

The Effects of a Web-Based Alcohol Prevention Program on Social Norms, Expectancies, and Intentions to Prevent Harm among College Student-Athletes

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Abstract:

College athletes are at risk for heavy alcohol use, which jeopardizes their general health, academic standing, and athletic performance. Effective prevention programming reduces these risks by targeting theory-based intermediate factors that predict alcohol use while tailoring content to student-athletes. The purpose of this study was to examine the impact of the myPlaybook online prevention program on student-athletes' social norms, negative alcohol expectancies, and intentions to use alcohol-related harm prevention strategies. NCAA Division II student-athletes were recruited from 60 institutions across the United States to complete myPlaybook and pretest/posttest surveys measuring demographics and targeted outcome variables. Participants were randomly assigned to the treatment group (pretest-program-posttest; final $n = 647$) or the delayed treatment "control" group (pretest-posttest-program; final $n = 709$). Results revealed significant program effects on social norms ($p < .01$) and intentions to use harm prevention strategies ($p < .01$), while the effect on negative alcohol expectancies was nonsignificant ($p = .14$). Implications for future research and practice are discussed.

Keywords: athletes | prevention | college | alcohol | social norms

Article:

College student-athletes are at risk for heavy drinking (Sabo, Miller, Melnick, Farrell, & Barnes, 2002; Yusko, Buckman, White, Pandina, 2008) despite evidence suggesting that participation in sports may be a protective factor for the use of other drugs (Naylor, Gardner, & Zaichkowsky, 2001). According to recent data from the National Collegiate Athletic Association (NCAA), at least 4 out of 5 college athletes report using alcohol (NCAA, 2014). Furthermore, a third of female student-athletes and more than forty percent of male student-athletes report binge drinking (i.e., consuming five or more drinks in one sitting; NCAA, 2014). Though overall prevalence rates of alcohol consumption are similar among college student-athletes and nonathletes, student-athletes are more likely to engage in binge or high-risk drinking as compared with their nonathlete peers (Green, Hartmann, & Nelson, 2014; Yusko et al., 2008). Not surprisingly, college student-athletes, as compared with nonathletes, report higher levels of negative alcohol- and drug-related consequences (Brenner, Metz, & Brenner, 2009; Dumas, Turrisi, Coll, & Haralson, 2007; Grossbard, Geisner, Neighbors, Kilmer, & Larimer, 2007; Huang, Jacobs, & Derevensky, 2010; Nattiv & Puffer, 1991).

Many of the negative consequences experienced by college student-athletes are the same physical, cognitive, and social effects of alcohol use experienced by nonathletes; however, these effects are exacerbated by the performance demands that intercollegiate sports place on student-athletes (Denny & Steiner, 2009). Physical and cognitive side effects such as dehydration, increased blood pressure, and difficulty concentrating can result in serious performance impairments, increased risk for injury, and longer recovery from injury for athletes (O'Brien & Lyons, 2000; Shirreffs & Maughan, 2006). In addition, risky behaviors associated with heavy alcohol consumption (e.g., underage drinking, driving under the influence, acts of vandalism, etc.) can have legal and loss of eligibility ramifications for the college student-athlete. Thus, addressing high-risk alcohol use among student-athletes is of central importance for professionals working in college sports settings.

PRINCIPLES OF PREVENTION SCIENCE: TARGETING MEDIATORS TO PRODUCE BEHAVIORAL CHANGE

Prevention programs are typically developed to change intermediate constructs that are thought to prevent a health problem of interest (MacKinnon, 1994). These intermediate constructs, known as mediators, are assumed to account for the relation between exposure to the program and the targeted outcomes (Baron & Kenney, 1986). Therefore, a prevention program is designed to produce change in a set of theory-informed mediators, and by doing so, is expected to produce change in the outcome (e.g., prevent, delay, or reduce the prevalence of the outcome). Theories of health behavior are typically used to guide the selection of mediators to be targeted in a prevention program.

