



Drug use among youth: National survey data support a common liability of all drug use

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ABSTRACT

The prevalence of substance use disorders in adults is higher if substance use is initiated during adolescence, underscoring the importance of youth substance use prevention. We examined whether the use of one substance by adolescents is associated with increased risk for using any other substance, regardless of use sequences. In 2017 we examined data from 17,000 youth aged 12–17 who participated in the 2014 National Survey on Drug Use and Health, a sample of nationally representative data on substance use among the U.S. civilian, non-institutionalized population aged 12 or older. Descriptive analyses and multivariable logistic regression models were applied. After controlling for age, sex, and race/ethnicity, compared with youth without past-month marijuana use, youth with past-month marijuana use were 8.9 times more likely to report past-month cigarette use, 5.6, 7.9 and 15.8 times more likely to report past-month alcohol use, binge use, or heavy use (respectively), and 9.9 times more likely to report past-month use of other illicit drugs. The prevalence of past-month use of cigarettes, marijuana, and other illicit drugs was significantly higher among past-month alcohol users compared with youth without past-month alcohol use, and increased as intensity of alcohol use rose. Among past-month cigarette smokers, the prevalence of marijuana, other illicit drugs, and alcohol use were each significantly higher than youth without past-month cigarette use. Youth marijuana use, cigarette smoking, or alcohol consumption is associated with other substance use. This finding has importance for youth prevention, supporting a message no use by youth of any substance.

1. Introduction

The medicalization, legalization, and normalization of marijuana use has invigorated a debate on whether this substantial legal and social transformation will significantly modify current patterns of marijuana use and other potentially hazardous substances, especially among youth (D'Amico et al., 2015; Hall et al., 2016). Concurrent with these social and legal changes, scientific evidence is accumulating that initiation of marijuana, alcohol, and cigarette smoking during adolescence heightens susceptibility to addiction and other adverse consequences (Degenhardt et al., 2016; Jordan & Andersen, 2017; Khokhar et al., 2018; Meruelo et al., 2017; Tice, 2013). The heightened vulnerability of youth to addiction, other adverse consequences, and the lamentable rise in opioid use disorders and death (Madras, 2017) provide a compelling rationale to prevent youth substance use nationally as a public health priority. Research has examined many risk and protective factors for initiation and escalation to compulsive use. Effective prevention may be

optimized by addressing all substance use rather than focusing on individual substances.

As marijuana availability has risen with increasing legal and social acceptance, it becomes a public health imperative to examine factors that increase marijuana use including the alcohol and tobacco (nicotine) as well as other illegal for youth. More than 40 years ago, Kandel and Faust (Kandel & Faust, 1975) investigated adolescent involvement in drug use based on random and sequential sampling of students in New York State middle and high schools. Of over 8000 students surveyed, they reported that students who smoked cigarettes and drank alcohol rapidly progressed to marijuana use within 5–6 months, but of those who had not initiated use of tobacco or alcohol, fewer than one tenth as many had used marijuana. Progression to using other illicit drugs was much higher among marijuana users than non-marijuana users. A similar conclusion was drawn from the National Longitudinal Study of Adolescent Health report, based on a large comprehensive survey of adolescents in the United States (Moss et al., 2014). This

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survey examined the U.S. prevalence of various patterns of early adolescent (prior to age 16) use of alcohol, cigarettes, and marijuana. It concluded that early onset of use of alcohol, marijuana and cigarettes combined was more common than initiation of individual substances in early adolescence. A recent study examining prevalence of adolescent marijuana use by groups separated by their use of cigarettes, binge alcohol use and neither substance (Miech et al., 2017) provided additional evidence for the link between use of substances (Chadi & Levy, 2017).

The generalized risk factor for initiation of substance use, based partially on international surveys, has gained traction in recent years (Degehardt et al., 2009; Fergusson et al., 2006; Huizink et al., 2010; Mackesy-Amity et al., 1997; Vanyukov et al., 2012). According to this interpretation, early onset of any drug use is attributable to common liabilities, with the sequence of specific drugs used influenced by individual traits, local culture, and availability (Palmer et al., 2012). Regardless of which model is sustained with ongoing epidemiological or biological study, patterns of drug use are influential in shaping prevention strategies targeting youth.

The present study examined recent patterns of substance use among 12–17 year-old adolescents from the nationally representative survey data on substance use. We specifically examined whether among youth, use of one substance is associated with increased risk for using any other substance, and conversely, whether the non-use of one substance is associated with decreased risk for using other substances. Our population-based approach, which examined generalized risk for substance use among the most vulnerable cohort of substance users, youth aged 12–17, can inform current national public health youth prevention efforts.

