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A Comprehensive and Comparative Review of Adolescent Substance Abuse Treatment Outcome

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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 Rohan, 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 Aman, 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 most 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). 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. Hennegger 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. Hennegger 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). Pretreatment 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


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


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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

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Client Characteristics</th>
<th>Program Characteristics</th>
<th>Methodology</th>
<th>Results</th>
</tr>
</thead>
</table>
| Friedman, Glickman & Morrissey (1986)      | 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-bc; 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 bcs; 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 |
| Friedman & Glickman (1986)                 |      |                                                                                        |                                                                                         |                                  |                                                                                                                                                                                |
| Friedman, Glickman & Kovach (1986)         | 1    |                                                                                        |                                                                                         |                                  | 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                                                                                                                                                      |
| Harrison & Hoffman (1987)                  | 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 bx; USA                       | SR of A by phone or mail at 6 mo & 1 yr post-tx | 1 year 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 |
| CATOR 2a                                   |      |                                                                                        |                                                                                         | only tx completers included in follow-up (NRS)                              |                                                                                                                                                                                |
| Hoffmann & Kaplan (1991)                   | >1000| 80% 15-17; 64% male; higher socio-economic; most polydrug users with A,M 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 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 |
<p>| CATOR 2b                                   |      |                                                                                        |                                                                                         | only tx completers (100%) included in follow-up (n=826)                     |                                                                                                                                                                                |</p>
<table>
<thead>
<tr>
<th>Study and Location</th>
<th>Sample Characteristics</th>
<th>Findings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hser, Grelia, Hsieh &amp; Anglin (1999) DATOS-A</strong>&lt;br&gt;<strong>3a</strong></td>
<td>11-18 age; 74% male; 54% white; most polydrug users with M most common; 59% with criminal justice supervision</td>
<td>14 adolescent outpatient tx programs in 6 cities; USA</td>
<td>1 year follow-up&lt;br&gt;• 43% with weekly marijuana use in past yr compared to 94% 1 yr pre-tx&lt;br&gt;• 15% heavy drinkers in past yr compared to 22% 1 yr pre-tx&lt;br&gt;• 43% with any hard drug use in past yr compared to 50% 1 yr pre-tx&lt;br&gt;• 50% committed illegal act in past yr compared to 66% 1 yr pre-tx&lt;br&gt;<strong>variables related to success (all 3 tx modalities):</strong> 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</td>
</tr>
<tr>
<td><strong>Hubbard, Cavanaugh, Craddock &amp; Rachal (1985) TOPS</strong>&lt;br&gt;<strong>4a</strong></td>
<td>57% &lt;18 &amp; 43% 18-19; 66% male; 86% white; most polydrug users; 14% prior drug tx; 28% legal pressure for tx</td>
<td>11 publicly funded outpatient programs; USA</td>
<td>1 year follow-up&lt;br&gt;• decreases in most drug use in previous year, although less than obtained for residential tx; increases in use for individuals in tx &lt;3 mo&lt;br&gt;• increase in criminal activity; increase in full-time work except 18-19 yr olds in tx &lt;3 mo; decrease in suicidal thoughts&lt;br&gt;• 33% tx drop-out rate</td>
</tr>
<tr>
<td><strong>Rush (1979) UDCS</strong>&lt;br&gt;<strong>5a</strong></td>
<td>&lt;18; 55% male; 87% white; 47% multi-drug users; 15% prior treatment; 14% with convictions</td>
<td>Outpatients from all public Pennsylvania drug treatment facilities; 123 days median treatment time; USA</td>
<td>Discharge&lt;br&gt;• <strong>variables related to success:</strong> 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</td>
</tr>
<tr>
<td><strong>Hser, Grelia, Hsieh &amp; Anglin (1999) DATOS-A</strong>&lt;br&gt;<strong>3b</strong></td>
<td>9 short-term adolescent inpatient programs in 6 cities; USA</td>
<td>1 year follow-up&lt;br&gt;• 52% with weekly marijuana use in past yr compared to 96% 1 yr pre-tx&lt;br&gt;• 20% heavy drinkers in past yr compared to 38% 1 yr pre-tx&lt;br&gt;• 49% with any hard drug use in past yr compared to 71% 1 yr pre-tx&lt;br&gt;• 58% committed illegal act in past yr compared to 80% 1 yr pre-tx</td>
<td></td>
</tr>
<tr>
<td><strong>Hubbard, Cavanaugh, Craddock &amp; Rachal (1985) TOPS</strong>&lt;br&gt;<strong>4b</strong></td>
<td>50% &lt;18 &amp; 50% 18-19; 70% male; 78% white; most polydrug users; 26% prior drug tx; 39% legal pressure for tx</td>
<td>14 publicly funded residential programs, mostly therapeutic communities; 77 days median time in tx; USA</td>
<td>1 year follow-up&lt;br&gt;• decrease in use for all substances in previous year&lt;br&gt;• decrease in criminal activity; increase in full-time work except 18-19 yr olds in tx &lt;3 mo; decrease in suicidal thoughts&lt;br&gt;• variables related to success: time in tx&lt;br&gt;• 90% tx drop-out rate</td>
</tr>
<tr>
<td><strong>Rush (1979) UDCS</strong>&lt;br&gt;<strong>5a</strong></td>
<td>18 &amp; 19 age; 70% male; 81% white; 51% multi-drug users; 27% previous treatment; 30% with convictions</td>
<td>Outpatient sample; 100 days median treatment</td>
<td>Discharge&lt;br&gt;• <strong>variables related to success:</strong> strongest predictor was being employed at admission; weaker, but also significant were school status at admission, being white, and length of time in treatment</td>
</tr>
</tbody>
</table>
therapeutic community sample; 36 days median treatment

