

## Substance-Related Disorders

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The substance-related disorders include a range of pathological conditions associated with legal and/or illegal use of one or more drugs of abuse, medications, or toxins. *DSM-5* classifies these conditions into two broad categories: *substance use disorders*, which are characterized by dependence and/or abuse, and *substance-induced disorders*, which involve intoxication or withdrawal. These categories are organized around symptoms associated with the use of substances from 10 classes (alcohol, caffeine, cannabis, hallucinogens, inhalants, opioids, sedatives/hypnotics/or anxiolytics, stimulants, tobacco, and other substances).

### Substance Use Disorders

Historically, substance-related disorders were classified according to whether they were characterized by symptoms of dependence or of abuse. Dependence symptoms constituted cognitive, behavioral, and physiological indicators of persistent use despite significant substance-related problems. For instance, affected individuals may spend a large amount of time obtaining, using, or recovering from the substance; and may also show a pattern of increasing or more protracted use than intended. In addition, they may exhibit social impairment and/or use the substance under conditions that are physically or psychologically risky. Furthermore, affected individuals might show evidence of tolerance (the need for larger and larger amounts of the substance

to achieve intoxication), withdrawal (the emotional and physical problems that arise from the sudden reduction or cessation of substance use following prolonged ingestion), and severe adverse consequences, including failure to meet obligations, use in risky situations and legal, social, or interpersonal problems caused by substance use.

*DSM-5* combines the *DSM-IV* categories of substance abuse and substance dependence into a single disorder measured on a continuum from mild to severe. According to *DSM-5*, substance use disorders should be diagnosed when individuals persist in the use of a substance despite significant substance-related problems. In past editions of the *DSM*, substance abuse and substance dependence were described as separate conditions: *substance abuse* was a patterned use of substance, whereas *substance dependence* was characterized by the repeated compulsive use of a substance, even though this use leads to adverse effects.

Evidence suggests that adolescents who abuse substances can be grouped into three categories: *frequent users* who use a single substance at least once weekly and have tried another drug, *abstainers* who did not try any drugs, and *experimenters* who tried one substance a few times and have also tried at least one other drug (Colder & Chassin, 1999; Shedler & Block, 1990). The main model used to explain substance abuse posits that biopsychosocial factors influence the propensity toward substance abuse. According to the biopsychosocial approach, substance abuse is not viewed as a unitary disease. Instead, symptoms are seen as acquired habits that emerge as a function of interacting genetic, social, pharmacological, and behavioral factors. Accordingly, a comprehensive understanding of the relationships among these interrelating factors is necessary to understand the causes, correlates, natural history, and treatment of substance use. This model is the most commonly

endorsed model used by treatment researchers because of its rigorous explanation of the complex and intricate nature of addiction.

### Substance Abuse Disorders

In general, the *DSM-5* divides substance abuse disorders into three categories, which include intoxication, withdrawal, and substance- or medication-induced disorders. These categories can further be broken down into caffeine-related disorders, alcohol-related disorders, cannabis-related disorders, hallucinogen-related disorders, sedative, anxiolytic, or hypnotic disorders, opioid-related disorders, and stimulant-related disorders.

*Substance intoxication* occurs when ingestion of a substance results in one or more behavioral, physiological, or psychological symptoms. Intoxication has an impact on a number of sensory functions, including perception, psychomotor behavior, concentration, attention, and general cognitive processing. Intoxication can also affect interpersonal behavior.

*Substance withdrawal* refers to the emotional and physical problems that arise from the sudden reduction or cessation of substance use following prolonged ingestion. Withdrawal is often accompanied by high levels of discomfort and distress and can impair physiological and psychological functioning.

### Alcohol

In general, moderate to severe alcohol consumption elicits mood lability, feelings of euphoria, a reduction in impulse control, and an increase in social confidence. However, nausea, dysphoria, and mild fatigue are common next-day effects. During intoxication, lowered impulse control in conjunction with enhanced mood lability can culminate in increased violence toward the self and others. Furthermore, increased alcohol consumption is associated with anxiety, dysphoria, and the aforementioned violence capability.