2. Methods

2.1. Data source

We examined data from youth aged 12–17 who participated in the 2014 National Survey on Drug Use and Health (NSDUH), conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA). NSDUH provides nationally representative data on substance use among the U.S. civilian, noninstitutionalized population aged 12 or older. The NSDUH data collection protocol was approved by the Institutional Review Board at RTI International. Data are collected by interviewers during in-person visits to households and non-institutional group quarters. The interview averages about an hour. Audio computer-assisted self-administered interviewing is used, providing respondents with a private, confidential way to record answers. Excluded from the surveys are persons without a household address (e.g., homeless persons not living in shelters, prisoners), active-duty military, and institutional residents. The annual weighted response rate of the 2014 NSDUH was 58.3%. Details regarding NSDUH methods are provided elsewhere.

2.2. Measures

The 2014 NSDUH collected data on past-month (prior to survey interview) and lifetime use of tobacco, alcohol, marijuana, and non-marijuana illicit drugs (e.g., cocaine, hallucinogens, heroin, and inhalants and nonmedical use of prescription pain relievers, sedatives, and stimulants) among all respondents. Patterns of alcohol use were questioned in greater depth as NSDUH collected past-month binge alcohol use (drinking five or more drinks on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 day in the past 30 days) and heavy alcohol use (drinking 5 or more drinks on the same occasion on each of 5 or more days in the past 30 days) among all respondents. In addition, NSDUH collected sociodemographic characteristics, such as age, sex, and race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or non-Hispanic other).

2.3. Statistical analyses

Analyses were conducted in four stages. First, descriptive analyses were conducted to estimate the prevalence of past-month and lifetime use of marijuana, illicit drugs other than marijuana, alcohol, and cigarettes among youths. Second, multivariable logistic regression models were applied to estimate age, sex, and race/ethnicity adjusted prevalence of past-month and lifetime use of (a) cigarettes, alcohol, and illicit drugs among youth by marijuana use status; (b) marijuana, other illicit drugs, and cigarettes among youth by level of alcohol use; and (c) marijuana, other illicit drugs and alcohol use among youth by status of cigarette use. It is important to adjust for age, sex, and race/ethnicity because the prevalence of substance use among youth varies by these factors. This study used SUDAAN (Research Triangle Institute, 2015) to account for the complex sample design and sampling weights of the NSDUH.

3. Results

3.1. Unadjusted prevalence of past-month and lifetime substance use

Based on the sampled 17,000 youth aged 12–17 years from the 2014 NSDUH data, we estimated that among youth in the U.S., the unadjusted prevalence of past-month use of marijuana, cigarettes, alcohol, or illicit drugs other than marijuana was 7.4%, 4.9%, 11.5%, or 2.6%, respectively. The unadjusted prevalence of lifetime use of marijuana, cigarettes, alcohol, or illicit drugs other than marijuana was 16.4%, 14.2%, 29.6%, or 13.4%, respectively.

3.2. Associations between marijuana use and use of other substances

Youth who used marijuana in the past month were much more likely to use cigarettes and alcohol, to binge drink, to drink heavily and use other illicit drugs compared to youth who did not use marijuana in the past month (Table 1). After adjusting for age, sex, and race/ethnicity, compared to their peers who reported not using marijuana, past month marijuana users were 8.9 times more likely to report past-month cigarette use (23.6% vs. 2.7%); 5.6 times more likely to report alcohol use (44.6% vs. 8.0%); 7.9 times more likely to report binge alcohol use (27.5% vs. 3.5%); 15.8 times more likely to report heavy alcohol use (5.9% vs. 0.4%); 9.9 times more likely to report illicit drug other than marijuana use (21.7% vs. 2.2%). Youth who never used marijuana in their lifetime reported far lower lifetime rates of cigarette, alcohol and non-marijuana illicit drug use (Table 1).

Associations between alcohol use and use of tobacco, marijuana, other illicit drugs

Youth who used alcohol in the past month were much more likely to use cigarettes, marijuana, and other illicit drugs than youth who chose not to use alcohol in the past month (Table 2). As the intensity of alcohol use increased, the prevalence of tobacco, marijuana and other illicit drug use increased in tandem with highest use recorded in heavy alcohol users. After adjusting for age, sex, and race/ethnicity, compared to youth who reported no past-month alcohol use, youth with past-month alcohol use but without past-month binge or heavy alcohol use were 5.8 times more likely to report past-month marijuana use (20.0% vs. 3.5%); 4.8 times more likely to report past-month illicit drug use other than marijuana (10.5% vs. 2.2%); and 3.8 times more likely to report past-month cigarette use (9.4% vs. 2.5%). By contrast, compared to youth who reported no past-month alcohol use, youth with past-month binge alcohol use but without heavy alcohol use were: 9.9 times more likely to report past-month marijuana use (34.3% vs. 3.5%); 7.6 times more likely to report past-month illicit drug use other than marijuana (16.4% vs. 2.2%); and 8.1 times more likely to report past-month cigarette use (20.4% vs. 2.5%). Furthermore, compared to youth who reported no past-month alcohol use, youth with past-month heavy alcohol use were: 15.7 times more likely to report past-month

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