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Prevalence of Adolescent Substance Use

Adolescents are more vulnerable to addictive substances than adults for myriad reasons. First, adolescents' brains are not fully developed until the mid-twenties. The areas of the brain responsible for rational judgment, cogent decision making, and impulse control are not fully developed. Therefore, adolescents are more likely to engage in experimentation with high-risk behaviors such as drug use and sexual activities. Second, adolescents in the United States are increasingly subject to and exposed to psychosocially unstable families (for example, blended families, single-parent families, etc.). Therefore, a stable family structure in which appropriate social modeling can occur is restricted. Third, adolescents in the United States are increasingly exposed to social aggression within the family and in social peer groups. Rates of exposure to painful social situations have increased, thereby increasing the potential for emotional trauma for which individuals tend to self-medicate. Finally, with the explosion of various social media mechanisms, adolescents are allowed the opportunity to access sources for substances (CSAT, 2004).

Substances of various types are discussed in this chapter. Although tobacco is a highly addictive substance, is illegal for people under the age of 18, and its use is correlated with many health-related problems, it is not dealt with in this work, because it is not considered to be an immediate mental health or physical danger. The use of tobacco products in their many forms constitutes a major health problem in this country, but their effects are considered long range, whereas the use of other substances addressed in this chapter are considered more immediately deleterious.

It has been reported that adolescents' use of tobacco and marijuana, alcohol, and other illicit substances such as cocaine or heroin and the misuse of prescription medications is a public health problem of epidemic proportions (National Center on Addiction and Substance Abuse, 2011). As such, this epidemic presents a clear and present danger to millions of American youths. In addition, there are severe financial and psychosocial consequences to the general population.

Several national surveys track adolescent health and substance use over various timeframes. These surveys include the National Survey on Drug Use and Health (NSDUH) conducted by the U.S. Department of Health and Human Services' Substance Abuse and Mental Health Services Administration, the Youth Risk Behavior Surveillance System (YRBS) conducted by the CDC, and Monitoring the Future conducted by the University of Michigan and supported by the National Institute on Drug Abuse (NIDA). In addition, in 2011 the Center on Addiction and Substance Abuse (CASA) at Columbia University synthesized the finding from these surveys in an exhaustive report entitled *Adolescent Substance Abuse: America's #1 Public Health Problem* (CASA, 2011).

Although a number of sources were used to establish prevalence rates, unless otherwise indicated, the prevalence data presented in this chapter are a synthesis of information from NSDUH (SAMHSA, 2007a), YRBS (CDC, 2009, 2012), and Monitoring the Future (Johnston, O'Malley, Bachman, & Schulenberg, 2011). The most recent data available from the NSDUH and YRBS data set are from the 2009 surveys, and the data from Monitoring the Future are from 2010. These studies were used because of their holistic and comprehensive use of sample size and the intricacy of survey questions employed.

The vast majority of adolescent high school students (75.6 percent, about 10.0 million) have used one or more addictive substances (CDC, 2009, 2012). Nearly half of the high school students (64.1 percent, about 6.1 million) are current users. Nearly three-quarters (72.5 percent) have used alcohol, nearly half (46.3 percent) have used tobacco products, more than a third (36.8 percent) have used marijuana, and 6.0 percent have used cocaine. More than a third (35.3 percent) of ninth graders and 56.6 percent of 12th graders are current substance users. Moreover, high school students also engage in dangerous patterns of substance use. For instance, although they drink less alcohol than adults, when they do use alcohol they consume more drinks per day (4.9 drinks) than other age groups, including 18- to 25-year-olds (4.4 drinks). In addition, since the national age for legal purchases of alcohol was lowered to 18 years in 1984, the number of vehicular deaths has decreased dramatically, but the rate of alcohol poisoning deaths related to binge alcohol use has increased. This is due in part to adolescents continuing to use and abuse alcohol in secret and in clandestine ways to avoid detection from adults and those in authority.