The symptoms of alcohol withdrawal can be severe and include: anxiety, hyperreflexia, tremors, nausea, vomiting, and mild

tachycardia. In the days following acute withdrawal, some people experience fatigue, insomnia, anhedonia (sexual), and prolonged mood instability. It is often difficult to distinguish continued withdrawal from an anxiety or major depressive disorder.

### Cocaine and Amphetamines

Intoxication from cocaine, methamphetamine or alternative stimulant drugs at a mild to moderate level elicits feelings of euphoria, wellbeing, and a perceived increase in cognitive function, strength, and achievement. Yet as substance consumption increases, the ability to concentrate and maintain focus decreases. Concordantly, as substance dosage increases, the risk of impulsive behaviors and risky sexual activity also increases.

Following intoxication with a stimulant, a person will become extremely fatigued and depressed, and will often crave the substance in order to ameliorate withdrawal symptoms. Even after prolonged abstinence (several weeks) addicts often report chronic feelings of dysphoria, anxiety, and anhedonia (lack of pleasure), which can persist for weeks. In addition, chronic, heavy stimulant abuse can lead to long-term changes in the brain impacting the memory and attention centers of the brain, occasionally causing psychotic symptoms to manifest.

### Epidemiology

Within the general population in the United States, epidemiological data suggest that lifetime frequency rates of any substance abuse or dependence range between 2.6% and 7.7%, respectively (Compton, Thomas, Stinson, & Grant, 2007). In general, research has shown substance abuse peaks during late adolescence and early adulthood, after which a decline is observed, as individuals enter into middle adulthood. This decline has been attributed to the increased personal, social, and family responsibilities that accrue during middle adulthood (Johnston, O'Malley, & Bachman, 2001). Research on substance abuse

and dependence in older adult populations is somewhat limited.

### **Substance Abuse Among Adolescents**

Within adolescent populations, alcohol (discussed in Alcohol-Related Disorders) is the most widely used substance; data suggest that 7 out of 10 adolescents have used alcohol. Nicotine and marijuana/hashish are also among the most heavily used substances among adolescents; marijuana is the most frequently used illegal drug (Johnston, O'Malley, Bachman, & Schulenberg, 2013).

Among adolescents, substance abuse is more prevalent in males than females, although the gender ratio varies with age. For example, data from the Multimodal Treatment Study of Children With ADHD (MTA), a national school-based survey, showed that adolescent males report higher prevalence rates in the annual use of heroin, LSD, steroids, and smokeless tobacco. In addition, they reported an increase in the daily use of marijuana and heroin. However, females are as likely as males to report being daily smokers. In addition, at younger ages, females and males show similar rates of use of many drugs. Females and males have reported different motivations for drug use. For example, males typically report stronger social and enhancement motives for drinking than do females. At younger ages, females report stronger coping and conformity motives for drinking than do males; however, this pattern of gender difference reverses among adults (Cooper, 1994).

Several epidemiological studies have shown significant ethnic differences in substance use. For example, African American populations tend to have lower rates of drug use than do White populations; cigarette smoking is particularly uncommon in African American populations. This finding is counterintuitive based on further demographic information. Socioeconomic status indicators, which tend to be lower in African Americans, are inversely correlated with psychiatric disorders; thus one

would expect higher rates of substance use based on the comorbidity between psychiatric disturbance and substance use (Kip, Peters & Morrison-Rodriguez, 2002). Abuse of barbiturates, amphetamines, and hallucinogens is particularly prevalent among White male youths, abuse of heroin and cocaine is more common among Hispanic youths, and Native American adolescents tend to abuse alcohol (Perron, Howard, Vaughn, & Jarman, 2009). In addition, rates of daily nicotine use are highest among Native Americans. A meta-analysis of 14 epidemiological concluded that among adolescents, lifetime prevalence rates for substance abuse are highest among American Indian youths and lowest among Asian American youths (Kandel, 1995).