Discharge
• "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

1. dozens of public outpatient programs; 108 days median time in tx
2. control group of 38 who chose not to enter tx USA

Sells & Simpson (1979) DARP

During treatment
• significant reductions in substance use (particularly opioids) 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 nonopioids in previous 2 mo; decrease in opioid use, nonopioid use, minor decreases in marijuana and alcohol use compared to 2 mo pre-tx; "control group" too dissimilar to make comparisons (higher pre-tx opioid 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

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

During treatment
• significant reductions in substance use (particularly opioids) 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 nonopioids; 6% had problems related to alcohol in previous 2 mo; decreased opioid use, nonopioid 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 opioids 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
<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Age Range</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>Treatment Settings</th>
<th>Follow-Up</th>
<th>Findings</th>
</tr>
</thead>
</table>
| U.S. Dept of Health and Human Services (1997b) NTIES | 236 | 13-17 | 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 | 1 year follow-up | • SR of A + urinalysis for 50% at 1 yr post-tx  
• 82% of entire sample (4411) included in follow-up (NRS)  
• 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 | 156 | 13-18 | 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 | 5 year follow-up | • SR of A corroborated by urinalysis at 5 yr post-tx  
• 59% from total sample of 3047 included in follow-up (NRS)  
• 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**

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Client Characteristics</th>
<th>Program Characteristics</th>
<th>Methodology</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>AADAC (1995)</td>
<td>395</td>
<td>12-17 age; 63% male; majority polydrug users with A,M,H most common; 76% hx arrests; 27% hx suicide attempts; 35% physically &amp; 24% sexually abused</td>
<td>26 AADAC facilities in Alberta, CANADA; 83% outpatient (13% G; 17% F; 3 sessions ave); 8% day tx &amp; 5% non-hospital residential tx (S, R, 84% G; 65% F; 29 days ave); skills orientation; CANADA</td>
<td>• SR of A &amp; P by phone at discharge &amp; 3 mo post-tx • 53% A &amp; 14% P included at discharge and 49% A &amp; 14% P included in follow-up (NRS)</td>
<td>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</td>
</tr>
<tr>
<td>AARC (1994)</td>
<td>56</td>
<td>16.9=ave age (13-22); 76% male; 87% white; polydrug use with M &amp; A most common; 24% tx mandated; 88% hx arrest; 37% hx suicide attempts</td>
<td>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</td>
<td>• SR of A &amp; P at 2-24 mo post-tx (ave=8-12 mo) • 68% A included at follow-up (did not include drop-outs receiving &lt;2 mo tx)</td>
<td>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 &lt;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</td>
</tr>
<tr>
<td>Alford, Koehler &amp; Leonard (1991)</td>
<td>157</td>
<td>16=ave age; 62% male; disproportionate higher socioeconomic; majority polydrug users with A,M,H most common; &gt;44% hx arrests; 61% hx school suspension</td>
<td>45 day hospital inpatient followed by 45 day halfway house; NA/AA 12 step program; G, F; USA</td>
<td>• SR of A &amp; 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</td>
<td>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</td>
</tr>
<tr>
<td>Amini, Zilberg, Burke &amp; Salasnek (1982)</td>
<td>87</td>
<td>16.1=ave age; 69% male; 52% white; 100% conduct disordered youth referred through probation; excluded S’s with psychosis, mental retardation &amp; serious violence potential</td>
<td>1. non-hospital residential tx (F,G,R,S, 132 days ave) 2. outpatient probation; USA</td>
<td>• random assignment to tx group • SR of A 1 yr after entering program • 84% included in follow-up</td>
<td>~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</td>
</tr>
</tbody>
</table>
Azrin, Donohue, Besalel, et al. (1994) 13