Social norms theory postulates that beliefs about norms, such as perceptions regarding the actions of one's peers or perceptions that peers approve certain behaviors, influence an individual's behavior (Berkowitz, 2005; Perkins & Berkowitz, 1986). These perceptions can be characterized as descriptive or injunctive norms. Descriptive norms refer to an individual's perceptions of the prevalence of other people's substance use behaviors; while injunctive norms are an individual's perceptions about others' acceptance or endorsement of certain behaviors, such as peer approval or disapproval of heavy episodic drinking (Borsari & Carey, 2003;

Cialdini, Kallgren, & Reno, 1990; Perkins, 2002). Studies have shown that these perceptions are related to alcohol use among student-athletes, and that correcting misperceived norms can have an impact on personal substance use (Doumas, Haustveit, & Coll, 2010; Lewis & Neighbors, 2006; Mastroleo, Marzell, Turrise, & Borsari, 2012; Moreira, Smith, & Foxcroft, 2009; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007).

Expectancies have also been shown to influence alcohol use among student-athletes (Olthuis, Zamboanga, Martens, & Ham, 2011). Positive expectancies are the beliefs that alcohol use will yield positive outcomes. Negative expectancies are beliefs that alcohol use produces undesirable or negative effects. Positive expectancies are associated with greater alcohol consumption while negative expectancies are associated with lower alcohol consumption (Jones, Corbin, & Fromme, 2001). In addition, alcohol expectancies can mediate the impact of peer influence on alcohol use (Scheier & Botvin, 1997; Olthuis et al., 2011). Olthuis and colleagues found that negative alcohol expectancies mediated the association between teammate approval and hazardous alcohol use.

According to the Theory of Reasoned Action (Ajzen & Fishbein, 1975), and more recently Theory of Planned Behavior (Ajzen, 1991), a person's intentions to engage in or abstain from drinking alcohol likely predicts an individual's actual use of alcohol. For example, a study by Eilidh and colleagues (2012) examining alcohol use among pregnant women showed that women with greater intentions to abstain from alcohol use during pregnancy were in fact less likely to drink alcohol, while odds for drinking during pregnancy increased significantly among women with weaker intentions to abstain. Such findings highlight the important role of intentions in reducing or limiting risky alcohol behavior (Eilidh, Forbes-McKay, & Henderson, 2012). In addition to directly targeting individuals' intentions to limit alcohol consumption at heavy or extreme levels, cultivating intentions to prevent harm resulting from high-risk alcohol use may be an effective strategy for ameliorating risky alcohol-related behavior (Gastil, 2000). Harm prevention approaches focus on avoidance and intervention strategies that promote responsible alcohol consumption rather than an abstinence-only approach (Marlatt, Larimer, Baer, & Quigley, 1993). Programs and strategies focused on harm prevention have been found to increase college students' intentions to prevent harm; for example, by refraining from the risk of drinking and driving by arranging for a vehicle or designated driver (Graham, Tatterson, Roberts, & Johnston, 2004; McBride, Farrington, Midford, Meuleners, & Phillips, 2003; McBride, Midford, Farrington, & Phillips, 2000).

Based on the wealth of research on the effects of social norms, expectancies, and intentions to avoid alcohol or prevent harm, we developed an empirically supported theoretical model (see Figure 1) for explaining alcohol behaviors among college student-athletes. This model proposes that social norms about peer substance use (Social Norms Theory; Perkins, 2003) and positive and negative expectancies about the effects and consequences of substance use (Health Belief Model; Rosenstock, 1974; Becker, Radius, & Rosenstock, 1978) are factors that influence behavioral intentions to resist use of alcohol and to prevent harm (Theory of Reasoned Action; Ajzen & Fishbein, 1975). Behavioral intentions are in turn predictive of engaging in or avoiding substance use and its related consequences. Research provides clear support for targeting social norms (Perkins & Craig, 2006; Thombs & Hamilton, 2002; Turrise et al., 2009), expectancies (Wetherill & Fromme, 2007), and intentions to prevent harm (Grossbard et al., 2007) as

mediators in athlete-tailored interventions, and thus are the variables of focus in the current study.