Drug use is a widespread phenomenon among American youth living both in urban and in rural areas (Johnston et al., 2013). Recent surveys, however, revealed larger declines in the use of a number of legal and illicit drugs in urban areas than in nonurban areas. Thus, crack cocaine and heroin use among adolescents is relatively low in areas of varying population density. Although variations in overall rates of illicit substance abuse across youths from different social classes are minimal (as are use rates for legal substances such as nicotine), adolescents from different socioeconomic classes tend to vary according to their access to different drugs, leading to class-related differences in patterns of use. For example, although general cocaine use is more prevalent among adolescents in higher socioeconomic classes, there are minimal socioeconomic differences in the use of "crack," which is a cheap form of cocaine.

### **Substance Abuse Among Adults**

Because substance use in adolescence is a risk factor for substance abuse in adulthood, it is important to review the data on substance use and abuse in adult populations as well.

A large study of young adults (21–35 years) found 5-year prevalence rates of 14.2% for

abuse of or dependence on any substance, 4.4% for abuse of or dependence on any *illicit* substance, and 13.1% for alcohol abuse or dependence (Latvala et al., 2009). Factors associated with substance use in this sample included both affective and behavioral characteristics, early initiation of substance use, parental behavior (e.g., low monitoring), learning difficulties, and lower education. Another study (Johnston, O'Malley, Bachman, & Schulenberg, 2003) found that young adults were more likely to frequently abuse alcohol and to use illicit drugs if they were unemployed, if they were parents without custody of their children, or if they had used during high school. In contrast, less frequent use was associated with being a college graduate, being female, being a professional, being married, or being a custodial parent.

In older adults (50+), the literature is limited, as older populations are often omitted from epidemiological studies; this lack of data has led the Royal College of Psychiatrists to label members of this group with substance-related problems “invisible addicts.” However, existing data suggest that, in both America and Europe, older individuals’ use of both legal and illegal substances has increased (Gossop, 2008; Wu & Blazer, 2011). More specifically, the percentage of older adults using both legal and illegal drugs has increased in 2013 relative to earlier decades. It is estimated that by 2020 the number of older adults (anyone over 50 years of age) with a substance use disorder will double from 2.8 to 5.7 million in the United States (Gfroerer, Colliver, & Penne, 2009); this statistic is mirrored in Europe, as rates of substance use are also projected to double from 2001 to 2020 (Gossop, 2008). Knowledge of causes, characteristics, and consequences of substance use in this population is virtually nonexistent, which has hindered the development of effective prevention and treatment programs that specifically target the older individuals (Aartsen, 2011).

### Age of Onset and Clinical Course

Substance use is typically initiated in adolescence. Research suggests that the typical age of onset for drug use begins in early adolescence (11–12 years of age). According to the *Monitoring the Future* (MTF) data, the typical time for onset of alcohol use and first intoxication is in 7th to 10th grade (see Alcohol-Related Disorders for detail). Adolescents’ substance use generally starts with legal drugs such as tobacco and alcohol, and illegal drug use begins during the high school period. Some researchers suggest that earlier *substance use*, before the age of 15, increases the risk of later *substance abuse*. Similarly, early use of some drugs may predict the later use of illicit drugs, as postulated by the “gateway theory,” which states that tobacco and alcohol use may boost the risk of later use of illegal drugs, including cocaine and hallucinogens.

Over the adolescent years, the use of drugs increases in both quantity and frequency, peaking at 18–25 years. Substance use disorders are also at the highest level during this period. In the mid to late 20s, the use of illegal drugs begins to decrease. Therefore, substance use is thought to be a youth-related problem; however, elderly persons often experience problems with older adult-onset alcohol abuse and prescription drug abuse.

Psychiatric disorders predict and perhaps influence substance use throughout the lifespan. Rates of mood and disruptive disorders are higher in adolescents using substances compared with a non-using group. Rates of comorbidity of substance abuse with other psychiatric disorders are similar in adolescents and in adults. Particularly among adolescents, those with substance abuse tend to have a comorbid psychiatric disorders (Essau, 2011) such as major depression, anxiety disorders, disruptive behavior disorders, and attention deficit hyperactivity disorder (ADHD). In young women, major depression and posttraumatic stress disorders are the most common comorbid disorders with substance abuse.

