referrals to complete Phase I treatment. However, at the end of Phase II, there was not a statistically significant difference for ethnicity, ($X^2(1) = 2.36$, $p = .15$). There was no statistically significant difference by gender ($X^2(1) = 3.33$, $p = .07$) or by race ($X^2(1) = .01$, $p = .95$). Chi-square tests were also conducted to examine whether there was a relationship between JJS status and treatment completion. At Phase I, the X^2 was statistically significant ($X^2(1) = 11.21$, $p < .01$), indicating that JJS youth were more likely than non-JJS referrals to complete that phase of treatment (84% and 59% respectively). However, at Phase II, while completion rate were in the same direction as in Phase I, the X^2 was not statistically significant ($X^2(1) = 1.52$, $p = .22$), suggesting that there was no difference in completion rates between the two groups (39% and 24% respectively).

4. DISCUSSION

The findings of this study confirm improved retention rates in treatment of Cannabis Use Disorders (CUD) among adolescents referred by the legal system compared to referrals from the general population. In addition, there was no difference found in abstinence rates between the JJS and non-JJS referrals.

There was a higher severity of substance use at baseline for Non-JJS youth than JJS youth. There was also a statistically significant difference for ethnicity at baseline with Non-Hispanic youth more likely than Hispanic referrals to complete Phase I treatment. However, there was not a statistically significant difference for ethnicity at the end of Phase II. There was no statistically significant difference by gender. These findings have not been associated with treatment completion or abstinence status.

Research has consistently showed that substance abusers who stay in treatment longer have a lower likelihood of subsequent drug use and commit fewer crimes (Sinha, Easton, & Kemp, 2003). Moreover, treatment outcomes in adults were similar or sometimes better compared with referrals from the general population (Kelly *et al*., 2005; Coviello *et al*., 2013). It is noteworthy that among adolescents who participated in the Cannabis Youth Treatment (CYT) study reductions in substance use frequency and consequences were similar among adolescents in and out of the JJS (Webb, Burleson, & Ungemack, 2002). Continued studies could improve understanding the temporal ordering of substance use and delinquency in adolescence that might be critical to effectively intervene and prevent further escalation (Hunter, Miles, Pedersen, Ewing, & D'Amico, 2014).

The limitations of the study include the following: the majority of participants were male, as such; the limited representation of females compromises the generalizability of the findings. Participants also resided in the Northeast U.S. therefore; the sample may not fully apply to adolescents living outside of this region. In addition, the sample was underpowered to assess the contribution of covariates such as age, gender, ethnicity, co-occurring disorders and severity of SUD at intake.

Nonetheless, the study has a number of strengths that increase confidence in the validity of the results. These include an ethnically and racially diverse sample, assessment instruments with good psychometric properties, treatment randomization, and manualized evidence-based interventions for both phases of treatment.

In future research, it would be beneficial to explore how the heterogeneity of the JJS referrals affects SUD treatment outcome. That is, to examine a potentially more accurate and pragmatically innovative classification of three subgroups of JJS referrals to treatment based on their commitment or mandated legal status. First, youth mandated to

participate and complete treatment; second, those mandated to participate, but whose mandate expired before treatment completion; and third, youth recommended or suggested, but not mandated to participate in treatment.

CONCLUSION

In conclusion, this study replicated findings from the adult and youth literature regarding superior retention in treatment of SUD for JJS referrals. However, we found similar rather than higher rates of outcomes. Additional research examining how to make use of good retention rates among JJS referrals, particularly those who are poor responders to treatment, is warranted (Kaminer *et al*., 2017). Such a study would focus on activating mediators of change in order to improve abstinence rates.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the University of Connecticut School of Medicine Institutional Review Board, USA.

CONSENT FOR PUBLICATION

Written informed consent was obtained from all the participants for this study.

AVAILABILITY OF DATA AND MATERIALS

The qualitative data supporting the findings of the article is available on request from the corresponding author.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

Support to Dr. Kaminer was received from the National Institute on Drug Abuse (NIDA) (RO1 DA 3054-02). The funding organization had no role in the design and conduct of the collection, management, analysis, and interpretation of the data; preparation, review, or approval the manuscript: and decision to submit the manuscript for publication.

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