The average age at which adolescents begin using these substances is between 13 and 14 years old. Early use of substances is indicative of potentially dangerous future risks of addictive behaviors. Nearly one in eight high school students (11.9 percent, 1.6 million) has a diagnosable substance use disorder and more than one in six (17.7 percent, about 766,000) meet the clinical criteria for this disorder. There are 75.5 percent of high school students who have used or abused

addictive substances and 46.1 percent are actively using substances, which dwarfs the prevalence of other risky health behaviors considered to be epidemic (Johnston et al., 2011.) (By comparison, approximately 34.2 percent of adolescents meet the medical criteria for obesity.)

Almost half of all high school students (46.1 percent, 6.1 million) are current substance users (CDC, 2012). Of these drug-using adolescents, 41.8 percent consume alcohol and 20.8 percent report binge drinking. More than a quarter (26.3 percent) of high school students who report regular substance abuse consume tobacco products (that is, cigarettes, cigars, and smokeless tobacco), 20.8 percent use marijuana, and 2.8 percent use cocaine (CDC, 2009, 2012; Johnston et al., 2011).

On a positive note, the percentage of adolescents who report having used alcohol, tobacco, marijuana, or cocaine has decreased over the past decade from 82.7 percent in 1999 to 75.8 percent in 2009 (Johnston et al., 2011).

ALCOHOL

Although alcohol use among high school adolescents has been decreasing in recent years, it remains the most commonly used addictive substance among high school adolescents. The overall percentage of high school students who have ever used alcohol declined by 10.5 percent from 81.0 percent in 1999 to 72.5 percent in 2009. The percent of adolescents currently using alcohol declined by 16.4 percent from 50.0 percent in 1999 to 41.8 percent in 2009 (CDC, 2012). Moreover, the rates of binge alcohol abuse also decreased between 1999 and 2009 from 31.5 percent to 24.2 percent across ages for males and females (CDC, 2012; SAMHSA, 2012).

Nonetheless, alcohol use and abuse among adolescents remains a grave concern in America. Nearly three-quarters (72.5 percent) of high school students have used alcohol at least once. Four in 10 (41.8 percent) are current drinkers. The overall likelihood of alcohol use increases between the start and end of high school. That is, two-thirds of ninth graders (63.4 percent) have used alcohol by the 12th grade and eight out of 10 (79.6 percent) have use alcohol (CDC, 2009).

Ethnic and Racial Differences

Although high school adolescents of all ethnicities and races are drinking less alcohol today than in 1999, there remains a substantial variance between ethnic and racial adolescent groups. Black adolescents drink at a lesser rate than their white counterparts, and blacks who drink consume less than white adolescents. As of 2009, Hispanic adolescents are more likely to have ever used alcohol (76.6 percent) than white adolescents (73.8 percent), black adolescents (33.4 percent), and adolescents of other ethnicities and races (32.6 percent). In addition, white adolescents are more likely to be current binge alcohol drinkers (27.8 percent) than Hispanic adolescents (24.1 percent) or adolescents of other ethnicities and races (17.6 percent) (Johnston et al., 2011).

Gender Differences

Since 1999, adolescent girls are slightly more likely than boys to have ever consumed alcohol and to have done so in the previous 30 days. Prior to 2003, adolescent males were slightly more likely than their female counterparts to be current alcohol drinkers; by 2009, the gender differences had reversed, with girls being slightly more likely than boys to be current drinkers (42.9 percent versus 40.8 percent). In 2009, 74.2 percent of adolescent girls and 70.9 percent of boys reported ever having had a drink. However, adolescent boys consistently binge on alcohol at a higher rate than girls. In 2009, 25.0 percent of adolescent boys and 23.4 percent of adolescent girls binged on alcohol during the previous 30 days (CDC, 2009; Johnston et al., 2011).

MARIJUANA

Ranking behind alcohol and tobacco as the most commonly used addictive substance by adolescents, marijuana is the most commonly used illicit substance in the United States. Since 1999, the overall percentage of high school adolescents who reported ever having used marijuana has declined steadily by 22.0 percent. The percent of those currently using marijuana has declined from a high of 26.7 percent in 1999, but it appears to have moved upward slightly in 2009 (CDC, 2012; Johnston et al., 2011).

