Running Head: OUTCOME OF ADOLESCENT SUBSTANCE ABUSE TREATMENT

A Comprehensive and Comparative Review of Adolescent Substance Abuse Treatment Outcome

Robert J. Williams, Samuel Y. Chang, and ACARG

Addiction Centre, Foothills Medical Centre, Calgary, Alberta, Canada

in Clinical Psychology: Science & Practise (2000, Vol 7, 138-166)

Abstract

There are relatively few studies on adolescent substance abuse treatment. The ones that exist tend to be methodologically weak. Methodologically stronger studies have usually found most adolescents receiving treatment to have significant reductions in substance use and problems in other life areas in the year following treatment. Average rate of sustained abstinence after treatment is 38% (range 30-55) at 6 months and 32% at 12 months (range 14-47). Variables most consistently related to successful outcome are treatment completion, low pre-treatment substance use, and peer/parent social support/nonuse of substances. There is evidence that treatment is superior to no treatment, but insufficient evidence to compare the effectiveness of treatment types. The exception to this is that outpatient family therapy appears superior to other forms of outpatient treatment.

There have been several reviews and commentaries on the adolescent drug treatment literature (e.g., Brown, 1993; Brown, Mott and Myers 1990; Bukstein, 1994; Davidge and Forman, 1988; Dusenbury, Khuri and Millman, 1992; Kaminer, 1994; Spicer, 1991; U.S. Department of Health and Human Services, 1995a; Winters, Latimer and Stinchfield, in press). The most thorough review has been that of Catalano, Hawkins, Wells, Miller and Brewer (1990/1991). In this review Catalano and his colleagues identified 16 treatment outcome studies and an additional 13 studies that examined factors affecting treatment progress or treatment outcome. Four of these studies were multi-site, multi-program evaluations (Friedman, Glickman and Morrissey, 1986; Drug Abuse Reporting Program (DARP) reported in Sells and Simpson, 1979; Treatment Outcome Prospective Study (TOPS) reported in Hubbard, Cavanaugh, Craddock and Rachal, 1985; and the Uniform Data Collection System (UDCS) reported in Rush, 1979). In their review of all of these studies, they concluded that treatment was likely better than no treatment, but there was no evidence that one treatment type was superior to another. Pre-treatment factors associated with outcome were race, seriousness of substance use, criminality, and educational status. During-treatment factors predictive of outcome were time in treatment for residential programs, involvement of family in treatment, experienced staff who used practical problem solving, and programs that provided comprehensive services (school, recreation, vocation, contraceptive). Post-treatment factors were believed to be the most important determinants of outcome. These included involvement in work and school, association with nonusing friends, and involvement in leisure activities.

Unfortunately, Catalano et al.'s (1990/1991) review has several limitations. Catalano et al. (1990/1991), as well as several other reviewers of the adolescent literature (e.g. Newcomb and Bentler, 1989), have pointed out that the small number of treatment outcome studies makes conclusions very tentative. For comparison purposes, in the adult literature, there have been over 1000 studies on alcohol treatment (Miller et al., 1995). A second major problem concerns the poor methodological quality of the adolescent treatment studies that do exist. Small sample sizes, lack of post-treatment follow-up, poor follow-up rates, failure to include treatment drop-outs in the results, and lack of control groups are characteristic of many of these studies. Only four out the sixteen outcome studies cited by Catalano et al. (1990/1991) employed control groups. By contrast, Miller et al. (1995), in their review of alcohol treatment in adults, were able to draw on 219 controlled studies. A final problem with Catalano et al.'s (1990/1991) review concerns their selection of studies. In three studies the average age was 19 or older (DeJong and Henrich, 1980; Khuri, Millman, Hartman and Kreek, 1984; Roffman, Stephens, Simpson and Whitaker, 1988). Ten studies did not report substance use either at discharge or post-discharge (determination of factors affecting treatment outcome cannot be made unless treatment outcome is known) (e.g., Barrett, Simpson and Lehman, 1988; DeAngelis, Koon and Goldstein, 1978; Iverson, Jurs, Johnson and Rohen, 1978; Williams and Baron, 1982). Finally, Catalano et al. (1990/1991) did not include eight studies that were available at the time and would have been appropriate to include (i.e., Brown, Vik and Creamer, 1989; Feigelman, Hyman and Amann, 1988; Friedman, 1989; Harrison and Hoffman, 1987; Query, 1985; Szapocznik, Kurtines, Foote, Perez-Vidal and Hervis, 1983; Szapocznik, Kurtines, Foote, Perez-Vidal and Hervis, 1986; Vaglum and Fossheim, 1980).

Fortunately, there have been many additional adolescent treatment outcome studies published since 1991. The purpose of the present paper is to provide a more comprehensive and updated review of this literature to re-examine treatment

effectiveness and factors related to outcome. Only 13 out of the 53 studies in the present review were included in Catalano et al. (1990/1991).

Inclusion Criteria

Studies were found by consulting all prior reviews and by conducting keyword searches of the databases ETOH, PsycINFO, and Medline using the terms adolescent, youth, drug, alcohol, polydrug, substance abuse, therapy and treatment. All studies providing substance abuse treatment to adolescents that reported substance use results at discharge or post-treatment were included. Nonpublished studies were included, when available, because of the possibility that published studies might be biased toward higher quality programs and better results. Non-controlled studies were included because so few controlled studies exist. Studies were excluded from the review only if the average age of the clients was <13 or >19 (i.e., Baer et al., 1992; Bensen, 1985; DeJong and Henrich, 1980; Gorelick, Wilkins and Wong, 1989; Holsten, 1980; Khuri et al., 1984; Langrod, Alksne and Gomez, 1981; Nigam, Schottenfeld and Kosten, 1992; Roffman et al., 1988; Wilkinson and LeBreton, 1986), or if the sample size was 20 or less (i.e., Bry and Krinsley, 1992; Duehn, 1978; Frederiksen, Jenkins and Carr, 1976; Kaminer, 1992; Myers, Donahue and Goldstein, 1994; Smith, 1983; Vik, Grizzle and Brown, 1992).

Organization

Study characteristics and outcome are reported in Tables 1 and 2. Table 1 reports studies that combined results from different programs located in different sites ("multi-site, multi-program studies") and Table 2 reports single program studies. Each table describes, if available, the number of adolescents entering treatment, characteristics of the treatment population, characteristics of the treatment program(s), methodology used to obtain information on substance use, and results of treatment.

Number of studies and publication date

The first thing apparent from Tables 1 and 2 is the small total number of studies (n = 53). Although this is considerably more than identified by Catalano in 1991, it is still a small number compared to the number of adult studies. It is also a very small number when you consider that in 1991 there were over 3000 adolescent treatment programs in the United States (U.S. Department of Health and Human Services, 1993). One of the reasons for the small number is that research on adolescent substance abuse treatment is much more recent than research on adult substance abuse. Only 3 of the studies in the current review were published in the 1970's, versus 19 in the 1980's and 32 in the 1990's.

Client characteristics

The treatment populations appear to be homogeneous. For studies reporting demographic features: 90% have an average age between 15-17 (ranging 14-19); in 96% of studies males comprise the majority (ranging 0-100%); and in 89% Caucasians comprise the majority (ranging 0-100%). Pattern of substance abuse is also fairly similar between studies. In the large majority of studies adolescents are polydrug users with alcohol and marijuana being the most commonly used substances. Finally, most studies

identify high levels of associated family, school, legal and psychological problems. It is estimated that approximately half of substance-abusing adolescents have a comorbid DSM mental disorder ("dually-diagnosed") (Greenbaum, Foster-Johnson and Petrila, 1996). The only sub-populations that have been examined to any extent in these studies are conduct disordered youth (6 studies) and Hispanics (3 studies). It is important to note that the demographic characteristics of adolescents in these studies appear to be representative of the general adolescent treatment population in the United States (Friedman and Beschner, 1990; U.S. Department of Health and Human Services, 1995b) and also representative of the adolescent substance-abusing population (U.S. Department of Health and Human Services, 1997a).

Program Characteristics

In contrast to the homogeneity of the treatment population, there is great diversity in the types of programs. The main dimensions upon which they vary are their location (hospital or substance abuse treatment facility); their intensity (residential, day treatment, outpatient); their duration (few sessions to over a year); and their comprehensiveness. Comprehensiveness is reflected in whether the program is theoretically focused (e.g., 12 step, outward bound) or eclectic; whether it provides a limited or broad range of services (i.e., just substance abuse treatment or substance abuse treatment and recreational, occupational, educational, psychiatric services); and the number of modalities by which treatment is provided (e.g., group therapy or individual, group and family therapy).

Treatment programs can be roughly grouped into four main types, although there is considerable (and increasing) overlap between these programs. The most common type reported in this review, is the "Minnesota model". This is a short (4-6 week) hospital inpatient program typically offering a comprehensive range of treatment (individual counselling, group therapy, medication for comorbid conditions, family therapy, schooling, and recreational programming). This type of program sometimes also has an AA/NA 12 step orientation and is often followed by outpatient treatment (Winters et al., in press). Most of the large multi-site, multi-program treatment outcome studies such as the Treatment Outcome Prospective Study (TOPS) and the Chemical Abuse Treatment Outcome Registry (CATOR) have studied this type of program.

The second most common type of treatment reported in this review are outpatient programs (e.g., Azrin, Donohue, Besalel, Kogan and Acierno, 1994; Lewis, Piercy, Sprenkle and Trepper, 1990). The focus is usually individual counselling, although sometimes family therapy and group treatment are also used. Alternatively, family therapy is sometimes the primary treatment modality. Outpatient treatment tends to be less intensive than hospital treatment (e.g. 1-2 sessions per week), but longer in duration. Treatment usually has no set length, varying anywhere from 1 session to 6 months, with a modal length of perhaps 3 months.

A third, less common type of treatment, is a lengthy (6 month - 2 year) "therapeutic community" type program based in a specialized substance abuse treatment facility (Jainchill, Bhattacharya and Yagelka, 1995; Pompi, 1994). These tend to be highly regimented residential settings with treatment facilitated by paraprofessionals, but run by the residents themselves. Members progress through a hierarchy of responsibilities within this community of former substance abusers. In the older, traditional therapeutic communities, adolescents comprise only a small minority of the treatment population (e.g., Hubbard et al., 1985; Rush, 1979; Sells and Simpson, 1979). However, there are newer forms of this treatment that provide services

exclusively to adolescents (e.g., Friedman, Schwartz and Utada, 1989; Feigelman et al., 1988). These programs retain the indoctrinational and highly structured nature of traditional therapeutic communities. However, they are often day programs where the recovering adolescent lives in the home of an adolescent further progressed in treatment. Because of their structured nature and length, these types of programs tend to have very high drop-out rates (in the present studies ranging from 34-90% with a median of 75%).

A fourth type of program is the "outward bound"/lifeskills training type program (e.g., McPeake, Kennedy, Grossman and Beaulieu, 1991; Richardson, 1996). This type of program is occasionally provided as the primary treatment, and sometimes as a supplement to other treatment types. It is typically an intensive 3 or 4 week outing that exposes adolescents to a non-drug lifestyle and presents them with challenges intended to facilitate personal development and resistance to drugs.

In addition to these formal treatment programs, many high schools provide on-site group counselling for substance use and abuse. These programs are not included in the present review because they tend to target students in earlier stages of substance abuse and because there are virtually no published outcome studies (Wagner, Brown, Monti, Myers and Waldron, 1999).

The considerable variability in the types of treatment programs in the present review reflects the variability in adolescent treatment programs generally (U.S. Department of Health and Human Services, 1995b). However, it is important to note that the present studies are not proportionally representative of adolescent treatment programs. The most commonly studied program in the present review is the hospital inpatient program, whereas the large majority of adolescents in the United States are treated in outpatient programs, particularly self-help groups (Friedman and Beschner, 1990; U.S. Department of Health and Human Services, 1997a). It is also important to note that because 48 of the studies presented were conducted in the United States (4 in Canada, 1 in Norway), the results do not necessarily reflect international adolescent substance abuse treatment or outcome.

Methodology

The methodology used in these studies tends to be inconsistent. There is no standard time period at which outcomes are typically evaluated. Some studies have evaluated outcome at the end of treatment (e.g., Rush, 1979) while others have evaluated outcome as long at 6 years post-treatment (e.g., Feigelman et al., 1988). The most common time periods in the present studies are at discharge, 6 months post-treatment and 12 months post-treatment. Similarly, the window of time being assessed at outcome varies from "current use" (e.g., Grenier, 1985) to substance use in the previous 6 years (e.g., Feigelman et al., 1988). The most common assessment windows are time since discharge or the past year.

There are differences in how success is measured between studies. A common measure in the adolescent literature is abstinence rates (reported in 31 of the present studies). However, abstinence is arguably a less appropriate measure of success than reduction in substance use (reported in 31 of the present studies). Focusing on the fact that only a minority of people are abstinent following treatment and that the proportion of people with sustained abstinence declines with time disguises the fact that <u>most</u> people tend to have reduced substance use as a consequence of treatment as well as experiencing improvements in other areas of functioning (Agosti, 1995; Valliant, 1995).

Secondly, while lifelong abstinence may be an appropriate long-term goal for an older person with many years of drug dependence, this is probably a less realistic or clinically essential goal for a 15 or 16 year old, at least with respect to substances such as alcohol. Finally, since substance abuse is typically associated with problems in various life areas (employment/school, social, legal, family, psychological, medical) it is reasonable to measure the impact of substance abuse treatment on these other areas, which was only done in 29 of the present studies. The usual motivation for treatment is not the substance use itself, but the impact that substance abuse is having on the person's life. Although there is evidence that abstinence rates are highly correlated with drug reduction rates and improvements in other life areas, the relationship is far from perfect (Brown, Myers, Mott and Vik, 1994).

The methodology in these studies also tends to be weak. The current standard used in evaluating treatment effectiveness is to report success rates for all individuals that the program intended to treat. It is useful to know the effectiveness of treatment for people who completed treatment versus people who dropped out prematurely. However, it is not appropriate to simply report success rates for people who completed treatment, as treatment completion is strongly associated with treatment success (Baekeland and Lundwall, 1975; Stark, 1992). Also, a high success rate with treatment completers is not particularly useful if only a small percentage of people actually complete treatment. Unfortunately, some of these studies, including the multi-program, multi-site CATOR study (Harrison and Hoffman, 1987; Hoffmann and Kaplan, 1991), have only reported results for treatment completers.

A poor follow-up rate is another common problem. Adolescents who are difficult to contact or who refuse to participate in follow-up outcome studies are known to have significantly poorer outcomes than individuals who are easy to contact and cooperative (Stinchfield, Niforopulos and Feder, 1994). Forty-eight percent of the studies in this review have follow-up rates less than 75% of those entering treatment. Seventeen percent have rates below 50%.

