Marijuana use in the context of alcohol interventions for mandated college students☆

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ABSTRACT

Objective: Concurrent use of marijuana and alcohol among college students is highly prevalent and associated with negative consequences. It remains unclear whether marijuana use is influenced by or lessens the efficacy of alcohol interventions delivered within a stepped-care approach.
Method: Participants were 530 college students who violated campus alcohol policy and were mandated to an alcohol-focused brief advice (BA) session. Participants who reported continued risky alcohol use (4+ heavy drinking episodes and/or 5+ alcohol-related consequences in the past month) six weeks following the BA session were randomized to a brief motivational intervention (BMI; $n = 211$) or assessment only (AO; $n = 194$) condition. Follow-up assessments were conducted 3, 6, and 9 months' post-intervention.
Results: Multiple regression analyses revealed that marijuana user status did not influence drinking outcomes following the BA session. However, hierarchical linear models suggested that marijuana users who were randomized to BMI or AO reported higher levels of binge drinking, pBAC and consequences compared to non-users, regardless of condition. Despite this, heavy drinking marijuana users and nonusers had equivalent reductions on alcohol use outcomes following the BMI sessions. Marijuana users who received a BMI did not significantly reduce marijuana use frequency compared to participants in the AO group.
Conclusion: Use of marijuana did not lessen the efficacy of the BA session on alcohol use or consequences. Findings suggest that marijuana users respond similarly to alcohol interventions as do non-users and can benefit from brief or more intensive alcohol interventions. A marijuana-focused intervention may be warranted to facilitate changes in marijuana use.

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1. Introduction

College students often drink alcohol and use drugs simultaneously during parties and other social events (Murphy et al., 2006; Stinson et al., 2005). Dual marijuana and alcohol use is especially prevalent, with

47% of marijuana users reporting simultaneous use of alcohol (Haas et al., 2015). Furthermore, individuals who have a cannabis use disorder (CUD) are at increased likelihood for the development of an alcohol use disorder (AUD; Stinson et al., 2006, Agosti et al., 2002; Regier et al., 1990), and rates of substance use disorders and treatment admissions are highest among individuals that use marijuana or alcohol compared to other substances (SAMHSA, 2011). Approximately 68% of individuals with current CUD and over 86% of those with a history of CUD meet criteria for an AUD (Agrawal et al., 2007; Stinson et al., 2006). Cannabis dependence doubles the risk for long-term persistent alcohol consequences (Copeland et al., 2012) and dual marijuana and alcohol users consume higher levels of alcohol and experience more alcohol-related consequences than only drinkers (Shillington & Clapp, 2001, 2006; Simons & Carey, 2006; Simons et al., 2010). Despite these additional risks, 60% of college students do not perceive regular marijuana use to be harmful (Miech et al., 2015).

The combination of low perceived risk, policy changes surrounding marijuana legalization, and the rise in marijuana use over the past 10 years (SAMHSA, 2014) heightens the importance of effective interventions for alcohol and marijuana use. In the adult substance use treatment literature, it is relatively well-established that alcohol use negatively impacts treatment of other substances (e.g., cigarette smoking, and cocaine; Fiore et al., 2008; Kahler et al., 2010; Leeman et al., 2008; Pulido et al., 2014). In contrast, literature examining the impact of marijuana use on the treatment of other substances is mixed. With the exception of a few studies that do not show marijuana use to negatively influence alcohol or smoking cessation outcomes (Magill et al., 2009; Metrik et al., 2011), many studies have demonstrated that using marijuana before or during alcohol treatment is associated with higher levels of drinking at follow-up (Alessi et al., 2011; Mojarrad et al., 2014; Subbaraman et al., 2016). For example, among alcohol dependent individuals, those who used marijuana during alcohol treatment reported fewer days abstinent from alcohol one year following treatment than those who did not use marijuana (Subbaraman et al., 2016). Thus, marijuana use seems to have a negative impact on alcohol treatment outcomes.

A number of studies have also examined secondary changes in marijuana use following receipt of an alcohol-specific intervention. A recent integrative data analysis study indicated that alcohol BMIs may not facilitate changes in marijuana use among college students (White et al., 2015); instead, regardless of treatment condition, college students who successfully reduced their drinking at short- and long-term follow-ups were more likely to be non-users of marijuana or reduce their marijuana use at follow-up. This complementary relationship between marijuana and alcohol use is also supported by research indicating that the risk factors for initiation and maintenance of problematic use are similar across substances (Simons et al., 2005). Together, these studies suggest that interventions for alcohol may lead to secondary changes in marijuana use. Consistent with this hypothesis, young adults who participated in an in-person BMIs for alcohol use in an emergency department (ED) setting reported greater decreases in marijuana use at the 6-month follow-up than those who received feedback only (Magill et al., 2009). Similarly, weekly marijuana users who were seeking treatment for cigarette smoking and completed a brief alcohol intervention within the context of the smoking cessation intervention, demonstrated reductions not only in heavy drinking and tobacco smoking but also in marijuana use (Metrik et al., 2011). In the college setting, BMIs that target multiple substances have also been associated with reductions in poly-drug use (McCambridge & Strang, 2004; White et al., 2006, 2007).

