

# Overview of Alcoholic De Addiction in Adolescents



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## Abstract

Alcohol and other drug use among adolescents has been a public health problem for decades. Although some substance use is developmentally routine, a number of adolescents meet the criteria for a substance use disorder and could significantly benefit from excellent treatment programs. However, parents and health care providers want confirmation of the efficacy of adolescent-specific alcohol treatment programs. The factors surrounding issues regarding the efficacy of current adolescent treatment programs are as follows, adolescent-specific treatment services specific to adolescents; the variety of therapeutic modalities; post treatment relapse and recovery rates; and the need for evidence-based, quality assessments and research. Current Adolescent alcohol treatment efforts are summarized, with regard to the efficacy of adolescent treatment and recovery rates.

**Keywords:** Adolescents; Substance abuse; Substance use disorders; Drug treatment; Treatment effectiveness; Cognitive-behavioral therapy; Motivational interviewing; Recovery; Twelve-step program; Aftercare; Treatment outcome; Therapeutic community; Family-based therapy; Brief intervention; Contingency management reinforcement approach

**Abbreviations:** AA: Alcoholics Anonymous; CBT: Cognitive Behavioral Therapy; BI/MI: Brief Intervention/Motivational Interviewing; TC: Therapeutic community

## Introduction

As recent research continues to show alarming rates of drug and alcohol use among adolescents, all over the world it continues to be a public health concern [1], The University of Michigan annual surveys in 2010 indicated that daily marijuana use among high school seniors has reached its highest point in 30 years [2]. Nearly 65% of high school seniors and 29% of eighth graders have reported using alcohol in the past month, although alcohol use has declined slightly in comparison with previous years [2]. The implication and public health importance of adolescent drug use can be stressed from the fact that the early initiation of drug use is correlated with an increased risk of a group of problem behaviors, such as marketing drugs and violence-related charges subsequent legal problems [3], consequences related to driving under the influence of a substance [4], and physical, sexual, and emotional abuse as recognized in juvenile detention centers [5]. In general, any substance use problems in adolescence has been shown to increase the risk of later development of alcohol substance abuse [6].

To comprehend the size of the problem, it is important to highlight the prevalence of problematic alcohol use and the gap in the treatment. It is projected that about 1.5 million teenagers

meet criteria for an alcohol substance abuse of them only 7% receive treatment for the disorder [7]. This treatment gap is related to a variety of factors, such as poor health care coverage, lack of motivation among the youth or parents, inaccessibility of specialized adolescent treatment programs, and reduced quality in adolescent treatment services [8]. It is critical to address these gaps. Biological influences subjected to maturity are another factor that adds to the distinctive challenges centered around adolescent drug use. The prefrontal cortex which monitors impulsivity, goal setting, reasoning, and judgment is believed to be immature throughout the period of adolescence. The nucleus accumbens is also still developing and may add to the escalation in adolescent's tendency for thrill seeking [9]. The tendency to act imprudently and neglect negative consequences may also be augmented by the biological immaturities. It is presumed that there is a higher likelihood of successful recovery when their treatment selections are tailored to their precise psychological, developmental, and social needs of adolescents. The evidence based, quality treatments for adolescent is an vital need based on population prevalence of adolescent alcohol substance abuse, the biological development of the adolescent brain, and the lack of adolescent-specific treatment services. Current adolescent treatment practices are presented in the light of recent

literature regarding the effectiveness of adolescent treatment and recovery rates. The modifications in brain structure, function, and neurocognition along with Adolescent brain development and abnormalities in indices of brain functioning are related to the substance use throughout adolescence, especially alcohol during this critical developmental period. Neuropsychological assessment and structural and functional imaging will be presented to help elucidate the relationship between neurocognition with alcohol and marijuana use. Moreover, methodological issues in neuroimaging and neuropsychological assessment research will be reviewed.

It is known that chronic heavy drinking is related to adverse consequences on the adult brain [10]. This relationship is recently been explored in the adolescent brain. As the rates of alcohol use increase exponentially between ages 12 and 18 understanding the effects of alcohol and drug use on adolescent neurocognition is vital. Studies have shown that alcohol use increases from 17% to 45% between 8th and 12th standards. About 73% of youth have used alcohol in their lifetime by their senior year of high school [11]. About 23% of youth meet diagnostic criteria for a substance use disorder (alcohol or drug abuse or dependence) in the past year by age 20 [12]. The usage of alcohol and drugs during a period of critical neurological development may interrupt the natural course of brain maturation and key processes of brain development although developing brain is more resilient to neurotoxic effects. Adolescence may be a period of heightened vulnerability for alcohol's effect on the brain [13-16]. Cognitive deficits ensuing from these alcohol and drug related neural insults have possibly harmful implications for following academic, occupational, and social functioning extending into adulthood. Therefore, it is important to expound neurocognitive sequelae from heavy drinking and drug use.