Ascertainment of substance use is a problematic issue. Many studies have relied exclusively on adolescent self-report for determination of substance use post-treatment. Adolescent self-report tends to be reasonably reliable and valid (Adair, Craddock, Miller and Turner, 1996; Smith, McCarthy and Goldman, 1995). However, this is influenced by the demand characteristics and memory requirements of the situation. Under reporting is characteristic of recent arrestees (Fendrich and Xu, 1994; Harrison, 1995; Magura and Kang, 1996); for less socially acceptable drugs (e.g., cocaine) (Lundy et al., 1997; Wish, Hoffman and Nemes, 1997); when parents are present (Aquilino, 1997); and when answers are given verbally (Aquilino, 1997; Turner, Lessler and Gfroerer, 1992). Similarly, individuals tend to be less honest about substance use after treatment than before treatment (Wish et al., 1997), with repeated assessments being associated with progressively less honest reporting (Fendrich, Mackesy-Amiti, Wislar and Goldstein, 1997). Retrospective reports are influenced by current substance use status, with higher reports of retrospective use being associated with higher current use and vice versa (Czarnecki, Russell, Cooper and Salter, 1990; Collins, Graham, Hansen and Johnson, 1985).

It is preferable to provide some corroboration of adolescent self-report. Some studies have done this by means of parental report. The problem with this is that parental awareness of adolescent substance use tends to be quite poor (Friedman, Glickman and Morrissey, 1990; Williams, McDermitt and Bertrand, submitted for publication). Establishing that substance use is occurring by means of a positive report

by either the adolescent or parent may improve validity, but procedures that require a positive report by both the adolescent and parent likely decrease validity. Studies in the present review that have relied exclusively on parental report (Ralph and McMenamy, 1996; Knapp, Templar, Cannon and Dobson, 1991; Grenier, 1985) have questionable validity. Other studies have corroborated adolescent self-report through urinalysis drug testing (Azrin et al, 1994; Feigelman et al., 1988; Jenson, Wells, Plotnick, Hawkins and Catalano, 1993; Joanning, Quinn, Thomas and Mullen, 1992; Lewis et al, 1990; Liddle et al., 1993 (as cited in Stanton and Shadish, 1997)). Here again, although a positive drug testing result almost always indicates use, a negative result does not reliably indicate lack of use as many substances (e.g. cocaine, alcohol) are quickly metabolized and will not show up in urine unless testing is done within 1-2 days of use.

A final problem concerns how long to wait after discharge to evaluate treatment effectiveness. Evaluations done at the end of treatment, or shortly thereafter, tend to overestimate the enduring effects of treatment (Miller and Sanchez-Craig, 1996). However, very long follow-up periods may also distort the effects of treatment depending on age of follow-up. Longitudinal studies consistently show a steady increase in prevalence of drug and alcohol use peaking in the late teens to early 20's and diminishing significantly thereafter (Fillmore, 1988; Kandel and Logan, 1984; Kandel and Raveis, 1989; Labouvie, 1996; Pape and Hammer, 1996). Diminished use in the mid to late 20's is thought to occur because adult roles (jobs, marriage, parenting) become incompatible with continued substance use (Kandel and Raveis, 1989; Labouvie, 1996). These trends are even more pronounced for heavy substance use and are consistent across various historical periods (Kandel and Logan, 1984; Pape and Hammer, 1996). Therefore, it should not be surprising that studies in the present review that have done follow-up in the late teens or early 20's show very low rates of substance reduction or even increases (e.g., Sells and Simpson, 1979; U.S. Department of Health and Human Services (SROS); 1998; Marzen, 1990). By comparison, studies providing follow-up in the mid 20's tend to show fairly high rates of abstinence and substance reduction (e.g., Richardson, 1996; Vaglum and Fossheim, 1980).

This issue of natural recovery illustrates the need for control groups. Without a control group it is impossible to attribute improvements to the treatment rather than natural recovery or a placebo effect. Reid Hester, who, along with William Miller, have been pre-eminent researchers in adult alcohol abuse treatment, has commented that ".....one of the most important lessons we learned from this (treatment outcome research) was the value of controlled clinical trials. Historically, a number of treatments have been introduced with glowing results from case studies and uncontrolled clinical trials only to have subsequent controlled studies find that the new treatment did not contribute in any significant way to outcome" (Hester, 1994, p.36). Only 14 studies in the present review had comparison groups with either random or matched assignment to condition (Amini, Zilberg, Burke and Salasnek, 1982; Azrin et al., 1994; Braukmann et al., 1985; Friedman, 1989; Grenier, 1985; Hennggeler et al., 1991; Joanning et al., 1992; Kaminer, Burleson, Blitz, Sussman and Rounsaville, 1998; Lewis et al., 1990; Liddle et al., 1993 (as cited in Stanton and Shadish, 1997); Scopetta, King, Szapocznik and Tillman, 1979 (as cited in Waldron, 1997); Szapocznik et al., 1983; Szapocznik et al., 1986; Vaglum and Fossheim, 1980).

Results

Studies with serious methodological problems were excluded from the results section. Specifically, studies were excluded if drop-outs were not included in the results, if follow-up rates were less than 75%, if only parental report was used to establish substance use, or if the average age of the treatment group was ≥ 21 at time of follow-up. The following results are based on the 21 remaining studies (#'s **1, 3, 5, 7**, 11, 12, 15, 16, 17, 18, 19, 24, 28, 34, 36, 39, 42, 43, 47, 49, 52).

Sustained Abstinence

Eight studies reported abstinence rates at discharge or post-discharge (**7**, 16, 17, 18, 19, 39, 42, 47), with four of them assessing abstinence at more than one time period (16, 17, 42, 47). Figure 1 is a graphic presentation of these results. The one multi-site, multi-program study is identified, as are studies with repeated measures.

The only time periods with more than two data points are 6 months and 12 months. Average sustained abstinence at 6 months is 38% (range 30-55) and 32% at 12 months (range 14-47)[1].

Although there appears to be some tendency for abstinence rates to decrease with time since discharge, the amount of decrease is fairly small. Richter, Brown and Mott's (1991) repeated measures study actually obtained a slight increase due to sampling differences between the two time periods. The one study reporting abstinence at discharge (Lewis et al., 1990) found only 39-40% of adolescents receiving outpatient family therapy or family education were abstinent by the end of treatment. This low rate of abstinence at discharge is also found in the outpatient studies not included in the review because of having methodological weaknesses potentially inflating success (studies 9, 13, 35, 48 have an average abstinence rate of 44% at discharge). Brown et al. (1989) and Brown et al. (1990) have reported that 2/3rds of adolescent relapse occurs in the first three months post-treatment (see also Brown, 1993). While this might be true for the short inpatient programs Brown and her colleagues have studied, it does not appear to be the case for outpatient programs, where only a minority of adolescents actually achieve abstinence by the end of treatment.

Reduced Substance Use

Thirteen studies reported the percentage of adolescents with decreased substance use following treatment (**3,** 12, 15, 16, 18, 36, 39, 42, 47, 49, 52) or the average group decrease in substance use (**1,** 24). In 12 out of 13 studies there was a reduction in substance use following treatment. Braukmann et al. (1985) did not find group homes or teaching family group homes to reduce substance use in conduct disordered males. Most studies did not quantify the extent to which substance use had been reduced. Friedman, Glickman and Morrissey (1986), in their examination of 30 outpatient programs (sample of 5603), reported that average drug usage at discharge decreased to approximately 50% of pre-treatment levels. Friedman (1989) reported a 50% reduction in average drug usage at 9 months post-treatment for adolescents in family therapy groups as well as adolescents whose parents attended parent support groups. In Lewis et al. (1991), 38% of adolescents receiving outpatient family education reported reduced substance use at discharge and 55% receiving family therapy reported reduced

substance use. At 6 months post-discharge 57% of adolescents reported reduced substance use in the inpatient programs studied by Brown et al. (1990) and by Richter et al. (1991). At 12 months post-discharge 51-55% of adolescents reported reduced marijuana use in the multi-site, multi-program DATOS-A study (Hser, Grella, Hsieh and Anglin, 1999) and 62% reported reduced substance use in Richter et al. (1991).

Functioning in Other Life Areas

Eight studies evaluated the effect of treatment on other aspects of the adolescent's life (**1, 3, 7**, 12, 15, 24, 42, 52). Most of these studies simply reported whether there were group improvements as a result of treatment and did not indicate the degree of improvement. Four out of the 5 studies that examined illegal behaviour found decreases following treatment, with Braukmann et al. (1985) being the exception. Sixteen to 30% fewer adolescents committed an illegal act in the previous year compared to the year before treatment in the multi-site, multi-program DATOS-A study (Hser et al., 1999). Forty-one to 48% fewer adolescents committed an illegal act in the previous year compared to the year before treatment in the multi-site, multi-program NTIES study (U.S. Department of Health and Human Services, 1997b). The four studies that examined change in mental health all found improvements following treatment. The three studies examining change in family problems all found improvement following treatment. Two of the 3 studies examining school functioning reported improvements. Friedman, Glickman and Morrissey (1986) did not find improved school functioning in their study of 30 different outpatient programs but did find improvements in employment following treatment.

Type of Treatment

It would be interesting to compare treatment outcome between treatment types. The above results are general findings across outpatient programs, outward-bound programs, short-term inpatient, and long-term residential programs. Unfortunately, there is an insufficient number of each type of program to make comparisons. Even if there were, the lack of randomized controlled studies would prevent any definitive conclusions. The randomized controlled studies that have been done have focused primarily on types of outpatient treatment (see below). No controlled studies have investigated the relative merits of the major treatment types, treatment setting, treatment length, or intensity.

Controlled Comparisons

The evidence presented thus far indicates that the majority of adolescents who enter into substance abuse treatment have significantly reduced substance usage and significant improvements in life functioning in the year subsequent to treatment. However, in the absence of no-treatment control groups, the extent to which this improvement is due to treatment, as opposed to natural recovery, regression to the mean, or a placebo effect, is uncertain. There are only two studies that provide evidence on this issue. Braukmann et al. (1985) compared the effectiveness of group home treatment on male conduct disordered youth to a no-treatment group of matched friends. Although teaching-family group homes produced superior drug reductions during treatment, at 3 month follow-up there was no significant difference between the

treatment group and no-treatment group. Grenier (1985) compared a wait control group to a random sample of former patients in a hospital inpatient program. At 9 months post-treatment, 66% of the treatment group were not currently using drugs versus only 20% of the control group. Unfortunately, only parental report was used in the no-treatment group (versus adolescent and parental report in the treatment group) and the follow-up rate for the no-treatment group was only 36%. However, these methodological problems would normally tend to inflate improvement rates.

There have been 13 studies comparing the effectiveness of one treatment type against another. A few of these studies employed conditions that could be construed as no-treatment controls. For example, Amini et al. (1982) compared the effectiveness of 132 day residential drug abuse treatment versus outpatient probation. One year after entering treatment significant decreases in substance use and antisocial behaviour were found in both groups, but there was no significant difference between the groups. Hennggeler et al. (1991) compared four months of multisystemic family therapy to monthly meetings with a probation officer for conduct disordered youth in South Carolina. At discharge adolescents receiving family therapy had significantly lower marijuana and alcohol use in the previous 3 months as compared to adolescents who just met with their probation officer. Vaglum and Fossheim (1980) compared three different 5-6 month inpatient drug treatment programs for youths in Norway to a control group of individuals treated on other psychiatric wards. At 3 years post-treatment, they found 24% abstinent in group 1, 56% in group 2, 45% in group 3, and 27% in the control group (reduced drug use in 41%, 82%, 81% and 56% respectively). At 4.5-5.5 years post-treatment they found 41% abstinent in group 1, 63% in group 2 and 38% in the control group (reduced drug use in 65%, 85%, and 61% respectively).

Other studies made comparisons between treatments that were both presumed to have beneficial effects on drug abuse. Braukmann et al. (1985) compared teaching-family group homes to non-teaching family group homes for male conduct disordered youth. Teaching-family homes specifically taught adaptive skills in the areas of relationship development and self-discipline. Teaching-family group homes produced superior drug reductions during treatment, but there was no difference at 3 month follow-up. Azrin et al. (1994) compared 15 sessions of supportive counselling to 15 sessions of behavioural treatment (intended to restructure family and peer relations and improve urge control) in a small group of 26 adolescents. At the end of treatment only 9% of the adolescents receiving counselling were abstinent versus 73% in the behavioural group. Superior improvements in school/work attendance, family relations, and mood were also found in the behavioural group. Kaminer et al. (1998) compared a small group receiving 2-3 weeks of inpatient group therapy followed by 12 weeks of outpatient cognitive-behavioural group therapy to a small group receiving 2-3 weeks of inpatient group therapy followed by 12 weeks of outpatient interactional group therapy. Three months after treatment, he found significantly greater substance use reduction in the group receiving the cognitive-behavioural training.

Several studies compared family therapy to other substance abuse treatments. Hennggeler et al. (1991) found that at 4 years post-treatment family therapy produced significantly lower drug-related arrests compared to individual counselling for a group of conduct disordered youth in Missouri. Friedman (1989) found no difference in substance use at 9 months post-treatment between a group of adolescents receiving 6 months of outpatient family therapy versus a group whose parents enrolled in a 6 month parent support group. Joanning et al. (1992) compared 7-15 sessions of family therapy to 12 sessions of adolescent group therapy and to 6 sessions of family drug education.

Substance use at discharge was found to be significantly lower in the family therapy condition compared to the other two conditions. Liddle et al. (1993) (as cited in Stanton and Shadish, 1997) compared 16 sessions of family therapy to 16 sessions of family psychoeducation to 16 sessions of adolescent peer group treatment. At 6 and 12 months post-treatment family therapy was more effective at reducing substance abuse and improving school grades than either peer group treatment or multifamily psychoeducation group. Lewis et al. (1990) compared 12 session family therapy to 12 sessions of family education. At discharge greater substance use reduction was found in the family therapy group, but there were no differences in abstinence rates. Scopetta et al. (1979) (as cited in Waldron, 1997) compared family therapy to family therapy plus systems intervention in a small sample of 33 Hispanic youths. No difference in abstinence rates were observed at discharge. Szapocznik et al. (1983) and Szapocznik et al. (1986) compared family therapy to "one-person family therapy" where the therapist attempted to change the family system through working with one family member. Both techniques produced reductions in substance use at discharge and 6-12 month follow-up with no significant differences in effectiveness between the conditions.

Table 3 is a summary of all controlled comparisons and their results. To summarize, there have been an insufficient number of studies comparing treatment to no treatment. On the other hand, a treatment effect above and beyond natural recovery, placebo response, or regression to the mean is implied by the fact that 9 out of 15 treatment comparisons found an advantage for one type of treatment over another (9 out of 12 if eliminating the three studies comparing variants of family therapy).