More than one-third (36.8 percent) of high school adolescents have used marijuana. One in five (20.8 percent) high school adolescents are currently using marijuana. By ninth grade, one-quarter (26.4 percent) have tried marijuana; by 12th grade, nearly half (45.6 percent) have used marijuana (SAMHSA, 2012). The majority (96.8 percent) of those adolescents reporting marijuana use have additionally used other addictive substances. Among those reporting marijuana use, 93.0 percent have also used alcohol, 76.1 percent have used tobacco products, 36.8 percent have misused controlled prescription drugs, and 33.7 percent have used other illicit substances. Among active marijuana users, 84.9 percent reported current use of another addictive substance: 69.7 percent consumed alcohol, 58.6 percent used tobacco products, 18.5 percent misused prescription drugs, and 14.2 percent had used other illicit drugs such as cocaine or amphetamines (Johnston et al., 2011).

Among high school adolescents, 7.5 percent used marijuana for the first time before the age of 13 (CASA, 2011). Statistical analysis of national data found that the average age of initiation of marijuana use among high school adolescents was 14.3 year of age (CASA, 2011).

On average, high school adolescents who use marijuana use it more frequently than adolescents reporting alcohol use (10.5 days per month versus 4.4 days per month, respectively). Between 1999 and 2010, the daily rate of marijuana use among high school seniors remained steady at about 6.0 percent from 1999 through 2003, then decreased to 5.0 percent between 2005 and 2007, and increased again to 6.1 percent in 2010 (Johnston et al., 2011).

Ethnic and Racial Differences

Between 2002 and 2009, the frequency of current marijuana use increased slightly among black adolescents from 10.7 days per month in 2002 to 11.1 days per month in 2009. Black adolescents (41.2 percent) and Hispanic adolescents (39.9 percent) are somewhat more likely to report ever using marijuana than white adolescents (35.7 percent) and adolescents of other ethnicities and races (29.2 percent). Black adolescents were also more likely to be current marijuana users (22.2 percent) than Hispanic adolescents (21.6 percent), white adolescents (20.7 percent), and adolescents of other ethnicities and races (17.0 percent) (CASA, 2011; Johnston et al., 2011).

Since 1999, the overall percentage of adolescents who have ever used marijuana fell considerably among whites and other ethnicities and races, while the percent of Hispanic and black adolescents who ever used marijuana increased slightly in recent years. Rates of current marijuana use have steadily increased across all ethnicities and races.

Gender Differences

As of 2009, more adolescent boys than girls reported having used marijuana (39.0 percent versus 34.3 percent). Although adolescent boys consistently used marijuana at higher rates than girls, the rates for lifetime marijuana use have steadily declined among adolescent boys more than girls. In recent years, current marijuana use increased from 22.1 percent in 2005 to 23.4 percent in 2009 among adolescent boys and from 17.0 percent in 2007 to 17.9 percent in 2009 among adolescent girls (Johnston et al., 2011).

CONTROLLED PRESCRIPTION DRUG MISUSE

The fourth most commonly used addictive substance among adolescents in the United States is controlled prescription drugs. However, what compromises much of the prevalence data relative to controlled prescription misuse is whether the drugs were ever prescribed to the abusing adolescent or a family member. How the abusing adolescent obtained the controlled medications is of concern in general and is questionable, but the major issue is whether these drugs were misused or abused. The overall percent of high school adolescents who reported that they had ever misused a controlled drug has declined since 2002. However, in 2009 there was a slight increase in the misuse of these drugs from a reported low of 14.1 percent in 2008. Current misuse of any controlled prescription drug also declined through 2008 but showed a slight increase in 2009. In 2009, 14.8 percent of high school adolescents had misused prescription drugs in their lifetime, and 4.0 percent were currently misusing prescription drugs. The likelihood of misusing controlled prescription drugs nearly doubles between the start and end of high school (CASA, 2011; Johnston et al., 2011).