One explanation for the differential influence of alcohol interventions on marijuana use across these studies may be related to the populations examined. Thus far, alcohol interventions delivered to acute-risk populations (ED patients and treatment-seeking individuals) have had an impact on marijuana use outcomes, while collectively, interventions delivered to 'college students' have not. However, college students are a heterogeneous population, and not all require the same level of intervention (Barnett et al., 2008; Barnett & Read, 2005). To our knowledge, no one has examined the influence of an alcohol intervention on marijuana use when alcohol interventions are provided sequentially in the context of stepped care, in which individuals who do not respond to an initial, low-intensity level of treatment are provided a more intensive treatment (Borsari, 2012; McKellar et al., 2012; Sobell & Sobell, 2000).

The purpose of the current study was to examine marijuana use in the context of a stepped care intervention for alcohol use. We conducted a secondary analysis of data from a randomized clinical trial implementing stepped care with mandated college students (Borsari et al., 2012). In this study, all participants received a brief advice (BA) session (Step 1) administered by a peer counselor. Participants who continued to drink in a risky manner (4 or more heavy episodic drinking [HED] incidents and/or 5 or more alcohol-related consequences in the past month) six weeks following the BA session were randomly assigned to either BMI or AO conditions (Step 2). Step 2 participants

who completed the BMI as opposed to AO reported greater reductions in alcohol-related consequences (but not alcohol use) at all follow-up assessments (3, 6, and 9 months).

We tested three hypotheses to examine whether interventions that reduce alcohol-related outcomes may also reduce marijuana use. First, because dual marijuana and alcohol users consume higher levels of alcohol use and experience more alcohol-related consequences (Simons et al., 2010), we hypothesized that marijuana users (compared to non-users) would report higher HED frequency, peak blood alcohol content (pBAC), and alcohol related consequences in the 6 weeks following a BA session, after controlling for their pre-BA drinking behavior. Second, we hypothesized that heavy-drinking marijuana users who did not respond to the BA session and, therefore, were randomized to a Step 2 BMI or AO would report worse alcohol-related outcomes at 3-, 6-, and 9-month follow-ups than non-users. Third, we examined whether marijuana users changed their marijuana use frequency at any of the three assessment time points following the Step 2 BMI. Examination of marijuana use in this context will improve our understanding of whether marijuana use lessens the efficacy of alcohol interventions, even when delivered sequentially in stepped care. Furthermore, it will inform future intervention efforts aimed at reducing both alcohol and marijuana use.

2. Method

2.1. Participants and procedures

Participants were 530 undergraduate students (67% male; 96% Caucasian) age 18 years and older who violated the campus alcohol policy at a four-year, private, liberal arts university in the Northeast (Borsari et al., 2012). Students were referred to the student health office for mandatory counseling following adjudication by campus judicial affairs staff, agreed to participate in the study and provided informed consent. All students received Step 1, a manualized, 10 to 15-min Brief Advice (BA) session that was administered by a peer counselor (fellow college student). Six weeks after the BA session, participants completed an online assessment. Higher risk students (i.e., those who reported 5 or more alcohol-related consequences and 4 or more HED occasions in the past month) were eligible to receive the next step of care and were randomly assigned to BMI ($n = 211$) or AO ($n = 194$). Lower-risk drinkers (4 or fewer alcohol-related consequences and 3 or fewer HED episodes; $n = 125$) were not randomized to Step 2 nor were provided additional intervention, but completed follow-up assessments at 3, 6 and 9 months.

2.2. Interventions

2.2.1. Step 1: BA session

The manualized BA was administered by a peer counselor and was mostly didactic psychoeducation (Cunningham et al., 2001). In addition, counselors solicited personal information from participants using open-ended questions and gave participants the opportunity to ask questions or discuss their personal alcohol use. The average time of the BA session was 14.07 min ($SD = 4.59$).

2.2.2. Step 2: BMI

This manualized BMI (adapted from Dimeff, Baer, Kivlahan, & Marlatt, 1999) has resulted in significant reductions in alcohol use and consequences with both mandated and non-mandated students in similar trials (Borsari & Carey, 2000, 2005; Carey et al., 2009; Hustad et al., 2014). During the BMI, participants reviewed a personalized feedback report of their responses to the baseline and six-week follow-up assessments, including perceived descriptive norms, BAC and tolerance, alcohol-related consequences, influence of setting on drinking, and alcohol expectancies. The BMIs were delivered by PhD students or postdoctoral fellows ($n = 11$), and subsequent transcription coding analysis of BMI sessions revealed high Motivational Interviewing fidelity (MI; see