There are no well-designed studies providing comparisons between the main treatment types (outpatient, short-term inpatient, long-term residential, outward bound). However, there are several studies comparing variants of outpatient treatment. There is preliminary evidence that behavioural or cognitive-behavioural treatment may be superior to supportive counselling (Azrin et al., 1994) or interactional group therapy (Kaminer et al., 1998). There is good evidence that family therapy may be superior to other outpatient treatments. Family therapy was more effective than other forms of non-family outpatient treatment (individual counselling, adolescent group therapy, family drug education, meetings with probation officer) in five out of six studies. The only comparison finding no difference was with parent support groups. There is no evidence to date that one type of family therapy is superior to other types of family therapy. The superiority of family therapy in substance abuse treatment has also been identified in a couple of recent reviews of the general family therapy literature (Stanton and Shadish, 1997; Waldron, 1997).

Variables associated with successful treatment

The variables associated with treatment success are reported in Table 4. The table identifies the variable, studies finding it to be related to decreased substance use post-treatment, and studies finding it not to be related to decreased substance use. Variables are divided into pre-treatment, treatment, and post-treatment variables. Studies were excluded from the table if they did not use adolescent report, had follow-up rates <75%, or if they did not include drop-outs.

The pre-treatment variable with the most consistent relationship to positive outcome is lower pre-treatment substance use, found in 6 out of 7 studies. Peer and parental social support, particularly in their nonuse of substances, was related to positive outcome in the three studies examining this. Better school attendance and functioning at

pre-treatment was related to success in 3 out of 4 studies. Other variables with some evidence of a relationship to success are less conduct disorder, being employed, greater motivation for treatment, having fewer prior substance abuse treatments, and less psychopathology. Studies examining demographic variables have not found these variables to be consistently related to outcome.

Treatment completion is the treatment variable with the most consistent relationship to positive outcome. However, it is unclear whether this reflects the impact of treatment or is just another indicator of motivation. Larger programs with larger budgets, therapist experience, and program comprehensiveness (i.e., provision of schooling, vocational counselling, recreational activities, birth control, etc.) were predictive of better outcome in a comprehensive analysis of 30 treatment programs (sample of 5603) by Friedman and Glickman (1986). (Number of different services received has also been shown to be robustly associated with outcome for adults (McLellan et al., 1994)).

Post-treatment variables related to a positive outcome are attendance in aftercare (motivational or treatment effect?), having nonusing parents and peers, and having better relapse coping skills. Prior analyses have found post-treatment variables to be the most powerful predictors of post-treatment outcome in adolescents (Shoemaker and Sherry, 1991). However, to some extent this is to be expected, as many post-treatment variables are reflections of successful treatment (e.g., better coping skills, association with nonusing peers, decreased interpersonal conflict, etc.).

Summary

A comprehensive review of the literature on the effectiveness of adolescent substance abuse treatment identified 8 multi-program, multi-site studies and 45 single program studies. Client characteristics have been similar between studies and representative of the adolescent treatment population in the United States as a whole. Treatment programs are diverse, however. The three main types of treatment are hospital inpatient, outpatient therapy, and therapeutic community programs. Published reports on hospital inpatient programs are over-represented in the literature relative to their actual use in treatment. The methodology used in treatment outcome research studies is inconsistent with regards to the time period at which outcome is evaluated, the number of prior months of substance use being assessed, and how success is measured. Reduction in substance use is a more appropriate measure of success than abstinence, but is only reported in 50% of studies. The methodology in treatment outcome studies also tends to be weak. The most common problems are poor follow-up rates, lack of control groups, failure to include drop-outs in the results, reliance on parental rather than adolescent report, and follow-up periods that are either too short (at discharge) or too long (>3 years). Methodologically stronger studies have usually found most adolescents receiving treatment to have significant reductions in substance use and problems in other life areas in the year following treatment. Sustained abstinence averages 38% (range 30-55) at 6 months post-treatment and 32% at 12 months (range 14-47). Pre-treatment variables most consistently related to successful outcome are lower substance use, peer/parental social support, and better school functioning. Treatment variables most consistently related to successful outcome are treatment completion, programs that provide comprehensive services, programs with experienced therapists, and larger programs with larger budgets. Post-treatment variables most consistently related to outcome are attendance in aftercare and peer/parental social support. There is evidence

that treatment is superior to no treatment, but insufficient evidence to compare the effectiveness of treatment types. The exception to this is that outpatient family therapy appears superior to other forms of outpatient treatment. There is no evidence concerning the relative merits of treatment setting, treatment length, treatment intensity, treating homogenous versus heterogeneous populations, or whether certain types of adolescents are best treated by certain types of programs.

Implications and Recommendations

The most obvious implication of the present review is that more and better-designed studies need to be conducted. There is a particular need for randomized controlled studies to compare treatment against no treatment and to investigate the advantages of treatment types, length, setting, intensity, population homogeneity, and patient-treatment matching. It is recommended that these studies have the following methodological characteristics:

1. The treatment population the program intended to treat should be described in terms of how they were selected, average age, gender, race/ethnicity, psychopathology, exclusionary criteria, baseline substance use, and baseline measure(s) of problems in other life areas.
2. Substance use should be established by adolescent self-report along with some type of corroboration (i.e., biochemical analysis, third party report). Validity will be enhanced if procedures are used that provide privacy, confidentiality and/or anonymity (e.g., self-administered questionnaires, interviews conducted by individuals not connected with treatment). Validity will also be enhanced if procedures are used that minimize recall artifact. An example of this is the Time-Line Follow-Back procedure (Sobell and Sobell, 1996) which provides the person with a calendar with important dates as anchors and asks him/her only to recall which days/weeks which substances were used, rather than to estimate overall averages or frequencies. The time window being assessed should include a past month measure (in addition to possibly a 6 or 12 month measure), to minimize recall artifact and to allow for biochemical corroboration. Baseline measure(s) of problems in other life areas should be obtained in a similar fashion.
3. The nature of the treatment should be described in terms of its length, intensity, setting, therapist characteristics, and components (i.e., groups, individual therapy, schooling, recreational programming, medication, parent support, aftercare).
4. Outcome evaluation should take place at time periods commonly used by other studies to allow for comparison and accumulation of data. Evaluation at 6 and 12 months post-treatment is currently recommended. Documentation of the dropout rate, dropout characteristics, and follow-up rate is needed. Efforts need to be made to ensure follow-up rates above 75%, perhaps through financial incentives (e.g., Richter et al., 1991; Shoemaker and Sherry, 1991; Hser et al., 1999). When sample sizes are large it may be preferable to exhaustively follow a small random sample (e.g. 50%) than to obtain low follow-up rates for the entire sample.
5. Post-treatment substance use and problems in life areas should be established in the same manner used at baseline. Results should report reduction in substance use, reduction of problems in other life areas, and abstinence. These results should be reported separately for the entire sample and for treatment completers.

It is much more difficult to make programmatic recommendations on the basis of the limited evidence available. However, the evidence suggests a few things.

1. Because treatment appears preferable to no treatment, programs should strive to be readily accessible and able to provide treatment for large numbers of people.
2. Programs should develop procedures to minimize treatment dropout and to maximize treatment completion.
3. Programs should attempt to provide or arrange for post-treatment aftercare.
4. Programs should attempt to provide comprehensive services in areas other than just substance abuse (i.e., schooling, psychological, vocational, recreational, medical, family, legal).
5. Family therapy should be a component of treatment.
6. Programs should encourage and develop parent and peer support, especially in regards to nonuse of substances.

There is insufficient evidence to make recommendations about other aspects of treatment. However, there are two others areas of related research that may provide some guidance. One is adult substance abuse treatment and the other is treatment for adolescent emotional/behavioural problems. Both of these areas have clearly established that treatment is superior to no treatment (Agosti, 1995; Hoag and Burlingame, 1997; Kazdin, 1990; Mann and Borduin, 1991; Miller et al., 1995; Target and Fonagy, 1996; U.S. Department of Health and Human Services, 1995a; Weisz, Weiss, Han, Granger and Morton, 1995).

With regards to treatment setting (outpatient, residential, inpatient), adult substance abuse research has found a slight advantage for inpatient over outpatient treatment in some circumstances (Annis, 1996; Finney, Hahn and Moos, 1996; Longabaugh, 1996). The impact of treatment setting on adolescent emotional/behavioural problems is less well researched, but evidence to date has not found any differential impact on outcome (Bates, English and Kouidou-Giles, 1997; Curry, 1991).

Duration of treatment also has a weak effect on outcome. A review of brief interventions for alcohol problems has found them often to be as effective as more extensive treatment (Bien, Miller and Tonigan, 1993). It also appears that short hospital stays and time-limited therapy do not adversely affect mental health outcome for most people (Johnston and Zolese, 1999; Pfeiffer, O'Malley and Shott, 1996; Steenbarger, 1994).

Type of treatment is important. When treatment advantages have been found for alcohol abuse they have favoured a community reinforcement approach (because of its comprehensiveness and behavioural orientation?), behavioural contracting, social skills training and motivational enhancement (Miller et al., 1995). Behavioural treatment is superior to nonbehavioural treatment for adolescent emotional/behavioural problems (Target and Fonagy, 1996; Weisz et al., 1995). Family therapy appears particularly effective for conduct disordered youth (Mann and Borduin, 1991; Target and Fonagy, 1996).

In general, therapist experience, training and professional discipline have a very weak relationship to mental health treatment outcome (Roth and Fonagy, 1996; Smith et al., 1980; Weiss et al., 1995), although experience may enhance client retention and improve outcome for more severely disturbed patients (Roth and Fonagy, 1996). Much more important than training or experience is the quality of the therapeutic relationship between therapist and client (Horvath and Symonds, 1991; Morris and Nicholson, 1993;

Roth and Fonagy, 1996). This is believed to be fostered through therapist qualities of flexible/intelligent thinking, good interpersonal skills, and genuine empathy (Lazarus, 1993; Miller, 1993; Miller et al., 1995; Mohr, 1995; Najavits and Weiss, 1994).

References

AADAC (1995). Adolescent Treatment: Excellence through Evaluation. Alberta Alcohol and Drug Abuse Commission, Government of Alberta, Canada.

Adair, E.B.G., Craddock, S.G., Miller, H.G. & Turner, C.F. (1996). Quality of treatment data: Reliability over time of self-reports given by clients in treatment for substance abuse. Journal of Substance Abuse Treatment, 13, 145-149.

AARC (1994). An Evaluation of Alberta Adolescent Recovery Centre. Prepared in consultation with Synergy Research Group. 303 Forge Rd. SE, Calgary, Alberta.

Agosti, V. (1995). The efficacy of treatments in reducing alcohol consumption: A meta-analysis. The International Journal of the Addictions, 30, 1067-1077.

Alford, G.S., Koehler, R.A. & Leonard, J. (1991). Alcoholics Anonymous - Narcotics Anonymous model inpatient treatment of chemically dependent adolescents: a 2 year outcome study. Journal of Studies on Alcohol, 52, 118-126.

Amini, F., Zilberg, N.J., Burke, E.L. & Salasnek, S. (1982). A controlled study of inpatient vs. outpatient treatment of delinquent drug abusing adolescents: one year results. Comprehensive Psychiatry, 23, 436-444.

Annis, H.M. (1996). Inpatient versus outpatient setting effects in alcoholism treatment: Revisiting the evidence. Addiction, 91, 1804-1807.

Aquilino, W.S. (1997). Privacy effects on self-reported drug use: Interactions with survey mode and respondent characteristics. In L. Harrison & A. Hughes (eds), The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates (NIDA Research Monograph 167). Rockville, MD: U.S. Department of Health and Human Services.

Azrin, N.H., Donohue, B., Besalel, V.A., Kogan, E.S., Acierno, R. (1994). Youth drug abuse treatment: a controlled outcome study. Journal of Child & Adolescent Substance Abuse, 3, 1-16.

Baekeland, F. & Lundwall, L. (1975). Dropping out of treatment: A critical review. Psychological Bulletin, 82, 738-783.

Baer, J.S., Marlatt, G.A., Kivlahan, D.R., Fromme, K., Larimer, M.E., Williams, E. (1992). Experimental test of three methods of alcohol risk reduction with young adults. Journal of Consulting and Clinical Psychology, 60, 974-979.

Barrett, M.E., Simpson, D.D. & Lehman, W.E.K. (1988). Behavioral changes of adolescents in drug abuse intervention programs. Journal of Clinical Psychology, 44, 461-173.

Bates, B.C., English, D.J. & Kouidou-Giles, S. (1997). Residential treatment and its alternatives: A review of the literature. Child & Youth Care Forum, 26, 7-51.

Benson, G. (1985). Course and outcome of drug abuse and medical and social condition in selected young drug abusers. Acta Psychiatr Scand, 71, 48-66.

Bianco, D.M. & Wallace, S.D. (1991). The chemically dependent female adolescent: A treatment challenge. In T.M. Rivinus (ed.), Children of Chemically Dependent Parents: Multiperspectives from the Cutting Edge (pp 173-225). New York: Mazel.

Bien, T.H., Miller, W.R. & Tonigan, J.S. (1993). Brief interventions for alcohol problems: A review. Addiction, 88, 315-335.

Braukmann, C.J., Bedlington, M.M., Belden, B.D., Braukmann, B.P.D., Husted, J.J., Ramp, K.K. & Wolf, M.M. (1985). Effects of a community-based group-home treatment program on male juvenile offenders use and abuse of drugs and alcohol. American Journal of Drug and Alcohol Abuse, 11, 249-278.

Brown, S.A. (1993). Recovery patterns in adolescent substance abuse. In J.S. Baer, G.A. Marlatt & R.J. McMahon (ed.), Addictive Behaviours across the Lifespan: Prevention, Treatment and Policy Issues (pp 161-183). Sage Publications.

Brown, S.A., Gleghorn, A., Schuckit, MA., Myers, M.G. & Mott, M.A. (1996). Conduct disorder among adolescent alcohol and drug abusers. Journal of Studies in Alcohol, 57, 314-324.

Brown, S.A., Mott, M.A. & Myers, M.G. (1990). Adolescent alcohol and drug treatment outcome. In R.R. Watson (ed), Drug and Alcohol Abuse Prevention (pp 373-403). Humana Press.

Brown, S.A., Myers, M.G., Mott, M.A. & Vik, P.W. (1994). Correlates of success following treatment for adolescent substance abuse. Applied and Preventative Psychology, 3, 61-73.

Brown, S.A., Vik, P.W. & Creamer, V.A. (1989). Characteristics of relapse following adolescent substance abuse treatment. Addictive Behaviours, 14, 291-300.

Bry, B.H., Krinsley, K.E. (1992). Booster sessions and long-term effects of behavioral family therapy on adolescent substance use and school performance. J Behav Ther Exp Psychiatry, 23, 183-189.

Bukstein, O.G. (1994). Treatment of adolescent alcohol abuse and dependence. Alcohol Health and Research World, 18, 296-301.

