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“What I got from treatment”: Predictors of treatment content received and association of treatment content with 6-month outcomes in adolescents

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Abstract

Some adolescents show a greater response to treatment than others. We examined the extent to which amount of treatment content received was associated with certain patient characteristics (e.g., readiness to change) and severity of substance involvement at 6-month follow-up. Adolescents (N=107) recruited from outpatient addiction treatment reported at follow-up on the extent to which treatment addressed addictive behaviors (e.g., getting motivated to change) and other concerns (e.g., depression). Contrary to prediction, readiness to change did not predict amount of treatment content received, but greater number of inpatient days during follow-up predicted greater endorsement of addictive behaviors content. At 6-months, more addictive behaviors content received was associated with fewer alcohol symptoms. For both alcohol and marijuana, greater endorsement of treatment content related to other concerns was associated with greater substance involvement at 6-months, suggesting the importance of evaluating and addressing other concerns because youth may present with problems in multiple domains.

Keywords

adolescent; substance use treatment; treatment outcomes

Post-treatment improvements in adolescents' substance involvement, and functioning in domains such as family and peer relations, and school or work performance have been documented (reviews: Williams & Chang, 2000; Chung & Maisto, 2006). Little is known, however, about the specific types of treatment content that may be associated with reductions in substance involvement among adolescents. Two types of addiction treatment content include interventions that target reductions in substance use, and those that address other health behaviors and concerns (e.g., depression, anger management, interpersonal relations) (CSAT 1999; 2006). Investigation of the type of treatment content that adolescents report receiving from addiction treatment, and how specific types of treatment content are associated with substance use outcomes has implications for increasing understanding of mechanisms

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underlying behavior change, and improving the effectiveness of interventions provided to youth.

Adolescent substance users present to substance abuse treatment with problems in multiple areas of functioning (Kaminer & Bukstein, 2008). Substance use may negatively impact the adolescent's family relations, academic functioning, and peer relations (e.g., Tims et al., 2002). Many adolescents in substance abuse treatment also report involvement in the criminal justice system (e.g., 60-72%; Chan et al., 2008). Another concern is that substance use may occur in the context of co-occurring psychopathology (e.g., conduct disorder), a combination that tends to be associated with worse treatment outcomes (e.g., Grella et al., 2001). The most commonly co-occurring psychiatric disorders among adolescents in substance abuse treatment include conduct disorder, depression (e.g., major depression, dysthymia), and attention deficit hyperactivity disorder (ADHD) (e.g., Diamond et al., 2006; Grella et al., 2001). In addition, prevalence of lifetime trauma exposure for youth in substance abuse treatment is relatively high, ranging from 39-86% in males and 59-92% for females, depending on the types of trauma covered in the assessment (Hawke et al., 2008). Given the variety of problems reported by adolescent substance users, treatment would ideally aim to reduce substance use behavior, as well as foster improvement in multiple domains of functioning.

A variety of treatment approaches for adolescent substance abuse exists (e.g., Stevens & Morral, 2003), and includes, for example, a 12-step-based approach to recovery, relapse prevention (e.g., Marlatt & Gordon, 1985), family-based interventions (e.g., Liddle, 2002), and motivational enhancement (e.g., Diamond et al., 2002). Despite differences across community-based treatment programs in specific program content, substance abuse treatment provided to adolescents involves shared core components (CSAT, 1999). These core treatment components include, for example, working toward a goal of reducing or abstaining from substance use, providing psycho-education regarding the risks associated with substance use, and providing services or referrals to services related to other concerns (e.g., co-occurring psychopathology, medical problems), as needed.

Few studies have examined adolescents' perceptions of what was received during substance abuse treatment, and how what was received may be associated with treatment outcome. In the Drug Abuse Treatment Outcomes Studies for Adolescents (Etheridge et al., 2001), adolescents' report of services received and unmet needs indicated that unmet needs most often involved psychological and family problems, due to limited program resources. A gap in knowledge exists regarding the extent to which adolescents' report of treatment content received (e.g., given help to decrease drinking, got help in setting goals in my life) is associated with treatment outcomes. Specifically, although it is likely that greater endorsement of receiving substance-related treatment content would be associated with less substance involvement over follow-up, the role of interventions that address other concerns (e.g., depression) in relation to substance involvement during early recovery has not received much attention. That is, each type of treatment content (i.e., addictive behaviors, other concerns) may uniquely predict level of post-treatment substance involvement, information that could usefully guide decisions regarding the utility of expanding treatment to address both substance use and other areas of functioning.

Several factors may impact adolescents' reports of what they receive from substance use treatment. First, longer duration in treatment has been consistently associated with better adolescent treatment outcomes (Williams & Chang, 2000), and likely exerts this effect through a larger "dose" of treatment content, which permits repetition and elaboration of program content. Second, greater readiness to change substance use behavior at the start of treatment also may be associated with greater endorsement of treatment content received, because those who are motivated to change substance use behavior may be more likely to absorb and retain

treatment content. Third, co-occurring psychopathology (e.g., conduct problems, depression), may influence receptivity to treatment content or affect an adolescent's ability to fully participate in treatment (e.g., difficulties concentrating due to depression may interfere with the retention of treatment content). Few studies have examined the potential impact of treatment dose, readiness to change substance use behavior, and co-occurring psychopathology on patients' reports of what they received from substance use treatment, although such information could be used to tailor interventions to better suit the needs of certain adolescent subgroups.