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

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

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


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

Discharge
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


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

Discharge
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

Discharge
36% abstinent in previous 3 mo
64% relapsed in 1st 3 mo post-tx
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

3 month follow-up
30% abstinent in previous 6 mo
relapses occur most commonly in presence of social pressure to drink
<table>
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<tr>
<th>Study Authors</th>
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<td>Brown, Mott &amp; Myers</td>
<td>18</td>
<td>indep. replication of Brown et al (1989)</td>
<td>3 inpatient programs; USA</td>
<td>indep. SR of A &amp; P at 6 &amp; 12 mo post-tx&lt;br&gt;97% included at 6 mo &amp; 95% at 12 mo</td>
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<td>Cady, Winters, Jordan et al.</td>
<td>234</td>
<td>67% 15-17; 61% male; 83% white; 14% court-ordered</td>
<td>residential or outpatient tx program (ave=23 days); USA</td>
<td>SR of A at 6 mo “follow-up”&lt;br&gt;85% included in follow-up</td>
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<tr>
<td>Cornwall &amp; Blood</td>
<td>20</td>
<td>16.5=ave age; 65% male; polydrug users; 63% school failure; 67% legal difficulties; 63% abused</td>
<td>nonrandom assignment to group (inpatient more severe drug abuse)</td>
<td>discharge&lt;br&gt;significant reduction in drug abuse&lt;br&gt;significant improvement in self-esteem, family functioning, psychological problems, behavioural problems compared to pre-tx&lt;br&gt;37% drop-out rate for day tx; 41% for inpatient&lt;br&gt;6 month follow-up&lt;br&gt;significant reduction in drug abuse&lt;br&gt;significant improvement in self-esteem, peer relations, family functioning, psychological problems, behavioural problems compared to pre-tx&lt;br&gt;no significant differences in tx outcome between inpatient and day tx</td>
</tr>
<tr>
<td>DeLeon</td>
<td>84</td>
<td>64% male; 23% white; most polydrug users, opiates primary drug for 1/4; 45% court referred</td>
<td>residential therapeutic community (Phoenix House); USA</td>
<td>2 yr post-tx&lt;br&gt;78% follow-up at both 1 &amp; 2 yrs (NRS)</td>
</tr>
<tr>
<td>Feigelman, Hyman &amp; Amann</td>
<td>73</td>
<td>68% male; 100% white; higher socioeconomic; most polydrug users with M,A,H most common; 71% hx arrests</td>
<td>non-hospital day tx of 19-39 months; G,F,S,R; USA</td>
<td>SR of A (19% phone) + urine screen + check of MV offenses at 6.1 yr (3-8 yr range) post-tx&lt;br&gt;48% included in follow-up (NRS)</td>
</tr>
<tr>
<td>Fitestead</td>
<td>1127</td>
<td>16.3=ave age; 70% male; 91% white; most polydrug users with A,M,C most common</td>
<td>27 different non-hospital residential programs operated by PARKSIDE Medical Services Corp; 33 days average; USA</td>
<td>SR of A by phone at 11 mo post-tx&lt;br&gt;49% included in follow-up (NRS)</td>
</tr>
<tr>
<td>Friedman</td>
<td>169</td>
<td>17.9=ave age; 60% male; 90% white; most polydrug users with M,A,Am most common; 35% hx arrests</td>
<td>1. family therapy in 6 different outpatient programs of 6 mo duration&lt;br&gt;2. parent support groups in 6 outpatient programs of 6 mo duration; USA</td>
<td>random assignment to tx group&lt;br&gt;SR of A &amp; P at 9 mo post-tx&lt;br&gt;80% included in follow-up</td>
</tr>
</tbody>
</table>

