Adolescent Substance Abuse Treatment:
A Synthesis of Controlled Evaluations

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Objective: A synthesis was conducted to assess outcome findings and methodological characteristics of controlled evaluations of adolescent substance abuse treatments. Method: Extensive computerized and manual bibliographic searches were employed to identify controlled evaluations of adolescent substance abuse treatment. Meta-analytic techniques were utilized to gauge effect sizes across studies to determine which interventions are most effective. An index of methodological quality was computed for each study using ratings of 13 study design factors. Interventions were classified by a combination of their design strength, achievement of desired effect, and other evidence factors. Results: Findings indicate that multidimensional family therapy and cognitive-behavioral group treatment received the highest level of evidentiary support. Seven other interventions showed evidence of effectiveness as well. Conclusions: Several interventions are effective for treating adolescent substance abuse. These treatments are psycho-social in nature, exist within a structured framework, and should be appealing to social work practitioners.

Keywords: substance abuse treatments; evidence-based practice; family based; adolescents; court-referred youth

Widespread concerns persist within the United States regarding the prevalence and consequences of adolescent substance abuse. In addition to age-old drugs such as alcohol, marijuana, and cocaine, "new" drugs and related problems continually emerge such as "club drugs" such as ecstasy and Gamma-Hydroxy-Butyrate (GHB). Rates of adolescent drug use fluctuate significantly in time. For example, National Household Survey on Drug Abuse (NHSDA) trend data, administered yearly and based on responses from 12- to 17-year-olds about whether they have ever used an illicit drug, reveal peak usage in 1979 (31.8%), declining to a low point in 1993 (16.4%), followed by an upsurge again in 2001 (28.4%; National Household Survey on Drug Abuse [NHSDA], 2002). Monitoring the Future study findings indicate that in the late 1970s, nearly 40% of high school seniors had used an illicit drug in the past month, a rate that declined by the early 1990s, only to rise again to a level of approximately 25% in 2001 (Johnston, O'Malley, & Bachman, 2002). Furthermore, national data on a number of drug-related emergency room episodes show alarming increases from 1978 (323,100) to 2001 (639,484; Drug Abuse Warning Network, 2001).

Several interrelated issues are germane to the study of adolescent substance use and abuse. Distinctions need to be made between individuals who use drugs and those who abuse or become dependent on them. This is because most adolescents who use drugs do not escalate into abuse or dependence (Newcomb, 1995). For example, in a large community sample of 3,072 adolescents, Young and colleagues (2002) found that although drug experimentation was common, a much smaller percentage of older adolescents met criteria for substance dependence. Early initiation of illicit drug use is associated with an increased risk for a constellation of problem behaviors (Perkonigg et al., 1999). In addition, etiological research showed an emergence of positive findings related to individual-level characteristics (e.g., genetic, physiological, and personality traits) and family variables (Weinberg, Rahdert, Colliver, & Glantz, 1998).

Previous narrative reviews have identified a number of promising interventions designed to treat adolescent substance abusers (Deas & Thomas, 2001; Waldron, 1997; Williams & Chang, 2000). These reviews,

however, did not synthesize the subject matter in any quantifiable way. The conceptual bases of these interventions vary widely. Although there are disparate theoretical models guiding these interventions, the primary difference lies in the scope of each intervention's target level. For example, behavioral therapy and 12-step programs primarily focus attention at the level of the individual. Conversely, multisystemic therapy targets individual-, family-, and community-level factors that influence substance abuse. The predominant conceptual basis for many of these interventions is drawn from human ecology; the essential proposition being that individuals are embedded in a web of relationships across various levels of interaction (i.e., self, peers, family, community) that influence their behavioral trajectory along the life course (Bronfenbrenner, 1999).

Given the multitude of interventions in this area coupled with the growing consensus that treatment protocols should be rooted in scientific research, three primary research questions drive the present inquiry: (a) Which interventions are most effective in reducing substance use and abuse among adolescents? (b) What is the comparative methodological quality of studies in the adolescent substance abuse treatment domain? and (c) How effective are particular interventions in light of research design strength? Answers to these questions represent a preliminary step toward a path of employing evidence-based treatments for adolescents in multiple settings as well as identifying promising interventions that can be replicated in future research.