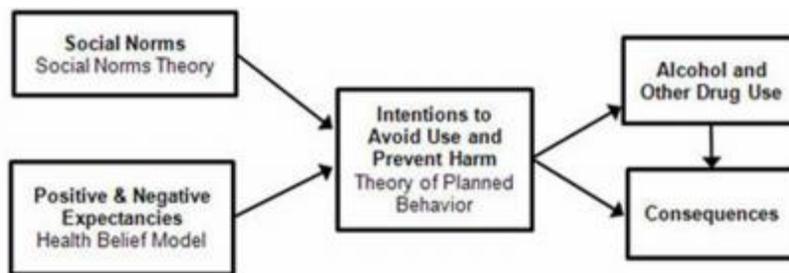


Figure 1 — Theoretical model for myPlaybook Alcohol-Prevention Program.

LIMITED EFFECTIVENESS OF EXISTING ALCOHOL PREVENTION PROGRAMS FOR STUDENT-ATHLETES

Some evidence-based interventions have been shown to be moderately successful in reducing the amount and frequency of alcohol use among college students in general, college students affiliated with fraternities, and college students who were former high school athletes (Baer et al., 2001; Borsari & Carey, 2000; Larimer, Turner, Anderson, Fader, Kilmer, Palmer, & Cronce, 2001; Marlatt et al., 1998; Martens, Smith, & Murphy, 2013; Turrisi et al., 2009). Interventions aimed specifically at collegiate student-athletes have been successful at changing perceptions of drinking norms on campus, but have not been as successful at reducing drinking behavior among student-athletes (Nelson & Wechsler, 2001; Thombs & Hamilton, 2002). While a study by Martens and colleagues (2010) showed promise for a personalized drinking feedback intervention targeted specifically to college athletes, there were no significant differences in reported weekly alcohol consumption between intervention and control groups at a 6-month follow-up. Similarly, a study by Doumas and colleagues (2010) evaluating the effects of an internet-based intervention targeting normative feedback with student-athletes showed only modest reductions in weekly drinking among heavy drinkers. Thus, despite efforts to reduce drinking behavior among this group, risky drinking behavior among college student-athletes prevails. The development and evaluation of effective theory-based alcohol prevention programs for student-athletes who are particularly at risk for heavy alcohol use and related consequences is needed.

Existing online alcohol prevention programs (e.g., Martens et al., 2010; Doumas et al., 2010) primarily use normative data and personalized feedback as a means to impact alcohol behaviors of student-athletes. However, other relevant mediators of alcohol use, including expectancies and harm reduction, were not addressed in these programs. Limited effects demonstrated in research studies of these programs may be a result of their focus on only one mediator of alcohol behavior change, whereas a multipronged approach that accounts for the role of several mediators may maximize the effect on behavioral outcomes. In addition, these programs rely on an assessment and feedback approach, but a potentially more effective method might be to integrate e-learning instructional strategies to more effectively deliver relevant content in an interactive and dynamic format.

Therefore, based on existing research highlighting the important influence of social norms, expectancies, and intentions on alcohol use, we developed an internet-based alcohol prevention program for college student-athletes, called myPlaybook. In an attempt to maximize effects beyond what previous programs have demonstrated, the current intervention was designed to target multiple factors shown to influence alcohol use and be delivered in a dynamic web-based format (see *Intervention*). There are multiple advantages to internet-based behavioral interventions, including their broad reach, self-paced and interactive format, demonstrated success, and their cost-effectiveness as compared with facilitator-led interventions (Carey, Scott-Shelton, Elliot, Bolles, & Carey, 2009; Elliott, Carey, & Bolles, 2008; Hustad, Barnett, Borsari, & Jackson, 2010; Rooke, Thorsteinsson, Karpin, Copeland, & Allsop, 2010). The flexibility they offer is particularly attractive for use with student-athletes who have demanding schedules (Brenner & Swanik, 2007; Denny & Steiner, 2009).