This prospective study of adolescents recruited from addiction treatment focused on two main types of treatment content that youth reported receiving over 6-month follow-up: interventions that aim to reduce substance use, and interventions that address other concerns (e.g., anger management). In examining patient characteristics that predicted the amount of treatment content that youth reported receiving over follow-up, we tested the hypothesis that greater dose of treatment and greater readiness to change would be associated with greater endorsement of treatment content received. In addition, we examined the extent to which the amount of treatment content received was associated with severity of substance involvement at 6-month follow-up. We predicted that adolescent reports of greater treatment content received over follow-up would be associated with lower severity of substance involvement at 6-months.

Materials and Method

Sample characteristics

Adolescents, age 14-18, were recruited prior to attendance at the first treatment session from six community-based treatment sites offering group-based intensive outpatient (IOP) treatment for adolescent substance users. All sites were located in urban areas in Western Pennsylvania. Five of the six sites are run by Gateway Rehabilitation Centers, a not for profit organization. The sixth site was an adolescent Dual Diagnosis clinic (i.e., substance use disorder and co-occurring psychopathology), which is part of a university-based medical center.

Of the 142 adolescents who completed a baseline research assessment, which typically occurred within two weeks of starting IOP, 115 youth (81%) completed both the baseline and 6-month follow-up. However, 8 adolescents had missing scores on the "What I got from treatment" measure (due to marking most items "not applicable"), reducing the sample to 107 for these analyses (75% of the baseline sample).

A majority of the 107 adolescents were male (61.7%); 88.8% were Caucasian, 5.6% were African-American, and 5.6% were of other ethnicity (e.g., bi-racial). The sample had a mean age of 16.6 ($SD=1.2$), and represented a range in socio-economic status (SES) (range 1-5, mean=2.5, $SD=1.1$) (Hollingshead, 1975). Roughly one-third (34%) were recruited from the Dual Diagnosis Clinic, 66% were recruited from Gateway sites. Adolescents reported referral to treatment from a variety of sources: 35% by parents, 28% by the courts, 16% by prior treatment, 17% by the school, and 4% referred themselves to treatment. Importantly, the sample's demographic characteristics (i.e., gender and mean age) are similar to those of youth admitted to publicly funded treatment (SAMHSA, 2007). With regard to attrition over follow-up, there was no difference between those who completed the 6-month assessment versus those who did not on demographic characteristics, or any baseline variable ($p>.10$).

Adolescents most commonly reported alcohol and marijuana as the substances for which they were receiving treatment. At baseline, the majority met criteria for a current (past 6-months) DSM-IV marijuana diagnosis (81.3%: 40.2% marijuana abuse, 41.1% dependence); the mean number of DSM-IV marijuana symptoms was 3.5 ($SD=2.6$, range 0-9). Less than half (44.9%) met criteria for a current alcohol diagnosis (34.6% abuse, 10.3% dependence) at baseline; the mean number of DSM-IV alcohol symptoms was 1.6 ($SD=1.9$, range 0-8). Adolescents

recruited from Gateway and the Dual Diagnosis Clinic did not differ in average number of alcohol symptoms at baseline or 1-year follow-up ($ps>.24$), but did differ in average number of marijuana symptoms at baseline (3.0 vs 4.4, respectively, $p<.01$) and at 1-year follow-up (1.2 vs 3.0, respectively, $p<.01$).

With regard to the more common forms of co-occurring psychopathology, at baseline, 26.2% of adolescents met DSM-IV criteria for a current depression diagnosis (e.g., major depression, dysthymia), 32.7% had a conduct disorder diagnosis, 32.4% met criteria for attention deficit hyperactivity disorder (ADHD), and 9.2% met criteria for an anxiety disorder (e.g., panic disorder, generalized anxiety, but excluding posttraumatic stress disorder [PTSD]). In addition, the lifetime prevalence of traumatic events reported by adolescents at baseline was 25% for witnessing a violent crime (e.g., saw someone shot), 15% were the victim of a violent crime (e.g., mugged, attacked), 9% reported physical abuse (e.g., welts or broken bones), and 6% reported sexual abuse (e.g., rape). Roughly one-third (37%) of the sample reported lifetime occurrence of at least one of these 4 traumatic events (mean number of events endorsed out of 4 total events: 0.6, $SD=0.8$, range=0-3). Only 2 adolescents (1% of the sample) met criteria at baseline for a lifetime diagnosis of PTSD.

The prevalence of the 4 more common psychiatric disorders in the sample was higher among adolescents recruited from the Dual Diagnosis Clinic compared to Gateway sites ($ps<.01$): anxiety disorder (18% vs 4%, respectively), ADHD (55% vs 20%), depression (47% vs 12%), and conduct disorder (49% vs 25%). As in other community-based substance abuse treatment programs for adolescents that are not specifically dual diagnosis programs (e.g., Grella et al., 2001), some adolescents recruited from Gateway treatment sites also met criteria for a co-occurring psychiatric condition. There was no difference in the lifetime occurrence of the 4 traumatic events for youth recruited from Gateway versus the Dual Diagnosis clinic ($ps>.10$).

Study recruitment and assessment procedures

Prior to attending the first IOP session, all adolescents were told about an on-going research project by an administrative staff person who handled the admissions process (Gateway) or by their therapist (Dual Diagnosis Clinic). Adolescents who expressed interest in research participation were then introduced to research staff, who provided a description of study procedures. Written informed consent for the adolescent's participation was obtained from interested youth, prior to data collection, from the minor adolescent's parent (with the minor providing assent), or from the 18-year old adolescent. Among adolescents to whom the study was introduced, 65% provided informed consent and were scheduled for a baseline assessment. It is not possible to compare the demographic and substance use characteristics of those who declined study participation to those who provided consent. Among adolescents who provided informed consent, 89% completed the baseline assessment; those who completed baseline did not differ in gender or age (ethnicity was not obtained at the time of recruitment) from those who did not complete the baseline assessment.

The baseline assessment, which typically lasted 2-2.5 hours, collected data on lifetime history of substance involvement, psychiatric conditions, and readiness to change substance use. Adolescents also completed monthly phone follow-ups (about 15 minutes long), that collected data on substance use and treatment utilization in the past month. The 6-month follow-up, which usually took 1.5 hours to complete, covered the interval since the baseline assessment, querying the same domains as the baseline assessment, and included a measure of "What I got from treatment" (see below). A urine drug screen was administered at baseline and at 6-months. Discrepancies between urine drug screen results and self-reported drug use were probed to ensure high quality self-report of substance use. Participants were compensated for their time. The University's Institutional Review Board approved the study protocol.

Treatment program characteristics

Each IOP treatment program from which adolescents were recruited to the study adhered to a goal of abstinence from alcohol and other substances, and recommended participation in 6-8 weeks of IOP treatment. Each site ran one rolling admissions adolescent IOP treatment group, which met three times per week, for 3-hours per session. Because the treatment content of the IOP groups focuses on reducing substance use, trauma-related intervention is not a core IOP treatment component at any of the sites from which adolescents were recruited. However, at each site, IOP groups do address trauma-related and other concerns if they are raised in discussion, and further evaluation and referral to address these other concerns is made, as needed. All sites include random urine drug screens, administered roughly once per week, to monitor compliance with a treatment goal of abstinence.

Gateway's adolescent IOP curriculum is consistent across sites, and is based largely on introducing and working the 12-steps of recovery (e.g., CSAT, 1999). Gateway's curriculum includes five rotating core components: the disease concept of addiction based on the 12-steps of recovery (introduced 2-3 times during the recommended 6-8 week length of stay), the development of relapse prevention skills (e.g., Marlatt & Gordon, 1985), managing feelings (e.g., anger), 12-step facilitation (e.g., presentations by AA/NA members, and encouraging 12-step meeting attendance), and building self-esteem (e.g., identifying alternative healthy activities). Each week (i.e., 3 IOP group sessions) focuses on a core treatment component. Across the types of treatment content covered, the proportion of 12-step content is roughly 60%, relapse prevention is 20%, managing feelings is 10%, and building self-esteem is 10%.

Treatment at the adolescent Dual Diagnosis Clinic offers a rotating schedule of 12 manualized sessions that cover psycho-education regarding the co-occurrence of mental health and addictive disorders, treatment goals and roadblocks to recovery, phases of recovery, relapse prevention, and 12-step principles and facilitation. Treatment sessions incorporate motivational enhancement techniques, relapse prevention strategies, 12-step facilitation, and patient education regarding substance use and co-occurring psychiatric illness. Because all youth in the dual diagnosis clinic present with co-occurring psychiatric illness, all are evaluated by the clinic's medical director to determine, if necessary, appropriate medication. The medical director meets with patients shortly after IOP admission, and as needed thereafter for medication monitoring. Across types of treatment content provided, the proportion of 12-step content provided is roughly 20%, relapse prevention (40%), managing feelings (20%), and patient education regarding co-occurring psychiatric illness and substance use (20%).

Treatment provider characteristics

At each site, IOP treatment was provided by master's level clinicians, who have at least 1 year of experience working with adolescent substance users. Most clinicians have 2+ years of experience in working with adolescent substance users. Clinicians at each site are knowledgeable regarding the 12-steps of recovery, and have training in the use of cognitive-behavioral interventions (e.g., relapse prevention) with adolescent substance users. Gateway and Dual Diagnosis therapists receive weekly supervision from senior staff at their respective programs. In addition, therapists at the Dual Diagnosis clinic have been trained in motivational enhancement interventions for substance use (e.g., Miller & Rollnick, 2002).

Measures

DSM-IV substance use disorder (SUD) diagnoses and symptoms—An adapted version of the Structured Clinical Interview for DSM-IV SUDs (SCID; First et al., 1997; Martin et al., 1995; 2000) was used at baseline and 6-month follow-up to determine the presence of SUD diagnoses and symptom counts. SCID adaptations accommodate developmental considerations in symptom assessment with adolescents (e.g., school grades dropping due to

substance use). The maximum number of alcohol symptoms is 11 (4 abuse and 7 dependence symptoms), and for marijuana is 10 (4 abuse and 6 dependence symptoms, because marijuana withdrawal is not included). The adapted SCID has fair to high retest reliability for DSM-IV alcohol abuse ($\kappa=.64$) and dependence ($\kappa=.69$), cannabis abuse ($\kappa=.45$) and dependence ($\kappa=.87$), and nicotine dependence ($\kappa=.66$) (Chung et al., 2004). Retest intraclass correlations (ICCs) for total symptom count were high (alcohol = .91, cannabis = .95, nicotine = .89) (Chung et al., 2004).