Cady, M.E., Winters, K.C., Jordan, D.A., Solberg, K.B. & Stinchfield, R.D. (1996). Motivation to change as a predictor of treatment outcome for adolescent substance abusers. Journal of Child & Adolescent Substance Abuse, 5, 73-91.

Catalano, R.F., Hawkins, J.D., Wells, E.A., Miller, J. & Brewer, D. (1990/1991). Evaluation of the effectiveness of adolescent drug abuse treatment, assessment of risks for relapse, and promising approaches for relapse prevention. The International Journal of the Addictions, 25, 1085-1140.

Collins, L.M., Graham, J.W., Hansen, W.B., & Johnson, C.A. (1985). Agreement between retrospective accounts of substance use and earlier reported substance use. Applied Psychological Measurement, 9, 301-309.

Cornwall, A. & Blood, L. (1998). Inpatient versus day treatment for substance abusing adolescents. Journal of Nervous and Mental Disease, 186, 580-582.

Curry, J.F. (1991). Outcome research on residential treatment: Implications and suggested directions. American Journal of Orthopsychiatry, 61, 348-357.

Czarnecki, D.M., Russell, M., Cooper, M.L. & Salter, D. (1990). Five-year reliability of self-reported alcohol consumption. Journal of Studies on Alcohol, 51, 68-76.

Davidge, A.M. & Forman, S.G. (1988). Psychological treatment of adolescent substance abusers: A review. Children & Youth Services Review, 10, 43-55.

DeAngelis, G.G., Koon, M. & Goldstein, E. (1978). Treatment of adolescent phencyclidine (PCP) abusers. Journal of Psychedelic Drugs, 12, 279-286.

DeJong, R. & Henrich, G. (1980). Follow-up results of a behaviour modification program for juvenile drug addicts. Addictive Behaviour, 5, 49-57.

DeLeon, G. (1984). The Therapeutic Community: Study of Effectiveness. National Institute on Drug Abuse Research Monograph. DHHS Pub. No. (ADM) 84-1286. Washington, DC: U.S. Govt. Printing Office.

Duehn, W.D. (1978). Covert sensitization in group treatment of adolescent drug abusers. The International Journal of the Addictions, 13, 485-491.

Dusenbury, L., Khuri, E. & Millman, R.B. (1992). Adolescent substance abuse: A sociodevelopmental perspective. In J.H. Lowinson, P. Ruiz, & R.B. Millman (ed), Substance Abuse: A Comprehensive Textbook (pp.831-842). Williams & Wilkins.

Feigelman, W., Hyman, M.M. & Amann, K. (1988). Day-care treatment for youth drug abuse: a 6 year follow-up study. Journal of Psychoactive Drugs, 20, 385-395.

Fendrich, M., Mackesy-Amiti, M.E., Wislar, J.S. & Goldstein, P. (1997). The reliability and consistency of drug reporting in ethnographic samples. In L. Harrison & A. Hughes (eds),

The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates (NIDA Research Monograph 167). Rockville, MD: U.S. Department of Health and Human Services.

Fendrich, M. & Xu, Y. (1994). The validity of drug use reports from juvenile arrestees. International Journal of the Addictions, 29, 971-985.

Fillmore, K.M. (1988). Alcohol use across the Life Course: A Critical Review of 70 Years of International Longitudinal Research. Addiction Research Foundation: Toronto.

Filstead, W.J. (1992). Treatment outcome: an evaluation of adult and youth treatment services. In J.W. Langerbucher, B.S. McCrady, W. Frankenstein, P.E. Nathan (ed.) Annual Review of Addictions Research and Treatment, Vol 2, (pp 249-278). New York: Pergamon.

Finney, J.W., Hahn, A.C. & Moos, R.H. (1996). Effectiveness of inpatient and outpatient treatment for alcohol abuse: The need to focus on mediators and moderators of setting effects. Addiction, 91, 1773-1796.

Fredericksen, L.W., Jenkins, J.O. & Carr, C.R. (1976). Indirect modification of adolescent drug abuse using contingency contracting. Journal of Behavior Therapy and Experimental Psychiatry, 7, 377-378.

Friedman, A.S. (1989). Family therapy vs. parent groups: Effects on adolescent drug abusers. American Journal of Family Therapy, 17, 335-347.

Friedman, A.S. & Beschner, G.M. (1990). Treatment needs and treatment services for adolescent drug abusers. in A.S. Friedman & S. Granick (eds.), Family Therapy for Adolescent Drug Abuse (pp.23-45). Lexington: Lexington Books.

Friedman, A.S. & Glickman, N.W. (1986) Program characteristics for successful treatment of adolescent drug abuse. The Journal of Nervous and Mental Disease, 174, 669-679.

Friedman, A.S. & Glickman, N.W. (1987). Effects of psychiatric symptomatology on treatment outcome for adolescent male drug abusers. Journal of Nerv Ment Dis, 175, 425-430.

Friedman, A.S., Glickman, N.W. & Kovach, J.A. (1986). The relationship of drug program environmental variables to treatment outcome. American Journal of Drug and Alcohol Abuse, 12, 53-69.

Friedman, A.S., Glickman, N.W. & Morrissey, M.R. (1986). Prediction to successful treatment outcome by client characteristics and retention in treatment in adolescent drug treatment programs: A large-scale cross validation study. Journal of Drug Education, 16, 149-165.

Friedman, A.S., Glickman, N.W. & Morrissey, M.R. (1990). What mothers know about their adolescents' alcohol/drug use and problems, and how mothers react to finding out about it. In A.S. Friedman & S. Granick (eds.), Family Therapy for Adolescent Drug Abuse (pp 169-181). Lexington: Lexington Books.

Friedman, A.S., Granick, S. & Kreisher, C. (1994). Motivation of adolescent drug abusers for help and treatment. Journal of Child & Adolescent Substance Abuse, 3, 69-88.

Friedman, A.S., Granick, S., Kreisher, C., & Terras, A. (1993). Matching adolescents who abuse drugs to treatment. American Journal on Addictions, 2, 232-237.

Friedman, A.S., Schwartz, R. & Utada, A. (1989). Outcome of a unique youth drug abuse program: A follow-up study of clients of the Straight, Inc. Journal of Substance Abuse Treatment, 6, 259-268.

Friedman, A.S. & Terras, A. (1996). Psychic symptomotology as predictor to outcome of treatment for adolescent drug abusers. Journal of Child & Adolescent Substance Abuse, 5, 81-90.

Friedman, A.S., Terras, A. & Ali, A. (1998). Differences in characteristics of adolescent drug abuse clients that predict to improvement: For inpatient treatment versus outpatient treatment. Journal of Child & Adolescent Substance Abuse, 7, 97-119.

Friedman, A.S., Terras, A., Kreisher, C. (1995). Family and client characteristics as predictors of outpatient treatment outcome for adolescent drug abusers. Journal of Substance Abuse, 7, 345-356.

Friedman, A.S., Utada, A. & Glickman, N.W. (1986). Outcome for court-referred drug-abusing male adolescents of an alternative activity treatment program in a vocational high school setting. Journal of Nervous and Mental Disease, 174, 680-688.

Gaus, S. & Henderson, G. (1985). Supportive life skills program for court-committed adolescent substance abusers. In A.S. Friedman & G.M. Beschner (eds), Treatment Services for Adolescent Substance Abusers. Rockville, Md.: National Institute on Drug Abuse, DHHS publ. no. (ADM) 85-1342.

Gorelick, D.A., Wilkins, J.N. & Wong, C. (1989). Outpatient treatment of PCP abusers. American Journal of Drug and Alcohol Abuse, 15(4), 367-74.

Greenbaum, P.E., Foster-Johnson, L. & Petrila, A. (1996). Co-occurring addictive and mental disorders among adolescents: Prevalence research and future directions. American Journal of Orthopsychiatry, 66, 52-60.

Grenier, C. (1985). Treatment effectiveness in an adolescent chemical dependency treatment program: A quasi-experimental design. International Journal of the Addictions, 20, 381-391.

Griffen-Shelley, E., Sandler, K.R. & Park-Cameron, R.P. (1991). A follow-up study of dually diagnosed (chemically dependent) adolescents. Journal of Adolescent Chemical Dependency, 2, 1-11.

Harrison, L.D. (1995). The validity of self-reported data on drug use. The Journal of Drug Issues, 25, 91-111.

Harrison, P.A. & Hoffmann, N.G. (1987). CATOR 1987 Report. Adolescent Residential Treatment: Intake and Follow-up Findings. St. Paul, MN: Chemical Abuse/Addiction Treatment Outcome Registry.

Hennggeler, S.W., Bourdin, C.M., Melton, G.B., Mann, B.J., Smith, L.A. et al. (1991). Effects of multisystematic therapy on drug use and abuse in serious juvenile offenders: A progress report from 2 outcome studies. Fam Dynamics Addict Q, 1, 40-51.

Hester, R.K. (1994). Outcome research: Alcoholism. In M. Galanter & H.D. Kleber (eds), The American Psychiatric Press Textbook of Substance Abuse Treatment (pp 35-43). Washington, D.C.: APA.

Hoag, M.J. & Burlingame, G.M. (1997). Child and adolescent group psychotherapy: A narrative review of effectiveness and the case for meta-analysis. Journal of Child & Adolescent Group Therapy, 7, 51-68.

Hoffmann, N.G. & Kaplan, R.A. (1991). CATOR report: One-year Outcome Results for Adolescents. Key Correlates and Benefits of Recovery. St. Paul, MN, CATOR/New Standards.

Holder, H., Longabaugh, R., Miller, W.R. & Rubonis, A.V. (1991). Cost effectiveness of treatment for alcoholism: A first approximation. Journal of Studies on Alcohol, 52, 517-540.

Holsten, F. (1980). Repeat follow-up studies of 100 young Norwegian drug abusers. Journal of Drug Issues, 10, 491-504.

Horvath, A.O. & Symonds, B.D. (1991). Relation between working alliance and outcome in psychotherapy: A meta-analysis. Journal of Consulting and Clinical Psychology, 38, 139-149.

Hser, Y.I., Grella, C., Hsieh, S.C., & Anglin, M.D. (1999, June). National Evaluation of Drug Treatment for Adolescents (DATOS-A). Paper presented at the College on Problems of Drug Dependence, Acapulco, Mexico.

Hubbard, R.L., Cavanaugh, E.R., Craddock, S.G. & Rachal, J.V. (1985). Characteristics, behaviors, and outcomes for youth in the TOPS. In A.S. Friedman & G.M.

Beschner (eds), Treatment Services for Adolescent Substance Abusers. Rockville, Md: National Institute on Drug Abuse, U.S. Department of Health and Human Services.

Iverson, D.C., Jurs, S., Johnson, L. & Rohen, R. (1978). The effect of an education intervention program for juvenile drug abusers and their parents. Journal of Drug Education, 8, 101-111.

Iverson, D.C. & Roberts, T.E. (1980). The juvenile intervention program: Results of the process, impact and outcome evaluations. Journal of Drug Education, 10, 289-300.

Jainchill, N., Bhattacharya, G. & Yagelka, J. (1995). Therapeutic communities for adolescents. In Rahdert, E. & Czechowicz, D. (eds), Adolescent Drug Abuse: Clinical Assessment and Therapeutic Interventions. NIDA Research Monograph 156. U.S. Dept. of Health & Human Services.

Jenson, J.M., Wells, E.A., Plotnick, R.D., Hawkins, J.D. & Catalano, R.F. (1993). The effects of skills and intentions to use drugs on posttreatment drug use of adolescents. Am J Drug Alcohol Abuse, 19, 1-18.

Joanning, H., Quinn, W., Thomas, F. & Mullen, R. (1992). Treating adolescent drug abuse: a comparison of family systems therapy, group therapy, and family drug education. Journal of Marital and Family Therapy, 18, 345-356.

Johnstone, P. & Zolese, G. (1999). Length of hospitalisation for those with severe mental illness. Cochrane Database of Systematic Reviews, Issue 2.

Kaminer, Y. (1992). Desipramine facilitation of cocaine abstinence in an adolescent. J Am Acad Child Adolesc Psychiatry, 31, 312-317.

Kaminer, Y. (1994). Adolescent substance abuse. In M. Galanter & H.D. Kleber (eds), The American Psychiatric Press Textbook of Substance Abuse Treatment (pp 415-437). Washington, D.C.: American Psychiatric Association.

Kaminer, Y., Burleson, J.A., Blitz, C., Sussman, J. & Rounsaville, B.J. (1998). Psychotherapies for adolescent substance abusers. Journal of Nervous and Mental Disease, 186, 684-690.

Kandel, D.B. & Logan, J.A. (1984). Patterns of drug use from adolescence to young adulthood: I. Periods of risk for initiation, continued use, and discontinuation. American Journal of Public Health, 74, 660-665.

Kandel, D.B. & Raveis, V.H. (1989). Cessation of illicit drug use in young adulthood. Archives of General Psychiatry, 46, 109-116.

Kazdin, A.E. (1990). Psychotherapy for children and adolescents. Annual Review of Psychology, 41, 21-54.

Kennedy, B.P. & Minami, M. (1993). The Beech Hill Hospital/Outward Bound Adolescent Chemical Dependency Treatment Program. J Subst Abuse Treat, 10(4), 395-406.

Khuri, E.T., Millman, R.B., Hartman, N. & Kreek, M.M. (1984). Clinical issues concerning alcoholic youthful narcotic abusers. Advances in Alcohol and Substance Abuse, 3, 69-86.

Knapp, J.E., Templar, D.I., Cannon, W.G. & Dobson, S. (1991). Variables associated with success in an adolescent drug treatment program. Adolescence, 26, 305-317.

Labouvie, E. (1996). Maturing out of substance use: Selection and self-correction. Journal of Drug Issues, 26, 457-476.

Langrod, L., Alksne, L. & Gomez, E. (1981). A religious approach to the rehabilitation of addicts, in J. Lowinson & P. Ruiz (eds), Substance Abuse: Clinical Problems and Perspectives (pp. 408-420). Williams & Wilkins.

Lazarus, A.A. (1993). Tailoring the therapeutic relationship, or being an authentic chameleon. Psychotherapy, 30, 404-407.

Lewis, R.A., Piercy, F.P, Sprenkle, D.H., & Trepper, T.S. (1990). Family-based interventions for helping drug-abusing adolescents. Journal of Adolescent Research, 5, 82-95.

Longabaugh, R. (1996). Inpatient versus outpatient treatment: No one benefits. Addiction, 91, 1809-1810.

Lundy, A., Gottheil, E., McLellan, A.T., Weinstein, S.P., Sterling, R.C., Serota, R.D. (1997). Under-reporting of cocaine use at post-treatment follow-up and the measurement of treatment effectiveness. Journal of Nervous and Mental Disease, 185, 459-62.

Magura, S. & Kang, S.Y. (1996). Validity of self-reported drug use in high risk populations: a meta-analytical review. Substance Use and Misuse, 31, 1131-53.