Thus, the purpose of the current study was to evaluate whether this web-based alcohol prevention program could effectively target and change social norms, expectancies, and intentions to prevent harm. Because of the novelty of targeting multiple factors that influence alcohol use within a single intervention, we first sought to examine whether the intervention could, in fact, effect change in each of these factors. We hypothesized that, compared with a control group that had not yet received the intervention, student-athletes who received the myPlaybook program would display: 1) a decrease in perceived social norms for the prevalence of alcohol use among their peers, 2) an increase in negative expectancies about alcohol use, and 3) an increase in intentions to use harm prevention strategies from pre- to posttest. Although reducing alcohol use behaviors and related consequences is clearly the long-term goal of the myPlaybook program, the primary focus of this article is to describe the impact of the myPlaybook program on important risk and protective factors associated with student-athlete alcohol use. Demonstrating the program's ability to effect change in these factors within a student-athlete population is the first step within a larger research initiative to develop and evaluate an evidence-based alcohol intervention program for student-athletes.

METHOD

Participants

Participants were NCAA Division II freshman and transfer student-athletes competing in the United States. The sample was limited to Division II student-athletes because there was an NCAA initiative focused on alcohol and other drug prevention for Division II student-athletes at the time of recruitment. Freshman and transfer studentathletes were selected as the focus of this study because students in their first year of college are more likely to engage in risky behaviors such as increased patterns of alcohol use (National Institute on Alcohol Abuse and Alcoholism, 2015). In addition, first-year student-athletes are less likely than veteran student-athletes to have been previously exposed to sport-related drug and alcohol prevention efforts due to limited potential exposure time as a student-athlete (NCAA, 2014). Thus, limiting the sample minimizes confounding of current exposure-outcome associations by previous exposure-outcome associations.

Data from 1,356 student-athletes who completed both the pretest and posttest surveys are included in this study. Participants were primarily first-year students (87.4%), with some transfer students in their second (4.3%), third (6.4%), and fourth (1.3%) years also completing the program. Ages ranged from 18 to 24 years and most (71.1%) participants were 18 years-old ($M = 18.43$, $SD = .955$). Female (53.2) and male (46.8%) student-athletes were similarly represented. Participants identified as White (83.1%), Black (10.2%), American Indian/Alaskan Native (.8%), Hispanic (4.5%), and Asian/Pacific Islander (1.4%). All NCAA sports were represented, with football (12.3%) and women's soccer (10.5%) having the greatest representation in the sample.

Measures

Demographic questions were used to gather information regarding gender, age, ethnicity, and sport played. The primary outcome variables in this study are social norms, negative alcohol expectancies, and intentions to use harm prevention strategies.

Social norms were assessed using a single-item measure of participants' ratings for perceived prevalence of college athlete binge drinking (i.e., "Overall, what percentage of intercollegiate athletes consumed five or more drinks in a row on at least one occasion in the last two weeks?"). Possible response options include an 11-point scale ranging from 0% to 91–100%.

The *negative alcohol expectancies* subscale included 12 items that asked student-athletes to rate on a 4-point scale (1= very unlikely, 4= very likely) the likelihood of a list of potential consequences that might occur to them personally if they were to drink 5 or more whole drinks of an alcoholic beverage two to three times per week. Items included performance-related effects (e.g., reduced lean muscle mass, decrease in strength and performance), as well as general alcohol effects taken from the Alcohol Expectancy Questionnaire (AEQ; Brown, Christiansen, & Goldman, 1987; e.g., have a memory loss, get nauseated or vomit). The reliability for this measure was assessed in the current sample and demonstrated excellent consistency ($\alpha = .929$).

Intentions to use harm prevention strategies were assessed with the question, "How likely do you think it is that you will do the following during the next 30 days?" Responses to the 11-item measure were on a 5-point scale (1= I definitely won't do this, 5= I definitely will do this). Sample items include "use a designated driver," "alternate alcoholic and non-alcoholic drinks," and "avoid drinking games." The reliability for this measure was assessed in the current sample and demonstrated acceptable consistency ($\alpha = .748$).