METHOD

Study Selection

Controlled evaluations were selected according to the following eligibility criteria: (a) no evaluations of interventions targeting adults were included unless studies of mixed groups of adults and adolescents could allow specific determinations as to the effectiveness of treatment outcomes for adolescent subjects, (b) investigations utilizing pharmacological therapies were included only if drugs were administered as part of an integrated treatment protocol combining medications with one or more psycho-social interventions, (c) substance use treatment outcomes (as opposed to compliance, safety, other problem behaviors, or prevention-only outcomes) were examined, (d) studies included a drug or alcohol use outcome measure, (e) studies were controlled evaluations (i.e., comparison group that included a control group, wait-list control, or contrasting treatment group as part of the design) published in English.

Literature Search

The search objective was to identify all controlled evaluations of substance abuse treatments for adolescent clients for a 15-year time span (between 1988 and 2003). This time frame was selected because experimental designs for adolescent substance abusers were not readily available before this period; in addition, this period of time parallels the rise in evidence-based treatment approaches in allied health professions. Databases systematically searched included Medline (1988 to March, 2003), PsychInfo (1988 to March, 2003), Social Science Abstracts (1988 to March, 2003), Criminal Justice Abstracts (1996 to March, 2003), the Cochrane Library of Systematic Reviews and Controlled Trials Register, the C2 registries of the Campbell Collaboration Library, and a National Library of Medicine computerized bibliographic search. Numerous alcohol and drug treatment Web sites were also searched. Manual searches of the reference sections of identified studies, other relevant articles, reference sections of recent pertinent book titles, and government documents were also conducted. Keyword searches included the following descriptors entered singularly and in Boolean format with "and" or "or": adolescent, drug abuse, drug dependence, substance abuse, substance use disorders, psycho-social interventions, psycho-social treatments, youth, behavioral interventions, behavioral treatments, psycho-therapy, randomized controlled trials, and controlled clinical trials. Total search results incorporating the above-mentioned keywords yielded a total of 3,012 citations. Following search descriptor refinements, duplicate citation removal, and step-by-step screening and filtering of articles vis-à-vis inclusion criteria, 32 publications remained. Full-text articles were retrieved and re-examined for relevance and final study selection. Findings from 15 investigations published between 1989 and 2002 in 18 journal articles constituted the final study sample.

Coding Procedures

Study characteristics, such as citation information, methodological attributes, outcome variable information, measures, key findings, intervention description as well

as other pertinent information, were recorded by both authors onto an intervention coding form. Following this initial coding procedure, information was double coded for all of the articles. An interrater reliability of .96 showed minimal coding error. Furthermore, the first author reviewed all coding forms for accuracy and completeness, and for rare cases of discrepant codes for study variables, study authors met and achieved consensus via discussion.

Analysis of Methodological Quality

Each study was rated with regard to methodological characteristics using an adapted version of the Methodological Quality Rating Scale (MQRS). This scale was developed by Miller and colleagues (1995) and the Mesa Grande project evaluating alcohol dependence treatment outcome studies (Miller, Andrews, Wilbourne, & Bennett, 1998; Miller & Wilbourne, 2002) and has been used in other systematic reviews (Vaughn & Howard, 2004) and meta-analyses (Apodaca & Miller, 2003). Table 1 displays the 13 dimensions of methodological quality assessed by the MQRS. Each study was evaluated across 13 methodological attributes. The maximum number of points a study could garner ranged from 1 (*extremely poor quality*) to 16 (*exceptionally high quality*). Interrater agreement of the 13 MQRS dimensions was assessed across the entire sample of 15 studies; only 9 of 195 ratings of the two raters differed yielding an interrater agreement of 95%.

Effect Size Calculation

For intervention studies with sufficient statistical information, we calculated the effect size, *d* (Cohen, 1988). For treatment/comparison design studies, the effect size was calculated as the difference between the intervention group's mean posttest score and the comparison group's mean posttest score divided by the pooled standard deviation. When the researchers reported only a *t* or *F* statistic, we estimated the effect size by applying the formulas derived by Rosenthal and colleagues (Rosenthal, 1991; Rosenthal & Rosnow, 1984):

$$d = \frac{2t}{\sqrt{df}}$$

$$d = \frac{2\sqrt{F}}{\sqrt{df(error)}}$$

When only a chi-square test was available, a correlation measure of the effect size, *r*, was estimated by applying a formula developed by Rosenthal (1991):

$$r = \phi = \sqrt{\frac{x^2(1)}{N}}$$

Then, *r* was converted to *d* as follows:

$$d = \frac{r}{\sqrt{1-r^2}}$$

These various methods allowed different interventions to be compared against one another and facilitated comparisons across studies using standardized quantitative values. Effect size magnitude was categorized as small (.20), medium (.50), and large (.80) as suggested by Cohen (1988).