Mann, B.J. & Borduin, C.M. (1991). A critical review of psychotherapy outcome studies with adolescents: 1978-1988. Adolescence, 26, 505-541.

Marzen, T.J. (1990). The effectiveness of an adolescent rehabilitation program for alcohol and other drug addictions in a San Francisco hospital: a 5 year follow-up study. Dissertations Abstracts International, 51, 2979-A.

McLellan, A.T., Alterman, A.I., Metzger, D.S., Grissom, G.R., Woody, G.E., Luborsky, L. & O'Brien, C.P. (1994). Similarity of outcome predictors across opiate, cocaine, and alcohol treatment: Role of treatment services. Journal of Consulting and Clinical Psychology, 62, 1141-1158.

McPeake, J.D., Kennedy, B., Grossman, J. & Beaulieu, L. (1991). Innovative adolescent chemical dependency treatment and its outcome: A model based on Outward Bound programming. Journal of Adolescent Chemical Dependency, 2, 29-57.

Miller, L. (1993). Who are the best psychotherapists? Qualities of the effective practitioner. Psychotherapy in Private Practice, 12, 1-18.

Miller, W.R., Brown, J.M., Simpson, T.L., Handmaker, N.S., Bien, T.H., Luckie, L.F., Montgomery, H.A., Hester, R.K. & Tonigan, J.S. (1995). What works? A methodological analysis of the alcohol treatment outcome literature. In R.K. Hester & W.R. Miller (eds), Handbook of Alcoholism Treatment Approaches (2nd ed) (pp 12-44). Needham Heights, MA: Allyn & Bacon.

Miller, W.R. & Sanchez-Craig, M. (1996). How to have a high success rate in treatment: advice for evaluators of alcoholism programs. Addiction, 91, 779-785.

Mohr, D.C. (1995). Negative outcome in psychotherapy: A critical review. Clinical Psychology – Science & Practice, 2, 1-27.

Morris, R.J. & Nicholson, J. (1993). The therapeutic relationship in child and adolescent psychotherapy: Research issues and trends. In T.R. Kratochwill & R.J. Morris (eds), Handbook of Psychotherapy with Children and Adolescents (pp 405-425). Boston, MA: Allyn & Bacon.

Myers, M.G., Brown, S.A. & Mott, M.A. (1995). Preadolescent conduct disorder behaviors predict relapse and progression of addiction for adolescent alcohol and drug abusers. Alcoholism: Clinical and Experimental Research, 19, 1528-1536.

Myers, W.C., Donahue, J.E. & Goldstein, M.R. (1994). Disulfiram for alcohol use disorders in adolescents. Journal of the American Academy of Child & Adolescent Psychiatry, 33, 484-489.

Najavits, L.M. & Weiss, R.D. (1994). Variations in therapist effectiveness in the treatment of patients with substance use disorders: An empirical review. Addiction, 89, 679-688.

Newcomb, M.D. & Bentler, P.M. (1989). Substance use and abuse among children and teenagers. American Psychologist, 44, 242-248.

Nigam, R., Schottenfeld, R. & Kosten, T.R. (1992). Treatment of dual diagnosis patients: a relapse prevention group approach. J Subs Abuse Treat, 9(4), 305-9.

Pape, H. & Hammer, T. (1996). How does young people's alcohol consumption change during the transition to early adulthood? A longitudinal study of changes at aggregate and individual level. Addiction, 91, 1345-1357.

Pfeiffer, S.I., O'Malley, D.S. & Shott, S. (1996). Factors associated with the outcome of adults treated in psychiatric hospitals: A synthesis of findings. Psychiatric Services, 47, 263-269.

Pompi, K.F. (1994). Adolescents in therapeutic communities: Retention and post-treatment outcome. In F.M. Tims, G. DeLeon & N. Jainchill (eds), Therapeutic Community: Advances in Research and Application (NIDA Research Monograph 144). Rockville, MD: U.S. Department of Health and Human Services

Query, J.M. (1985). Comparative admission and follow-up study of American Indians and whites in a youth chemical dependency unit on the north central plains. The International Journal of the Addictions, 20, 489-502.

Ralph, N. & McMenamy, C. (1996). Treatment outcomes in an adolescent chemical dependency program. Adolescence, 31, 91-107.

Richardson, D.W. (1996). Drug rehabilitation in a treatment farm setting: The Nitawgi Farm experience, 1978-1990. Journal of Developmental & Behavioural Pediatrics, 17, 258-261.

Richter, S.S., Brown, S.A. & Mott, M.A. (1991). The impact of social support and self-esteem on adolescent substance abuse treatment outcome. Journal of Substance Abuse, 3, 371-385.

Roffman, R.A., Stephens, R.S., Simpson, E.E. & Whitaker, D.L. (1988). Treatment of marijuana dependence: Preliminary Results. Journal of Psychoactive Drugs, 20, 129-137.

Roth, A. & Fonagy, P. (1996). The relationship between outcome and therapist training, experience, and technique. In A. Roth & P. Fonagy (eds), What Works for Whom? A Critical Review of Psychotherapy Research (pp 341-357). New York: Guilford.

Rush, T.V. (1979) Predicting treatment outcome for juvenile and young adult clients in the Pennsylvania substance abuse system. In G.M. Beschner & A.S. Friedman (eds), Youth Drug Abuse: Problems, Issues, and Treatment (pp 629-656). Lexington, MA: Lexington Books.

Sells, S.B. & Simpson, D.D. (1979). Evaluation of treatment outcome for youths in drug abuse reporting program (DARP): A follow-up study. In G.M. Beschner & A.S. Friedman (eds), Youth drug abuse: Problems, Issues and Treatment (pp 571-628). Lexington, Mass: Lexington Books.

Shoemaker, R.H. & Sherry, P. (1991). Post treatment factors influencing outcome of adolescent chemical dependency treatment. Journal of Adolescent Chemical Dependency, 2, 89-105.

Smith, T.E. (1983). Reducing adolescent's marijuana abuse. Social Work in Health Care, 9, 33-44.

Smith, M.L., Glass, G.V. & Miller, T.I. (1980). The Benefits of Psychotherapy. Baltimore: John Hopkins University Press.

Smith, G.T., McCarthy, D.M. & Goldman, M.S. (1995). Self-reported drinking and alcohol-related problems among early adolescents: Dimensionality and validity over 24 months. Journal of Studies on Alcohol, 56, 383-394.

Sobell, L.C. & Sobell, M.B. (1996). Alcohol timeline followback (TLFB) users' manual. Toronto: Addiction Research Foundation.

Spicer, J. (1991). Does your program measure up? An addiction professional's guide for evaluating treatment effectiveness. Center City, Minnesota: Hazelden.

Stanton, M.D. & Shadish, W.R. (1997). Outcome, attrition, and family-couples treatment for drug abuse: A meta-analysis and review of the controlled, comparative studies. Psychological Bulletin, 122, 170-191.

Stark, M.J. (1992). Dropping out of substance abuse treatment: A clinically oriented review. Clinical Psychology Review, 12, 93-116.

Steenbarger, B.N. (1994). Duration and outcome in psychotherapy: An integrative review. Professional Psychology – Research & Practice, 25, 111-119.

Stinchfield, R.D., Niforopulos, L. & Feder, S.H. (1994). Follow-up contact bias in adolescent substance abuse treatment outcome research. J. Stud. Alcohol, 55, 285-289.

Szapocznik, J., Kurtines, W.M, Foote, F.H., Perez-Vidal, A. & Hervis, O. (1983). Conjoint versus one person family therapy: Some evidence for the effectiveness of conducting family therapy through one person. Journal of Consulting and Clinical Psychology, 51, 889-899.

Szapocznik, J., Kurtines, W.M., Foote, F.H., Perez-Vidal, A. & Hervis, O. (1986). Conjoint versus one-person family therapy: Further evidence for the effectiveness of conducting family therapy through one person with drug-abusing adolescents. Journal of Consulting and Clinical Psychology, 54, 395-397.

Target, M. & Fonagy, P. (1996). The psychological treatment of child and adolescent psychiatric disorders. In A. Roth & P. Fonagy (eds), What Works for Whom? A Critical Review of Psychotherapy Research (pp 263-320). New York, NY: Guilford.

Turner, C.F., Lessler, J.T. & Gfroerer, J.C. (1992). Survey Measurement of Drug Use: Methodological Studies. Rockville, MD: National Institute on Drug Abuse.

U.S. Department of Health and Human Services (1993). National Drug and Alcoholism Treatment Unit Survey (NDATUS): 1991 Main Findings Report. Substance Abuse and Mental Health Services Administration. DHHS Pub. No. (SMA) 93-2007, Rockville, MD: the Administration.

U.S. Department of Health and Human Services (1995a). Effectiveness of Substance Abuse Treatment, September 1995. Substance Abuse and Mental Health Services Administration. DHHS Publication no. (SMA) 95-3067. Author.

U.S. Department of Health and Human Services (1995b). National Admissions to Substance Abuse Treatment Services: The Treatment Episode Data Set (TEDS) 1992-1995. Substance Abuse and Mental Health Services Administration. Author

U.S. Department of Health and Human Services (1997a). The Prevalence and Correlates of Treatment for Drug Problems. Substance Abuse and Mental Health Services Administration. DHHS Publication No. (SMA) 97-3135. Author.

U.S. Department of Health and Human Services (1997b). NTIES: The National Treatment Improvement Evaluation Study Final Report. Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, National Opinion Research Center at the University of Chicago, March 1997.

U.S. Department of Health and Human Services (1998). Services Research Outcomes Study. Substance Abuse and Mental Health Services Administration, Office of Applied Studies (OAS), September 1998.

Vaglum, P. & Fossheim, I. (1980). Differential treatment of young abusers: A quasi-experimental study of a therapeutic community in a psychiatric hospital. Journal of Drug Issues, 10, 505-16.

Vaillant, G.E. (1995). The Natural History of Alcoholism Revisited. Cambridge, Mass: Harvard University Press.

Vik, P.W., Grizzle, K.L. & Brown, S.A. (1992). Social resource characteristics and adolescent substance abuse relapse. Journal of Adolescent Chemical Dependency, 2, 59-74.

Wagner, E.F., Brown, S.A., Monti, P.M. Myers, M.G. & Waldron, H.B. (1999). Innovations in adolescent substance abuse intervention. Alcoholism: Clinical and Experimental Research, 23, 236-249.

Waldron, H.B. (1997). Adolescent substance abuse and family therapy outcome: A review of randomized trials. Advances in Clinical Child Psychology, 19, 199-234.

Weiss, J.R., Weiss, B., Han, S.S., Granger, D.A. & Morton, T. (1995). Effects of psychotherapy with children and adolescents revisited: A meta-analysis of treatment outcome studies. Psychological Bulletin, 117, 450-468.

Wilkinson, D. & LeBreton, S. (1986). Early indications of treatment outcome in multiple drug users. In Treating Addictive Behaviors: Processes of Change. New York: Plenum.

Williams, S.G. & Baron, J. (1982). Effects of short-term intensive hospital psychotherapy on youthful drug abusers: I. Preliminary MMPI data. Psychological Reports, 50, 79-82.

Williams, R.J., McDermitt, D. & Bertrand, L. (submitted for publication). Accuracy of parental beliefs about adolescent drug use.

Winters, K.C., Latimer, W.L. & Stinchfield, R.D. (in press). Adolescent treatment for alcohol and other drug abuse. In Source Book on Substance Abuse: Etiology, Methodology and Intervention. New York: Allyn & Bacon.

Wish, E.D., Hoffman, J.A. & Nemes, S. (1997). The validity of self-reports of drug use at treatment admission and at follow-up: comparisons with urinalysis and hair assays. In L. Harrison & A. Hughes (eds), The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates (NIDA Research Monograph 167). Rockville, MD: U.S. Department of Health and Human Services.

Author Note

Robert J. Williams, Addiction Centre, Foothills Medical Centre; Samuel Y. Chang, Addiction Centre, Foothills Medical Centre; Addiction Centre Adolescent Research Group (ACARG): Brian Cram and Mark Lagimodiere, Addiction Centre, Foothills Medical Centre. The authors would like to thank Nady el-Guebaly and David Hodgins for useful critiques of earlier drafts of this paper.

Correspondence concerning this article should be addressed to Dr. Robert J. Williams, Addiction Centre, Foothills Medical Centre, 6th Floor North Tower, 1403-29th Street NW; Calgary, Alberta, CANADA, T2N 2T9. Electronic mail may be sent to rob.williams@CRHA-Health.Ab.Ca.

Footnotes

[1] Abstinence rates are similar when all 53 studies are included: average of 39% abstinence at discharge, 37% at 6 months, and 35% at 12 months.

