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Short Communication

Text messaging as an adjunct to a web-based intervention for college student alcohol use: A preliminary study



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ABSTRACT

Brief, web-based motivational interventions have shown promising results for reducing alcohol use and associated harm among college students. However, findings regarding which alcohol use outcomes are impacted are mixed and effects tend to be small to moderate, with effect sizes decreasing over longer-term follow-up periods. As a result, these interventions may benefit from adjunctive strategies to bolster students' engagement with intervention material and to extend interventions beyond initial contacts into student's daily lives. This study tested the efficacy of text messaging as an adjunct to a web-based intervention for heavy episodic drinking college students.

Methods: One-hundred and thirteen undergraduate student risky drinkers recruited from an introductory psychology class were randomly assigned to one of three conditions—assessment only (AO), web intervention (WI), and web intervention plus text messaging (WI + TXT). Heavy drinking episodes (HDEs), weekend quantity per occasion, and alcohol-related consequences were assessed at baseline and one month follow-up. Univariate analysis of covariance (ANCOVA) was used to assess the influence of condition assignment on 1-month outcomes, controlling for baseline variables.

Results: Planned contrasts showed that those in the WI + TXT condition showed significantly less weekend drinking than those in the AO and WI conditions. Although those in the WI + TXT condition showed significantly fewer HDEs compared to AO, it was not significantly different than the WI only condition. No differences were observed on alcohol-related problems.

Discussion: These findings provide partial support for the view that text messaging may be a useful adjunct to web-based interventions for reducing alcohol consumption among student drinkers.

1. Introduction

Heavy episodic drinking, defined as consumption of 4+ (females) or 5+ (males) drinks on one occasion, is a risk factor for negative consequences among college students (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; White & Hingson, 2014). Students who drink at lower levels may also experience negative consequences (Read, Beattie, Chamberlain, & Merrill, 2008; White & Hingson, 2014) and are at risk for progressing into heavier drinking throughout college (Sher & Rutledge, 2007; Wechsler, Isaac, Grodstein, & Sellers, 1994). Given low problem recognition (Mallett, Bachrach, & Turrise, 2008; Wechsler et al., 2002) and treatment seeking (SAMHSA, 2014) among students, alternative methods of reaching these individuals are critical (Hunt & Eisenberg, 2010).

Web-based interventions are easily accessible, frequently utilized, and perceived as less stigmatizing and highly acceptable by students (Bhochhibhoya, Hayes, Branscum, & Taylor, 2015; Kypri,

Saunders, & Gallagher, 2003). They have shown promising effects for reducing drinking quantity, drinking frequency, heavy drinking episodes (HDEs), and alcohol-related consequences (Dumas, Kane, Navarro, & Roman, 2011; Hester, Delaney, & Campbell, 2012; Kypri et al., 2009) as well as for preventing the initiation of drinking (Palfai, Winter, Lu, Rosenbloom, & Saitz, 2014; Paschall, Antin, Ringwalt, & Saitz, 2011). However, effect sizes in these studies tend to be small to moderate and decrease rapidly over time especially among populations not seeking treatment (Carey, Scott-Sheldon, Elliott, Bolles, & Carey, 2009; Carey, Scott-Sheldon, Garey, Elliott, & Carey, 2016). Therefore, it may be necessary to incorporate additional elements to bolster intervention effects (Neighbors et al., 2010).

Text messaging may be a useful approach as it may increase the salience of information presented in web-based interventions (Mason, Ola, Zaharakis, & Zhang, 2015). Text messaging adjuncts have been used to reiterate normative feedback, highlight non-drinking activities and goals, promote self-monitoring, and present harm reduction

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strategies during high risk times for drinking (Suffoletto et al., 2016; Tremblay et al., 2010). This approach is low cost, requires few resources, and is convenient, particularly for young adults who exhibit high rates of text messaging (Mason et al., 2015; Smith, 2015). Text messaging interventions may also help overcome barriers to substance use treatment for young adults, such as stigma or low treatment engagement (Mason et al., 2015; SAMHSA, 2014). Previous work has shown text messaging interventions may increase intention to reduce drinking, readiness to change, and confidence in ability to change use among students (Mason, Benotsch, Way, Kim, & Snipes, 2014).

This preliminary study sought to assess the utility of a text messaging adjunct to a web-based intervention for college student drinking. Participants were randomized to assessment only (AO), web-based intervention (WI), or web-based intervention plus text messaging (WI + TXT). It was hypothesized that WI + TXT would exhibit less drinking and fewer consequences at follow-up compared to both WI and AO.