1. 10 wk day treatment; G,S,F,R<br>2. 12 wk inpatient program; G,S,F,R<br>3. discharge<br>4. 11 month follow-up<br>5. 3-8 year follow-up<br>6. 6 month follow-up<br>7. 6 month follow-up<br>8. 1 & 2 year follow-up<br>9. 3% totally abstinent, additional 26% had no use of illegal drugs and only moderate use of alcohol in previous 6 years; <br>10. 11 month follow-up
Friedman & Glickman (1987) 25

- 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)

6-13 month follow-up after beginning treatment
- 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

- 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
- SR of A at 6-13 months after entering tx (ave=10.8 mo)
- 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

- 16.8=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)
- 65% abstinent from alcohol, 74% from marijuana, 91% from amphetamines, 90% from hallucinogens, 86% from cocaine, 95% sedatives, 92% inhalants since discharge; 85% report lower substance use since discharge
- significant improvement in suicidal ideation, fights, arrests comparing status at admission to status at follow-up
- 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

- 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
- 14.6 month follow-up
- 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

- 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 learning) 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)

Follow-up 22 months after admission
- significant decrease in frequency of PCP and hallucinogen use per month compared to pre-tx, but significant increase in frequency of alcohol, cocaine and heroin use per month compared to pre-tx
- significant decrease in legal offenses; school problems; slight decrease in family problems; mixed effects on psychological problems compared to pre-tx
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 non-graduates), 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=ave age; 77% male; mostly white and middle-class; most polydrug users with A most common

1. 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

Grigg, Borduin, Melton et al (South Carolina) 32a

47=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

Grigg, Borduin, Melton et al (Missouri) 32b

76=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=ave age; 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