## Treatment Approaches

Confrontational methods, presumably to break down the defense mechanisms that accompany the alcohol substance abuse were the treatment approaches for alcohol substance abuse earlier [17]. Treatment programs were shaped for adult alcoholics and drug abusers, and adolescents were "treated" by transferring them to correctional institutions or inebriate housing and asylums fashioned for adults [18]. In the 1950s, hospitals and churches began to recognize that adolescent drug use behaviors did not mimic those of adults, and that adolescents may profit from a dissimilar treatment approaches. Riverside Hospital in New York City opened the first treatment center for juvenile addicts in 1952, marking the birth of adolescent-specific treatment programs [18]. Most adolescents were still treated at adult-based programs through the 1980s although developmentally unfitting. Research has since identified substantial differences between adults and adolescents presenting with an alcohol substance abuse that are applicable to treatment design and efficacy. For example, adolescents present higher rates of binge use, lower problem recognition, and higher rates of comorbid psychiatric problems as compared with adults

[19]. In addition, adolescents are more likely to be more susceptible to peer influence [20] and are more highly focused on immediate concerns [21].

It is imperative that treatment programs be designed specifically for adolescents because adolescent and adult drug problems are often manifested differently. However, treatment programs created specifically for teenagers did not materialize until the 1980s and slowly continued to grow through the 1990s [18]. Fortunately, advances in alcohol substance abuse assessment have led to more thorough needs assessment and improved service placement for individuals, especially adolescents. The majority of current substance abuse treatment programs incorporate a set of services that can dispensed in different formats and for different lengths of time. In most cases today, once an adolescent's substance use habits and related factors have been professionally assessed, the individual will be referred to one of five treatment levels, according to American Society of Addiction Medicine patient placement criteria [22]. These levels, ranging on a continuum of service intensity, include the following:

- a) Early intervention services, including educational or brief intervention services.
- b) Outpatient treatment, in which adolescents typically attend treatment for 6 h/wk or less for a period dependent on progress and the treatment plan.
- c) Intensive outpatient, in which adolescents attend treatment during the day (up to 20 h/wk) but live at home (ranging in length from 2 months-1 year).
- d) Residential/inpatient treatment includes programs that provide treatment services in a residential setting (lasting from 1 month-1 year).
- e) Medically managed intensive inpatient, which is most suitable for adolescents whose substance use, biomedical, and emotional problems are so severe that they need 24-hour primary medical care for a length relying on the adolescent's progress.

Within these five levels of care, doctors may apply a wide variety of hypothetical orientations or modalities. To date, most outpatient and inpatient adolescent programs will use an diverse treatment approaches, integrating multiple therapeutic models in their treatment service context. The most usually utilized therapeutic models include the following:

- a) Family-based therapy. Family therapy characteristically includes the adolescent and at least one other parent or guardian. This approach is founded on the therapeutic premise that the family conveys the most profound and long-lasting influence on child and adolescent development [23]. This treatment approach seeks to reduce an adolescent's use of drugs and solve the problem behaviors that often go with drug use by tackling the mediating family risk

factors, such as poor family communication, cohesiveness, and problem solving.

b) Individual and group therapy. Individual therapy refers to one-on-one psychosocial therapeutic sessions between a patient and a therapist, whereas group therapy refers to psychosocial sessions between a group of individuals and a therapist (or two). Although both therapies are useful in adolescent substance use treatment, group therapy is the most predominant treatment modality [24]. They are clustered together in this description because in the field of adolescent substance use treatment, similar theoretical approaches are used within both modalities. The most researched and utilized theoretical approaches within individual and group therapy include cognitive-behavioral therapy (CBT), brief intervention/motivational interviewing (BI/MI), and the contingency management reinforcement approach.

c) CBT is centered on the premise that thoughts cause behaviors, and these thoughts determine the way in which people perceive, interpret, and assign sense when dealing with the environment [25]. By adapting our thought processes maladaptive behaviors can be transformed, even if our environment does not change. In the context of adolescent substance use, CBT encourages adolescents to develop self-regulation and coping skills by teaching the youth to recognize stimulus cues that lead to drug use, to use various strategies to circumvent situations that may trigger the desire to use, and to mature one's skills for communication and problem solving [26].

