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Cannabis Use and Risk for Substance Use Disorders and Mood or Anxiety Disorders

Kevin P. Hill, MD, MHS

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Cannabis Use and Risk of Psychiatric Disorders: Prospective Evidence From a US National Longitudinal Study

Carlos Blanco, MD, PhD; Deborah S. Hasin, PhD; Melanie M. Wall, PhD; Ludwig Flórez-Salamanca, MD; Nicolas Hoertel, MD, MPH; Shuai Wang, PhD; Bradley T. Kerridge, PhD, MPH; Mark Olfson, MD, MPH

IMPORTANCE With rising rates of marijuana use in the general population and an increasing number of states legalizing recreational marijuana use and authorizing medical marijuana programs, there are renewed clinical and policy concerns regarding the mental health effects of cannabis use.

OBJECTIVE To examine prospective associations between cannabis use and risk of mental health and substance use disorders in the general adult population.

DESIGN, SETTING, AND PARTICIPANTS A nationally representative sample of US adults aged 18 years or older was interviewed 3 years apart in the National Epidemiologic Survey on Alcohol and Related Conditions (wave 1, 2001-2002; wave 2, 2004-2005). The primary analyses were limited to 34 653 respondents who were interviewed in both waves. Data analysis was conducted from March 15 to November 30, 2015.

MAIN OUTCOMES AND MEASURES We used multiple regression and propensity score matching to estimate the strength of independent associations between cannabis use at wave 1 and incident and prevalent psychiatric disorders at wave 2. Psychiatric disorders were measured with a structured interview

(Alcohol Use Disorder and Associated Disabilities Interview Schedule-*DSM-IV*). In both analyses, the same set of wave 1 confounders was used, including sociodemographic characteristics, family history of substance use disorder, disturbed family environment, childhood parental loss, low self-esteem, social deviance, education, recent trauma, past and present psychiatric disorders, and respondent's history of divorce.

RESULTS In the multiple regression analysis of 34 653 respondents (14 564 male [47.9% weighted]; mean [SD] age, 45.1 [17.3] years), cannabis use in wave 1 (2001-2002), which was reported by 1279 respondents, was significantly associated with substance use disorders in wave 2 (2004-2005) (any substance use disorder: odds ratio [OR], 6.2; 95% CI, 4.1-9.4; any alcohol use disorder: OR, 2.7; 95% CI, 1.9-3.8; any cannabis use disorder: OR, 9.5; 95% CI, 6.4-14.1; any other drug use disorder: OR, 2.6; 95% CI, 1.6-4.4; and nicotine dependence: OR, 1.7; 95% CI, 1.2-2.4), but not any mood disorder (OR, 1.1; 95% CI, 0.8-1.4) or anxiety disorder (OR, 0.9; 95% CI, 0.7-1.1). The same general pattern of results was observed in the multiple regression analyses of wave 2 prevalent psychiatric disorders and in the propensity score-matched analysis of incident and prevalent psychiatric disorders.

CONCLUSIONS AND RELEVANCE Within the general population, cannabis use is associated with an increased risk for several substance use disorders. Physicians and policy makers should take these associations of cannabis use under careful consideration.

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Cannabis use remains a critical issue in the United States. In 2014, an estimated 22 million US residents used cannabis,¹ double the number from 10 years ago.² As of December 2016, 28 states and the District of Columbia have implemented or have voted to authorize medical cannabis programs, and 8 states and the District of Columbia have legalized recreational cannabis.³ Health care professionals often are concerned about whether cannabis use will lead to psychiatric illnesses such as substance use disorders, anxiety disorders, or mood disorders among their patients. Many stakeholders are concerned that an association between cannabis use and psychiatric illnesses will lead to a steady increase in these illnesses as more states implement medical or recreational cannabis legalization policies. Given these trends and concerns, it has become increasingly important to obtain longitudinal data to clarify the relationship between cannabis use and subsequent psychiatric disorders.

Previous research on the association between cannabis use and psychiatric disorders was inconclusive. Cross-sectional studies have consistently shown an association between cannabis use and psychiatric disorders,⁴ but longitudinal studies of this relationship have yielded inconsistent results.^{5,6} This discordance may be due in part to the variability in sample sizes and psychiatric disorders analyzed in these studies. A large, diverse, prospective study was needed to better inform clinical practice and public policy.