Intervention

myPlaybook is a web-based intervention program designed specifically for college student-athletes that focuses on the prevention of alcohol and other drug use among this population. This program, which functions as a course housed within an online learning management system, targets social norms, expectancies, and intentions, and provides general information on NCAA banned substances and drug testing procedures. The myPlaybook program includes specific learning activities focused on perceived social norms of student-athlete alcohol use (norms), student-athletes' expectations about the effects of alcohol use (expectations), and strategies to prevent or limit negative consequences of alcohol use (harm prevention).

The norms activities are designed to challenge student-athletes' misconceptions- and often overestimations- of the prevalence and acceptance of heavy episodic drinking among their peers. For example, in one activity student-athletes make guesses on the prevalence of alcohol use by other athlete and nonathlete college students. Then a comparison of their response with actual prevalence rates is presented back to them in a visual format. The *expectations* learning activities require student-athletes to critically reflect on their beliefs about the consequences of their alcohol use and provides accurate information that challenges positive expectancies while especially reinforcing negative ones. This is accomplished by describing examples that suggest perceived positive outcomes of alcohol use are not a direct result of actually consuming alcohol (e.g., Bar Lab study; Wiers & Kummeling, 2004). Harm prevention learning activities equip student-athletes with effective strategies to limit the amount of alcohol consumed and the related effects of intoxication, to prevent risky behaviors while intoxicated, and to intervene to help others. In these activities, student-athletes consider possible harm prevention strategies they could implement in their own experiences.

The entire program was designed to be completed within 90 min. Knowledge checks (brief quizzes), which participants were required to pass before continuing to the next sections, were built in at the end of each set of activities to promote authentic engagement with important intervention content.

Procedure

During the middle of the spring semester all NCAA Division II-affiliated colleges and universities at that time ($N = 296$) received an emailed invitation from an NCAA representative to participate in a study of the myPlaybook program in the subsequent fall semester. The fall semester was selected for implementation because it is an optimal time to deliver alcohol and other drug prevention programming to student-athletes who are new to the university (i.e., freshman and transfer). Ninety-two institutions responded to this call and expressed interest in participating in the study. Administration turnover and other logistical issues (e.g., semester schedules) forced some schools to drop out before the start of the study leaving 60 schools who participated in the study. One athletic department administrator from each participating school served as a liaison for the study and participated in a 1-hr webinar training on the myPlaybook program and study protocol during the summer preceding the fall implementation.

At the beginning of the fall semester, freshman and transfer student-athletes from each participating school received an e-mail that included information about the study, instructions on how to access their myPlaybook account, and a link to the web-based pretest survey that was administered via SurveyMonkey. Of the 4,974 freshmen and transfer student-athletes who received the invitation to participate, 2,871 completed the pretest survey (58% response rate). Among the pretest respondents, 47% ultimately completed the posttest, for a final sample of $n = 1,356$. All participants completed the pretest during a 2-week window at the beginning of the fall semester. Pretest data were used to stratify schools on important demographic and outcome variables (e.g., gender, ethnicity, past 30 day alcohol and other drug use). Schools within each strata were then randomized to the treatment or delayed-treatment control group. This procedure resulted in 30 schools in each of the treatment ($n = 1,527$) and control ($n = 1,344$) groups.

Participants in the treatment group completed the myPlaybook program during a 2-week implementation window, and then completed the posttest survey (final $n = 647$) within one week following the close of the implementation window. Participants from schools in the control group completed the posttest survey (final $n = 709$) during the same one-week window as the treatment group and were then offered the opportunity to complete the myPlaybook program. The time between the pretest and posttest survey was an average of 47.63 days (mode = 56 days).