BI/MI techniques are becoming ideal therapeutic approaches for addiction since the past decade, recently for adolescents. Person-centered, non-confrontational style in supporting the youth to discover different aspects of his or her alcohol use patterns are used in this therapeutic approach. Adolescents are encouraged to examine the pros and cons of use of alcohol misuse and to create goals to help them achieve a healthier lifestyle. The therapist provides personalized feedback and respects the youth's freedom of choice regarding his or her own behavior. The therapist's instruction in assisting the individual to examine and resolve ambivalence and to encourage the client's responsibility for selecting and working on healthy changes in behavior, although the relationship between the therapist and client is more of a partnership than an expert-recipient role [27]. The contingency management reinforcement approach boosts healthy changes in behavior by rewarding adolescents for objective evidence of abstinence, such as negative urinalysis [28]. Based on the conceptual framework of behavior analysis and behavioral pharmacology, this approach regards substance use and related behaviors as operant behaviors that are reinforced by the effects of the drugs involved. Following the operant conditioning model, the adolescent's drug use will subside when tangible incentives are offered for abstinence.

a) Twelve-step programs. These programs integrate a self-help approach centered within the context of reciprocal support

[29]. They are organized around the basic tenets of Alcoholics Anonymous (AA), and are a commonly applied strategy in inpatient and outpatient treatment programs, as well as a standalone approach. Approximately 2.3% of AA members in the United States and Canada are under the age of 21 [30]. Within this approach, individuals support each other's sobriety through encouragement of mental and spiritual health via a lifelong spiritual journey through 12 steps.

b) Therapeutic community (TC) is holistic in nature and characteristically rooted in self-help principles and practical knowledge of the recovery community [31]. This treatment option, views the community as the key agent of change and emphasizing mutual self-help, behavioral consequences, and shared values for a healthy lifestyle [32]. For adolescents, TCs tend to be long-term residential treatment programs that often implement a wide variety of therapeutic techniques, including (but not limited to) individual counseling sessions, family therapy, 12-step techniques, life skills techniques, and recreational techniques.

c) Pharmacotherapy. This treatment approach uses medication to address various aspects of addiction, including craving reduction, aversive therapy, substitution therapy, and treatment of underlying psychiatric disorders. There is limited research on this treatment strategy for adolescents, although several pharmacologic studies have been conducted in adult populations. However, youth may react differently to the potential side effects of medications [33].

Pharmacotherapy for alcohol dependence is always delivered in a psychosocial context that may modulate the outcome of the treatment. The rigorous study of diverse psychotherapeutic treatments for alcohol dependence has shown numerous distinct approaches to be effective. Psychosocial interventions for alcohol dependence, including Alcoholics Anonymous, can be combined successfully with pharmacotherapy. Psychosocial interventions, ranging from brief medical management to more intensive individualized psychotherapies, produce positive outcomes in certain studies, depending on the precise medication and the study setting. Successful combinations may comprise of use of behavioral therapy plus a Disulfiram for patients taking that medication, and the combination of Naltrexone or Acamprosate with cognitive-behavioral therapy or psychosocial support. Research examining the best combinations of medications with different psychosocial treatments for alcohol dependence may further inform the medical fraternity (Weiss and Kueppenbender, 2006). The pharmacology treatment alcohol dependence, consists of use of benzodiazepines as suitable agents for alcohol withdrawal, with choice among different agents depending on their duration of action, rapidity of onset, and cost. Dosage are, based on withdrawal severity measured by withdrawal scales, comorbid illness, and history of withdrawal seizures.  $\beta$ -Blockers, clonidine, carbamazepine, and neuroleptics are used as add on therapy. Both acamprosate and naltrexone are adjuvant therapies for managing alcohol dependence in adults.

Acamprosate is especially useful in a therapeutic approach aimed at achieving abstinence, whereas naltrexone is usually indicated in programmes to control consumption, are safe and acceptably tolerated but compliance in adolescents is erratic. Administration of disulfiram improves the usefulness of acamprosate. Efficacy of topiramate in the relapse prevention of alcoholism has been shown in Brazil.

### Research on Treatment Outcomes

The efficacy of treatment can be quite difficult to measure due to unique patient characteristics that may play a role in that person's treatment experience. Considering all the modalities and features of adolescent treatment, it is important to note that as with many other medical conditions, treatment does not ensure a "cure." Lipsey and colleagues [34] conducted a meta-analysis of various treatment modalities to define which programs produce the best adolescent outcomes. In their analysis, they compared 55 research studies of numerous therapeutic methods that were tested against a control or alternative treatment sample. The Lipsey et al. [34] review is regarded as a systematic and statistically sound appraisal of adolescent treatment programs although most of the studies reviewed in the meta-analysis were over a decade ago. The Lipsey et al. [34] review focused on 12-step-based therapy, TC, family-based interventions, CBT, motivational-based therapy (MI and BI), and mixed or other methods. A regular pattern appeared that showed overall positive effects for all treatment models when compared with comparison conditions, but family therapy, CBT, and motivational enhancement therapy/CBT tended to show the best outcomes. However, it is advisable to observe these findings with caution given the relatively small number of studies and the fact that many studies' efforts to control for confounds were not ideal [34].