Depression and conduct disorder diagnoses—The Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS, Clark et al., 1997; Kaufman et al., 1997) was used at baseline and 6-month follow-up to assess the presence of current (i.e., past 6 months; coded as present or absent) non-substance use disorder DSM-IV Axis I psychopathology (e.g., conduct disorder, major depression). The K-SADS also includes assessment of 13 types of traumatic events (i.e., car accident, other accident, fire, witness of a disaster, witness of a violent crime, victim of a violent crime, witness to domestic violence, physical abuse, sexual abuse, any other type of event, death of a close person, abortion or miscarriage, serious illness) that may be associated with PTSD. The K-SADS demonstrated good interrater reliability for traumatic events and diagnostic status in adolescent substance users (Clark et al., 1997).

What I got from treatment (WIGT; Miller & Brown, 1994)—The WIGT includes 40 items (see Table 1), representing two types of treatment content: “Addictive behaviors” (12 items) and “Other concerns” for which treatment may have helped (28 items). The WIGT was selected as a general measure of addiction treatment program content, and was not intended to assess treatment content for a specific treatment program. The WIGT was administered at the 6-month follow-up, using a time frame of “past 6 months” to cover all types of treatment that may have been received over follow-up, including the index IOP treatment episode. The delay in WIGT administration (rather than collecting data upon IOP discharge) provides the adolescent with the opportunity to gain perspective on what was received in treatment, particularly in the context of efforts to manage substance use over follow-up. WIGT items provide good coverage of the range of substance abuse treatment content provided to youth in community-based treatment settings (cf. CSAT, 1999;2006), and its general coverage of addiction treatment content (rather than content that is specific to a particular program) is well suited to the naturalistic follow-up design of this study, in which adolescents may have been involved in additional treatment after the index IOP episode. WIGT items were rated on a 4-point scale (0-3), where 0=definitely did not receive from treatment (i.e., NO!), and 3=definitely did receive from treatment (i.e., YES!).

Because the WIGT was developed for adults, and little is known regarding the factor structure of the measure in adolescents, we performed a preliminary exploratory factor analysis (EFA), which we then followed with a confirmatory factor analysis (CFA) to obtain factor scores for use in regression analyses. Mean and variance-adjusted weighted least squares estimation (WLSMV) was used to handle ordered categorical data in Mplus 4.2 (Muthén & Muthén, 2006). The purpose of conducting the EFA and CFA was not to comprehensively determine the WIGT's factor structure, but to develop summary scores, representing the extent to which an adolescent reported receiving certain types of treatment content, for subsequent analyses. Determination of CFA goodness of fit was based on the following guidelines: Confirmatory Factor Index $\geq .95$, Tucker-Lewis Index $\geq .95$, and Weighted Root Mean Residual (WRMR) $< .90$ (Bentler, 1992; Muthén & Muthén, 2006).

The EFA evaluated up to 3 factors; solutions with 4 or more factors would not converge. The eigenvalues for the three EFA factors were 20.90, 3.33, and 2.24. Inspection of the 2- and 3-factor EFA solutions indicated that the third factor represented two items related to alcohol use (“I was given help to stop drinking completely” and “I was given help to decrease my

drinking”), suggesting that the data were most parsimoniously represented by a 2-factor solution. Importantly, the 2-factor solution generated by the EFA generally reflected the WIGT's two sections: Addictive Behaviors and Other Concerns.

Based on the EFA, CFA was performed, specifying a 2-factor model, and selecting items that had a loading $\geq .70$ on one of the two factors identified in the EFA. Items with factor loading $\geq .70$ were selected in order to obtain a relatively robust 2-factor CFA solution. Thus, 8 items represented Addictive Behaviors, and 8 items represented Other Concerns (see Table 1 for the specific items). The 2-factor CFA model's goodness of fit to the data was adequate: although chi-square was statistically significant (chi-square=75.53, df=26, $p<.001$) and WRMR=0.996, both CFI=0.96 and TLI=0.98 suggested satisfactory fit of the model to the data. All items had significant loadings on their respective factor. The two factors were moderately correlated ($r=.66$). Internal consistency reliability (Cronbach's alpha) for Addictive Behaviors was .93, and for Other Concerns was .88. Factor scores were derived based on the 2-factor solution.

Readiness Ruler (CASAA, 1995)—The adolescent rated his/her level of readiness to change at baseline and 6-month follow-up for alcohol and marijuana using the Readiness Ruler. The ruler uses a 10-point scale, where 1=not ready to change, 4=unsure, 6-7=ready to change, and 10=trying hard to change. Single item measures of readiness to change substance use behavior have demonstrated satisfactory validity (e.g., Miller & Johnson, 2008).