Table 1

Multi-site, Multi-program Outcome Studies of Adolescent Substance Abuse Treatment

Study	N	Client Characteristics	Program Characteristics	Methodology	Results
Friedman, Glickman & Morrissey (1986) Friedman & Glickman (1986) Friedman, Glickman & Kovach (1986) **1**	5603	16=ave age; 62% male; 80% white; 38% history of arrests; polydrug users with M most common problem	30 outpatient programs in various states; 19 wks mean length of tx; USA	• self-report of A at discharge	Discharge • average frequency of use decreased 50% versus pre-tx, somewhat less for M • 82% employed/seeking employment vs 24% pre-tx; no increase in educational enrolment • *adolescent variables related to decreased substance use in order of importance*: M not primary drug of abuse (statistical artifact?); longer time in tx; fewer prior txs; white; each of these variables account for < 2% of the variance, however • *program variables related to decreased substance use*: treating large # of clients; large budget; therapists with >2 yrs experience; offering comprehensive services (schooling, vocational, recreation, birth control); using immediate crisis intervention, gestalt therapy, music/art therapy, group confrontation; program perceived as allowing free expression; small discrepancy between staff & client ratings of autonomy & staff control; programs rated by staff as having practical problem orientation, order and organization
Harrison & Hoffman (1987) CATOR **2a**	915	16=ave age; 67% male; most polydrug users with A,M most common; high levels of psychological, legal & educational problems	variety of residential tx programs; 38 days median time in tx; USA	• SR of A by phone or mail at 6 mo & 1 yr post-tx • only tx completers included in follow-up (NRS)	1 year follow-up • 44% abstinent in previous yr; additional 23% with brief relapse in previous yr • *variables related to success*: tx completion; female; absence of depression in females • 32% tx drop-out rate
Hoffmann & Kaplan (1991) CATOR **2b**	>1000	80% 15-17; 64% male; 90% white; higher socio-economic; most polydrug users with A,M,Am most common; 59% hx arrests; 20% hx suicide attempts; 25% out of school; 17% learning disabilities	20 different inpatient programs; USA	• assess method not reported • 6 mo & 1 yr follow-up post-tx • only tx completers (100%) included in follow-up (n=826)	6 month follow-up • 57% of tx completers abstinent in previous 6 months 1 year follow-up • 40% of tx completers abstinent in previous year • significantly reduced school problems and arrests for abstinent group • *variables related to success*: regular attendance at support group; parents attendance in support groups; proportion of friends using post-tx

Hser, Grella, Hsieh & Anglin (1999) DATOS-A **3a**	219	11-18 age; 74% male; 54% white; most polydrug users with M most common; 59% with criminal justice supervision	14 adolescent outpatient tx programs in 6 cities; USA	• SR of A at 1 yr post-tx • 74% of entire sample of 4229 included in follow-up	1 year follow-up • 43% with weekly marijuana use in past yr compared to 94%1 yr pre-tx • 15% heavy drinkers in past yr compared to 22% 1 yr pre-tx • 43% with any hard drug use in past yr compared to 50% 1 yr pre-tx • 50% committed illegal act in past yr compared to 66% 1 yr pre-tx • *variables related to success (all 3 tx modalities):* nonwhite; no psychiatric dx; no criminal involvement; nonusing pre-tx peer group (females only); number of problem areas addressed; residential tx; *variables with no relationship to success:* age; family drug problems; academic failure; tx intensity
3b	327		9 short-term adolescent inpatient programs in 6 cities; USA		1 year follow-up • 52% with weekly marijuana use in past yr compared to 96%1 yr pre-tx • 20% heavy drinkers in past yr compared to 38% 1 yr pre-tx • 49% with any hard drug use in past yr compared to 71% 1 yr pre-tx • 58% committed illegal act in past yr compared to 80% 1 yr pre-tx
3c	520		13 long-term adolescent residential programs in 6 cities; USA		1 year follow-up • 45% with weekly marijuana use in past yr compared to 98%1 yr pre-tx • 20% heavy drinkers in past yr compared to 33% 1 yr pre-tx • 28% with any hard drug use in past yr compared to 54% 1 yr pre-tx • 48% committed illegal act in past yr compared to 78% 1 yr pre-tx
Hubbard, Cavanaugh, Craddock & Rachal (1985) TOPS **4a**	580 (random select from 3389)	57% <18 & 43% 18-19; 66% male; 86% white; most polydrug users; 14% prior drug tx; 28% legal pressure for tx	11 publicly funded outpatient programs; USA	• 240 S's • SR of A at 1 yr post-tx	1 year follow-up • decreases in most drug use in previous year, although less than obtained for residential tx; increases in use for individuals in tx < 3 mo • increase in criminal activity; increase in full-time work except 18-19 yr olds in tx <3 mo; decrease in suicidal thoughts • 33% tx drop-out rate
4b	402 (random select from 3389)	50% <18 & 50% 18-19; 70% male; 78% white; most polydrug users; 26% prior drug tx; 39% legal pressure for tx	14 publicly funded residential programs, mostly therapeutic communities; 77 days median time in tx; USA	• 64% included in 1 yr post-tx follow-up (NRS)	1 year follow-up • decrease in use for all substances in previous year • decrease in criminal activity; increase in full-time work except 18-19 yr olds in tx <3 mo; decrease in suicidal thoughts • *variables related to success*: time in tx • 90% tx drop-out rate
Rush (1979) UDCS **5a**	2417	<18; 55% male; 87% white; 47% multi-drug users; 15% prior treatment; 14% with convictions	outpatients from all public Pennsylvania drug treatment facilities; 123 days median treatment time; USA	• "productivity" (either in school, in training program or employed) at discharge assessed • 75% included in analysis	Discharge • *variables related to success*: strongest predictor was being in school at admission, weaker, but also significant predictors were being employed at admission, being older when first began using drugs and having fewer felony convictions at admission
	1360	18 & 19 age; 70% male; 81% white; 51% multi-drug users; 27% previous treatment; 30% with convictions	outpatient sample; 100 days median treatment	• "productivity" at discharge assessed • 87% included in analysis	Discharge • *variables related to success*: strongest predictor was being employed at admission; weaker, but also significant were school status at admission, being white, and length of time in treatment

5b	503	<18; 70% male; 88% white; 76% multi-drug; 36% prior treatment; 39% with convictions	therapeutic community sample; 36 days median treatment	• "productivity" at discharge assessed • 97% included in analysis	Discharge • *variables related to success*: attending school at admission, length of time in treatment, and number of years in school
	458	18 & 19 age; 79% male; 80% white; 59% multi-drug; 45% previous treatment; 50% with convictions	therapeutic community sample; 34 days median treatment	• "productivity" at discharge assessed • 97% included in analysis	Discharge • *variables related to success*: time in tx best predictor; followed by employment at admission, attending school at admission, more felony arrests prior to tx
Sells & Simpson (1979) DARP **6a**	2745	72% <17; 63% male; 85% white; 31% opiate users; 10% prior tx	1. dozens of public outpatient programs; 108 days median time in tx 2. control group of 38 who chose not to enter tx USA	• SR of A during tx and 4-6 yr post tx • stratified sample of 158 included in follow-up (76% of intended sample)	During treatment • significant reductions in substance use (particularly opiods) and criminality with somewhat smaller improvements in productive activities (homemaking, school), employment, etc.; most improvement occurred in first 2 months • *variables related to success*: time in tx strongly predictive; noncriminality 4-6 year follow-up • 85% abstinent from opiates; 14% from alcohol; 34% from marijuana; 71% from other nonopiods in previous 2 mo; decrease in opiod use, nonopiod use, minor decreases in marijuana and alcohol use compared to 2 mo pre-tx; "control group" too dissimilar to make comparisons (higher pre-tx opiod use and delinquent activity) • increase in employment and productive activities, decrease in arrests in 2 previous mo compared to 2 mo prior to tx • *variables related to success*: time in tx; less pre-tx substance use • 48% tx drop-out rate
6b	1222	46% <17; 63% male; 71% white; 73% opiate users; 16% prior tx	1. dozens of public residential programs including therapeutic communities, methadone maintenance, and detoxification; 90 days median time 2. control group of 38 who did not attend tx USA	• SR of A during tx and 4-6 yr post tx • stratified sample of 238 included in follow-up (76% of intended sample)	During treatment • significant reductions in substance use (particularly opiods) and criminality with somewhat smaller improvements in productive activities, employment, etc.; most improvement occurred in first 2 months • methadone maintenance had greater improvements than other tx • *variables related to success*: time in tx strongly predictive; white 4-6 year follow-up • 91% abstinent from opiates; 10% from alcohol; 33% from marijuana; 76% from other nonopiods; 6% had problems related to alcohol in previous 2 mo; decreased opiod use, nonopiod use, no change in alcohol use, slight increase in marijuana use in previous 2 months compared to 2 months prior to tx; no tx group had improvements as well, but tx group improvements somewhat greater for opiods and alcohol • increase in employment and productive activities, decrease in arrests; no tx group had less favourable outcome on all variables • *variables related to success*: time in tx; fewer problems at admission • 67% drop-out rate

U.S. Dept of Health and Human Services (1997b) NTIES **7**	236	13-17=age; 79% male; 33% white; most polydrug users with M,A most common; 33% with prior tx	Federally funded programs; 59% outpatient; 37% long-term residential; 3% short-term residential; median length of 2 mo; USA	• SR of A + urinalysis for 50% at 1 yr post-tx • 82% of entire sample (4411) included in follow-up (NRS)	1 year follow-up • 30% abstinent in previous yr ; 10% decrease in number of outpatients using any illicit drug and 22% decrease in number of residential patients using any illicit drug in previous yr compared to yr prior to tx • Significant reduction in criminal activity in previous yr compared to yr prior to tx (48% fewer adolescents reported beating someone up; 41% fewer selling drugs; 48% fewer shoplifting; 48% fewer committing major property crimes) • 70% drop-out rate
U.S. Dept of Health and Human Services (1998) SROS **8**	156	13-18=age; 50% with legal pressure for tx	Nationwide representative sample of 99 different drug treatment programs; 80 outpatient; 47 inpatient; 28 residential; 1 outpatient methadone USA	• SR of A corroborated by urinalysis at 5 yr post-tx • 59% from total sample of 3047 included in follow-up (NRS)	5 year follow-up • significant increase in % of individuals using alcohol and crack in previous 5 years compared to 5 years before treatment (80.2% to 92.0% for alcohol; 5.1% to 15.4% for crack); no significant changes in use of other substances • significant increase in % of individuals with alcohol-related driving offenses and drug trafficking in previous 5 years compared to 5 years before tx; no significant changes in rates of prostitution, theft, break & entry, or parole violation

N = number entering treatment
CLIENT CHARACTERISTICS: A=alcohol; M=marijuana; C=cocaine; Am=amphetamines; H=hallucinogens
METHODOLOGY: SR=self report; A=adolescent; P=parent; NRS=nonrandom sample

Table 2

Single Program Outcome Studies of Adolescent Substance Abuse Treatment

Study	N	Client Characteristics	Program Characteristics	Methodology	Results
AADAC (1995) 9	395	12-17 age; 63% male; majority polydrug users with A,M,H most common; 76% hx arrests; 27% hx suicide attempts; 35% physically & 24% sexually abused	26 AADAC facilities in Alberta, CANADA; 83% outpatient (13% G; 17% F; 3 sessions ave); 8% day tx & 5% non-hospital residential tx (S, R, 84% G; 65% F; 29 days ave); skills orientation; CANADA	• SR of A & P by phone at discharge & 3 mo post-tx • 53% A & 14% P included at discharge and 49% A & 14% P included in follow-up (NRS)	Discharge • 27% abstinent and additional 33% with decreased substance use in previous month • 56% decreased life problems compared to pre-tx • 64% tx drop-out rate 3 month follow-up • 29% abstinent and additional 40% decreased substance use in previous month; 19% abstinent in previous 3 months • 56% with decreased life problems compared to pre-tx • *variables related to success:* enrolled in school at discharge, motivation, no family substance use, increased participation in recreational activities, improved problem solving
AARC (1994) 10	56	16.9=ave age (13-22); 76% male; 87% white; polydrug use with M & A most common; 24% tx mandated; 68% hx arrest; 37% hx suicide attempts	day tx (F,G, R, 12 step, peer pressure) while living in home of adolescent further along in tx; 9-12 mo modal time in tx; CANADA	• SR of A & P at 2-24 mo post-tx (ave=8-12 mo) • 68% A included at follow-up (did not include drop-outs receiving <2 mo tx)	8-12 month follow-up • 65% of tx completers abstinent since end of tx and 87% very reduced substance use; 33% of 2-12 mo drop-outs abstinent since drop-out and 78% with very reduced substance use; combined samples: 54% abstinent and 84% very reduced substance use since discharge (if assume <2 mo drop-outs have same outcome as 2-12 mo drop-outs then have 47.5% abstinence and 82% decreased substance use) • 91% with reduced criminal involvement; 94% with improved family life • 55% tx drop-out rate
Alford, Koehler & Leonard (1991) 11	157	16=ave age; 62% male; disproportionate higher socioeconomic; majority polydrug users with A,M,H most common; >44% hx arrests; 61% hx school suspension	45 day hospital inpatient followed by 45 day halfway house; NA/AA 12 step program; G, F; USA	• SR of A & family member (50% in person) at 6 mo, 1 yr, 2 yr post-tx • 96% of A included in 6 mo follow-up, 93% at 1 yr; 89% at 2 yr	6 month follow-up • 71% male (m) tx completers (c) essentially abstinent (no use or only 1-3 relapses); 37% m noncompleters (nc); 79% fc; 30% fnc in previous 6 mo 1 year follow-up • 48% mc; 44% mnc; 70% fc; 28% fnc essential abstinent in previous yr 2 year follow-up • 40% mc; 37% mnc; 61% fc; 27% fnc essentially abstinent in previous 2 yr • 72% of essentially abstinent A's had good social functioning vs 37% for high frequency users • *variables related to success*: tx completion; attendance at AA/NA
Amini, Zilberg, Burke & Salasnek (1982) 12	87	16.1=ave age; 69% male; 52% white; 100% conduct disordered youth referred through probation; excluded S's with psychosis, mental retardation & serious violence potential	1. non-hospital residential tx (F,G,R,S, 132 days ave) 2. outpatient probation; USA	• random assignment to tx group • SR of A 1 yr after entering program • 84% included in follow-up	~6 month follow-up • significant decrease in drug and alcohol use in both groups in previous 6 mo • no statistical difference between outcomes for inpatient vs outpatient • significant decrease in school disturbance and antisocial behaviour; significant decrease in several MMPI clinical scales in previous 6 mo

Azrin, Donohue, Besalel, et al. (1994) 13	26	16=ave age; 77% male; 79% white; polydrug users with M,C,H most common	1. supportive counselling (6 mo; 15 sessions) 2. behavioural tx (restructure family & peer relations, urge control) (6 mo; 15 sessions); USA	• random assignment to tx group • urinalysis supplemented by family report and SR at discharge	Discharge • 9% of A in counselling tx abstinent in previous mo vs 73% in behavioural tx • superior school/work attendance, family relations, mood, conduct in behavioural group
Bianco & Wallace (1991) 14	116	15.6=ave age; 100% female; polydrug users with A,M,Am most common; 16% out of school; 53% hx abuse; 17% hx arrests; 54% previous tx	residential tx (15 mo ave) (F,G) with gradual transitioning back to community; USA	• staff's indep ratings about post-tx functioning 46 mo (ave) post-tx (based on follow-up case records, post-discharge contacts & interviews with 59%) • 54% included in analysis (NRS)	Discharge • 48% abstinent at time of discharge; 89% with little or no drug involvement 46 month follow-up • 38% highly successful on global measure of success that included criminal activity, drug use, employment/homemaking/school, family functioning since discharge; 32% moderately successful; 30% not successful • *variables related to success:* involvement in school/employment/homemaking at discharge; drug use at discharge; family involvement in tx; traditional families; tx completion; completion of educational or skill development during tx
Braukmann, Bedlinton, Belden, et al (1985) 15	241	15.6=ave age; 100% male; 73% white; 100% juvenile offenders referred through court excluding S's with hx of extreme violence	1. Teaching-Family group homes (189 days ave) 2. non-Teaching-Family group home (289 days ave) homes 3. no tx group of 61 matched friends; USA	• matched assignment to tx group • SR of A during tx and by phone at 3 mo post-tx (on ave) • 25% included in follow-up (i.e.100% of matched pairs)	During treatment • youths in teaching-family group homes had significantly decreased substance use compared to all other conditions • *variables related to success*: lower pre-tx substance abuse; lower pre-tx antisocial behaviour 3 month follow-up • neither tx had a significant post-tx effect on substance use or prosocial behaviours compared to control group • no statistical difference between outcomes for Teaching Family Homes and non-Teaching Family Homes • *variables related to success:* lower pre-tx substance abuse; lower pre-tx antisocial behaviour
Brown, Gleghorn, Schuckit, et al (1996) & Myers, Brown & Mott (1995) 16	166	15.9=ave age; 60% male; 80% white; most polydrug users; excluded clients with DSM axis I diagnoses that predated substance use	two 4-6 wk inpatient programs (F,G,R,S); USA	• indep SR of A & P at 6 mo, 1 yr, 2 yr post-tx • 80% included at 1 and 2 yr post-tx	1 year follow-up • 14% abstinent in previous yr; significant decrease in drug and alcohol use in previous 3 mo compared to 3 mo pre-tx (alcohol=11 days/mo -> 5 days/mo; drugs=35 times/mo ->9 times/mo) 2 year follow-up • 14% abstinent in previous 2 yr; significant decrease in drug and alcohol use in previous 3 mo compared to 3 mo pre-tx (alcohol = 11 days/mo -> 7 days/mo; drugs = 35 times/mo ->7 times/mo) • *variables related to success*: fewer conduct disorder characteristics predicted better tx outcome for alcohol, but not other drugs; better post-tx relapse coping skills; post-tx interpersonal conflict; post-tx exposure to substance-abusing models (predictive for alcohol use but not drug use)
Brown, Vik & Creamer (1989) 17	75	15.6=ave age; 54%males; 82% white; most polydrug users with A,M,C most common; 61% hx arrests; 54% school problems; 87% family conflict; excluded S's with psychiatric disorder preceding tx	inpatient program; USA	• indep. SR of A & P at 3 & 6 mo post-tx • 81% included at 6 mo	3 month follow-up • 36% abstinent in previous 3 mo • 64% relapsed in 1st 3 mo post-tx 6 month follow-up • 30% abstinent in previous 6 mo • relapses occur most commonly in presence of social pressure to drink