6 month follow-up
• % 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

Jensen, Wells, Plotnick et al. (1993) 34

141=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
<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Characteristics</th>
<th>Intervention Details</th>
<th>Follow-up Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joanning, Quinn, Thomas &amp; Mullen</td>
<td>Ave age: 15.4; male: 60%; white: 68%; most common drug: M; 39% of arrested clients excluded</td>
<td>1. Family systems therapy (7-15 sessions) 2. Adolescent group therapy (12 sessions) 3. Family drug education (6 sessions)</td>
<td>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</td>
</tr>
<tr>
<td>Kaminer, Burleson, Blitz et al.</td>
<td>Ave age: 13-18; male: majority; white: majority; polydrug use with M most common; all with co-occurring mental health problems; excluded clients needing inpatient tx, psychosis, no permanent address</td>
<td>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)</td>
<td>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</td>
</tr>
<tr>
<td>Keskinen (1986)</td>
<td>Ave age: 16; male: 67%; white: 84%; most polydrug users with A, M, C most common; excluded clients with primary psychiatric diagnosis</td>
<td>1 mo residential program; USA</td>
<td>6 month follow-up: 67% abstinent from all substances</td>
</tr>
<tr>
<td>Knapp, Templer, Cannon &amp; Dobson</td>
<td>Ave age: 16; male: 81%; white: 51% court/probation referrals; polydrug users, predominantly soft drugs</td>
<td>30-40 days private hospital inpatient; F, G, S, R, AA/NA; USA</td>
<td>Discharge: 33% “currently” alcohol abstinent &amp; 66% “currently” using less alcohol compared to pre-tx; 39% “currently” drug abstinent &amp; 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</td>
</tr>
<tr>
<td>Lewis, Piercy, Sprenkle &amp; Trepper</td>
<td>Ave age: 16; male: 51%; court/probation referrals: polydrug users, predominantly soft drugs</td>
<td>1. Family therapy (12 sessions) 2. Family education (12 sessions)</td>
<td>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)</td>
</tr>
<tr>
<td>Liddle et al. (1993) (as cited in Stanton &amp; Shadish, 1997)</td>
<td>Ave age: 15.9; male: 51%; white: most polydrug users with M &amp; A most common</td>
<td>1. Multidimensional family therapy (16 session) 2. Multifamily psychoeducation (16 session) 3. Peer group tx (16 session)</td>
<td>6 &amp; 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%)</td>
</tr>
<tr>
<td>Study</td>
<td>N</td>
<td>Mean Age</td>
<td>Setting</td>
</tr>
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</tbody>
</table>
| Marzen (1990) | 54 | 16 yrs | 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  
- 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 |
- 79% included in 6 mo follow-up, 95% of whom were tx-completers; 48% included in 2 yr 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  
- 43% abstinent in previous 1 yr; 68% report greatly decreased use since discharge  
- 75% report improvement in interpersonal/psychological functioning |
| Kennedy & Minami (1993) | 100 | 16.5 yrs | 25 day outward bound program, F, G, AA/NA; 12 wk aftercare; USA | 3-12 mos post-tx | - SR of A & P by phone at 3, 6, 9, 12 mo post-tx  
- 91% included in follow-up  
- ~62% abstinent in previous 3 mos  
- ~55% abstinent in previous 6 mos  
- ~49% abstinent in previous 9 mos  
- ~47% abstinent in previous 12 mos  
- significant decrease in legal (50% -> 24%) and school problems (64% -> 19%) in previous 12 mos compared to 12 mos prior to tx; 75% improved family functioning and 83% happier  
- variables related to success: AA/NA attendance; pre-tx severity of substance abuse  
- 68% drop-out rate  
- variables related to success: older adolescents; participation in aftercare |
| Query (1985) | 134 | 18.8 yrs | 4-6 wk hospital inpatient; reality therapy; USA | 6-7 mos post-tx | - SR of A at 6-7 mo post-tx  
- 45% included in follow-up (NRS)  
- 22% abstinent in previous 6-7 mos; 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 mos  
- variables related to success: white  
- 34% tx drop-out rate  
- variables related to success: use of soft drugs or alcohol vs hard drugs |
| Ralph & McMenamy (1996) | 172 | 16.8 yrs | 45 day hospital inpatient; confrontational, token economy, F, G, AA/NA,1 yr aftercare available; USA | 1 yr follow-up | - SR of mother (69% by phone); follow-up period not clear  
- only tx completers included in follow-up (100%), i.e. 63% of total  
- 88% abstinent in previous 2 mos; 33% abstinent in previous 10 mos  
- 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  
- variables related to success: use of soft drugs or alcohol vs hard drugs |
| Richardson (1996) | 109 | 15-24 yrs; 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 | 5 yrs post-tx | - SR of A at 5 yr post-tx  
- 71% included in follow-up (NRS)  
- 49% abstinent from all drugs in previous 6 mos  
- variables related to success: use of soft drugs or alcohol vs hard drugs |

(NRS) = nonresponse rate specified
<table>
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<tr>
<th>Study</th>
<th>Sample Size</th>
<th>Mean Age</th>
<th>Gender</th>
<th>Race</th>
<th>Exclusion Criteria</th>
<th>Treatment Details</th>
<th>Follow-Up Details</th>
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<tr>
<td>Richter, Brown &amp; Mott (1991)</td>
<td>160</td>
<td>15.9</td>
<td>60%</td>
<td>78%</td>
<td>Male, age, excluded adolescents with psychiatric disorder predating substance abuse</td>
<td>2 inpatient programs; USA</td>
<td>6 month follow-up: 30% abstinence &amp; 27% minor relapsers in previous 6 mo 1 year follow-up</td>
</tr>
<tr>
<td>Scopetta et al. (1979) (as cited in Waldron, 1997)</td>
<td>33</td>
<td>17.2</td>
<td>64%</td>
<td>100%</td>
<td>Hispanic, primarily M &amp; tranquilizers</td>
<td>1. family therapy (3-20 sessions, ave=12) 2. family therapy plus systems intervention (school, justice system) (3-20 sessions, ave=12); USA</td>
<td>Discharge: 57% abstinence with no difference between groups</td>
</tr>
<tr>
<td>Shoemaker &amp; Sherry (1991)</td>
<td>144</td>
<td>15.7</td>
<td>60%</td>
<td>73%</td>
<td>Male, age, court-ordered; 31% with previous tx</td>
<td>3 residential tx programs; USA</td>
<td>3 month follow-up: significant reduction in substance use frequency in previous 3 months compared to 3 mo pre-tx</td>
</tr>
<tr>
<td>Stinchfield, Niforopulos &amp; Feder (1994)</td>
<td>254</td>
<td>18</td>
<td>58%</td>
<td>80%</td>
<td>Male, White, AA oriented hospital based inpatient; USA</td>
<td>• indep. SR of A and/or P at 6 mo &amp; 1 yr post-tx 62% included in follow-up at 6 mo; 53% at 1 yr (NRS)</td>
<td>6 month follow-up: 49% abstinence in 6 prior mo 16% suspended/expelled; 20% ran away from home; 7% drug arrests in 6 prior mo 1 year follow-up: 51% abstinence 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</td>
</tr>
<tr>
<td>Szapocznik, Kurtines, Foote, et al (1983)</td>
<td>62</td>
<td>17</td>
<td>78%</td>
<td>100%</td>
<td>Hispanic, lower &amp; middle class; excluded clients with psychosis or who needed hospitalization</td>
<td>1. conjoint family therapy (entire family) (4-12 sessions) 2. one-person family therapy (4-12 sessions); USA</td>
<td>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</td>
</tr>
</tbody>
</table>
Szapocznik, Kurtines, Foote et al (1986) 52
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
- slightly greater improvement in family functioning in one-person family therapy

