



Full length article

Correlates and trends in youth co-use of marijuana and tobacco in the United States, 2005–2014

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ABSTRACT

Background: Past-month marijuana and tobacco use (co-use) are increasing among U.S. adults, but little is known about the prevalence of co-use among U.S. youth. This study uses nationally representative data to assess the prevalence, correlates, and trends in co-use of marijuana and tobacco, tobacco-only use, and marijuana-only use among U.S. youth.

Methods: Data came from 176,245 youth ages 12–17 who responded to the National Survey on Drug Use and Health – a nationally representative, household interview survey – between 2005 and 2014. Prevalence, demographics and substance use characteristics from 2013 to 14 were assessed across three groups: past-month users of marijuana and tobacco (co-users), past-month tobacco-only users, and past-month marijuana-only users. Multinomial logistic regression was used to assess demographic correlates of each group. Linear and quadratic trends were assessed from 2005 to 2014 using logistic regression with orthogonal polynomials.

Results: In 2013–14, 5.4% of youth reported past-month co-use of tobacco and marijuana, 2.2% reported marijuana-only use, and 3.9% reported tobacco-only use. Co-use was associated with higher prevalence of past year marijuana dependence (vs. marijuana-only users), and higher past-month risky alcohol and other illicit drug use (vs. both tobacco and marijuana-only use groups). Co-use did not increase significantly between 2005 and 2014; tobacco-only use declined, and marijuana-only use increased.

Conclusions: Co-use of marijuana and tobacco is more prevalent than tobacco-only or marijuana-only use in U.S. youth. Given changing tobacco and marijuana policies, ongoing surveillance and studies that seek to increase our understanding of co-use behaviors in youth are critical.

1. Introduction

Past-month use of marijuana and tobacco is increasing in the U.S. among adults, with 68.6% of marijuana users reporting past-month use of tobacco, and 17.8% of tobacco users reporting past-month use of marijuana (Schauer et al., 2015a). However, similar nationally representative data on the prevalence of co-use among youth have not been previously published. For the purposes of this paper, co-use refers to the past-month use of both marijuana and tobacco. Use may occur in separate products, but at the same time or on the same day (e.g., concurrent use), in the same products (e.g., co-administered in blunts, which are cigars with marijuana in them, or spliffs [also called marijuana cigarettes] which are joints with tobacco in them), or on different days within the past-month.

Although policies legalizing non-medical and medical marijuana use are increasing in the United States, both tobacco and marijuana remain

illegal for youth to consume. In addition to potential punitive and legal repercussions, use of tobacco and marijuana among youth is also concerning from a health and safety standpoint. Tobacco use alone is the single most preventable cause of death and disease in the U.S., harming nearly every organ in the body (U.S. Department of Health and Human Services, 2014). Recent reviews suggest that little is known definitively about the health effects of marijuana (National Academies of Sciences, Engineering, and Medicine 2017; WHO, 2016; Colorado Department of Public Health and Environment, 2016). A number of potential harms – including dependence on marijuana and other drugs, and increased incidence of schizophrenia and psychosis, may be more likely in individuals who initiate marijuana earlier, and who have heavier patterns of use (National Academies of Sciences, Engineering, and Medicine 2017; WHO, 2016; Colorado Department of Public Health and Environment, 2016), making delaying initiation of marijuana in youth an important public health goal.

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While the use of marijuana and tobacco individually have associated health risks, data suggest the use of both substances, especially in combusted form, may have additive negative health effects (Barsky et al., 1998; Fligiel et al., 1997; Hall and Solowij, 1998). Furthermore, the psychoactive compound in marijuana, tetrahydrocannabinol (THC) has been shown in animal models to interact synergistically with nicotine, increasing the rewarding effects (Valjent et al., 2002), and potentially leading to increased dependence on one or both substances (Ford et al., 2002; Peters et al., 2012; Ream et al., 2008). Co-use in the form of co-administered products, like blunts and spliffs may also unknowingly expose youth who do not use tobacco products to nicotine (since youth often do not consider blunts a tobacco product) (Delnevo et al., 2011; Peters et al., 2016; Schauer et al., 2016). Whereas older research suggested that tobacco use was a gateway to use of marijuana, recent research finds that a reverse-gateway phenomenon, wherein marijuana use leads to subsequent tobacco use, is becoming more prevalent (Humfleet and Haas, 2004; Patton et al., 2005), especially among African-American youth (Kennedy et al., 2016). Finally, co-use has also been associated with other risk-taking behavior, especially among youth and young adults (Ramo et al., 2012), including increased use of other drugs and alcohol (Ramo et al., 2013), increased drugged driving (Bingham and Shope, 2004), and decreased condom use (Parkes et al., 2007). Co-use may thus be indicative of a potential risk-taking profile, or a result of shared risk factors that may also increase other risk-taking behavior.

