Testing the effects of e-mailed personalized feedback on risky alcohol use among college students

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HIGHLIGHTS

- Students who received e-mailed personalized feedback consumed fewer drinks.
- Students who received e-mailed personalized feedback reported fewer days drunk.
- Students also exhibited reductions in perceived quantity of peer alcohol use.
- Students also exhibited reductions in perceived frequency of peer alcohol use.

ARTICLE INFO

ABSTRACT

Objective: Although research utilizing the Internet to intervene with college student drinkers is growing, this study is the first to investigate the use of a theoretically-based and empirically supported personalized feedback form delivered via a single e-mail to college students.
Method: Students ($n = 191$) completed measures of their alcohol use, related consequences, and peer perceptions at baseline and 6 weeks after the intervention. Students were randomly assigned to receive either e-mailed personalized feedback or e-mailed generic feedback.
Results: Students who received e-mailed personalized feedback reported consuming significantly fewer drinks in a given week, as well as a fewer number of days being drunk in the previous 30 days. They also exhibited a significant reduction in the number of days they perceived their peers to have drunk alcohol and in the amount of alcohol they perceived their peers to consume per drinking occasion.
Conclusion: e-Mailed personalized feedback appears to help students become more aware of normative drinking behavior and reduce the quantity of alcohol they consume. Furthermore, e-mailed personalized feedback may be a cost-effective manner in which to intervene with college student drinkers.

1. Introduction

College student drinking is a significant public health concern that negatively impacts both the students that participate in the drinking behavior (Hingson, Heeren, Winter, & Wechsler, 2005; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002) and the people with whom they interact (Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004; Wechsler, 1996). Although approximately 19% of college students abstain from alcohol, 44% binge drink and 23% binge drink frequently (Wechsler et al., 2005). Furthermore, reported consequences of binge drinking include acute impairment, motor vehicle crashes, assaults, domestic violence, rape, unintended pregnancy, vandalism, alcohol poisoning, alcohol dependence, and other unintentional injuries (Nelson, Naimi, Brewer, & Wechsler, 2005; O'Malley & Johnston, 2002).

One of the most widely researched treatment approaches is the provision of personalized feedback regarding the student's use of alcohol (e.g., Dimeff, Baer, Kivlahan, & Marlatt, 1999; Walters & Bennett, 2000). Although the content of the feedback varies across studies, typical components include a summary of the participant's drinking patterns and how their use of alcohol compares to campus or national norms, discussion of negative alcohol-related consequences, didactics (e.g., blood alcohol content, calories consumed), and a review of moderation strategies (Walters & Neighbors, 2005). There is an expansive body of literature to support the

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effectiveness of brief personalized interventions among college students (Carey, Carey, Maisto, & Henson, 2006; Larimer & Cronce, 2007; Larimer, Cronce, Lee, & Kilmer, 2005; Walters & Neighbors, 2005).

Researchers have investigated delivering personalized feedback in a one-on-one motivational interviewing session (Baer et al., 1992; Borsari & Carey, 2000; Martens et al., 2007; Murphy et al., 2001, 2004), by postal mail (Agostinelli, Brown, & Miller, 1995; Collins, Carey, & Sliwinski, 2002; Henslee et al., 2006; Walters & Bennett, 2000; Walters, Bennett, & Miller, 2000), and via the computer (Bewick, Trusler, Mulhern, Barkham, & Hill, 2008; Butler & Correia, 2009; Chiauzzi, Green, Lord, Thum, & Goldstein, 2005; Kypri et al., 2004; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006). Each method has some evidence to support its use in facilitating reductions in drinking, although the extent to which these different forms have a lasting impact varies (Walters & Neighbors, 2005).

One particular delivery method which has received an increasing amount of empirical investigation is the Internet (Elliot, Carey, & Bolles, 2008). Walters, Miller, and Chiauzzi (2005) and more recently Campbell and Hester (2012) reviewed the literature on e-interventions including *Alcohol 101 Plus, AlcoholEdu, Alcohol Response-Ability, e-Chug, myStudentBody, The College Drinker's Check-up,* and *Under the Influence.* All of these interventions are delivered via the Internet, thus highlighting the utility of the Internet as a means for implementing alcohol programming. Furthermore, within these e-interventions the provision of feedback is one of the most consistent features. Additional research supports the use of Web-based screening and brief intervention to reduce alcohol use and negative consequences among college students (Dimeff & McNeely, 2000; Hester, Delaney, & Campbell, 2012; Kypri et al., 2004; Saitz et al., 2007) including high-risk populations, such as freshmen (Bersamin, Paschall, Fearnow-Kenney, & Wyrick, 2007; Walters, Vader, & Harris, 2006).