Intervention Classification Scheme

Interventions were classified relative to their methodological rigor and strength of outcome into one of five categories: (A) evidence of clinically meaningful effect (Evidence Summary [ES] > .20) with at least 1 year follow-up or replication and using relatively strong designs; (B) evidence of clinically meaningful effect (ES > .20) with relatively strong designs and less than 1-year follow-up and no replication; (C) evidence of negligible or undesired effect with less strong designs; (D) evidence of negligible or undesired effect with relatively strong designs; (I) evidence of indeterminate effect, mixed or incomplete findings. Given the lack of objective classification of methodological quality ratings, the relative strength of study designs was based on a median split (i.e., garnering 1 through 8 MQRS points could be considered less strong methodologically and 9 through 16 MQRS points as relatively strong methodologically).

RESULTS

Study characteristics and synthesis results across studies are presented in Table 3 for the 15 evaluations appearing in 18 published articles involving comparison and control groups of adolescents treated for substance abuse (N = 1,928). Beneficial effect sizes for substance-use reduction outcome variables appear as a negative value (–). Beneficial effect sizes for abstinence-related outcomes are reflected in positive values.

TABLE 1:   *Methodological Quality Ratings Scale*

Methodological Attributes	Points Assessed
A. Study design:	1 = Single group pretest posttest. 2 = Quasi-experimental (nonequivalent control). 3 = Randomization with control group.
B. Replicability:	0 = Procedures contain insufficient detail. 1 = Procedures contain sufficient detail.
C. Baseline:	0 = No baseline scores, characteristics, or measures reported. 1 = Baseline scores, characteristics, or measures reported.
D. Quality control:	0 = No standardization specified. 1 = Intervention standardization by manual, procedures, specific training, etc.
E. Follow-up length:	0 = Less than 6 months. 1 = 6 to 11 months. 2 = 12 months or longer.
F. Dosage:	0 = No discussion of dosage or % of treatment received. 1 = Dosage, % treatment enumerated and accounted for.
G. Collaterals:	0 = No collateral verification. 1 = Collaterals interviewed.
H. Objective verification:	0 = No objective verification. 1 = Verification of records (paper records, blood, materials, etc.).
I. Dropouts / attrition:	0 = Dropouts neither discussed nor accounted for. 1 = Dropouts enumerated and discussed.
J. Statistical power:	0 = Inadequate power due to sample size/ dropouts. 1 = Adequate power with adequate sample size.
K. Independent:	0 = Follow-up nonblind, unspecified. 1 = Follow-up of interventions treatment-blind.
L. Analyses:	0 = No statistical analyses or clearly inappropriate analyses. 1 = Appropriate statistical analyses (group differences, characteristics comparable).
M. Multisite:	0 = Single site or comparison of differing intervention. 1 = Parallel replications at two or more sites.

NOTE: Adapted from Miller et al. (1995). Scores could range from 0 (*low*) to 16 (*high*).

Intervention Targets

Clearly, the family is a critical area of intervention focus as 10 of 24 (42%) treatments examined targeted this point of change. Group treatments were represented by six (25%) interventions. Five (21%) interventions focused treatment explicitly on individual factors. Remaining treatments were of a mixed component design not clearly targeting the individual, group, or family. There was a notable absence of pharmacological treatments, which contrasts with the adult treatment literature that is increasingly employing medications, such as opioid antagonists, for substance use disorders (Vaughn & Howard, 2004; Volpicelli, Pettinati, McClellan, & O'Brien, 2001).