Timeline Follow-Back (TLFB, Sobell & Sobell, 1995)—The TLFB calendar method was used to collect data at baseline (past 30 days) and at monthly intervals over 6-month follow-up on the number of days of inpatient and outpatient attendance, and 12-step meeting attendance. To facilitate reliable and valid report of TLFB data, we first obtained information on life events that occurred since the last assessment (e.g., holidays, birthdays, “events” such as attendance at sporting events) to establish “anchors” for dates, and, in particular, dates when substance use, treatment, and 12-step meeting attendance occurred. To minimize missing TLFB data over follow-up, youth provided information “since the last assessment,” if a monthly assessment was missed (note that 89% of the sample completed 3 or more monthly follow-ups). The number of days attended for inpatient and outpatient treatment, and 12-step attendance was summed over 6-month follow-up. The inpatient summary variable was highly skewed, so a square root transformation was used to normalize the distribution of this variable. TLFB data collected from adolescents has good reliability and validity (Donohue et al., 2004, 2007; Waldron et al., 2001; Lewis-Esquerre et al., 2005).

Statistical analyses

Simultaneous multiple regression analyses were used to test the hypothesis that greater readiness to change at baseline and greater treatment attendance over follow-up would predict higher WIGT scores (i.e., more treatment content received through 6-month follow-up). In addition, in cross-sectional analyses of 6-month follow-up data, simultaneous multiple regression analyses were used to determine the extent to which WIGT scores were associated with severity of substance involvement at follow-up. Regression analyses controlled for demographic characteristics (e.g., gender, age, ethnicity); for cross-sectional analyses predicting treatment outcomes at 6-months, baseline level of substance involvement also was included as a covariate. Co-occurring psychopathology (i.e., depression and conduct disorder diagnosis) was included in the models to examine the association of common types of psychopathology with report of receiving treatment content related to other concerns, and because conduct problems generally predict worse treatment outcomes (Williams & Chang, 2000; Grella et al., 2001). In addition, regression analyses controlled for recruitment site (Gateway site and Dual Diagnosis Clinic), due to higher rates of co-occurring psychopathology among adolescents recruited from the Dual Diagnosis clinic compared to Gateway sites.

Results

Outpatient and inpatient treatment attendance over 6-month follow-up

Number of days of outpatient treatment attendance peaked, as may be expected, at the 1 month follow-up, when most adolescents were actively completing the 6-8 week recommended duration of IOP treatment (Figure 1). The majority (91%) of adolescents included in the analyses attended 9 or more IOP sessions (i.e., half or more of the recommended length of stay of 18-24 sessions over 6-8 weeks). The average number of days of 12-step meeting attendance peaked at follow-up months 1-2, in parallel with the number of days of outpatient treatment attendance. The number of outpatient days over 6-month follow-up ranged from 2-55, whereas the number of inpatient days ranged from 0-142 (71% reported no inpatient treatment over follow-up). Although inpatient attendance was low on average, some inpatient treatment utilization was observed throughout follow-up, reflecting the high risk nature of the sample.

Substance involvement and readiness to change at baseline and 6-month follow-up

As may be expected in a treatment sample, number of DSM-IV alcohol symptoms decreased from baseline to 6-month follow-up (1.64 [$SD=1.86$] versus 1.14 [$SD=1.67$], $t=2.66$ (106), $p<.01$). Likewise, number of marijuana symptoms decreased from baseline to 6-month follow-up (3.51 [$SD=2.60$] versus 1.84 [$SD=2.34$], $t=7.32$ (106), $p<.001$). The number of DSM-IV alcohol symptoms was not correlated with marijuana symptom count at baseline ($r=.10$), but these two variables were moderately correlated at 6-month follow-up ($r=.53$, $p<.01$).

For the alcohol Readiness Ruler, a decrease was observed over follow-up, from 6.68 ($SD=2.96$) to 5.61 ($SD=3.52$), $t=-2.68$ (89), $p<.01$. Readiness to change marijuana use also decreased from 7.64 ($SD=2.64$) to 6.76 ($SD=3.56$) over 6-month follow-up, $t=-2.16$ (97), $p<.05$.

Adolescent reports of treatment content received

As detailed in Table 1, among the types of treatment content that adolescents most often reported receiving over 6-month follow-up, more than half of the items reported were related to reducing substance use (e.g., "I learned some skills to keep from returning to alcohol or other drugs": 74.8%; "I received help in getting motivated to change": 66.4%). Among the least often reported items were discussing having been sexually (4.7%) or physically abused (8.4%), and receiving help to reduce tobacco use (14.0%). For the WIGT's Addictive Behaviors subscale, factor scores ranged from -1.84 to 1.87, with a mean of 0.00 ($SD=0.81$); in terms of items endorsed (rated "yes" or "definitely yes") out of a total of 8, the mean was 4.99 ($SD=2.80$, range=0-8). For the WIGT's Other Concerns subscale, factor scores ranged from -1.28 to 2.30, with a mean of 0.06 ($SD=0.72$); mean number of items endorsed was 1.45 ($SD=2.02$, range=0-8) out of a total of 8 items. There was no difference by gender in mean factor scores for either WIGT scale ($p>.10$).

Readiness to change substance use and treatment utilization as predictors of WIGT scores

The regression model predicting the WIGT Addictive Behaviors score (Table 2) accounted for 29% of the variance in the subscale score. The hypothesis that readiness to change at baseline would predict greater report of treatment content received through 6-month follow-up was not supported. However, more inpatient treatment days was associated with receipt of more Addictive Behaviors treatment content ($\beta = .31$, $p<.01$). In addition, older age ($\beta = .31$, $p<.01$) was associated with greater Addictive Behaviors treatment content received. In contrast to results for the Addictive Behaviors subscale, the regression model predicting scores on the WIGT Other Concerns subscale was not significant ($R^2=0.18$, $F(13,77)=1.28$, $p=.24$).