Brown, Mott & Myers (1990) 18		indep. replication of Brown et al (1989)	3 inpatient programs; USA	• indep. SR of A & P at 6 & 12 mo post-tx • 97% included at 6 mo & 95% at 12 mo	6 month follow-up • 33% abstinent and another 24% improved in previous 6 mo
Cady, Winters, Jordan et al. (1996) 19	234	67% 15-17; 61% male; 83% white; 14% court-ordered	residential or outpatient tx program (ave=23 days); USA	• SR of A at 6 mo "follow-up" • 85% included in follow-up	6 month follow-up • 43% abstinent in previous 6 mo • *variables related to success*: pre-tx substance abuse; time in tx; tx completion; motivation for tx; female • 25% tx drop-out rate
Cornwall & Blood (1998) 20	239	16.5=ave age; 65% male; polydrug users; 63% school failure; 67% legal difficulties; 63% abused	1. 10 wk day treatment; G,S,F,R 2. 12 wk inpatient program; G,S,F,R CANADA	• nonrandom assignment to group (inpatient more severe drug abuse) • SR of A at discharge and 6 mo follow-up • 56% included in discharge analysis; 44% included at 6 mo (tx drop-outs not included)	discharge • significant reduction in drug abuse compared to pre-tx • significant improvement in self-esteem, family functioning, psychological problems, behavioural problems compared to pre-tx • 37% drop-out rate for day tx; 41% for inpatient 6 month follow-up • significant reduction in drug abuse • significant improvement in self-esteem, peer relations, family functioning, psychological problems, behavioural problems compared to pre-tx • no significant differences in tx outcome between inpatient and day tx
DeLeon (1984) 21	84	64% male; 23% white; most polydrug users, opiates primary drug for 1/4; 45% court referred	residential therapeutic community (Phoenix House); USA	• 2 yr post-tx • 78% follow-up at both 1 & 2 yrs (NRS)	1 & 2 year follow-up • composite success index that included substance use and criminality showed decrease since discharge • *variables related to success*:: tx completer; nonlegally referred; primarily opiod user • 83% tx drop-out rate
Feigelman, Hyman & Amann (1988) 22	73	68% male; 100% white; higher socioeconomic; most polydrug users with M,A,H most common; 71% hx arrests	non-hospital day tx of 19-39 months; G,F,S,R; USA	• SR of A (19% phone) + urine screen + check of MV offenses at 6.1 yr (3-8 yr range) post-tx • 48% included in follow-up (NRS)	3-8 year follow-up • 3% totally abstinent, additional 26% had no use of illegal drugs and only moderate use of alcohol in previous 6 years • *variables related to success*: tx completion; age of 1st substance use; # prior txs • 86% tx drop-out rate
Filstead (1992) 23	1127	16.3=ave age; 70% male; 91% white; most polydrug users with A,M,C most common	27 different non-hospital residential programs operated by PARKSIDE Medical Services Corp; 33 days average; USA	• SR of A by phone at 11 mo post-tx • 49% included in follow-up (NRS)	11 month follow-up • 37% abstinent & additional 10% with one relapse since discharge; 78% report lower substance use since discharge • 67% report improvement in general overall functioning compared to pre-tx • *variables related to success*: female; tx completion; aftercare involvement • 34% drop-out rate from primary tx; 71% drop-out rate from full program (continuing care and self-help activities)
Friedman (1989) 24	169	17.9=ave age; 60% male; 90% white; most polydrug users with M,A,Am most common; 35% hx arrests	1. family therapy in 6 different outpatient programs of 6 mo duration 2. parent support groups in 6 outpatient programs of 6 mo duration; USA	• random assignment to tx group • SR of A & P at 9 mo post-tx • 80% included in follow-up	9 month follow-up • reduction in substance use and abuse by 50% in both groups "at time of follow-up" • significant decrease in psychological problems, family problems "at time of follow-up" • no difference between groups in degree of improvement

Friedman & Glickman (1987) 25	205	16.2=ave age; 100% male; 75% white; polydrug users with A,M,Am most common; 100% court-ordered	day program emphasizing counselling and supportive skill learning; USA	• SR of A at 22 mo after admission • 63% included in follow-up (NRS)	<u>follow-up 22 months after admission</u> • *variables related to success*: A with more psychiatric symptoms had somewhat better substance use outcomes; higher pre-tx substance use
Friedman, Granick, Kreisher & Terras (1993); Friedman, Granick & Kreisher (1994); Friedman, Terras & Ali (1998) 26	453	16.1=ave age; 52% male; 83% white; significantly higher level of substance abuse and other problems than outpatient sample 15.7=ave age; 70% male; 52% white	2 short hospital inpatient programs 4 long outpatient programs; USA	• SR of A at 6-13 months after entering tx (ave=10.8 mo)	<u>6-13 month follow-up after beginning treatment</u> • outpatient tx significantly greater effect in reducing substance abuse for patients with more severe social problems, family problems and employment problems; trend toward significance for psychiatric problems • *inpatient variables related to success*: younger, motivation for tx, not being Catholic, fewer pretx social problems, not being expelled, attending school; *variables with no relationship to success* : gender, race, intact family, socioeconomic status, pretx medical, school, family, psychological, legal, and drug problems • *outpatient variables related to success:* female, higher socioeconomic class, motivation for tx, less illegal behaviour, less drug use, not being expelled; *variables with no relationship to success*: age, race, religion, intact family, pretx medical, school, social, family, and psychological problems
Friedman, Schwartz & Utada (1989) 27	330	16.6=ave age; 70% male; 99% white; most polydrug users with A,M,Am most common; 29% suspended or dropped-out from school	14 mo (ave) non-hospital day program; G,F,R; 5 phase program starting with living in host home and gradually moving toward community integration; USA	• indep. SR of A & P at 14.6 mo (on average) post-tx • 67% included in follow-up (NRS)	<u>14.6 month follow-up</u> • 65% abstinent from alcohol, 74% from marijuana, 91% from amphetamines, 90% from hallucinogens, 86% from cocaine, 95% sedatives, 92% inhalants <u>since discharge</u>; 85% report lower substance use <u>since discharge</u> • significant improvement in suicidal ideation, fights, arrests <u>comparing status at admission to status at follow-up</u> • *variables related to success* : delinquency, church attendance, pre-tx drug abuse, drug abuse in peers, school attendance, sibling relationships, parental drug use, • 34% tx drop-out rate
Friedman, Terras & Kreisher (1995); Friedman & Terras (1996) 28	219	17.9=ave age; 64% male; 90% white; polydrug users with A,M,Am most common; 40% had been in jail	6 different outpatient programs; F,G; ave of 8.5 sessions; USA	• self-report of A & P at 15 months after start of treatment • 80% included in follow-up	<u>15 month follow-up after beginning treatment</u> • *variables related to success*: males without paranoia; individuals with borderline psychotic symptoms; positive family functioning; positive relationship with parents • 19% tx drop-out rate
Friedman, Utada & Glickman (1986) (Gaus & Henderson, 1985) 29	205	16=ave age; 100% male; 75% white; most polydrug use with M,A,Am most common; 100% court-referred conduct disordered youth; 82% dissatisfied with school	off-campus life skill activities (outward bound; adventure learning; community skills) for adolescents attending a private vocational high school; USA	• SR of A in person at 22 mo after admission to program • 63% included in follow-up (NRS)	<u>Follow-up 22 months after admission</u> • significant decrease in frequency of PCP and hallucinogen use <u>per month compared to pre-tx</u>, but significant increase in frequency of alcohol, cocaine and heroin use <u>per month compared to pre-tx</u> • significant decrease in legal offenses; school problems; slight decrease in family problems; mixed effects on psychological problems <u>compared to pre-tx</u>

Grenier (1985) 30	?	15=ave age; 60% male; mostly white and middle-class; most polydrug users with A,M,Am most common; 60% with drug-addicted family member	1. hospital inpatient "AA-family" model, F, G, S, R; 1 wk evaluation; 4 wks tx; 6 wks outpatient; 2 yrs aftercare 2. wait control group of 74 who contacted program but did not receive tx; USA	• random sample of 117 former patients contacted for tx group • SR of A & P by phone and mail for tx gp and SR of P for control gp; 9 mo since contact (1-18 mo range) • 36% controls included in follow-up (NRS)	9 month follow-up • 66% tx group not "currently using" (including graduates and nongraduates), which is significantly higher than the 20% in control group • 41% of control group had improved behaviour; not reported for tx group • 45% tx drop-out rate
Griffen-Shelley, Sandler & Park-Cameron (1991) 31	100	17=ave age; 77% male; mostly white and middle-class; most polydrug users with A most common	short-term hospital inpatient program specializing in dually-diagnosed patients; USA	• SR of A & P by mail at 1.5 yrs post-tx • 13% included in follow-up, 48% for drug results (NRS)	1.5 year follow-up • 35% abstinent at time of follow-up • improvements in psychological functioning, family relations, school performance, physical health
Hennggeler, Borduin, Melton et al (1991) (South Carolina) 32a	47	15.1=ave age; 72% male; 26% white; lower socioeconomic; 100% conduct disordered youth	1. multisystemic family therapy (ave=36 hr over 4 mo) 2. monthly meeting with probation; USA	• random assignment to tx group • SR of A at discharge	Discharge • adolescents receiving family therapy had significantly lower soft drug use in previous 3 mo compared to 3 mo pre-tx compared to adolescents receiving regular probation services
Hennggeler, Borduin, Melton et al (1991) (Missouri) 32b	76	14.4=ave age; 67% male; 70% white; lower socioeconomic; 100% conduct disordered youth referred through court	1. multisystemic family therapy (ave=24 hrs) 2. individual counselling (ave=28 hrs); USA	• random assignment to tx group • SR of A at 4 yrs post-tx • 100% included in follow-up	4 year follow-up • adolescents who received multisystemic family therapy had significantly lower drug-related arrest rates (3%) in previous 4 yrs than those who received individual counselling (15%) • tx refusers had a 17% substance-related arrest rate • 30% tx drop-out rate
Iverson & Roberts (1980) 33	138	96% between 12-18; 53% male; 99% white; M primary drug; 18% court referred	6 week, 6 session community based education program; USA	• SR of A at discharge and 6 mo post-tx • 80% included in follow-up	Discharge • % using marijuana >1x/wk decreased from 70% pre-tx to 55%; 9% to 2% for hallucinogens; 6% to 2% for depressants • significant increase in self-esteem and family communication 6 month follow-up • 30% using marijuana >1x/wk; 11% abstinent from marijuana in previous 6 mo; 0% using hallucinogens >1x/wk; 0% using depressants >1x/wk • significant decrease in delinquency and school problems from pre-tx; significant increase in family communication and self-esteem from pre-tx
Jensen, Wells, Plotnick et al. (1993) 34	141	15.4=ave age; 79% male; 51% white; 100% conduct disordered youth	residential juvenile facility (G, behavioural skills training); 3 mo average stay; USA	• SR of A at 12 mo post-tx corroborated by urinalysis on portion of sample • 92% included in follow-up	12 month follow-up • *variables related to success*: good post-tx social skills, problem-solving skills, self-control, and drug avoidance skills significantly related to decreased M use; lower variety & severity of pre-tx substance use for females; intention not to use for males

Joanning, Quinn, Thomas & Mullen (1992) 35	134	15.4=ave age; 60% male; 68% white; M most common drug; 39% hx of arrest; excluded clients who used narcotics, solvents, injected, or showing obvious signs of addiction	1. family systems therapy (7-15 sessions) 2. adolescent group therapy (12 sessions) 3. family drug education (6 sessions); USA	• random assignment to tx group • SR of A & P corroborated by urinalysis and reports of significant others (probation, teachers, etc) at discharge • 61% included in discharge analysis	Discharge • 54% of adolescents receiving family systems therapy abstinent; 16% of adolescent group therapy abstinent; 28% of family drug education abstinent • family systems therapy significantly superior to other tx conditions
Kaminer, Burleson, Blitz et al. (1998) 36	32	13-18 = age; majority male; majority white; polydrug use with M most common; all with co-occurring mental health problems; excluded clients needing inpatient tx, psychosis, no permanent address	1. 2-3 wk inpatient tx (G) followed by 12 wk outpatient cognitive-behavioural therapy (G) 2. 2-3 wk inpatient tx (G) followed by 12 wk outpatient interactional therapy (G); USA	• random assignment to tx group • self-report of A • 72% included in follow-up (NRS) • 3 mo post-tx follow-up	3 month follow-up • cognitive-behavioural group produced significantly better substance use reduction compared to interactional therapy group; no patient-tx matching effects • *variables with no relationship to success*: tx completion; gender
Keskinen (1986) (cited in Winters et al., in press) 37	320		1 mo residential program; USA	• 45% included in follow-up (NRS) • 6 mo & 12 mo post-tx follow-up	6 month follow-up • 67% abstinent from all substances
Knapp, Templer, Cannon & Dobson (1991) 38	94	16=ave age; 67% male; 84% white; most polydrug users with A,M,C most common; excluded clients with primary psychiatric diagnosis	30-40 days private hospital inpatient; F, G, S, R, AA/NA; USA	• SR of P by phone; follow-up period not reported • 50% included in follow-up (NRS)	Follow-up • 33% "currently" alcohol abstinent & 66% "currently" using less alcohol compared to pre-tx; 39% "currently" drug abstinent & 72% "currently" using less drugs compared to pre-tx • 45% "currently" have better grades compared to pre-tx (13% worse); 70% better family adjustment since leaving the program; 67% no "current" legal difficulties • *variables related to success*: female; fewer legal difficulties; fewer neurological risk factors; less pathological pre-tx MMPI scores; length of hospitalization not related to outcome
Lewis, Piercy, Sprenkle & Trepper (1990) 39	84	16=ave age; 81% male; 51% court/probation referrals; polydrug users, predominantly soft drugs	1. family therapy (12 sessions) 2. family education (12 sessions); USA	• random assignment to tx group • self-report of A corroborated by random urinalysis on all A • 89% included at discharge	Discharge • 39% of A receiving family therapy abstinent in mo prior to discharge vs 40% abstinent in family education group • 55% of A receiving family therapy had decreased substance use in mo prior to discharge compared to mo prior to tx (32% had increased substance use) vs 38% receiving family education (35% had increased substance use) • 18% tx drop-out rate
Liddle et al. (1993) (as cited in Stanton & Shadish, 1997) 40	178	15.9=ave age; 69% male; 51% white; most polydrug users with M & A most common	1. multidimensional family therapy (16 session) 2. multifamily psychoeducation (16 session) 3. peer group tx (16 session); USA	• random assignment to tx condition • self-report corroborated by urinalysis • discharge, 6 mo & 12 mo post-tx follow-up	6 & 12 month follow-up • all 3 conditions effective at reducing substance abuse; family therapy most effective followed by peer group tx, although effects not clearly evident until 1 yr post-tx for peer group tx • GPA improved from D- to C in family therapy tx, unchanged in other 2 groups • significantly more tx drop-outs in peer group tx (49% vs 35% and 30%)