Athletics department liaisons promoted the completion of myPlaybook and each liaison could earn a maximum incentive of \$100 and a chance to win an iPad based on the percentage of student-athletes who participated at their school. Per NCAA regulations, student-athletes were precluded from receiving participation incentives. To promote more accurate reporting of alcohol and drug use behaviors, student-athletes were ensured that their individual responses in the myPlaybook program and surveys would be kept confidential and were informed that they could withdraw from the study at any time. All student-athletes who participated in data collection procedures provided informed consent before accessing the pretest survey and completing the program. Only student-athletes who consented and who were 18 years of age or older were eligible to participate in data collection; however, those who declined to partake in data collection procedures or who were under the age of 18 still received the myPlaybook program. The study protocol was approved by the Institutional Review Board (IRB) of the evaluators' organization.

Data Analyses

A 2 (Group) \times 2 (Time) mixed MANCOVA with repeated measures on the second factor was conducted using IBM SPSS Statistics 22 to compare mean changes from pretest to posttest in reported social norms, expectancies, and intentions to prevent harm in the treatment group who received the intervention and the control group. Previous research indicates that male, White, and older college students are at higher risk for heavy alcohol use (Paschall & Saltz, 2007; Turrisi et al., 2009). Therefore, gender, age, and ethnicity (white vs. other) were entered as covariates in all analyses to control for their effects.

RESULTS

Table 1 provides descriptive statistics for the treatment and control groups at pretest and posttest, across each of the outcome variables. Pretest/posttest estimated marginal means (M) and standard errors (SE) are presented. There were no significant group differences among any of the outcomes at the pretest occasion (i.e., all p values $> .05$). There was a statistically significant multivariate effect found across the three dependent variables for the Group \times Time interaction, $F(3, 1224) = 14.03, p < .001, \text{partial } \eta^2 = .033$. Thus, univariate ANOVAs were conducted for each of the three factors to examine the nature of the multivariate interaction. Results for each dependent variable are provided below.

Table 1 Mean Changes from Pretest to Posttest Across Treatment and Control Groups

Variable	Pretest				Posttest			
	Treatment		Control		Treatment		Control	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Social norms**	4.56	.10	4.57	.10	4.20	.10	5.12	.09
Negative alcohol expectancies	2.89	.03	2.90	.03	2.90	.03	2.86	.03
Intentions to use harm prevention*	3.43	.05	3.50	.05	3.42	.05	3.31	.05

Note. Covariates were gender, age, and white vs. other ethnicity. Analysis for the variable "intentions to use alcohol harm prevention strategies" was restricted to past 30-day drinkers.

* $p < .01$, ** $p < .001$ for interaction.

Social Norms

Only 12.5% of the sample at pretest correctly identified the prevalence of binge drinking among college student-athletes to be in the range of 31–40%. Over 34% of student-athletes incorrectly overestimated the prevalence of binge drinking (i.e., suggesting that binge drinking prevalence is $> 40\%$). The Group \times Time interaction was significant for social norms related to other college student-athlete binge drinking, $F(1, 1211) = 40.42, p < .001$, partial $\eta^2 = .032$. Paired sample t tests for social norms revealed that the treatment group's normative perceptions became significantly more conservative from pretest to posttest ($p < .01$), while the control group's normative perceptions changed significantly to reflect perceptions of greater student-athlete binge drinking ($p < .001$).

Negative Alcohol Expectancies

The interaction between survey occasion and condition was not significant, $F(1, 1211) = 1.04, p = .27$ for negative alcohol expectancies. Based on the means, expectancies appeared to become slightly more negative from pretest to posttest among the treatment group, but this finding did not reach significance ($p = .14$). No significant change in expectancies was observed among the control group either ($p = .25$).

Intentions to use Harm Prevention Strategies

Harm prevention strategies include actions such as alternating alcoholic and nonalcoholic beverages, eating food before and during drinking, and avoiding drinking games; thus they are assumed to be relevant only to current drinkers. Therefore, analyses targeting intentions to use harm prevention strategies were restricted to data from student-athletes who reported any past 30-day alcohol use at pretest (i.e., treatment, $n = 272$; control, $n = 287$). The interaction between condition and survey occasion was significant for intentions to use strategies to prevent alcohol-related harm, $F(1, 554) = 5.79, p < .01$, partial $\eta^2 = .010$. Among past 30-day drinkers, the control group reported being significantly less likely to use harm prevention strategies at posttest compared with pretest ($p < .001$), whereas no decrease in intentions to prevent harm was observed in the treatment group ($p = .74$).