Cross-sectional analysis of WIGT scores as predictors of substance involvement at 6-months

For alcohol symptoms at 6-month follow-up, the regression model (Table 3) accounted for 43% of the variance in the outcome. Specifically, higher scores on the WIGT Addictive Behaviors scale were associated with fewer alcohol symptoms at follow-up ($\beta = -.33, p < .05$). Unexpectedly, higher scores on the WIGT Other Concerns subscale were associated with more alcohol symptoms at follow-up ($\beta = .36, p < .01$). In addition, older age ($\beta = .19, p < .05$) and conduct disorder ($\beta = .33, p < .01$) were associated with more alcohol symptoms at follow-up.

For marijuana, the regression model (Table 4) accounted for 49% of the variance in marijuana symptoms over follow-up. Higher scores on the WIGT Other Concerns subscale was, again unexpectedly, associated with more marijuana symptoms at follow-up ($\beta = .24, p < .05$). The Addictive Behaviors subscale was not uniquely associated with severity of marijuana involvement. Further, for marijuana, greater readiness to change marijuana use at 6-months was associated with fewer marijuana symptoms at follow-up ($\beta = -.25, p < .05$). Recruitment source also was associated with greater severity of marijuana involvement, such that adolescents from the Dual Diagnosis clinic had more marijuana-related symptoms at follow-up.

Discussion

This is one of the first studies to examine adolescent reports of addiction treatment content received in relation to treatment outcome. Consistent with the focus of substance use treatment, adolescents generally reported receiving more Addictive Behaviors treatment content, relative to Other Concerns during early recovery. Contrary to prediction, readiness to change substance use behavior at baseline was not associated with reports of more treatment content received over follow-up. However, more inpatient days over 6-month follow-up predicted greater Addictive Behaviors treatment content received, suggesting the benefit of short-term inpatient treatment, for certain adolescents, to maximize treatment gains. The unexpected association between greater amount of Other Concerns treatment content that was received and greater severity of alcohol and marijuana involvement over 6-month follow-up highlights the importance of evaluating service need in multiple areas (e.g., co-occurring psychopathology, trauma, physical health problems), and of providing referral and intervention for other identified areas of need during the index treatment episode, as well as continuing care, for substance using adolescents who present with problems in multiple areas of functioning (e.g., Garner et al., 2007; Godley et al., 2001; Kaminer & Bukstein, 2008).

Importantly, the Addictive Behaviors treatment content factor included items such as “getting motivated to change”, “setting goals in my life”, and learning to have fun without alcohol or drugs, in addition to “getting help in decreasing substance use”. For the majority of adolescents, substance abuse treatment appears to play a key role in enhancing and maintaining motivation to reduce substance use (e.g., King et al., under review; Kelly et al., 2000; Battjes et al., 2003). In an exploratory post-hoc analysis, there was no significant difference between adolescents recruited from Gateway versus the Dual Diagnosis clinic in reports of “getting motivated to change,” although Dual Diagnosis clinic therapists, but not Gateway clinicians, received formal training and supervision in motivational enhancement methods (e.g., Miller & Rollnick, 2002). As a common therapeutic factor, treatment may help to motivate reductions in substance use behavior by fostering positive aspects of early recovery, such as engaging in healthy alternative activities and positive goal-setting. The specific mechanisms by which treatment, particularly in community-based settings that do not include a specific motivational enhancement component, increases and enhances adolescents' motivation to reduce substance use remain unclear, and warrant further study.

Although a majority (73%) of adolescents reported “learning more about 12-step programs” during treatment, this item was not included in the score for the Addictive Behaviors treatment content scale. This result may have occurred because the WIGT was administered at 6-month follow-up. That is, 12-step attendance declined after follow-up month 3, around the time that most adolescents had been discharged from the index IOP episode. The decline in 12-step attendance over follow-up suggests a possible decrease in the salience of 12-step principles following treatment, and some reduction in its association with other types of Addictive Behaviors content received (although the item was close to the cut-off for inclusion in computing the subscale score). Of note, one study found that the aspects of Alcoholics Anonymous/Narcotics Anonymous that adolescents “liked best” involved general group processes related to support, universality (e.g., hearing someone's personal story of recovery), and instillation of hope (Kelly et al., 2008). Given the emphasis placed on discussing 12-step principles in many community-based treatment programs, further research is needed to identify the extent to which common (e.g., universality, social support for abstinence) versus 12-step specific therapeutic processes are associated with better outcomes for adolescents.

The Other Concerns factor included treatment content such as managing tension and anxiety, and receiving help regarding a romantic relationship. Although least often reported, treatment content related to discussing physical and sexual abuse was included as part of the Other Concerns factor, and suggests the important role of treatment in addressing, if necessary, trauma-related concerns that may impact recovery (e.g., Hawke et al., 2008). The unexpected finding that greater endorsement of help received regarding Other Concerns was associated with greater severity of substance involvement at 6-months suggests that, despite receiving more help with other concerns, attention to these concerns during the index treatment episode and in continuing care is needed to enhance treatment gains, particularly for youth with problems in multiple areas of functioning (e.g. youth from the Dual Diagnosis Clinic, particularly in relation to marijuana-related symptoms). Evaluations of treatment need (e.g., “What I want from treatment”, CASAA, 1995) at the time of treatment entry can help to clarify specific types of intervention needed to enhance overall treatment gains.