Marzen (1990) 41	54	16=ave age	hospital inpatient; USA	• 5-6 yrs post-tx • comparison of tx completers vs noncompleters • 54% of tx completers included in follow-up & 50% of noncompleters (NRS) • self-report of A & P by phone	5-6 year follow-up • 28% of tx-completers abstinent in past 12 months, additional 46% decreased use compared to pre-tx • other positive findings on numerous other factors • no difference in substance use in tx completers vs noncompleters
McPeake, Kennedy, Grossman & Beaulieu (1991) 42	58	16=ave age; 67% male; 100% white; 60% hx arrests; 81% school problems; excluding psychotic and/or acutely suicidal clients	25 day outward bound program, F, G, AA/NA; 12 wk aftercare; USA	• SR of A & P by phone at >6 mo and 2 yr post-tx • 79% included in 6 mo follow-up, 95% of whom were tx-completers; 48% included in 2 yr follow-up	>6 month follow-up • 37% abstinent in previous 6-12 mo; 73% currently abstinent; significant reduction in frequency of substance use currently compared to pre-tx • 79% improved on global index of interpersonal/psychological functioning 2 year follow-up • 43% abstinent in previous 1 yr; 68% report greatly decreased use since discharge • 75% report improvement in interpersonal/psychological functioning
Kennedy & Minami (1993) (separate evaluation of above program) 43	100	16.5=ave age; 81% male; 92% white; most polydrug users with A,M most common; 49% arrested for drug related offenses; MMPI profiles indicate narcissism, impulsiveness, and antisocial orientation; 18% out of school	25 day outward bound program, F, G, AA/NA; 12 wk aftercare; USA	• SR of A & P by phone at 3, 6, 9, 12 mo post-tx • 91% included in follow-up	3 month follow-up • ~62% abstinent in previous 3 mo 6 month follow-up • ~55% abstinent in previous 6 mo 9 month follow-up • ~49% abstinent in previous 9 mo 12 month follow-up • 47% abstinent in previous 12 mo • significant decrease in legal (50% -> 24%) and school problems (64% -> 19%) in previous 12 mo compared to 12 mo prior to tx; 75% improved family functioning and 83% happier • *variables related to success*: AA/NA attendance; pre-tx severity of substance abuse
Query (1985) 44	134	18.8=ave age; 76% male; 82% white & 18% native; most polydrug users with A,M,Am most common; 73% been in jail; 15% prior tx; 31% hx suicide attempts	4-6 wk hospital inpatient; reality therapy; USA	• SR of A at 6-7 mo post-tx • 45% included in follow-up (NRS)	6-7 month follow-up • 22% abstinent in previous 6-7 mo; 60% better able to avoid drugs compared to pre-tx • 37% either completed GED, graduated or started college; 10% had attempted suicide in previous 6-7 mo • *variables related to success*: white
Ralph & McMenamy (1996) 45	172	16.8=ave age; 72% male; 91% white; 26% on probation; 26% spec education classes; 12% ADH	45 day hospital inpatient; confrontational, token economy, F, G, AA/NA,1 yr aftercare available; USA	• SR of mother (69% by phone); follow-up period not clear • only tx completers included in follow-up (100%), i.e. 63% of total	follow-up • 88% abstinent in previous 2 mo; 33% abstinent in previous 10 mo • 79% with improved schooling after discharge; 77% with improved family relations after discharge • *variables related to success*: older adolescents; participation in aftercare • 34% tx drop-out rate
Richardson (1996) 46	109	15-24; 100% male; most polydrug users with "soft drugs" (M,LSD,solvents) most common; ADH and psychological problems common	1 mo residential on farm receiving daily psychotherapy and lifeskills; wkend follow-ups for next 2 months; CANADA	• SR of A at 5 yr post-tx • 71% included in follow-up (NRS)	5 year follow-up • 49% abstinent from all drugs in previous 6 mo • *variables related to success:* use of soft drugs or alcohol vs hard drugs

Richter, Brown & Mott (1991) 47	160	15.9=ave age; 60% male; 78% white; excluded adolescents with psychiatric disorder predating substance abuse	2 inpatient programs; USA	• indep.SR of A&P at 6 mo & 1 yr post-tx • 92% included in follow-up at 6 mo; 86% at 1 yr	6 month follow-up • 30% abstinent & 27% minor relapsers in previous 6 mo 1 year follow-up • 36% abstinent & 26% minor relapsers in previous year • *variables related to success*: quality of pre-tx and post-tx social supports (nonuse being a measure of quality); post-tx social support satisfaction; higher post-tx self-esteem; no diff in outcome as function of sex, age, race, religion, socioeconomic status, pre-tx substance use, family drug hx
Scopetta et al. (1979) (as cited in Waldron, 1997) 48	33	17.2=ave age; 64% male; 100% Hispanic; primarily M & tranquilizers	1. family therapy (3-20 sessions, ave=12) 2. family therapy plus systems intervention (school, justice system) (3-20 sessions, ave=12); USA	• random assignment to tx condition • SR of A at discharge	Discharge • 57% abstinence with no difference between groups • improved psychiatric and family functioning in both conditions
Shoemaker & Sherry (1991) 49	144	15.7=ave age; 60% male; 73% white; 16% court-ordered; 31% with previous tx	3 residential tx programs; USA	• SR of A at 3 mo post-tx • 94% included in follow-up at 3 months	3 month follow-up • significant reduction in substance use frequency in previous 3 months compared to 3 mo pre-tx • *variables related to success*: pre-tx variables account for 14-19% of variance (lower substance use, fewer school absences, female, lower peer use); tx variables for 4-9% (more family sessions during tx; family involvement in tx process); post-tx variables for 33-36% (lower family pathology, lower avoidant coping, higher cognitive coping, more post-tx therapy, lower peer use)
Stinchfield, Niforopulos & Feder (1994) 50	254	16=ave age; 58% male; 80% white	AA oriented hospital based inpatient; USA	• indep. SR of A and/or P at 6 mo & 1 yr post-tx • 62% included in follow-up at 6 mo; 53% at 1 yr (NRS)	6 month follow-up • 49% abstinent in 6 prior mo • 16% suspended/expelled; 20% ran away from home; 7% drug arrests in 6 prior mo 1 year follow-up • 51% abstinent in prior 6 mo • 19% suspended/expelled; 13% ran away from home; 13% drug arrests in 6 prior mo • hard to contact adolescents had significantly poorer outcomes • 7% tx drop-out rate
Szapocznik, Kurtines, Foote, et al (1983) 51	62	17=ave age; 78% male; 100% Hispanic; lower & middle class; excluded clients with psychosis or who needed hospitalization	1. conjoint family therapy (entire family) (4-12 sessions) 2. one-person family therapy (4-12 sessions); USA	• random assignment to tx group • indep. SR of A & P at discharge & 6-12 mo post-tx • 60% included at discharge & 39% included in 6-12 mo follow-up (NRS, minimum of 4 tx sessions)	Discharge • significant reduction in substance abuse for both conditions • significant improvements in psychological status and family functioning in both conditions • no large differences between tx conditions in effectiveness 6-12 month follow-up • significant reduction in substance abuse in both groups at time of follow-up • significant improvements in psychological status and family functioning in both groups at time of follow-up • one-person family therapy slightly more effective

Szapocznik, Kurtines, Foote et al (1986) 52	35	17=ave age; 100% Hispanic; lower & middle class; 80% primarily M users, some A and barbiturate use	1. conjoint family therapy (entire family) (4-15 sessions) 2. one-person family therapy (4-15 sessions); USA	• random assignment to tx group • SR of A at discharge and 6-12 mo post-tx follow-up • 100% included at discharge and 57% included in 6-12 mo follow-up	6-12 month follow-up • reduced substance use in both conditions with no difference between the conditions; gains maintained at follow-up • improved psychiatric and family functioning in both conditions • slightly greater improvement in family functioning in one-person family therapy
Vaglum & Fossheim (1980) 53	100	19=ave age; 38% male; 63% used opiates or stimulants regularly; 50% regular IV drug use (comparisons between the 3 groups found no differences in substance use; however, control group had more males and group 2 had lower socioeconomic class and higher "deprivation index")	1. 3 different inpatient drug tx programs on psychiatric wards; 5-6 mo ave (range 2 days to 29 mo); 62% F; 71% confrontive milieu therapy 2. control gp of 60 drug abusers treated on other psychiatric wards (NRS but roughly comparable to tx gps); NORWAY	• SR of A corroborated by police, national registers, family, friends & therapists at discharge & 3 yr and 4.5-5.5 yr post-tx follow-up • 96% included in follow-up	Discharge • 44% of patients improved 3 yr follow-up • 24% abstinent in group 1, 56% in group 2, 45% in group 3, and 27% in control group in previous year; reduced substance use in 41%, 82%, 81% and 56% respectively in previous year 4.5-5.5 yr follow-up • 41% abstinent in group 1, 63% in group 2 and 38% in control group in previous year; reduced substance use in 65% group 1, 85% group 2, and 61% control in previous year • group using psychedelics did best in supportive and limit-setting milieu therapy combined with individual and family therapy; opiate and CNS using group did best in intensive confrontative, therapeutic community along with individual and family therapy

N = number entering treatment
CLIENT CHARACTERISTICS: A=alcohol; M=marijuana; C=cocaine; Am=amphetamines; H=hallucinogens
PROGRAM CHARACTERISTICS: G=group therapy; F=family therapy; S=schooling; R=recreational programming
METHODOLOGY: SR=self report; A=adolescent; P=parent; NRS=nonrandom sample; NRA=nonrandom assignment

Table 3

Controlled Comparisons of Adolescent Substance Abuse Treatment

Study	Atypical Population?	Treatment Comparison	Post-tx Differences
Braukmann et al. (1985)	conduct disordered males	• Teaching-Family group homes • non-Teaching-Family group homes • no treatment group	NO
Grenier (1985)	NO	• hospital inpatient tx • wait control group	inpatient treatment superior
Amini et al. (1982)	conduct disordered	• non-hospital residential tx • meetings with probation officer	NO
Hennggeler et al. (1991) South Carolina	conduct disordered	• multisystemic family therapy • meetings with probation officer	family therapy superior
Hennggeler et al. (1991) Missouri	conduct disordered	• multisystemic family therapy • individual counselling	family therapy superior
Vaglum & Fossheim (1980)	hard drug users, older	• inpatient drug tx programs • drug abusers treated on other wards	2 out of 3 tx groups superior to control
Azrin et al. (1994)	NO	• behavioural tx (restructure family & peer relations, urge control) • supportive counselling	behavioural treatment superior
Kaminer et al. (1998)	all with comorbid psychiatric problems	• inpatient tx followed by outpatient cognitive-behavioural group therapy • inpatient tx followed by outpatient interactional group therapy	cognitive-behavioural treatment superior
Friedman (1989)	NO	• family therapy • parent support groups	NO
Joanning et al. (1992)	NO	• family therapy • adolescent group therapy • family drug education	family therapy superior
Liddle et al. (1993) (cited in Stanton & Shadish, 1997)	NO	• family therapy • adolescent group therapy • multifamily psychoeducation	family therapy superior
Lewis et al. (1990)	NO	• family therapy • family education	family therapy superior
Scopetta et al. (1979) (cited in Waldron, 1997)	Hispanics	• family therapy • family therapy + systems intervention	NO
Szapocznik et al. (1983)	Hispanics	• family therapy • one-person family therapy	NO
Szapocznik et al. (1986)	Hispanics	• family therapy • one-person family therapy	NO

Table 4. Variables Related to Reduced Substance Use Post-treatment

Pre-treatment Variables	Studies finding variable related to reduced substance use	Studies finding variable not related to reduced substance use
lower/less serious pre-tx substance use	**5a, 6a**, 11, 34, 43, 49	47
peer/parent support/nonuse of substances	**3**, 47, 49	
school attendance & functioning	**5a, 5b,** 49	**3**
less/no conduct disorder	**3, 5a, 6a,** 11, 16	**5b,** 16
employed pre-tx	**5a, 5b**	
motivation for treatment	19, 34	
fewer prior substance abuse treatments	**1**	
less psychopathology	**3**	
high pre-tx family functioning	28	
higher intelligence/pre-tx skills	34	
race/ethnicity (white)	**1, 5a, 6b**	**3,** 47
female	19, 49	32, 47
socioeconomic status		47
religion		47
family hx substance abuse		**3,** 47
age		**3,** 47
Treatment Variables		
treatment completion/time in tx	**1, 5a, 5b, 6a, 6b,** 11, 19	32
program comprehensiveness	**1, 3**	
bigger programs with larger budgets	**1**	
therapist experience	**1**	
family involvement in treatment	49	
treatment intensity		**3**
Post-Treatment Variables		
attendance in aftercare (e.g. NA/AA)	11, 43, 49	
peer/parent support/nonuse of substances	16, 47, 49	16
better relapse coping skills	16, 34	
lower family pathology	49	
interpersonal conflict	16	
self-esteem	47	

Note. Bold font represents multi-site, multi-program studies.

Figure 1. Percentage of adolescents with sustained abstinence as a function of time since discharge. Each data point represents a different study. Connected data points represent repeated measures in the same study.