In the April 2016 issue of *JAMA Psychiatry*, Blanco et al⁷ used a nationally representative sample of US adults aged 18 years or older to examine prospective associations between cannabis use and the risk of substance use and mental health disorders in the general adult population. The authors examined results from the National Epidemiologic Survey on Alcohol and Related Conditions, which included 34 653 respondents who were interviewed twice with a 3-year gap between

interviews. Multiple regression and propensity score matching were used to estimate the strength of independent associations between cannabis use during the initial interview (wave 1) and the prevalence of psychiatric disorders during the second interview (wave 2). Key potential confounding variables such as sociodemographic characteristics, family history of substance use disorder, psychiatric disorders, and psychosocial stressors were controlled for in both analyses.

The study by Blanco et al⁷ illustrated the risks of cannabis use. Adult cannabis use during wave 1 was significantly associated with substance use disorders 3 years later during wave 2. The magnitude of increased risk was substantial in which those who initially reported cannabis use were more likely to have a substance use disorder 3 years later than those who did not use cannabis (86.3% vs 17.4%, respectively; adjusted odds ratio [OR], 6.2 [95% CI, 4.1-9.4]). Specifically, wave 1 cannabis users had an increased risk during wave 2 of having a cannabis use disorder (25.0% vs 0.9% who did not use cannabis; adjusted OR, 9.5 [95% CI, 6.4-14.1]), alcohol use disorder (51.5% vs 8.6%; adjusted OR, 2.7 [95% CI, 1.9-3.8]), nicotine use disorder (17.3% vs 6.6%; adjusted OR, 1.7 [95% CI, 1.2-2.4]), and any other drug use disorder (13.9% vs 1.1%; adjusted OR, 2.6 [95% CI, 1.6-4.4]). In addition, the study demonstrated a clear dose-response relationship in which increased frequency of cannabis use during wave 1 was associated with an increased likelihood for having a substance use disorder during wave 2.

Adult cannabis use during wave 1 was not associated with mood or anxiety disorders during wave 2. Even though previous studies have shown that cannabis use can exacerbate existing mood or anxiety disorders, the findings reported by Blanco et al⁷ illustrated that cannabis use was not associated with new mood or anxiety disorders. Of note, 2 statistical methods were used to validate the results, and 1 method, propensity score matching, showed that cannabis use during wave 1 was associated with increased incidence of social anxiety disorder during wave 2.

Although this investigation is the most comprehensive study to date on this topic, it had 3 important limitations. First, the asso-

ciations shown do not establish a causal relationship between cannabis use and substance use disorders because confounding factors may vary over time across survey waves. Second, the follow-up period was only 3 years. A lengthier follow-up period may offer additional insight into the strength of the relationship between cannabis use and psychiatric disorders. Third, the cannabis use frequency categories (no use during the last 12 months, some use but less than once per month, and more than once per month) are broad enough to raise the possibility that there may have been difficulty capturing meaningful differences in cannabis use patterns. For example, a person who uses cannabis almost daily and multiple times per day may have very different risk for substance use disorders or psychiatric disorders than a person who uses the drug once per month.

The United States has reached a pivotal point on the issue of cannabis. Adult cannabis use has increased steadily while the perception of risk for cannabis has declined.⁸ In the face of these trends, it is more important than ever to understand the effects of cannabis. Even though the risks of cannabis use among adolescents and its association with the future development of other substance use disorders is well documented,⁹ the study by Blanco et al⁷ clarifies that any user—including an adult—is at increased risk for developing substance use disorders. The dose also matters in that the risk for developing substance use disorders increased with increased frequency of cannabis use.

Psychiatric disorders affect lives at every level from individuals to families and to society as a whole. Substance use disorders cost the United States an estimated \$700 billion annually from related crime, lost work productivity, and health care expenses.¹⁰ The study by Blanco et al⁷ is an important step toward understanding the relationship between cannabis use and psychiatric disorders. There remains a critical need for additional cannabis research. As the research is being performed, it is important to tell people about it, thereby increasing educational efforts aimed at the public, health care professionals, and policy makers.

ARTICLE INFORMATION

Author Affiliations: Substance Abuse Consultation Service, Harvard Medical School, Boston, Massachusetts; Division of Alcohol and Drug Abuse, McLean Hospital, Belmont, Massachusetts.

Corresponding Author: Kevin P. Hill, MD, MHS, McLean Hospital, Division of Alcohol and Drug Abuse, 115 Mill St, Belmont, MA 02478 (khill@mclean.harvard.edu).

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