Few patient characteristics predicted the amount of treatment content that adolescents reported receiving over 6-month follow-up. Specifically, baseline severity of alcohol and marijuana involvement, presence of depression or conduct disorder, and level of readiness to change were not uniquely associated with amount of treatment content received over follow-up. Among the factors examined, older age and more inpatient days uniquely predicted greater receipt of Addictive Behaviors treatment content. Results related to older age suggest the need for further examination regarding how treatment content or structure can be enhanced to increase reports of treatment content received by younger adolescents. The association between inpatient days and treatment content received needs to be interpreted in the context that a minority had an inpatient stay during follow-up, inpatient treatment is provided to youth who need a higher level of care than outpatient services, and the inpatient stay was more recent (and possibly more salient) than the index IOP episode. The finding that more treatment is associated with a higher score on Addictive Behaviors treatment content received provides some support for the concurrent validity of this subscale.

There also was some support for the hypothesis that adolescent reports of greater Addictive Behaviors treatment content received was associated with lower severity of substance use at 6-months, but only for alcohol. In contrast to alcohol, for marijuana, greater readiness to change at 6-months, but not report of treatment content received, uniquely predicted severity of marijuana involvement at 6-months. The cross-drug differences in predictors of problem severity at follow-up raise the possibility of different processes of change for alcohol and marijuana, although reductions, on average, tended to occur for both substances during early recovery.

Certain study limitations warrant consideration. Specifically, reports of “What I got from treatment” were obtained at 6-month follow-up, and covered all types of treatment that the adolescent received during that interval, including the index IOP episode. Thus, it is not possible to determine what specific types of treatment content were received during a particular episode of treatment, if multiple treatment episodes occurred over follow-up. Further, administration of the WIGT at discharge from the index treatment episode, rather than at 6-month follow-up, may result in different findings. In addition, the adolescent's perceived need for and importance of receiving each type of treatment-related item was not obtained, although such information could help to refine the evaluation of treatment content received and its relation to substance use outcomes. Replication of the WIGT's factor structure, and its association with patient characteristics and outcomes also is warranted in other samples. In addition, future studies could tailor the WIGT to more comprehensively assess treatment content specific to certain treatment programs. Other considerations include limits to the generalizability of study findings given that adolescents were recruited from group-based IOP treatment, were primarily Caucasian (i.e., there was limited ethnic minority representation), and represent a generally high risk, primarily marijuana using sample of youth. In addition, the use of self-reported substance involvement may be subject to retrospective and other reporting biases, although care was taken to maximize valid self-report of substance use and other data.

Research on the treatment content that adolescents report having received, and the relation of treatment content received to short-term outcomes can help to identify mechanisms of treatment change and treatment components that are associated with better outcomes. Treatment content on Addictive Behaviors that was most salient to youth included enhancing motivation to change substance use, discussing healthy alternative activities and goal-setting, as well as discussing specific skills to reduce substance use. The finding that greater Addictive Behaviors treatment content received was associated with lower alcohol, but not marijuana, involvement at follow-up, suggests the possibility of different processes of change for these two substances. Adolescents who present to substance abuse treatment with problems in multiple areas of functioning may benefit from treatment that addresses both Addictive Behaviors and Other Concerns during the index treatment episode, and in the context of continuing care.

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Figure 1.
Mean number of days of outpatient and inpatient treatment over 6-month follow-up (N=107)
NOTES: BL = Baseline

Table 1

“What I got from treatment”: rates of item endorsement and item factor loadings (N=107)

		Factor Loading	
	% “Yes”	Addictive Behaviors	Other Concerns
Section 1: Addictive Behaviors			
1. I received detoxification, to ease withdrawal from alcohol or other drugs	13.1		
2. I found out for sure whether I have a problem with alcohol or other drugs	49.5		
3. I was given help to stop drinking alcohol completely	49.5		
4. I was given help to decrease my drinking	52.3		
5. I was given help to stop using drugs (other than alcohol)	65.4	.876	
6. I was given help to decrease my use of drugs (other than alcohol)	62.6	.793	
7. I was given help to stop or cut down on using tobacco	14.0		
8. My parents were involved in my treatment	58.9		
9. I received help for emotional problems	36.4		
10. I learned more about alcohol/drug problems	74.8		
11. I learned some skills to keep from returning to alcohol or other drugs	74.8	.797	
12. I learned more about 12-step programs like Alcoholics Anonymous (AA) or Narcotics Anonymous (NA)	72.9		
Section 2: Other Concerns for which treatment may have helped			
13. I talked about some personal problems	54.2		
14. I fulfilled a requirement of the courts	51.4		
15. I got help with problems in a romantic relationship	15.0		.824
16. I got help with some health problems	14.0		.784
17. I got help to decrease my stress and tension	26.2		.867
18. I learned more about nutrition and exercise	12.1		
19. I got help with depression or moodiness	29.9		.771
20. I was helped to work on my spiritual growth	20.6		
21. I learned how to solve problems in my life	43.0	.852	
22. I got help with expressing angry feelings	43.0		
23. I was given help to have healthier relationships	41.1		
24. I was shown how to express my feelings in a more healthy way	44.9		
25. I was taught how to relax better	34.6		
26. I got help in handling boredom	40.2		
27. I received help with feelings of loneliness	26.2		
28. I discussed having been physically abused	8.4		.646
29. I discussed having been sexually abused	4.7		.808
30. I worked on having better self-esteem	29.0		
31. I was given help with sleep problems	18.7		
32. I was given help with legal problems	28.0		
33. I was given advice about financial problems	11.2		
34. I received help with personal fears or anxieties	21.5		.837
35. I received help with feelings of confusion	25.2		.870
36. My counselor listened to me	79.4		