Depression plays a significant role in substance abuse for males as well; however, males who abuse substances are more likely to have post-traumatic stress disorders, anxiety disorders, and ADHD.

Substance use in adolescence may affect the course of adolescent development and produce serious consequences in later adulthood. Use of substances during the adolescent period has been linked with psychological distress and mental health problems in adulthood. Adolescents who smoked more than one pack of cigarettes a day at the age of 16 were more likely than other individuals to be diagnosed with an anxiety disorder at the age of 22 (Johnston et al., 2003).

Research suggests that short-term substance use negatively affects judgment and performance but long-term effects are less clear. In the short term, heavy drinking may be associated with a greater risk for morbidity and mortality from impaired driving, accidents, low levels of behavioral coping, and risky sexual behavior. Researchers suggest that accidents, suicide, and homicide account for more than 80% of deaths in adolescents, and that two thirds of adolescents with conduct disorder engage in substance abuse. Early illicit drug abuse has also been linked with problem behaviors, such as early sexual activity, which may lead to sexually transmitted disease and human immunodeficiency virus (HIV) infection. Its long-term effects may be more serious since substance use itself is correlated with numerous risk factors, including conduct problems, poor parenting, and high-risk temperament, which may all contribute to later negative outcomes. Substance abuse has numerous effects on physical health, such as cirrhosis of the liver, malnutrition, and stomach problems. The use of drugs has also been shown to have long-term effects on brain functioning, including the significant reduction of cognitive abilities, such as abstract reasoning and problem solving. It also adversely affects social and emotional development, particularly in early adolescents.

### Risk and Protective Factors

Substance abuse is a psychiatric disorder with genetic, neurobiological, and environmental contributors. For example, *genetic influences* increase the risk for substance use. In adolescence, family history risk is associated with the early onset of substance use. Family history risk has both heritable and environmental factors. In addition, twin and adoption studies indicate significant heritability for substance use and abuse. This heritability appears to vary across conditions, however. For example, heritability of the use or abuse of illegal drugs tends to be low but the heritability of tobacco use and dependence tends to be higher. Certain *personality characteristics* are also associated with substance use. These include unconventionality, low ego control, sensation seeking, aggression, impulsivity, and inability to delay gratification. Longitudinal studies have shown that certain childhood temperamental characteristics, such as poor impulse control, are also predictive of later substance abuse problems.

Consistent findings have revealed that people who experience high level of life stress and emotional distress are more likely than other people to use alcohol or drugs. In addition, low self-esteem, depression, anxiety, and attentional problems have also been associated with substance use.

Competing theories have attempted to explain substance abuse and addiction on a psychological level. From the psychoanalytic perspective, substance abusers tend to have overly harsh superegos; therefore, they use drugs to escape intense feelings of anger and fear. Nevertheless, this model is difficult to reconcile with findings that psychopaths, who have a weak conscience, are at markedly elevated risk for substance use disorders. According to behavior-oriented explanations, substance use is a learned behavior that is reinforced by a reduction of anxiety and tension. From a biological perspective, scholars have linked *biobehavioral markers* of undercontrol to adolescents' substance use. For example, reductions in P3 (a brain-elevated related

potential occurring approximately 300 ms following stimulus onset) amplitude have been reported for several forms of undercontrolled behaviors, such as antisocial personality disorder, ADHD, and aggression. In addition, sociocultural factors significantly influence substance abuse. For example, widely replicated studies have consistently revealed *peer pressure* and *neighborhood* to increase risk for substance use and abuse. This is a widely replicated finding within the extant literature. In addition, personal affiliation with a drug-using peer group or clique increases the risk for adolescents substance use by validating the behavior and providing the opportunity to engage in drug use. *Siblings* can also be an important source of peer influence for adolescent drug use. Findings have determined a link between adolescent substance use and sibling substance use in both biological and adoptive sibling pairs; the latter finding suggests that at least some of this transmission is attributable to shared environmental factors.