DISCUSSION

The purpose of this study was to conduct an initial investigation of a web-based alcohol prevention program's effect on social norms, expectancies, and intentions to prevent harm within a student-athlete population. We hypothesized that, compared with a delayed-treatment control group, student-athletes who received the myPlaybook alcohol prevention program would report a decrease in perceived social norms for the prevalence of alcohol use among their peers, an increase in negative expectancies about alcohol use, and an increase in intentions to use harm prevention strategies from pre- to posttest.

Consistent with our hypothesis, results indicate that student-athletes in the treatment group held more conservative beliefs about social norms for peer alcohol use after completing the program, while the control group, which had not received the intervention, had higher estimations of the prevalence of peer alcohol use. When college students overestimate the levels of alcohol use by their peers, they may increase their own use so that it adheres to the misperceived norms. Therefore, student-athletes are less likely to engage in high risk drinking when they perceive that fewer of their peers are doing so. myPlaybook's effect on changing social norms is thus an important one.

Contradictory to the second hypothesis, the intervention group did not appear to significantly change (increase) student-athletes' expectations of negative (undesired) outcomes of alcohol misuse (e.g., doing something you will regret). This may potentially be because students are entering college with a well-established understanding of negative alcohol expectancies and therefore a program such as myPlaybook is unable to impact this variable. To increase effectiveness, future iterations of the myPlaybook program should focus more on student-athlete expectancy valuations, which not only encourage an individual to consider their expectancies regarding a certain behavior but also whether they endorse the expectancy to be positive or negative. Recent research demonstrates that to effectively target behavioral expectancies, programming should assess and respond to an individual's valuation of specific expectations (Olthuis et al., 2011). Therefore, attempts to simply decrease positive expectancies or increase negative expectancies alone may not influence an individual's behavior unless expectancies are desired or valued.

The effect of the myPlaybook intervention on student-athletes' intentions to prevent harm related to alcohol consumption was also examined. The control group had lower intentions to use harm prevention strategies from pre to posttest while intentions held steady among the treatment group. Although participants in the treatment group did not report increased intentions to prevent harm as expected, the hypothesis was partially supported in that there appears to be a buffering effect observed for participants in the treatment group, which was not present for the control group. The fact that student-athletes who received the intervention maintained their intentions to prevent harm during a time (i.e., freshman year) when risk of substance use typically increases (Fromme, Corbin, & Kruse, 2008) speaks to the potential of the myPlaybook intervention to help prevent alcohol-related harm among student-athletes.

Overall, initial findings support that a web-based alcohol intervention program can effectively target and impact variables that have been previously identified as mediators of alcohol use, particularly social norms and intentions to prevent harm, which is a key goal of alcohol prevention efforts. With the exception of findings for expectancies, outcomes observed in this

study generally support that an intervention like myPlaybook can influence important pathways to behavior change identified in the theoretical framework (see Figure 1) underlying this program. These findings provide initial evidence for the effectiveness of myPlaybook, which was designed to target these important risk and protective factors through cognitive-based strategies as a means to reduce high risk alcohol use in student-athletes. Other studies have focused specifically on normative personalized feedback approaches (Martens et al., 2010, Dumas et al., 2010). This study contributes to existing literature on alcohol prevention programming for student-athletes by examining an intervention that addresses multiple factors that influence alcohol use within a single webbased intervention. In addition, the current intervention content was packaged in a more elaborate online learning module which is different from the brief assessment and personalized feedback methods that have been typically used in the past.

It is important to note that this study was not focused on the effect of specific theoretical mediators on alcohol use, which has been demonstrated elsewhere (see introduction); instead, the current study focused on assessing whether the *myPlaybook* program can impact theory-informed factors that have been shown to influence alcohol use. Information gleaned from this study can inform the development of improved program prevention strategies to optimize the effects on all three of the variables examined in this study to reduce risky alcohol consumption. As risky alcohol use remains a critical issue among student-athletes, sport psychology professionals can benefit from a better understanding of how social norms, expectancies, and intentions to prevent harm can influence alcohol use among high-risk student-athletes. Examples of how sport psychology professionals can challenge norms, reinforce negative expectancies, and encourage harm prevention strategies are provided in Table 2.