	% "Yes"	Factor Loading	
		Addictive Behaviors	Other Concerns
37. I learned about how to have fun without drugs or alcohol	59.8	.823	
38. I got help in setting goals in my life	66.4	.934	
39. I learned about enjoyable ways to spend my free time	60.7	.924	
40. I received help in getting motivated to change	66.4	.902	
Mean factor score (SD)		.0057 (0.81)	.0563 (0.72)
Mean raw score: number of items endorsed (SD) ^I		4.99 (2.80)	1.45 (2.02)

Note:

^ITotal number of items on the Addictive Behaviors scale=8
Total number of items on the Other concerns scale=8

Table 2

Simultaneous regression analysis of baseline adolescent characteristics as predictors of the “What I got from treatment” Addictive Behaviors scale at 6 month follow-up

Predictor	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Sex	-.33	.18	-.20	-1.79
Age	.20	.07	.31	2.93**
Ethnicity	.12	.18	.07	.66
SES	.08	.08	.11	1.02
BL DSM-IV alcohol symptom count	-.07	.04	-.15	-1.44
BL DSM-IV marijuana symptom count	.01	.04	.03	.28
BL DSM-IV depression diagnosis	.14	.21	.08	.69
BL DSM-IV conduct disorder diagnosis	-.11	.18	-.08	-.58
BL Readiness Ruler: alcohol	.04	.03	.17	1.38
BL Readiness Ruler: marijuana	.04	.04	.13	1.03
Number of outpatient days over 6-months	.01	.01	.14	1.23
Number of inpatient days over 6-months ¹	.09	.03	.31	2.85**
Recruitment site	-.24	.21	-.15	-1.18

Model $F(13, 77)=2.43$, $p<.01$, $R^2=.29$

Notes:

SES=socioeconomic status, BL=baseline, Recruitment site coding: 0=Gateway site, 1=Dual Diagnosis Clinic

*
 $p<.05$

**
 $p<.01$

¹
square-root transformed

Table 3

Simultaneous regression analysis of “What I got from treatment” scores as predictors of alcohol symptoms at 6-months

Predicting ALCOHOL symptoms at 6-months	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Sex	.22	.31	.06	.71
Age	.26	.12	.19	2.18 [*]
Ethnicity	.49	.30	.14	1.64
SES	.01	.13	.01	.07
BL DSM-IV alcohol symptom count	.27	.08	.30	3.43 ^{**}
6-month DSM-IV depression diagnosis	-.25	.40	-.05	-.62
6-month DSM-IV conduct disorder diagnosis	1.14	.32	.33	3.63 ^{**}
6-month Readiness Ruler: alcohol	-.04	.04	-.10	-1.09
WIGT Addictive Behaviors subscale	-.67	.25	-.33	-2.65 [*]
WIGT Other Concerns subscale	.82	.28	.36	2.98 ^{**}
Recruitment site	.27	.30	.08	.90

Model $F(11, 86)=5.88, p<.01, R^2=.43$

Notes:

SES=socioeconomic status, BL=baseline, WIGT=What I got from treatment (at 6-month follow-up), Recruitment site coding: 0=Gateway site, 1=Dual Diagnosis Clinic

^{*}
 $p<.05$ ^{**}
 $p<.01$;

Table 4

Simultaneous regression analysis of “What I got from treatment” scores as predictors of marijuana symptoms at 6-months

Predicting MARIJUANA symptoms at 6-months	<i>B</i>	<i>SE B</i>	β	<i>t</i>
Sex	.68	.41	.14	1.66
Age	-.04	.16	-.02	-.22
Ethnicity	.66	.37	.14	1.79
SES	.14	.17	.07	.80
BL DSM-IV alcohol symptom count	.37	.08	.41	4.74 **
6-month DSM-IV depression diagnosis	-.15	.55	-.02	-.28
6-month DSM-IV conduct disorder diagnosis	.13	.43	.03	.31
6-month Readiness Ruler: marijuana	-.16	.06	-.25	-2.70 **
WIGT Addictive Behaviors subscale	-.30	.36	-.10	-.85
WIGT Other Concerns subscale	.79	.37	.24	2.11 *
Recruitment site	1.27	.40	.26	3.16 **

Model $F(11, 88)=7.60, p<.001, R^2=.49$

Notes:

SES=socioeconomic status, BL=baseline, WIGT=What I got from treatment (at 6-month follow-up), Recruitment site coding: 0=Gateway site, 1=Dual Diagnosis Clinic

* $p<.05$

** $p<.01$;