



Interventions to reduce college student drinking: State of the evidence for mechanisms of behavior change



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HIGHLIGHTS

- A systematic review examined support for mediation in college drinking interventions.
- Twenty-two mediators were examined in 61 trials.
- Descriptive norms consistently mediated intervention efficacy.
- Motivation to change consistently failed to mediate intervention efficacy.
- Only descriptive norms partially met criteria for serving as a mechanism of change.

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ABSTRACT

Interventions to reduce college student drinking, although efficacious, generally yield only small effects on behavior change. Examining mechanisms of change may help to improve the magnitude of intervention effects by identifying effective and ineffective active ingredients. Informed by guidelines for establishing mechanisms of change, we conducted a systematic review of alcohol interventions for college students to identify (a) which constructs have been examined and received support as mediators, (b) circumstances that enhance the likelihood of detecting mediation, and (c) the extent of evidence for mechanisms of change. We identified 61 trials that examined 22 potential mediators of intervention efficacy. Descriptive norms consistently mediated normative feedback interventions. Motivation to change consistently failed to mediate motivational interviewing interventions. Multiple active ingredient interventions were not substantially more likely to find evidence of mediation than single ingredient interventions. Delivering intervention content remotely reduced likelihood of finding support for mediation. With the exception of descriptive norms, there is inadequate evidence for the psychosocial constructs purported as mechanisms of change in the college drinking literature. Evidence for mechanisms will be yielded by future studies that map all active ingredients to targeted psychosocial outcomes and that assess potential mediators early, inclusively, and at appropriate intervals following interventions.

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1. Introduction

Alcohol use increases markedly following the transition from high school to college in the United States (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Sher & Rutledge, 2007). College students misuse alcohol to a greater extent than their non-college attending peers (Blanco et al., 2008; Slutske, 2005), with almost 45% of college students reporting a recent episode of heavy alcohol consumption (Hingson, Zha, & Weitzman, 2009). These instances of heavy drinking are implicated in the 1825 deaths, 599,000 injuries, 696,000 physical assaults, and 97,000 sexual assaults that occur among U.S. college students as a result of drinking each year (Hingson et al., 2009; Johnston, O'Malley, Bachman, & Schulenberg, 2011). Therefore, optimizing the efficacy of alcohol interventions for college students is an important goal.

Interventions aim to reduce alcohol use among college students as a means for reducing the likelihood of experiencing these serious negative consequences. These interventions reflect a range of active ingredients and delivery modalities (Carey, Scott-Sheldon, Carey, & DeMartini, 2007; Cronce & Larimer, 2011). Although meta-analyses support that interventions significantly reduce quantity and frequency of alcohol use, effect sizes tend to be small and few effects remain after 1 year (Carey, Scott-Sheldon, Elliott, Garey, & Carey, 2012; Carey et al., 2007).

Improving intervention efficacy is most likely to be achieved by examining mechanisms of change (Kazdin & Nock, 2003). Mechanisms are the psychosocial processes that are targeted in and altered by the intervention (e.g., expectancies and norms), and in turn, effect change in alcohol use or consequences. Examining mechanisms may improve intervention efficacy by identifying which intervention ingredients are effective and which should be abandoned. The importance of examining mechanisms has been emphasized in the mental health treatment

literature (Kazdin, 2007; Kazdin & Nock, 2003; Kraemer, Wilson, Fairburn, & Agras, 2002; La Greca, Silverman, & Lochman, 2009; Silverman & Hinshaw, 2008), but has also received attention in the alcohol abuse treatment literature (Longabaugh, 2007; Nock, 2007).

Recent reviews have described the magnitude of intervention-induced change in alcohol-related behavior, consequences, and psychosocial constructs (e.g., Carey et al., 2012; Scott-Sheldon, Demartini, Carey, & Carey, 2009). However, the extent of support for the mechanisms through which college alcohol interventions reduce drinking has not been examined. The present systematic review examines support for mechanisms of change in college drinking interventions.

Kazdin and Nock (Kazdin, 2007; Kazdin & Nock, 2003; Nock, 2007) outlined requirements for establishing a construct as a mechanism of change. Most important, studies must (a) demonstrate a strong association between the intervention and change in the mechanism. In turn, change in the mechanism must be associated with change in the outcome. A mechanism must minimally satisfy three additional criteria: (b) an experimental design is required to demonstrate intervention-induced change in the mechanism, (c) measurement of the mediator must temporally precede measurement of the outcome, and (d) a specific active ingredient must demonstrate a unique effect on a specific mechanism, and the mechanism must have a unique effect on the outcome. Evidence for a mechanism is further enhanced if it also demonstrates (e) plausibility, (f) consistency across trials, and (g) a dose-response relationship, such that higher doses of the treatment lead to greater change in the mediator and outcome. Our review focuses on randomized controlled trials, satisfying criterion (b). The extent to which studies demonstrate strong associations between the intervention, mechanism, and outcome constitutes the majority of this review. Support for the remaining criteria is also explored.

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