Methodological Quality of Identified Reports

Table 2 presents the methodological characteristics of the studies reviewed. Overall, methodological quality was high as exemplified by 13 studies (86.7%) utilizing randomization with a control group. Furthermore, 14 studies (93.3%) provided detail judged sufficient to allow for replication. Baseline scores, characteristics, and/or measures were reported in 13 studies (86.7%). All 15 studies employed intervention standardization procedures, enumerated and accounted for treatment dosages, and discussed and enumerated dropouts. Collateral contacts were utilized to validate subject self-reports in 9 studies (60.0%). Objective verification of records (urinalysis, arrest records) occurred in 11 studies (73.3%). The majority of studies (86.7%) employed appropriate statistical analyses. Finally, 2 studies were multisite trials.

MQRS Scores, Interventions, Outcome Variables, and Measures

As previously mentioned, MQRS scores were generally impressive. The range of scores across the 15 studies ranged between 8 (Sealock, Gottfredson, & Gallagher, 1997) and 15 (Liddle et al., 2001). The mean score across studies was 12.0 ($SD = 1.9$). The majority of the 24 interventions evaluated in these studies focused treatment at the family level. These interventions typically spanned 8 to 16 weeks. However, several were longer in duration. As shown in Table 4, the primary outcome of interest in this review was substance use reduction. This outcome could and often was expressed as alcohol use, months of abstinence, drug use, "hard" drug use, "soft" drug use, and marijuana use. In terms of outcome measures, self-report instruments were predominant. Collateral reports (typically parental), urinalysis, and arrest records were also employed

Samples

Table 3 displays sample data for each study. Sample sizes ranged from 22 to 426 ($M = 128.5$, $SD = 103.8$). Eight of 15 studies (53.0%) had sample sizes of more than 100. In terms of gender, treatment samples were largely male. Participants typically ranged from ages 14 to 21 years with most samples having a modal age of 15. Although overall samples had a preponderance of Whites, African Americans were well represented. Latinos, though not represented to any significant degree across studies, were the entire focus of one investigation (Santisteban et al., 2003). Seven of 15 studies were of juvenile offenders, probationers, or court-referred youth.

TABLE 2: *Methodological Quality Characteristics of Studies of Adolescent Substance Abuse Treatment (n = 15)*

Methodological Criteria	N	%
1. Quasi-experimental (nonequivalent control group).	2	13.3
2. Randomization with control group.	13	86.7
3. Procedures contain sufficient detail for replication.	14	93.3
4. Baseline scores, characteristics, or measures reported.	13	86.7
5. Intervention standardization by manual, procedures, specific training, etc.	15	100.0
6. Follow-up less than 6 months.	7	46.7
7. Follow-up 6 to 11 months.	3	20.0
8. Follow-up 12 months or longer.	5	33.3
9. Dosage, % treatment enumerated and accounted for.	15	100.0
10. Collaterals interviewed.	9	60.0
11. Verification of records (paper records, blood, materials, etc.).	11	73.3
12. Dropouts enumerated and discussed.	15	100.0
13. Adequate power with adequate sample size.	12	80.0
14. Follow-up nonblind, unspecified.	11	73.3
15. Follow-up of interventions treatment-blind.	4	26.7
16. Appropriate statistical analyses.	13	86.7
17. Single-site or comparison of differing interventions.	13	86.7
18. Parallel replications at two or more sites.	2	13.3

Most studies reported that samples were from lower socioeconomic status populations.

Outcome Findings

Table 3 presents the outcome findings for interventions by study. Overall, many of the treatments reduced substance use and increased abstinence rates. Treatment gains occurring immediately following treatment were often not maintained at follow-up. Posttreatment effect sizes ranged from an increase in substance use of .51 (medium, nonbeneficial effect; McGillicuddy, Rychtarik, Duquette, & Morsheimer, 2001) for coping skills training to a substantial reduction in substance use of –1.25 (large) for behavioral therapy (Azrin, Donohue, Besalel, Kogan, Acierno, 1994). At follow-up, effect sizes ranged from .39 (medium, nonbeneficial effect; Waldron, Slesnick, Brody, Turner, & Peterson, 2001) for cognitive behavioral treatment, to large reductions in substance use for both cognitive-behavioral group treatment (Kaminer & Burleson, 1999) and multidimensional family therapy of –.87 and –.86, respectively.