Vaglum & Fossheim (1980) 53
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
- 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
- 44% of patients improved

Discharge
• 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=recational programming
METHODOLOGY: SR=self report; A=adolescent; P=parent; NRS=nonrandom sample; NRA=nonrandom assignment
<table>
<thead>
<tr>
<th>Study</th>
<th>Atypical Population?</th>
<th>Treatment Comparison</th>
<th>Post-tx Differences</th>
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</thead>
<tbody>
<tr>
<td>Braukmann et al. (1985)</td>
<td>conduct disordered</td>
<td>• Teaching-Family group homes</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>males</td>
<td>• non-Teaching-Family group homes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no treatment group</td>
<td></td>
</tr>
<tr>
<td>Grenier (1985)</td>
<td>NO</td>
<td>• hospital inpatient tx</td>
<td>inpatient treatment superior</td>
</tr>
<tr>
<td>Amini et al. (1982)</td>
<td>conduct disordered</td>
<td>• non-hospital residential tx</td>
<td>NO</td>
</tr>
<tr>
<td>Hennegger et al. (1991) South</td>
<td>conduct disordered</td>
<td>• multisystemic family therapy</td>
<td>family therapy superior</td>
</tr>
<tr>
<td>Carolina</td>
<td></td>
<td>• meetings with probation officer</td>
<td></td>
</tr>
<tr>
<td>Hennegger et al. (1991) Missouri</td>
<td>conduct disordered</td>
<td>• multisystemic family therapy</td>
<td>family therapy superior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• individual counselling</td>
<td></td>
</tr>
<tr>
<td>Vaglum &amp; Fossheim (1980)</td>
<td>hard drug users,</td>
<td>• inpatient drug tx programs</td>
<td>2 out of 3 tx groups superior to control</td>
</tr>
<tr>
<td></td>
<td>older</td>
<td>• drug abusers treated on other wards</td>
<td></td>
</tr>
<tr>
<td>Azrin et al. (1994)</td>
<td>NO</td>
<td>• behavioural tx (restructure family &amp; peer relations, urge control)</td>
<td>behavioural treatment superior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• supportive counselling</td>
<td></td>
</tr>
<tr>
<td>Kaminer et al. (1998)</td>
<td>all with comorbid</td>
<td>• inpatient tx followed by outpatient cognitive-behavioural group therapy</td>
<td>cognitive-behavioural treatment superior</td>
</tr>
<tr>
<td></td>
<td>psychiatric problems</td>
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<td>Friedman (1989)</td>
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<td>Joanning et al. (1992)</td>
<td>NO</td>
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<td></td>
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<td>• adolescent group therapy</td>
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<td>• family drug education</td>
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<td>Liddle et al. (1993)</td>
<td>NO</td>
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<td></td>
<td>(cited in Stanton &amp;</td>
<td>• adolescent group therapy</td>
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<td></td>
<td>Shadish, 1997)</td>
<td>• multifamily psychoeducation</td>
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<td>Hispanics</td>
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<td></td>
<td>1997)</td>
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<td>Pre-treatment Variables</td>
<td>Studies finding variable related to reduced substance use</td>
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<td>better relapse coping skills</td>
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<td>self-esteem</td>
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**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.