Perhaps treatment effectiveness across all approaches could be enhanced if programs contained essential elements of effective treatment for adolescents. There have been nonsystematic efforts in the literature to identify key elements [35]. Recently, Drug Strategies [36] used an expert consensus procedure to detect core elements assumed to be related with effective drug treatment for adolescents. These elements include screening and comprehensive assessment to ensure understanding of the full range of issues the youth and family are experiencing. Addressing the adolescent's substance abuse problem as well as any medical, mental health, familial, or education problems is vital in enabling a remission. Parent's involvement in their adolescent's treatment and recovery increases the likelihood of a successful treatment experience. Developmentally appropriate services and therapies offered address the different needs and capabilities of adolescents. Strategies to engage and keep adolescents in treatment to help adolescents recognize the value of getting help for their problems. Staff should have knowledge of and experience working with adolescents/young adults with substance abuse problems and their families.

The programs should consider cultural and gender differences and address them within their population. Effective programs plan for care after the formal treatment program is completed to ensure support and successful recovery. Data gathering to quantify outcomes and success of the program. This assumption is supported by two studies that assessed select programs; both found that very few programs provided all the core elements [37,38].

### Recovery

Nearly all adolescent drug treatment approaches are based on an abstinence model, the return to drug use (or relapse) is a fairly common occurrence among adolescents [33,39]. Among youth treated for alcohol or drug problems, one third to one half are likely to return to some drug use at least once within 12 months following treatment [33]. The therapeutic elements and modalities discussed before can greatly affect the efficacy of treatment, but additional variables also have been shown to influence continued recovery and reduce the risk of relapse. The relapse risk has mainly two variables: treatment variables and individual variables. The factors specific to the adolescent's treatment experience, such as discharge status, counselor rapport, and aftercare attendance are considered treatment variables. The main prognosticator of treatment outcome in the general addiction field is the quality of the alliance between therapist and client. Continuing care, or aftercare, for adolescents also has been recurrently shown to decrease the likelihood of relapse and augment the maintenance of treatment gains [40,41]. The exclusive factors specific to the individual adolescent are considered individual variables. Psychiatric comorbidity, lack of family involvement, continuing influence with drug-using peers, and poor coping skills are shown to be associated with relapse [33,42,43]. The principal role of treatment and individual factors is that they interact to influence the adolescent's decision making. If too many relapse factors are present, decisions to use drugs is strengthened, yet if few or no relapse factors are present, the adolescents decision making is more likely to motivate him or her toward an alcohol-free lifestyle.

### Conclusions

The development and evaluation of treatments for adolescent alcohol abuse has made vast advances in the past decade. There has been a greater focus on varying interventions using different theory-based psychotherapies, as well as a recognition of the unique developmental milestones specific to adolescents. Psychosocial-based modalities, and that family systems-based treatments and motivational enhancement therapy/BI approaches dominate adolescent alcohol substance abuse treatment and have most empiric support compared with other modalities. We still know much less about the nature and extent of effective treatments for drug-abusing youth compared with adult-specific treatment, although there are many recent advances. Future research needs to continue assessing adolescent treatment efforts, and should include a more standardized measurement of outcome. Outcomes for the

studies mentioned in this review include abstinence rates, number of symptoms, reduction in drug use, and effect size; a more uniform measurement practice across studies would facilitate comparisons across studies. A need still exists for greater understanding of common practices and standards in community-based programs and how they provide essential clinical elements or characteristics of effective treatment (e.g., use of standardized adolescent assessment measures and developmentally adjusted strategies for treatment engagement). Most community-based treatment programs, on stand-alone approaches may not be as generalizable to the greater treatment community. We need to understand whether “aggressive” confrontational approaches, which have a longstanding tradition in many forms of addiction treatment for all ages [17], are operative with young people, or if alternatives of confrontational strategies are more effective with adolescents (e.g., attempts to raise an individual’s problem recognition). Few pharmacologic treatments of adolescents with alcohol substance abuse have been published; their role as an effective adjunct to psychosocial-based approaches merits more research. Understanding the elements of recovery from alcohol abuse needs further investigation. Specific variables in the management like aftercare, how the adolescent copes with the deaddiction, and coexisting disorders complicating recovery must be considered. The use of alcohol by peers, social support systems, family backing, along with psychotherapy motivation) will prolong recovery. Relapse may be prevented by newer technology based treatment based protocols taking into account adolescent brain development issues and ideal aftercare involvement by treating physicians.

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