Classification of Interventions

Table 4 displays the 24 interventions grouped by the evidence criteria previously described. Two interventions, multidimensional family therapy and cognitive-

behavioral group treatment, had the highest support ("A" rating). Seven interventions attained a ("B" rating): behavioral therapy, multisystemic therapy, combined cognitive-behavioral therapy and functional family therapy, family systems therapy, functional family therapy, combined Botvin life-skills with additive programs, and psycho-educational therapy. Interventions in the ("C" rating) category were supportive group counseling, interactional group treatment, aftercare services, and residential treatment services. Four interventions (individual counseling, family education, adolescent group treatment, and individual cognitive-behavioral treatment) received a ("D" rating). At this stage, study findings indicate that some interventions do not possess a high level of empirical support ("D" category) or perhaps have not been given enough of an opportunity to be effective owing to design features ("C" category) or the data is not present to make a clear judgment ("I" category).

DISCUSSION AND IMPLICATIONS FOR SOCIAL WORK PRACTICE

Studies of adolescent substance abuse treatment suggest that several interventions are effective in reducing substance use. For example, multidimensional family therapy is capable of producing and maintaining significant treatment gains for up to a year. Several other interventions also are supported to a substantial degree by current empirical evidence. Furthermore, these intervention studies were of relatively good quality methodologically. Most of the studies reviewed were randomized controlled trials employing standardized protocols. Although there exists a range of effective and promising treatments, many interventions were found to be either ineffective or of uncertain efficacy. As such, interventions listed under the "C," "D," and "I" categories on Table 4 cannot yet be recommended for clinical applications, particularly in light of alternative interventions more strongly supported by available empirical evidence. In addition, it should be emphasized that these conclusions are tentative. The presence of weak effect sizes does not mean that an intervention did not contribute any beneficial or harmful effects to individual participants. Yet, given the existence of more effective alternatives and the ethical responsibility to provide the best treatments available, their deployment may be ill advised at this time. Because many of the effective treatments are family centered and target a range

TABLE 3: Characteristics and Outcome Findings of Adolescent Substance Abuse Treatment Studies

Study	MQRS	Intervention Type & Duration	Sample	Outcome Variable & Measure	Effect Size Posttest	Effect Size Follow-Up	Key Findings
1. Azrin, Donohue, Besalel, Kogan, & Acierno (1994)	11	Behavioral therapy (BT; 6 months) or supportive group (SG) counseling (6 months)	26 adolescents: mean age = 16.0, 77% male, 23% female, 81% White, 19% African American and Hispanic.	Months of abstinence (SR, CR, U), days of drug use per month (SR, CR, U), alcohol use (SR, CR, U)	BT v. SG: d = −1.25; BT v. SG: d = −1.02; BT v. SG: d = −.96	No follow-up data reported.	Reduction of illegal drug use by behavioral program was superior compared to supportive counseling.
2. Friedman (1989)	13	Family therapy (FT) method (24 weeks) or parent group (PG) method (24 weeks)	135 adolescents: mean age = 17.9, 60% male, 40% female, predominantly White.	Drug severity index score (SR)		FT v. PG: d = 0	Both groups saw a 50% reduction on drug severity index score (mean value). No differences between groups.
3. Friedman, Terras, & Glassman (2002)	10	Botvin Life Skills Training (BLST) and Prothrow-Stith Anti-Violence Program (PS) and Values Clarification (VC; 4 weeks) or basic residential treatment (not specified)	201 court-adjudicated youths: mean age = 15.5, 100% males, predominantly African American, low SES.	Drug use (SR), alcohol use (SR)	Unable to compute or estimate effect sizes at post due to limited data.	BLST, PS, & VC v. BRT: d = −.36; BLST, PS, & VC v. BRT: d = −.18	Dosage and process analysis point to BLST for lowering drug use; however, impossible to eliminate effects of simultaneous modalities. Treatment group had significant reduction in drug use (not alcohol) vs. comparison group.
4. Henggeler et al. (1991)	10	Site 1: Multisystemic therapy (MST; 16 weeks) or individual counseling (IC; not specified)	144 juvenile offenders: mean age = 14.4, 67% male, 33% female, 70% White, 30% African American, low SES.	Substance-related offenses (A)	MST v. IC: d = −.18	No follow-up data reported.	Youths in the MST condition experienced significant reduction in alcohol use and marijuana use relative to comparison condition. Follow-up on substance-related offense yielded small reduction.
		Site 2: Multisystemic therapy (MST; 16 weeks) or usual services (US; not specified)	47 juvenile offenders: mean age = 15.1, 72% male, 74% African American, 26% White, low SES.	Soft drug use— alcohol and marijuana (SR)	MST v. US: d = −.64	No follow-up data reported.	