High school adolescents who have reported misuse of controlled prescription drugs (90.9 percent) also report having used other addictive substances. As such, among adolescents who have ever misused prescription drugs, 86.1 percent have

used alcohol, 68.5 percent have used nicotine products, 63.1 percent have used marijuana, and 46.6 percent have used additional illicit drugs. Among adolescents who identify as currently misusing prescription drugs, 72.7 percent currently use additional addictive substances: alcohol (60.0 percent), nicotine (50.2 percent), marijuana (49.5 percent), and other illicit substances (20.4 percent) (CASA, 2011; Johnston et al., 2011).

Although it is still a significant health problem in the United States, the lifetime misuse of controlled prescription drugs has declined among adolescents between 2002 and 2009 (CASA, 2011). For instance, sedative use declined from 1.1 to 1.0 percent, tranquilizer use declined from 4.6 to 4.1 percent, stimulant use declined from 5.6 to 3.1 percent, and opioid use declined from 14.6 to 12.9 percent (CASA, 2011).

Ethnic and Racial Differences

At 15.9 percent, white adolescents are more likely than adolescents of other ethnicities and races (12.3 percent of black adolescents, 14.1 percent of Hispanics, and 13.1 percent of adolescents of other races) to have misused controlled prescription drugs of all types. In addition, white adolescents (4.3 percent) are more likely to be current misusers of prescription medications than Hispanics adolescents (3.5 percent), black adolescents (4.0 percent), and adolescents of other ethnicities and races (3.2 percent) (CASA, 2011; Johnston et al., 2011).

Gender Differences

Adolescent females are more likely than their male counterparts to have misused controlled prescription medications (15.8 percent versus 13.9 percent). Adolescent females misuse controlled prescription medications compared to males as follows: tranquilizers (4.9 versus 3.3 percent), sedatives (1.2 versus 0.8 percent), stimulants (3.8 versus 2.6 percent), and prescription narcotics (13.4 versus 12.4 percent) (Johnston et al., 2011).

Prescription Sedatives

In 2009, only 1.0 percent of high school adolescents reported ever using prescription sedative or barbiturates, such as pentobarbital (Nembutal) or mephobarbital (Mebaral), but 0.2 percent reported having used one of these substances during the past month. Those reporting ever misusing sedatives increases between the beginning and ending of high school (from 0.8 percent of ninth graders to 1.3 percent of 12th graders).

Prescription Tranquilizers

During 2009, roughly 4.1 percent of high school adolescents reported ever misusing prescription tranquilizers such as lorazepam (Ativan), clonazepam (Klonopin), chlordiazepoxide (Librium), alprazolam (Xanax), or diazepam (Valium). In less than 1.0 percent of those who reported ever misusing prescription tranquilizers,

usage doubled from the beginning to the end of high school (from 2.5 percent of ninth graders to 6.1 percent of 12th graders) (CDC, 2012; Johnston et al., 2011).

Prescription Stimulants

During 2009, 3.1 percent of adolescents reported ever using stimulants such as dextroamphetamine (Dexedrine, Adderall), methylphenidate (Ritalin, Concerta), and sibutramine hydrochloride monohydrate (Meridia). Less than 1.0 percent (approximately 0.7 percent) reported having misused prescription stimulants during the past 30 days. The percentage of those who have ever used stimulants more than doubled between the beginning and end of high school (from 1.8 percent of ninth graders to 4.7 percent of 12th graders) (CDC, 2012; Johnston et al., 2011).

Prescription Narcotics

Although traditionally prescribed to adolescents at a lesser rate than adults, prescription narcotics in the typical form of pain medications (hydrocodone ([Lortab, Vicodin], codeine, morphine, and oxycodone [OxyContin, Percocet]), are the most widely misused controlled prescriptions drugs among adolescents (86.9 percent). One in eight (12.9 percent) adolescents has misused prescription narcotics and 3.4 percent report current misuse of these medications. The overall percent of adolescents who report ever having misused prescription narcotics doubles between the beginning and ending of high school (from 8.3 percent of ninth graders to 16.3 percent of 12th graders) (CASA, 2011).