Protective factors are variables that moderate the relationship between risk factors and negative consequences. Findings of longitudinal studies have revealed that across gender and ethnicity, protective factors include endorsing positive attitudes, increasing one's perception of the controllability of a situation, seeking friends as models of acceptable behavior, and engaging in prosocial activities. Self-control and regulatory activities may also buffer against substance use among high-risk individuals. Moreover, coping ability has been investigated as a protective factor against early substance use. Results of a longitudinal study carried out with children from seventh to ninth grade showed that using active problem-solving coping styles helped adolescents abstain from substance use.

### Treatment

Many researchers have contended that addiction is a progressive disease and that treatment requires abstinence. For this reason, some researchers believe that programs that do not

require abstinence are unsuccessful; nevertheless, controlled drinking approaches to alcohol dependence have met with at least some success in certain individuals.

The efficacy rates of treatment programs are highly variable. In part, this variability stems from differential outcome measures of success. For example, some therapies define success as tempering drug/alcohol use, others define success as abstaining from use for a short period of time after treatment, and still others define success as abstaining from drug and alcohol use for a prolonged time period. Current research shows that the most effective substance abuse intervention programs for adolescents integrate multiple approaches, including individual and group counseling, behavioral therapy, education, and specialized family therapy. Family-based interventions for adolescents have been shown to be effective in reducing substance use and improving psychosocial skills. For example, the family-based intervention *Multidimensional Family Treatment* (MDFT), a three-phase treatment program, has been found to be effective at treating drug use and enhancing problem-solving abilities, eliciting lifestyle changes, and increasing prosocial behavior in adolescents.

Investigations have also demonstrated the effectiveness of family-based treatments using cognitive behavioral therapy (CBT) for substance use or abuse. CBT teaches substance users effective coping skills to reduce or eliminate substance use. Treatment programs using CBT focus on a number of targets to reframe maladaptive thinking patterns while delivering the program individually, in groups or with family. In this regard, CBT builds coping skills through group discussions, behavioral modeling and role-play.

An alternative therapy that has been employed in controlled studies is *motivational enhancement therapy* (MET), which has been efficacious with adults and adolescents dealing with substance dependence. With MET, the client's motivation is considered to be internal rather than external. Treatment focuses on resolving clients' ambivalence about

giving up their pathological substance use. Consequently, they achieve change through listening and reflection, goal setting, nonconfrontational therapy sessions, and by increasing self-efficacy (Miller & Rollnick, 1991).

From a self-help standpoint, the 12-step model, embodied in Alcoholics Anonymous and allied programs, is one of the best-known support groups for treating individuals with a drug or alcohol problem. The program includes community-based meetings with recovering members who support each other's abstinence through confessions, sharing stories, and peer encouragement. In this program, opportunities for connecting with a lifeline "buddy" can also be provided if necessary for crisis purposes.

An additional program that has met with some success is the life skills program, which is applied to youth groups; it has also been found to be an effective strategy for reducing drug use or abuse. The program includes information about social skills, drug refusal, and personal management.

Some forms of psychotherapy and behavioral therapy are also considered viable treatment options for substance use disorders. The major strategy in psychotherapy is to place primary emphasis on controlling or reducing substance use, while pursuing other goals. In this sense, there appears to be a common strategy used to achieve these objectives. In the first stage, the therapist typically enhances the substance user's motivation to stop using. While this goal is achieved, the client is taught coping skills during the period of abstinence. However, if treatment is ineffective and substance abuse worsens, concerns about work, family, friends, possessions, and health can be addressed. In psychotherapy, this stage is called "enhancing reinforcement contingencies." In order to foster recovery, patients are encouraged to enhance the ability to identify, tolerate, and to respond appropriately to dysphoric affects. As a final stage, patients are usually encouraged to improve their interpersonal functioning and enhance social supports.

Data suggest that certain medications can also ameliorate substance use. Accordingly,

medication, for example naltrexone, disulfiram, or acamprosate, is used to reduce the reinforcing effects of the psychoactive substances, to make the drugs aversive, or to treat co-occurring mental disorders that may underlie drug use.

**SEE ALSO:** Addiction and Violence Risk; Addiction Treatments; Alcohol-Related Disorders

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