While researchers have begun to study the effects of feedback delivered via the Internet, no research has been conducted to date employing a single e-mail as the feedback delivery mechanism. Given that most college students are connected to the Internet and use email (Escoffery et al., 2005), a unique opportunity exists to examine the utility of this tool to intervene with risky college student drinkers. Determining the effectiveness of personalized feedback delivered via e-mail could have a significant impact on the way universities address college student drinking on campus. On many campuses, e-mail is considered an official form of communication. Therefore, feedback delivered via email could reach an extensive number of students in a cost-effective manner. Additionally, this method of feedback delivery would provide a non-invasive alcohol intervention that students would likely appreciate (Kypri, Saunders, & Gallagher, 2003). Thus, the purpose of the current study was to deliver a theoretically-based and empirically supported personalized feedback form via a single e-mail to college students enrolled in a large lecture course and evaluate the effectiveness in reducing risky alcohol use at a 6-week follow-up. We hypothesized that students who received e-mailed personalized feedback would report a significant reduction in alcohol use and alcohol-related consequences as well as more accurate peer perceptions of alcohol use when compared to students in the control group.

2. Methods

2.1. Participants

Approximately 600 students enrolled in Introduction to Psychology courses during the fall 2006 semester at a large, southern university were invited to participate in this study. The first author attended classes to explain the research opportunity and distributed consent documents and questionnaire packets. Potential participants were informed that the packets had to be returned within two weeks to a locked drop-box located in the Psychology department. Three-hundred and ten students

returned completed baseline questionnaire packets. Students were randomly assigned to receive either personalized or generic feedback. Six weeks after the intervention, the first author attended the same Introduction to Psychology classes as before, asked students to complete the follow-up packet and return it to the same lock-box. One hundred ninety-one (personalized group $n = 101$; generic group $n = 90$) students completed the follow-up measures and are included in the data analyses. The 191 students who completed both the baseline and follow-up packets differed from the 119 who failed to complete the follow-up packet in a number of ways. Most notably, non-completers reported higher levels of use on all of the alcohol consumption variables (days of use, days feeling drunk, binge drinking episodes, typical standard drinks consumed during typical drinking occasion; all differences significant at $p < .05$).

2.2. Measures

In addition to completing a general information questionnaire (i.e., age, gender, year in school, Greek membership, ethnicity, and place of residence), students completed a variety of measures to assess their alcohol use. Alcohol measures were also used to create the feedback forms. The Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Grant, 2001) is a 10-item self-report measure. The AUDIT was used to assess the frequency and quantity of alcohol use as well as to identify at-risk drinkers. The AUDIT has demonstrated good validity and reliability among college students (Fleming, Barry, & MacDonald, 1991; Kokotailo et al., 2004).

The Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) was used to assess the typical number of drinks consumed per week, and the average number of hours spent consuming alcohol on those days. The DDQ has been used in numerous studies of college student alcohol use (Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990; Marlatt et al., 1998; Murphy, McDevitt-Murphy, & Barnett, 2005) and is considered a reliable measure that is highly correlated with self-monitored drinking reports (Kivlahan et al., 1990). Participants also reported on recent frequency of alcohol consumption, feeling drunk, number of days feeling light-headed or high from alcohol use, and engaging in binge drinking (i.e., consuming 5 or more drinks on one occasion for males and 4 or more occasions for females) (Wechsler, Dowdall, Davenport, & Rimm, 1995; Wechsler, Dowdall, Maenner, Geldhill-Hoyt, & Lee, 1998).

Normative beliefs about the alcohol use of peers were assessed with items using a 5-point Likert scale. Perceived frequency was assessed on a scale from 0 (once a month or less) to 5 (nearly every day). Perceived quantity was assessed on a scale from 0 (0–2 drinks per night) to 5 (more than 8 drinks per night). The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) is a 23-item test that assesses alcohol-related problems and is formulated to be used with adolescents and young adults ages 12–21. The RAPI has been used extensively in the college student drinking literature (Borsari & Carey, 2001; Collins et al., 2002; Larimer et al., 2001; Marlatt et al., 1998) and has been shown to discriminate between clinical and normal samples of adolescent drinkers (White & Labouvie, 1989).

2.3. Procedure

After the initial distribution, completion, and collection of baseline surveys, participants were randomly assigned to one of two groups. For students randomly assigned to the personalized feedback group, a personalized feedback form was generated using information gathered from the above mentioned measures. Personalized feedback forms were modeled after previous studies (Agostinelli et al., 1995; Butler & Correia, 2009; Walters et al., 2000) and the BASICS (Dimeff et al., 1999) program. Feedback forms included information about the estimated blood alcohol level (BAL) on typical and peak drinking occasions, self-reported negative consequences, weekly average number of standard