Contents lists available at ScienceDirect

Drug and Alcohol Dependence

Full length article

Problem alcohol use and healthcare utilization among persons with cannabis use disorder in the United States

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ARTICLE INFO

ABSTRACT

Background: The emergency department (ED) and hospital settings represent crucial opportunities for engaging treatment for cannabis use disorder (CUD). Thus, there is a need to identify factors associated with healthcare utilization among persons with CUD to improve screening and intervention approaches. Problematic alcohol use may be a salient risk factor.

Methods: Using data from the 2005–2013 National Surveys on Drug Use and Health, we determined factors, including different patterns of alcohol use, associated with past-year ED admission and inpatient hospitalization among persons aged 12 years or older meeting criteria for CUD in the past year (N = 16,757). We also determined the prevalence and correlates of problem alcohol use among persons with CUD to further inform its association with healthcare utilization.

Results: Among persons with CUD, 40.15% and 10.04% reported past-year ED admission and inpatient hospitalization, respectively. Severe alcohol use disorder (AUD) ($\geq$ 6 AUD symptoms), female sex, Black race, low income, major depressive episode (MDE), and other substance use disorders were associated with increased odds of healthcare utilization; current (i.e., last month) alcohol use patterns were not. Persons with CUD that were males, ages 18–25 (vs. ages 12–17), Hispanic (vs. White), and with low income, other drug use disorders, or MDE had increased odds of AUD.

Conclusions: Findings suggest that screening and intervention efforts for improving treatment initiation or engagement for CUD may target cannabis-using women, blacks, low-income adults or those with severe AUD in the past year, another substance use disorder, or MDE.

1. Introduction

The emergency department (ED) is an important entry portal into the medical care system for individuals with severe substance use problems compared to non-users due to a lower attachment to primary care (Cunningham et al., 2009). According to the Drug Abuse Warning Network (DAWN), approximately 2.5 million ED visits in 2011 involved substance misuse or abuse (DAWN, 2011). The National Drug Intelligence Center (NDIC) estimates that healthcare costs for drug use-related nonhomicide ED visits is approximately $161 million annually (NDIC, 2011). Moreover, a statewide survey revealed that ED patients with unmet treatment need for substance use were 81% more likely to be admitted to the hospital during their current ED visit (Rockett et al., 2005). Drug-related hospital admissions are estimated by the NDIC to cost an additional $5.5 billion annually (NDIC, 2011). Therefore, these

healthcare settings represent critical opportunities for initiating and engaging substance use disorder (SUD) treatment in order to reduce problem use, injury recidivism, and high healthcare costs.

In particular, the use of screening, brief intervention, and referral to treatment (SBIRT) approaches has shown efficacy for ED patients with problem alcohol use and has received endorsement by the American College of Emergency Physicians (ACEP) for this application (ACEP, 2017). On the other hand, efficacy for SBIRT approaches remains to be definitively demonstrated and thus recommended for ED patients with problem drug use, despite the fact that illicit drugs account for approximately 50% of alcohol/drug-related ED visits annually (SAMHSA and DAWN, 2011). Of particular concern, the DAWN indicated that cannabis was involved in 455,668 ED visits in 2011, which was the second most after cocaine among illicit drugs (SAMHSA and DAWN, 2011), and the rate of cannabis-related ED admissions and

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hospitalizations increased from 2004 to 2011 (Zhu and Wu, 2016). Moreover, cannabis use disorder (CUD) is the most prevalent illicit drug use disorder in the United States, which affected over 4 million people aged 12 or older in 2015 (Center for Behavioral Health Statistics and Quality (CBHSQ), 2016). Some data suggest that the prevalence of past-year CUD among adults in the U.S. has increased since 2002 (Hasin et al., 2015; Azofeifa et al., 2016), which may be associated with increased permissive attitudes toward cannabis use and the current watershed in legal status of cannabis for medical and recreational purposes (Pacek et al., 2015; Azofeifa et al., 2016; Martins et al., 2016; Maxwell and Mendelson, 2016).

However, despite the concern for CUD and cannabis-involved health resource utilization, few studies have examined the efficacy of SBIRT approaches for ED patients with problem cannabis use or CUD. Two single-site studies suggested effectiveness of a BI delivered in the ED to decrease cannabis use and cannabis-related problems (Bernstein et al., 2009; ; Woolard et al., 2013); however, a large multisite trial with greater heterogeneity and relatively higher problem severity found no effect of a BI to reduce cannabis use among ED patients whose primary problem substance was cannabis (Bogenschutz et al., 2014). Thus, it is critical to identify factors associated with healthcare utilization among persons with CUD in order to inform additional ED-based assessments, which can be used to guide more targeted intervention.