#	Citation	N	Intervention	Outcome measures	Effect size	Effect size	Results
5a. & 5b.	Henggeler, Clingempeel, Brondino, & Pickrel (2002); Henggeler, Pickrel, & Brondino (1999)	13	Multisystemic therapy (MST; 18 weeks) or usual community services (US; not specified).	118 juvenile offenders: mean age = 15.7, 79% male, 50% African American, 47% White, 3% Other, low SES.	Alcohol/marijuana use (SR; post & follow-up), cocaine and other drug use (SR; post & follow-up), abstinence from marijuana (U; follow-up)	MST v. US: $d = -.38$; MST v. US: Insufficient data; MST v. US: $d = -.09$	MST v. US: $d = -.03$; MST v. US: $d = .24$	MST decreased self-report use of marijuana and other drugs at posttreatment. These changes were not maintained at 6-month follow-up. Four-year follow-up by urinalysis showed significant differences between groups with MST being superior for marijuana abstinence; small reductions in cocaine use and self-reported marijuana use.
6.	Joanning, Quinn, Thomas, & Mullen (1992)	11	Family systems therapy (FST; 12 weeks) or adolescent group therapy (AGT; 12 weeks) or family drug education (FDE; biweekly for 6 sessions).	89 adolescents: mean age = 15.4, predominantly White and Mexican American, low SES.	Drug use—abstinence (SR, CR, U)	FST v. AGT: $d = .46$; FST v. FDE: $d = .41$; AGT v. FDE: $d = -.14$	No follow-up data reported.	Posttest results showed all three therapies led to greater numbers of nonuse with FST having the most impact. Negligible differences between AGT and FDE.
7a. & 7b.	Kaminer & Burleson (1999); Kaminer, Burleson, Blitz, Sussmann, & Rounsaville (1998)	14	Cognitive-behavioral group treatment (CBGT; 12 weeks) or interactional group treatment (IGT; 12 weeks).	32 adolescents: mean age = 15.8, predominantly White and male.	Substance use (SR, U), severity of substance use (SR, U), alcohol use (SR; follow-up), drug use (SR; follow-up)	CBGT v. IGT: $d = -.81$; CBGT v. IGT: $d = -.62$	CBGT v. IGT: $d = -.87$; CBGT v. IGT: $d = -.62$	Adolescents assigned to CBGT demonstrated a large reduction in severity of substance use compared to IGT at 3 months. At 15 months both therapies showed positive impacts with CBGT superior. Very small follow-up sample size.
8.	Kaminer, Burleson, & Goldberger (2002)	12	Cognitive-behavioral coping skills group therapy (CBGT; 8 weeks) or psycho-education therapy (PET; 8 weeks).	88 adolescents: mean age = 15.4, 90% White, 42% female.	Alcohol use problems (SR, U), substance abuse problems (SR, U)	CBGT (with coping) v. PET: $d = -.15$; CBGT (with coping) v. PET: $d = -.42$	CBGT (with coping) v. PET: $d = -.57$; CBGT (with coping) v. PET: $d = 0$	Both conditions demonstrated substance use reduction at 3- and 9-month follow-up. CBGT condition superior to PET at all points except 9-month follow-up.

(continued)

331

TABLE 3 (continued)

