

College Students' Utilization of Protective Alcohol-Use Behaviors: Effects of Age, Gender, and Year in School

Kara Zografos, Vickie Krenz, Kathy Yarmo, and Emanuel Alcalá

California State University, Fresno

Abstract

Background and Purpose: College drinking is a major public health concern with four out of every five college students reporting alcohol use. The authors examined the frequency with which students utilized 11 protective alcohol use behaviors from the 2011 American College Health Association – National College Health Assessment (ACHA – NCHA – II). The effects of age, gender, and year in school on each of these behaviors were also examined. **Methods:** A total of 1,082 randomly selected students attending a California State University institution completed a web-based version of the NCHA-II. Descriptive statistics were conducted to describe the sample and the protective behaviors. Logistic regression analysis were conducted to assess the associations between each behavior with age, gender, and year in school. **Results:** The most frequently utilized behavior was staying with the same friends. Compared to undergraduate students, graduate students were more likely to utilize protective behaviors, and males were more likely than females to utilize the majority of these behaviors. **Conclusions:** This study provides support for the implementation of alcohol-related interventions in different sectors of the university, such as dormitories and fraternities.

© 2015 Californian Journal of Health Promotion. All rights reserved.

Keywords: American College Health Association – National College Health Assessment – II, alcohol, protective behaviors, binge drinking, college students

Introduction

Heavy alcohol use among college students remains a major public health concern (Wechsler, Lee, Nelson, & Meichum, 2002). According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), four out of every five college students reports alcohol use. Additionally, more than two out of every five college students engages in binge drinking, which is defined as five or more drinks in one sitting for men and four or more drinks in one sitting for women (Centers for Disease Control [CDC], 2012). Compared to students who do not engage in binge drinking, students who drink at this level are more likely to miss class, to do something that they later regretted, and to drive while intoxicated. Students who choose not to binge drink, but who live on campuses with a high proportion of binge drinkers, are also negatively affected and subjected to more incidences of assault and unwanted sexual advances. In addition, these non-drinkers often

experience interrupted studying or sleep, which can affect their academic performance (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Wechsler, