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DSM-5 cannabis use disorder, substance use and DSM-5 specific substance-use disorders: Evaluating comorbidity in a population-based sample

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Abstract
Cannabis use disorder (CUD) is frequently associated with concurrent substance use and/or comorbid substance use disorders (SUDs); however there is little specificity with regard to commonly abused individual drug types/classes. This study therefore aimed to provide insight into the degree of these co-occurring relationships across several specific newer and older generation illicit and prescription drugs. 36,309 adults aged 18+ from wave 3 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC-III) were assessed. Weighted cross-tabulations and multivariable logistic regression analyses were used to evaluate comorbidity between current DSM-5 CUD, substance use and DSM-5 SUD. Current DSM-5 CUD is associated with greater lifetime use of all examined drug classes, and previous 12-month use of several newer-class illicit and prescription stimulant-based substances (all $p < 0.05$). Current DSM-5 CUD was similarly associated with increased incidence of a range of DSM-5 SUDs and was independently associated with concurrently reporting current DSM-5; sedative (Adjusted OR= 5.1, 95%CI 2.9-9.0), cocaine (AOR= 9.3, 95%CI 5.6-15.5), stimulant (AOR= 4.3, 95%CI 2.3-7.9), club drug (AOR= 16.1, 95%CI 6.3-40.8), opioid (AOR= 4.6, 95%CI 3.0-6.8) and alcohol-use disorder (AOR= 3.0, 95%CI 2.5-3.7); but not heroin or 'other' drug use disorder (both $p > 0.05$). High comorbidity exists between DSM-5 CUD and many specific DSM-5 SUDs. Newer-class illicit and prescription stimulant-based drug use disorders are overrepresented among those with DSM-5 CUD. These findings underscore the need for tailored treatment programs for those presenting with DSM-5 CUD, and for greater treatment specification where poly-drug use is evident.

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1. Introduction

Cannabis (marijuana) is the most frequently consumed drug after alcohol and tobacco, and is the most commonly cultivated, trafficked and abused illicit substance worldwide (Degenhardt and Hall, 2012; UNODC, 2016). Rates of cannabis use and abuse are on the rise (Compton et al., 2004), and this is considered by some to be at least partially driven by greater availably (Freisthler and Gruenewald, 2014), recent decriminalisation in select regions (Miech et al., 2015), updated medicinal status (Freisthler and Gruenewald, 2014) and subsequent shifts in the public perception of the drug which typically align with public policy and legalisation status (Schuermeyer et al., 2014); however the exact role of marijuana liberalisation remains somewhat inconclusive (Pacula et al., 2017). Approximately one in ten of those who have ever consumed cannabis will also develop defined instance of cannabis use disorder (CUD) (Wagner and Anthony, 2002); and the progression from cannabis use to dependence is often quite rapid (Ridenour et al., 2003). Recent estimates suggest that between 2.5 (Hasin et al., 2016) and 19% (Farmer et al., 2015) of the adult population, or as many as 13.1 million individuals' globally, meet criteria for CUD disorder. Notable peaks in prevalence rates of CUD are observed among those who have previously used any other illicit substance (Chen et al., 2005), in young adults (20–24 years), among males, and those who live in higher income countries (Degenhardt et al., 2013); however some of these characteristic differences appear to be diminishing among more recent cohorts assessments (Degenhardt et al., 2008). Both epidemiological (Fergusson and Horwood, 2000) and preclinical data (Agrawal et al., 2004) indicates the potential gateway liability of cannabis as a preceding factor in later substance use and/or abuse. Indeed, a dose-response relationship exists between the frequency of previous cannabis use and rates of alcohol use (Stinson et al., 2006) and consumption of select illicit drugs such as amphetamine and non-medical opiates (Degenhardt et al., 2013); however the exact role of cannabis as a preceding factor in the development of other drug use disorders is still regarded as contentious.

Use or abuse of any psychoactive substances is associated with a marked increase in the probability of similarly abusing other categories of drugs (Tsuang et al., 1998). Longitudinal epidemiological studies confirm the predictive value of previous cannabis use in the later development of other defined substance use disorders (SUD) (Brook et al., 2002). This has also been shown to extend to cannabis dependence, as individuals with CUD have a similarly significantly elevated risk of other comorbid illicit drug use and defined instances of SUDs (Grant and Pickering, 1998). Indeed, emergent epidemiological survey data indicate that among those with DSM-4 and IDSM-4 diagnosed CUD (APA, 1994), 20% and 28%, respectively, reported concurrent use of other illicit drugs, and 14% and 23%, respectively, also met criteria for another illicit drug use disorder in the previous year (Grant and Pickering, 1998). Poly-substance abuse is increasingly reported as a contributing factor associated with acute hospital admissions (Mowbray et al., 1997) and has also been linked to increased rates of drug-related deaths and nonfatal drug overdoses (Kerr et al., 2007). Despite this, previous evaluations of comorbidity between CUD and other drugs of abuse lack specificity with regard to types of comorbid drug classes examined, as research often utilises aggregate measures of substance abuse only (Hasin et al., 2016), and does not provide individual assessment of each drug type/class. Moreover, few studies encompass a wide range of drug types and/or classes; particularly newer generation drugs of abuse among younger people, such as prescription amphetamines (Low and Gendaszek, 2002). This is problematic, as collapsing abuse and dependence categories into global measures of abuse and only evaluating a narrow range of substances neglects the more subtle archetypal aspects of poly-drug use, and provides little updated or relevant information for clinicians or those directly involved in both acute and longer-term treatment programs.

Despite the rapidly rising rate of those seeking treatment for CUD disorder (Dennis et al., 2002), systematic development of cannabis-specific clinical treatment interventions are currently lacking. Extant models of therapy for CUD often employ cognitive behavioural techniques derived from alcohol interventions which are modified to meet the needs of cannabis dependent patients (Copeland et al., 2001b); however the efficacy of long-term treatment programs is unclear, and the impact of complex diagnoses on these outcomes is largely unknown. Comorbidity of drug use significantly compounds the efficacy of a single-approach substance abuse treatment programs, and successful amelioration of co-occurring drug use often predicts favourable long-term treatment outcomes (such as a reduction in drug use and occurrence of non-fatal overdoses) (Stewart et al., 2002). Among cannabis users seeking treatment, co-occurring substance use and/or abuse has been linked to an elevated risk on measures of cannabis dependence, comorbid psychopathology, dysfunctional cannabis cognitions (Connor et al., 2013) and poorer treatment outcomes (Belendiuk et al. 2015). Multifaceted interventions are often recommended for those with poly-substance use (Stephens et al., 1993), and treatment avenues are often informed by the types of drugs used. Examination of specific characteristic poly-drug use among those with CUD may therefore assist in the development of tailored interventions for the growing number of individuals seeking treatment for this disorder, and thus help inform this urgent area of need within the clinical community.

Due to the high global prevalence of cannabis use and increasing prevalence of CUD, coupled with the incurred burden and comorbidity potential with other drug use and specific drug use disorders, explicit and systematic evaluations of poly-substance abuse have high clinical and public health relevance. Many of the current estimates and clinical interpretations examining CUD and other substance use are limited to aggregate or cursory evaluations only and lack specificity; and thus are of little clinical relevance. Comprehensive assessments as to the extent and strength of these associations may assist in the formulation of tailored and specific treatment modalities for individuals who fall within this diagnostic stratum.