In addition to the potential health consequences, co-use is increasingly important to understand and monitor in youth given the changing policy landscape. As policies legalizing marijuana for medical and recreational use increase across U.S. states, access to marijuana may increase, presenting more opportunities for both marijuana use and co-use of marijuana and tobacco. Furthermore, the lines are blurring between tobacco and marijuana products, with marijuana joints that look like cigarettes (Sticky Budz, 2016), marijuana vaporizers that look like electronic nicotine delivery systems (ENDS) (High Times, 2016), and documented evidence that some youth are using ENDS for marijuana (Morean et al., 2015). The overlap in product characteristics may further increase the propensity for co-use in youth.

Recent studies have explored co-use among adults (Schauer et al., 2015a, 2015b), and have sought to better understand the prevalence and correlates of blunt use, non-blunt marijuana use, and cigar use in adolescents and young adults (Cohn et al., 2016; Azofeifa et al., 2016). However, no study has used nationally representative data to assess the prevalence and correlates of overall co-use of marijuana and tobacco, compared with marijuana-only and tobacco-only use among adolescents. Given the importance of understanding and monitoring patterns in co-use or tobacco and marijuana among youth, this study sought to use nationally-representative data to characterize the current prevalence and correlates of, and trends in past-month co-use of marijuana and tobacco, marijuana-only use, and tobacco-only use among youth ages 12–17 years old.

2. Materials and methods

2.1. Sample

Data for this study came from 176,245 youth ages 12–17 who responded to the National Survey on Drug Use and Health (NSDUH) between 2005 and 2014. NSDUH is a cross-sectional, nationally representative household interview survey conducted annually by the Substance Abuse and Mental Health Services Administration (SAMHSA) with non-institutionalized U.S. individuals ages 12 and older. NSDUH uses a state-based design with stratified independent, multistage area probability sampling within each U.S. state and the District of Columbia. From 2005–2014, response rates for NSDUH ranged between 71 and 76%. Additional details about the sampling methodology can be found elsewhere (Center for Behavioral Health Statistics and Quality

and Administration, 2015). Data came from a de-identified dataset provided for public use by SAMHSA; thus, the Battelle Institutional Review Board exempted this study.

2.2. Measures

2.2.1. Tobacco use

Past-month tobacco use was defined as those who reported using tobacco (cigarettes, cigars, pipes, or smokeless tobacco) at least one day in the past 30-days. Current use of individual tobacco products was defined as the use of that specific product within the past 30-days.

Current use of cigars was computed separately from current use of blunts. NSDUH includes separate blunt use questions, and contains additional clarifying questions to resolve potential misclassifications (e.g., reported using blunts but not cigars, or blunts but not tobacco).

Any use of a product was defined as any past 30-day use, either alone or with other tobacco products. Use of only that product was defined as past 30-day use of just that product and no other tobacco products. “Only” categories are mutually exclusive; “any” categories are not.

Polytobacco use was defined as the use of more than one of the following tobacco products in the past 30-days: cigarettes, cigars, blunts (for the co-use group), pipes, chewing tobacco or snuff. Past-month tobacco use frequency was assessed, with daily use defined as the use of a tobacco product on 30 of the past 30-days, and non-daily use being defined as the use of a tobacco product on 1–29 of the past 30-days. Nicotine dependence was based on meeting the criteria for dependence outlined by the Nicotine Dependence Syndrome Scale (average score across 17 items, each with a 5-point Likert scale ≥ 2.75) (Shiffman et al., 2004) or by meeting the criteria assessed by the Fagerström Test of Nicotine Dependence (first cigarette was smoked within 30 min of waking up on the days they smoked) (Fagerstrom and Schneider, 1989; Heatherton et al., 1991).

2.2.2. Marijuana use

Past-month marijuana use was defined as the use of marijuana or hashish on at least one day in the past 30-days. Past-month marijuana use frequency was dichotomized (based on NSDUH annual reporting recommendations [Center for Behavioral Health Statistics and Quality and Administration, 2015]) to daily or near daily use, defined as use on ≥ 20 of the past 30-days, and use on < 20 of the past 30-days. Past-year marijuana dependence was assessed based on the criteria from the American Psychiatric Association (APA) Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, where dependence was based on an individual meeting three or more of six dependence criteria.

2.2.3. Co-use of tobacco and marijuana

Co-use of tobacco and marijuana was defined as those who reported using tobacco on at least one day in the past 30-days, and marijuana on at least one day in the past 30-days. NSDUH did not contain a question to assess whether the use of tobacco and marijuana necessarily occurred on the same day. Use of blunts (cigars with marijuana in them) was automatically classified as co-use of tobacco and marijuana since, by definition, blunts contain both products.

Among youth ages 12–17, four user groups were constructed: youth with past-month tobacco and marijuana use (co-users), youth with past-month marijuana-only use but no tobacco use (marijuana-only users), youth with past-month tobacco-only use but no marijuana use (tobacco-only users), and youth who had neither past-month marijuana nor tobacco use.

2.2.4. Other substance use variables

Other substance use variables, including alcohol use and other illicit substance use, were assessed. Past-month alcohol use was defined as past-month binge alcohol use (5+ drinks on the same occasion, at least

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