One factor associated with a higher risk-profile of CUD is the co-occurrence of problem alcohol use. Prior epidemiological data indicated that the majority of cannabis users also use alcohol (Pape et al., 2009; Terry-McElrath et al., 2013) and alcohol use disorder (AUD) is the most common substance-related comorbidity among those with CUD (Stinson et al., 2006; Khan et al., 2013). The co-use of alcohol and cannabis is associated with greater social problems (e.g., legal/accidents, work, fight, and relationship problems), academic problems, alcohol dependence, and depression compared to use of either substance alone (Midanik et al., 2007; ; Brière et al., 2011; Subbaraman and Kerr, 2015). One study suggested the presence of a positive association between marijuana problem severity and the frequency of alcohol use among cannabis users even when the two substances were not used simultaneously (Stein et al., 2014). Another study found that comorbid CUD and AUD was associated with a greater likelihood of major depressive episode, particularly among African Americans, compared to those with CUD or AUD alone and a greater arrest history compared to those with AUD alone (Pacek et al., 2012).

Despite this knowledge, data informing how to best screen for problem alcohol use among ED and hospital patients with CUD is lacking. Targeted and effective ED-based screening procedures are crucial given the limited time and competing priorities of medical providers in the ED. However, it is not clear whether certain patterns, time frames, or severity levels of problem alcohol use are associated with healthcare utilization among persons with CUD, which is necessary for guiding the most efficient screening strategies. To address these gaps in knowledge, we utilized data from the 2005–2013 National Surveys on Drug Use and Health (NSDUH) and examined the association of problem alcohol use and other factors with healthcare utilization (ED admission and inpatient hospitalization) among those with CUD. It is critical to leverage data from a national sample to enhance the generalizability of results to other ED and hospital settings. We also determined estimates of the prevalence and correlates of different patterns of alcohol use and AUD among those with CUD to identify population subgroups with elevated odds of having co-existing cannabis and alcohol problems. Overall, we hypothesized that severity of alcohol use would be positively related to ED admission and inpatient hospitalization among persons with CUD.

2. Methods

2.1. Data source

The annual NSDUH is a cross-sectional survey sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) designed to provide ongoing estimates of the prevalence and correlates of drug use in the United States. The survey used multistage area probability sampling methods to select a representative sample of the civilian, non-institutionalized population aged ≥12 years. The sample included residents of households and non-institutionalized group quarters (shelters, college dormitories, group homes, military installations) from all 50 states and the District of Colombia.

NSDUH data collection was conducted in the households of eligible respondents for approximately one hour. Computer-assisted personal interviews were used to collect demographic information. Survey questions involving substance use, mental health, and other sensitive behaviors were assessed using audio computer-assisted self-interviewing (ACASI), in which the respondent either read the questions on a computer screen or listened to the questions through headphones and then directly entered responses into the computer.

Data for this study were combined from the 2005 through 2013 NSDUH public-use data sets (SAMHSA, 2006, 2014), as they used similar sampling methodology to allow analysis of the same variables across years; the pooled sample included 503,101 individuals aged 12 or older. Weighted response weights of household screening and interviewing for these years were 84–91% and 72–76%, respectively. Among the total sample, 3.33% (N = 16,757) met criteria for past-year CUD, which formed the analysis sample.

2.2. Study variables

2.2.1. Demographics

Self-reported sex, age, race/ethnicity, total family income, and residential location were included as covariates due to their association with CUD (Hasin and Grant, 2016). Survey year (categorical variable) was included as a control variable. Race/ethnicity was categorized into mutually exclusive groups that included non-Hispanic White, non-Hispanic Black, and Hispanic. Due to small sample size, other minority races including non-Hispanic Native-American (American Indian/Alaska-native), non-Hispanic native-Hawaiian/Pacific-Islander, non-Hispanic Asian-American, and mixed-race (> 1 race) were grouped together in a single category.

2.2.2. Cannabis use and CUD

Cannabis use was defined as any self-reported illicit (nonmedical) use of cannabis/hashish. Respondents were assessed according to their past-year use status and frequency of use. Past-year CUD was operationalized as meeting cannabis abuse or dependence based on the DSM-IV criteria. DSM-IV cannabis abuse was defined as having met ≥1 of four abuse criteria and determined not to be dependent upon cannabis; cannabis dependence was defined as having met ≥3 of six dependence criteria (APA, 2000). It is important to note that DSM-V removes the distinction between abuse and dependence, and CUD is defined by the presence of ≥2 of 11 criteria (APA, 2013).

2.2.3. Alcohol use and AUD

Alcohol use was defined as having fully consumed any alcoholic beverage, including a can/bottle of beer, a glass of wine/wine cooler, a shot of liquor, or a mixed drink containing liquor. Current binge alcohol use was defined as having ≥5 drinks at the same time or within a couple hours of each other on at least one day within the past 30 days. Current heavy alcohol use was defined as having ≥5 drinks at the same time or within a couple hours of each other on at least five days within the past 30 days. Four mutually exclusive levels of current (i.e., past month) alcohol use were determined that included: no current alcohol