Other Substances

Although nicotine, alcohol, marijuana, and prescription drugs are the typical substances most abused by adolescents, many adolescents use and abuse other addictive substances such as heroin, cocaine, methamphetamines, ecstasy, steroids, inhalants, and over-the-counter medications. Although specific data rates are not available for all the aforementioned, some trend data are available (CASA, 2011).

Heroin

Roughly, 2.5 percent of high school adolescents report having used heroin. Seemingly, heroin is more prevalent among older adolescents than students in lower grades. The overall percentage of adolescents who reported ever having used heroin was 2.4 percent in 1999, with minimal change in 2009 at 2.5 percent. Heroin is more commonly used among adolescent males than females (3.2 versus 1.7 percent). Hispanic adolescents are more likely (at 3.3 percent) to use heroin than either black or white adolescents (at 2.2 percent for each race) or any other ethnicity or race (at 3.2 percent) (CASA, 2011; Johnston et al., 2011).

Steroids

Some adolescents use anabolic steroids for the purpose of improving athletic competition. Steroids are synthetically manufactured drugs that mimic the hormone testosterone. On average, only about 3.3 percent of high school adolescents report

the use of steroids. As a trend, the rate of steroid use remains generally consistent for adolescents throughout high school. The overall percentage of adolescents reporting steroid use increased from 3.7 in 1999 to 6.1 in 2003 and has declined steadily since then. As one would expect, steroid use is higher for adolescent males than females (4.3 versus 2.2 percent). Hispanic adolescents have a higher rate of steroid use (at 3.9 percent) than adolescents who are white (at 3.1 percent), black (at 2.8 percent), or other ethnicities or races (at 3.8 percent) (CASA, 2011; CDC, 2009; Johnston et al., 2011).

Cold and Cough Medications

It is common knowledge that some adolescents and young adults misuse over-the-counter cold and cough medications. Approximately 4.0 percent of adolescents report misuse of these medications. Overall misuse of over-the-counter medication tends to increase with age and accessibility (for example, if an adolescent works in a store that sells these medications). Adolescent males tend to misuse these medications at a lesser rate than their female counterparts (3.4 versus 4.7 percent) (CASA, 2011).

Methamphetamines

Reports from adolescents about their abuse of methamphetamines increases with age. The overall percentage of adolescents who report having ever used methamphetamines decreased quite significantly from 1999 to 2009 (9.1 to 4.1 percent). Overall, methamphetamines use is higher for male adolescent than females (4.7 versus 3.3 percent). Hispanic adolescents tend to use more methamphetamines (at 5.6 percent) as compared to white adolescents (at 3.7 percent), black adolescents (at 2.7 percent), and adolescents of different ethnicities and races (at 4.8 percent) (CDC, 2012; Johnston et al., 2011).

Cocaine

The number of high school adolescents who reported having ever used cocaine decreased from 1999 (9.5 percent) to 2009 (6.4 percent). Adolescent males report a high rate of cocaine use (7.3 percent) as compared with their female counterparts (5.3 percent). Hispanic adolescents report a higher rate of cocaine use (9.4 percent) than black adolescents (2.9 percent), white adolescents (6.3 percent), or adolescents of different ethnicities and races (at 5.8 percent). The bulk of cocaine abuse reported is in the form of “powder” cocaine (CASA, 2011; CDC, 2012; Johnston et al., 2011).

Ecstasy

Approximately 6.7 percent of high school adolescents reported that they have ever used Ecstasy in 2009. Ecstasy abuse increases as adolescents age (CDC, 2009). Since 2001 when 11.1 percent of adolescents reported abuse of Ecstasy, abuse rates have decreased by 39.6 percent nationwide. Adolescent males are more likely to use Ecstasy (7.6 percent) than are adolescent females (5.5 percent). Hispanic adolescents (8.2 percent) are more likely than white adolescents (6.4 percent), black adolescents (5.1 percent), and adolescents from different ethnicities and races (7.3 percent) (CASA, 2011; Johnston et al., 2011).