Study	MQRS	Intervention Type & Duration	Sample	Outcome Variable & Measure	Effect Size Posttest	Effect Size Follow-Up	Key Findings
9. Lewis, Piercy, Sprenkle, & Trepper, (1990)	12	Purdue brief family therapy (12 weeks) or training in parenting skills (12 weeks)	84 adolescents (51.2% juvenile offenders): mean age = 16, 81% male, 96% White, 3% African American.	No drug use (SR, U), soft drug use (SR, U), hard drug use (SR, U)	Insufficient data to calculate effect sizes at 3-month posttest.	No follow-up data reported.	Both therapies appeared to be effective from pretest to posttest. However, Purdue brief family therapy reduced drug use for a larger proportion of adolescents.
10. Liddle et al. (2001)	15	Multidimensional family therapy (MDFT; 16 weeks) or adolescent group therapy (AGT; 14 to 16 weeks) or multi-family educational intervention (MEI; 16 weeks)	97 adolescents (61% juvenile offenders): mean age = 15.9, 80% male, 51% White, 18% African American, 15% Hispanic, 6% Asian, 10% Other, low SES.	Drug use—combined alcohol and marijuana (SR, CR, U)	MDFT v. AGT: d = −.77; MDFT v. MEI: d = −.58; AGT v. MEI: d = .02	MDFT v. AGT: d = −.25; MDFT v. MEI: d = −.86; AGT v. MEI: d = −.57	Improvement attained with all three treatments. MDFT was superior overall at posttreatment and 1-year follow-up on combined drug use outcome (reduction).
11. McGillicuddy, Rychtarik, Duquette, & Morsheimer (2001)	11	Coping skills training (CST; 8 weeks) or delayed treatment conditions (DTC; 8 weeks)	22 adolescents: mean age = 16, 72% male, 28% female, predominantly White.	Alcohol use days (CR), drinks per drinking day (CR), marijuana use days (SR, CR)	CST v. DTC: d = .16; CST v. DTC: d = .51; CST v. DTC: d = −.60	No follow-up data reported.	Results suggest improvements in parental coping skills may lead to reductions i n marijuana use. However, increases in alcohol-related outcomes versus delayed treatment condition.
12. Santisteban et al. (2003)	11	Brief strategic family therapy (BSFT; 4 to 20 weeks) or general group treatment (GGT; 6 to 16 weeks)	126 adolescents (school referred for behavior problems): mean age = 15.6, 100% Hispanic.	Alcohol use (SR, U), marijuana use (SR, U)	BSFT v. GGT: d = .58; BSFT v. GGT: d = −.21	No follow-up data reported.	Adolescents enrolled in BSFT showed reductions in substance use from pre to post. However, for alcohol use GGT superior at treatment termination. High dropout rates for both conditions.
13. Sealock, Gottfredson, & Gallagher (1997)	8	Residential Treatment Program (6 to 8 weeks) and After Care Program (44 weeks) or probation and usual services	426 juvenile offenders: primarily male and non-White.	Drug use (SR, U, A)	AA, SG v. P: d = −.21	AA, SG, & AC v. P & US: d = .19	Modest reductions during residential treatment. However, these were not maintained during after care services.

#	Citation		Intervention	Sample	Outcome measures	Effect sizes		Findings
14.	Waldron, Slesnick, Brody, Turner, & Peterson (2001)	13	Individual cognitive-behavioral therapy (CBT; 8 to 12 weeks) or individual cognitive-behavioral therapy and functional family therapy (FFT; 8 to 12 weeks) or FFT (8 to 12 weeks) or group counseling (GC; 8 to 12 weeks)	114 adolescents (majority court-adjudicated youth): mean age = 15.6, 80% male, 20% female, 38% White, 7% Native American, 47% Hispanic, 8% Other, low SES.	% days marijuana used (SR, CR, U)	CBT v. CBT & FFT: d = .37; CBT v. FFT: d = .79; CBT v. GC: d = –.10; CBT & FFT v. FFT: d = .41; CBT & FFT v. GC: d = –.49; FFT v. GC: d = –.99	CBT v. CBT & FFT: d = .39; CBT v. FFT: d = .28; CBT v. GC: d = .24; CBT & FFT v. FFT: d = –.09; CBT & FFT v. GC: d = –.14; FFT v. GC: d = –.04	Three of the four intervention packages demonstrated reductions in percentage of days of marijuana use (CBT alone was not effective at posttreatment and follow-up). At 4-month posttreatment FFT alone was superior to other interventions. At 7-month follow-up, however, the combined CBT and FFT intervention was slightly more effective than FFT alone.
15.	Winters, Stinchfield, Orland, Weller, & Latimer (2000)	14	Minnesota Model 12-Step Program (MM; 4 to 6 weeks) or delayed treatment condition (6 weeks)	179 adolescents: 60% between the ages 16 and 21 years; 56% male, largely White (85%).	Alcohol and drug: abstinence (SR, CR, U), lapses (SR, CR U), relapses (SR, CR, U)	Insufficient data to calculate effect sizes	Insufficient data to calculate effect sizes	MM 12-Step Program appeared to be superior to nontreatment group and delayed treatment group at 1-year follow-up.