2. Methods

2.1. Participants

Risky drinking undergraduate students, defined by experiencing at least 1 HDE in the past month or at least 1 alcohol-related consequence in the past 3-months, were recruited online ($N = 113$). These inclusion criteria reflect drinking patterns that put students at particular risk for harm (Ralston & Palfai, 2010; White & Hingson, 2014). Students fulfilled course research credit by participating in this study, which took place at a large private urban university in the northeastern United States.

2.2. Measures

Self-report measures were administered online at baseline and one-month follow-up via Qualtrics, an online survey development platform. Drinking outcomes were assessed with 2 questions from the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) including past 30-day HDE frequency (4 + (females) or 5 + (males) drinks on one occasion) and typical number of drinks per weekend day. A sum of consequences endorsed (Y/N) on the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ; Kahler, Strong, & Read, 2005) was used as a measure of alcohol-related consequences at both time points. The timeframe for the consequences measure was 3-months at baseline and 1-month at follow-up.

2.3. Intervention

2.3.1. Web-based intervention

eCHECKUP TO GO-alcohol is a web-based intervention that utilizes motivational techniques to provide individualized feedback on drinking behavior. Feedback includes information on drinking norms, costs and consequences of use, alternative activities, and change strategies. eCHECKUP TO GO is commercially available and is used in many universities and colleges in the US and Canada to address student drinking (San Diego State Research Foundation, 2014).

2.3.2. Text messaging adjunct

Students in the WI + TXT condition received one text per day over the month between baseline and follow-up. The 12 alcohol text messages were modeled after and reiterated all topics addressed in the eCHECKUP TO GO feedback, including 1) costs/consequences of drinking, 2) descriptive norms for drinking, 3) harm reduction strategies, and 4) alternative pleasant activities. Alcohol messages were designed to target high risk times for HDEs and were delivered on Thursday, Friday, and Saturday as the majority of student alcohol consumption occurs on these days (Tremblay et al., 2010).

These alcohol messages were embedded as part of a set of daily health behavior messages relevant for students. On Sunday-Wednesday students received psychoeducation about general health behaviors (e.g., diet, exercise, sleep). These other health messages were not designed to modify drinking per se but were used to maintain student engagement with text messages related to alcohol as part of a broader focus on health behaviors in their daily lives. Text messages included text and/or photographic content and were sent to each participant daily at 6:00 PM EST to maximize the possibility of engagement with messages.

2.4. Procedures

The University Institutional Review Board approved this study, which consisted of an in-person baseline and online 1-month follow-up session one. Participants were required to sign up for both parts and were granted 3 research credits for completion. At baseline, participants were consented, administered online surveys, and randomized.

Individuals in the AO condition completed only the surveys, while those in the other two conditions additionally completed eCHECKUP TO GO-alcohol. The WI + TXT condition also received the text messaging component. All WI + TXT participants were asked for permission and agreed to receive text messages and none elected to receive emails as the proposed alternative. A link to the follow-up portion was sent via email to all participants four weeks after baseline. Participants were debriefed at the study conclusion.

2.5. Statistical analyses

Of the 113 students enrolled, 2 failed to complete follow-up and were excluded from the analyses. These participants did not differ on key variables. Therefore, all analyses were conducted using a final sample of 111. Data were analyzed using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). ANCOVA was used to examine the effect of experimental condition on drinking-related outcomes controlling for corresponding baseline values. Planned contrasts using WI + TXT as the reference group (see Fig. 1) were used to test whether WI + TXT significantly differed from WI and AO conditions on outcome variables at follow-up. Secondary contrasts using AO as the reference group were also run to determine whether WI significantly differed from AO.

3. Results

3.1. Descriptive statistics

The sample consisted of 80 female (72.1%) and 31 male undergraduate students (58.6% first year students, 26.1% sophomores, 7.3% juniors, 7.3% seniors). The average age was 18.99 (S.D. = 1.17) in this sample, which consisted of primarily white (64.9%; 23.4% Asian, 1.8% Black, 7.2% Hispanic, and 9.9% multiracial/other) native English speakers (80.2%).

3.2. Effect of intervention on drinking outcomes

Baseline characteristics are presented in Table 1. One-way ANOVAs indicated no significant differences at baseline among the 3 conditions for each of these variables.

3.2.1. Heavy episodic drinking

Because the heavy episodic drinking variable was positively skewed, a log-transformation was used in these analyses. One extreme outlier in follow-up data (≥ 7 S.D.) was removed from analyses of heavy episodic drinking. Covariate adjusted means for the untransformed variables are presented in Fig. 1. Overall, condition assignment did not significantly predict HDEs at follow-up controlling for baseline HDEs, $F(2, 106) = 2.76, p = 0.07, \text{partial } \eta^2 = 0.05$. Planned contrast indicated that

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