Table 2 Application of Targeted Factors Influencing Alcohol Use for Sport Psychology Professionals Working with Student-Athletes

Factors	Objectives	Example Strategies
Social Norms	Correct misperceptions about the prevalence of alcohol misuse by student-athletes nationally. A secondary focus could be the prevalence of alcohol-related consequences (e.g., drinking and driving and sexual risk behaviors).	Use national collegiate student-athlete data on alcohol misuse and negative consequences (e.g., NCAA substance use survey) in a “guess the norm” activity. Providing student-athletes with NCAA data and other forms of personalized feedback (how their own behavior compares to national norms) in response to their original “guesses/estimates” can challenge erroneous normative beliefs.
Expectancies	Decrease expectations of positive outcomes of alcohol misuse (e.g., increased enjoyment of social interactions). Increase negative expectations of alcohol misuse (e.g., increased likelihood of doing something you would regret).	Present student-athletes with a case study on an Alcohol Expectancy Challenge “bar lab” example (see Wiers & Kummeling, 2004) that challenges positive expectancies of alcohol misuse. Have student-athletes complete a decisional balance chart to weigh the perceived pros and cons of their alcohol-related behaviors.
Intentions to Prevent Harm	Increase self-efficacy to prevent harm during drinking events (e.g., alternating alcoholic and nonalcoholic drinks; identifying a designated driver; and eating before/during drinking).	Role-play various social drinking scenarios to practice a variety of harm prevention strategies, including communication strategies to minimize the number of counteroffers to drink.

Limitations and Future Directions

The high attrition rate among participants is a limitation of the current study. Participation in the study was voluntary; student-athletes were not required by athletics departments to participate in

data collection procedures. Due to NCAA compliance issues, financial incentives could not be offered to promote adherence from pretest to posttest, making retention a challenge in this population. Yet, despite a high dropout rate, a relatively large sample size was obtained for this pilot. While other alcohol education programs have often been evaluated within a sample of student-athletes at one university, a total of 60 schools participated in the current study, enhancing generalizability of the findings. Group assignment procedures also promote internal validity, with participants stratified based on gender, ethnicity, and several alcohol and drug use outcome variables. Because only Division II student-athletes were included in the sample for this study, future research should also seek to include samples representing all three NCAA competition divisions as well as other national collegiate athletic organizations (e.g., National Association of Intercollegiate Athletics).

Another limitation is the self-report nature of the data and whether student-athletes accurately report their alcohol-related perceptions. Despite the limitations of self-report methods they remain a reliable and valid approach to measure alcohol-related outcomes (Del Boca & Darkes, 2003). Lastly, the primary limitation of this study is the lack of a behavioral measure of alcohol use at the posttest. Alcohol use outcomes were not included in the primary analyses for this study because the timing of the posttest survey following program implementation was not sufficient to report behavioral changes. Acknowledging this limitation, the current study was primarily designed to be an initial test of the program's effect on relevant factors that have been shown to influence alcohol use. Ultimately, this is an important step toward conducting a fully powered randomized control trial in the future which would allow for more confident conclusions regarding the effect of the program on alcohol use behaviors of student-athletes.

CONCLUSION

The results presented in this report demonstrate that an online alcohol prevention program can effectively target and change previously identified mediators of alcohol use among collegiate student-athletes. After completing myPlaybook, student-athletes demonstrated immediate gains in social norms (i.e., norms became more conservative) and maintained their intentions to use harm prevention strategies related to alcohol use. Given the theoretical basis and research evidence suggesting that correcting social norms and promoting intentions to prevent harm reduces future substance use and related consequences, the findings of this study are encouraging and highlight the utility of incorporating theory-based alcohol prevention strategies with college student-athletes.

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