NOTE: BRT = basic residential treatment; MQRS = Methodological Quality Rating Scale; SR = self-report; CR = collateral report; U = urinalysis; A = arrest records. MQRS score M = 12.0 (SD = 1.9)

333

TABLE 4:   *Evidence Summary (ES) of Interventions for Adolescent Substance Abuse Treatment*

A. Evidence of clinically meaningful effect (ES > .20) with at least 1-year follow-up or replication and using relatively strong designs.
   Multidimensional family therapy (MDFT)
   Cognitive-behavioral group treatment (CBGT)
B. Evidence of clinically meaningful effect (ES > .20) with relatively strong designs and less than 1-year follow-up and no replication.
   Behavioral therapy (BT)
   Combined cognitive-behavioral therapy and functional family therapy (CBT & FFT)
   Family systems therapy (FST)
   Functional family therapy (FFT)[a]
   Multisystemic treatment (MST)[a]
   Combined Botvin life-skills training (BLST), Prothrow-Stith Anti-Violence Program (PSAV), and Values Clarification Program (VC)
   Psycho-educational therapy (PET)
C. Evidence of negligible or undesired effect with less strong designs.
   Supportive group counseling (SG)
   Interactional group treatment (IGT)
   Aftercare services (AS)
   Residential treatment services with multiple and variable components (RST)
D. Evidence of negligible or undesired effect with relatively strong designs.
   Individual counseling (IC)
   Family education (FE; multidimensional educational intervention [MEI])
   Adolescent group treatment (AGT)
   Individual cognitive-behavioral treatment (CBT)
I. Evidence of indeterminate effect, mixed or incomplete findings.
   Parent group method (PG)
   Minnesota Model 12-Step Program (MM)[b]
   Coping skills training (CST)
   Brief strategic family therapy (BSFT)
   General group treatment (GGT)
   Purdue brief family therapy (PBFT)[b]
   Training in parenting skills (TIPS)[b]

NOTE: MQRS = Methodological Quality Rating Scale.
One to 8 points on MQRS = *less strong design*; 9 to 16 points on MQRS = *relatively strong design*
a. Shown to be effective in other studies with reducing adolescent violence and problem behavior.
b. Insufficient data available to calculate effect sizes.

of factors that influence adolescent chemical use behavior, social work practitioners should find these treatments appealing.

The conclusions reached are to some extent limited by the modest number of controlled evaluations of adolescent substance abuse treatments. By comparison, there are more than 300 controlled evaluations of alcohol dependence treatments in the adult literature (Miller & Wilbourne, 2002). Additional limitations include the possibility that we did not identify all published studies of adolescent substance abuse treatments. Although comprehensive search methods were employed in this review, it is possible that some published evaluations meeting inclusion criteria were not identified. In addition, some potential methodological criteria were not a part of the MQRS employed. This procedure, however, does represent a reasonable assessment of study quality that attempts to move beyond simple descriptions. In addition, 7 of 15 studies reviewed included samples of juvenile offender or court-referred youth. As such, this observation reduces the potential generalizability of these findings to adolescents evidencing substance abuse problems who are not offenders. Although there is a strong relationship between drug use and crime, using illegal substances in itself is a criminal offense. Therefore, it is not surprising that many studies of adolescents with substance use problems are drawn from this population.

In the future, more controlled evaluations are needed that assess adolescent substance abuse treatment outcomes across longer periods of time. Additional studies of youth with co-occurring disorders who take medications would also be useful. Furthermore, specific analyses of heavy substance-abusing youth and substance-dependent youth are critical. As substance abuse and dependence is a costly problem that tends to begin early and become chronic, it is paramount that policy makers and practitioners utilize those interventions with the greatest scientific support. Finally, it should be noted that there was a relative lack of contribution from social work researchers with most interventions developed by psychiatrists and clinical psychologists. Given that social workers frequently encounter adolescents with substance abuse problems, greater social work research involvement in the adolescent substance abuse treatment domain may prove beneficial to the profession and the clients they serve.

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