A text message intervention for alcohol risk reduction among community college students: TMAP

Beth C. Bock [a,*], Nancy P. Barnett [b], Herpreet Thind [c], Rochelle Rosen [d], Kristen Walaska [e], Regina Traficante [f], Robert Foster [g], Chris Deutsch [g], Joseph L. Fava [e], Lori A.J. Scott-Sheldon [d]

[a] Centers for Behavioral and Preventive Medicine, Brown Medical School, The Miriam Hospital, Providence, RI 02903, United States
[b] Center for Alcohol and Addiction Studies and Department of Behavioral and Social Sciences, Brown School of Public Health, Providence, RI 02912, United States
[c] Department of Community Health and Sustainability, University of Massachusetts Lowell, MA 01854, United States
[d] Centers for Behavioral and Preventive Medicine, The Miriam Hospital, Brown Medical School, Providence, RI 02903, United States
[e] Centers for Behavioral and Preventive Medicine, The Miriam Hospital, Providence, RI 02903, United States
[f] Community College of Rhode Island, Psychology Department, Warwick, RI 02886, United States
[g] Live Inspired, LLC, Washington, DC 20002, United States

HIGHLIGHTS

• TMAP showed excellent feasibility, acceptability, recruitment and retention.
• TMAP participants reduced heavy drinking episodes compared to controls.
• TMAP significantly reduced negative consequences of alcohol use.
• TMAP participants increased confidence in their ability to limit drinking.

ARTICLE INFO

ABSTRACT

Background: Students at community colleges comprise nearly half of all U.S. college students and show higher risk of heavy drinking and related consequences compared to students at 4-year colleges, but no alcohol safety programs currently target this population.
Objective: To examine the feasibility, acceptability, and preliminary efficacy of an alcohol risk-reduction program delivered through text messaging designed for community college (CC) students.
Methods: Heavy drinking adult CC students ($N = 60$) were enrolled and randomly assigned to the six-week active intervention (*Text Message Alcohol Program*: TMAP) or a control condition of general motivational (not alcohol related) text messages. TMAP text messages consisted of alcohol facts, strategies to limit alcohol use and related risks, and motivational messages. Assessments were conducted at baseline, week 6 (end of treatment) and week 12 (follow up).
Results: Most participants (87%) completed all follow up assessments. Intervention messages received an average rating of 6.8 ($SD = 1.5$) on a 10-point scale. At week six, TMAP participants were less likely than controls to report heavy drinking and negative alcohol consequences. The TMAP group also showed significant increases in self-efficacy to resist drinking in high risk situations between baseline and week six, with no such increase among controls. Results were maintained through the week 12 follow up.
Conclusions: The TMAP alcohol risk reduction program was feasible and highly acceptable indicated by high retention rates through the final follow up assessment and good ratings for the text message content. Reductions in multiple outcomes provide positive indications of intervention efficacy.

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1. Introduction

Excessive alcohol use is the third-leading preventable cause of death in the U.S. (CDC, 2016), and is a widespread problem among college students (Hingson, Zha, & Weitzman, 2009). Nearly half of all community college students (CCS) engage in heavy alcohol use (Blowers, 2009),

similar to the prevalence among students at residential colleges (Hingson et al., 2009; Johnston, O'Malley, Bachman, & Schulenberg, 2013; Wechsler, Lee, Nelson, & Kuo, 2002). However, CCS are at higher risk for negative consequences of heavy drinking including social and health impairment, physical or sexual assault, and unintentional and fatal injuries, and are significantly more likely to drive under the influence compared to students at residential colleges (Blowers, 2009; Hingson et al., 2009; Sheffield, Darkes, Del Boca, & Goldman, 2005; VanKim, Laska, Ehlinger, Lust, & Story, 2010). Despite their high risk and that these students comprise 45% of all college students nationwide (Juszkiewicz, 2014; Knapp, Kelly-Reid, & Ginder, 2012), there has been relatively little effort to assess and intervene with community college students on alcohol-related issues (Seigers & Carey, 2011). While there are currently 1685 community colleges in the U.S. serving over 8 million students (Juszkiewicz, 2014), we were unable to locate any research concerning the development of interventions for alcohol use targeted to CCS.

Efforts are needed to assist this population. CCS differ from students at residential colleges in several important ways. CCS tend to come from lower-income families, have more diverse ethnic/racial backgrounds (Provasnik & Planty, 2008), and typically have multiple roles and responsibilities (e.g., child rearing and employment), which speaks to the need for interventions that are tailored to the needs and life circumstances of this at-risk population. Moreover, community colleges have fewer resources for behavioral risk-prevention interventions compared to residential colleges (Chiauzzi et al., 2011; Sheffield et al., 2005).