Inhalants

Inhalants are defined here as carbon-based compounds such as petroleum products (gasoline, glues, lighter fluid, and paint products). These products produce intoxication (inability to coordinate movements, dizziness, confusion, and so on) when inhaled. These compounds are widely available, and are easy for adolescents to obtain (as, for example, with household cleaning products). Approximately 11.7 percent of adolescent high school students report having used inhalants. Owing to their accessibility, inhalants are quite popular with younger adolescents.

The overall prevalence of inhalant use has decreased from 14.7 percent in 2001 to 13.3 percent in 2007. Adolescent females are more likely to use inhalants (12.9 percent) than adolescent males (10.6 percent). The rate of use is highest among Hispanic adolescents (14.0 percent), as compared with the rate among white adolescents (11.5 percent), black adolescents (8.3 percent), or adolescents of different ethnicities and races (13.2 percent) (CASA, 2011; Johnston et al., 2011).

SUBSTANCE USE DISORDERS AMONG ADOLESCENTS

Substance use disorders are mental health and medical conditions involving either abuse (poor judgment and decision making) or dependency (psychological reliance or physical addiction). One major difficulty in identifying adolescents who have a substance use disorder is delineating those who have a substance abuse disorder from those having a substance dependency. By definition, substance use among people younger than 18 years is considered abuse. Hence, any illegal use of licit or illicit substances by adolescents constitutes abuse. Substance dependency is a more intricate diagnosis and involves meeting multiple symptom criteria. Therefore, much of the data on prevalence tend to cluster around people who meet the substance use disorder criteria for abuse but not necessarily for dependency (American Psychiatric Association [APA], 1994). For example, specific substance use needs to be identified in order to derive an accurate evaluation of substance dependency. Given the overall polysubstance use (that is, multiple drugs used in tandem or in succession) by adolescents, it is often quite difficult to identify a specific substance.

The overall rate of substance use disorders has declined among adolescents between 2002 and 2009 (15.4 to 11.9 percent). However, the rate of substance use disorders among adolescents remains relatively high. One in eight adolescents (11.9 percent, approximately 1.6 million) currently meets the DSM-V (APA, 2013) diagnostic criteria for a substance use disorder. Specifically, of adolescents ages 18 and younger who report having ever used alcohol or other substances, 19.4 percent technically have a substance use disorder.

In 2009, female adolescents were slightly more likely than their male counterparts to have a diagnosable substance use disorder (12.3 versus 11.4 percent, respectively). Furthermore, Hispanic adolescents (14.0 percent) were more likely to have a diagnosable substance use disorder than white adolescents (12.7 percent), black adolescents (7.0 percent), or adolescents of other ethnicities or races (9.0 percent) (CASA, 2011).

CONCLUSIONS

As evidenced in the prevalence rates cited in this chapter, substance abuse by adolescents is a serious problem in the United States. The overall prevalence rates strongly suggest that it is a major health and mental health problem on the magnitude of a national epidemic.

There have been some positive changes in adolescent substance abuse patterns in the United States. Since 1999, the overall percentage of adolescents who have ever used alcohol has declined by 10.5 percent and marijuana use has declined by 22.0 percent. In addition, since 2002, the misuse of controlled substances has declined by 15.5 percent (CASA, 2011; Johnston et al., 2011). However, despite these declines, rates of adolescent substance abuse remain unacceptably high, and there have been no major decreases noted during the past decade.

Current ongoing adolescent substance abuse is cast in the context of a national trend of acceptance of substance use. In March 2013, just five months after Washington state and Colorado voted to legalize marijuana for recreational use for individuals 18 years old and older, the Pew Research Center (2013) found that 52 percent of Americans responded that they believe marijuana should be legalized in America. Moreover, the Pew Research Center found in the same survey that 48 percent of the respondents reported that they had used marijuana. This poll also found a sharp decline in the percentage of Americans who believe that marijuana is a “gateway” drug that leads users to try other harder drugs such as cocaine. The poll found that the bulk of respondents were young adults, with 50 percent reporting themselves as parents with minor children living in the home. With this accepting view by young adults in America relative to the use of marijuana, it is expected that these values will be transmitted to adolescents in this country.