Recent research indicates that text messaging using mobile phones is a viable delivery channel that can meet this challenge while also being appropriate for different drinking profiles (Kuntsche & Robert, 2009; Head, Noar, Iannarino, & Grant Harrington, 2013). However, only a few studies have investigated text messaging for alcohol use reduction. Recent studies by Suffoletto, Callaway, Kristan, Kraemer, and Clark (2012) and Suffoletto et al. (2014) have shown reduced drinking among young adult emergency department patients given a 12-week text message delivered intervention compared to controls. A recent meta-analysis of 14 studies examined the effectiveness of text message interventions for tobacco and alcohol cessation within adolescent and young adult populations (Mason, Ola, Zaharakis, & Zhang, 2015). Results showed a summary effect size of 0.25, indicating that, in general, text message delivered interventions have a positive effect on reducing substance use behaviors. Together, these studies indicate that text messaging is a promising method of delivering intervention for alcohol risk reduction. However, the majority of studies to date have been feasibility trials in small samples, studies in populations with mental health comorbidities, or studies in hospital settings (Scott-Sheldon et al., in press). To date, only two have been conducted with college students. One randomized residential college students ($N = 40$) to 2 weeks of text messages or assessment-only control (Weitzel, Bernhardt, Usdan, Mays, & Glanz, 2007). The intervention group showed significant reductions in drinking at post-intervention compared to controls. A second study among 46 residential college students evaluated a 2-week combined alcohol and smoking reduction intervention and found significant reductions in drinking and smoking at 1-month follow-up (Witkiewitz et al., 2014). None of the extant studies have been designed for or conducted among CCS.

1.1. Study objectives

The objectives of this study were to evaluate the (1) feasibility (i.e., number of contacts from interested students, number of eligible participants, achievement of recruitment goals, and the time required to achieve the planned enrollment number), (2) acceptability (i.e., proportion of eligible students who enrolled, the completion rate of study assessments, participant ratings of individual text messages, and participant sharing of text messages), and (3) preliminary efficacy of the *Text Message Alcohol Program* (TMAP) for alcohol-related harm

reduction for heavy drinking CC students relative to an attention control condition. The development of TMAP is described in detail elsewhere (Bock et al., 2014, 2015). In brief, the intervention components include information about alcohol-related risks, motivational messages, harm reduction strategies, and evocative questions. We expected that the demand for the intervention would be high, intervention implementation would be efficient, and that the text messages would be perceived favorably (feasibility and acceptability: Bowen, Kreuter, Spring, et al., 2009). We also expected that participants given TMAP would show greater reduction in alcohol use and related problems, increased readiness to change, self-efficacy for alcohol refusal, and use of protective behavioral strategies compared to the comparison condition at the end of the intervention (week 6), and that the group differences would be retained at 12 weeks.

2. Methods

2.1. Study design

We used a two-arm randomized trial to compare TMAP to an attention control condition consisting of general motivational text messages delivered on the same schedule as TMAP messages. Assessments were conducted at enrollment, week six (end of treatment), and week 12 (follow up). All procedures were approved by the Institutional Review Board of the Lifespan Corporation.

2.2. Procedures

2.2.1. Recruitment, enrollment, and randomization

Eligible participants were 18 to 28 years of age, enrolled in community college, reported at least one day in the past 2 weeks of drinking at least 4 drinks, and used text messaging. Participants were recruited through posted flyers at local community colleges. Interested students contacted the research staff who sent an authenticated link to the study screening survey using the student's college email to ensure that they were currently enrolled CC students. The screening survey provided a detailed description of the study. Individuals who met eligibility criteria on the screening survey were relayed to an online consent form followed by the baseline survey. Upon completion of the survey, participants were randomized into one of the two study conditions and were provided instructions to text a phone number associated with their assigned condition to begin receiving text messages. Randomization was stratified by gender and by frequent heavy drinking status, which was defined as three or more heavy drinking episodes (HDE; ≥4 drinks in one sitting for women and ≥5 for men) in the past two weeks (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).

2.2.2. Intervention conditions

Both conditions provided six messages per week for six weeks delivered on the following schedule: Thursday evening ($n = 1$), Friday and Saturday evenings ($n = 2$ each), and Sunday evening ($n = 1$). Each text was followed by a brief message requesting that the participant rate the text from 1 ("not at all") to 10 ("liked it a lot"). If no reply was received within 30 min, a reminder text was sent asking the participant to rate the previous message.

2.2.2.1. TMAP intervention. In the TMAP condition, the intervention texts were written in three broad domains: 1) Facts about alcohol, 2) Strategies to limit alcohol use and alcohol-related risks, and 3) Motivational messages. Within each of these domains, messages represented the following content categories: Pregaming, Safety, Caring, Driving/social responsibility, Consequences, Limits/strategies, Awareness of physical sensations related to alcohol use/over-use, Planning, and Fun/emotion/social topics (Table 1). TMAP participants could also text any of five key words at anytime: TAXI or CAB, COST or MONEY, BAC, TIPS,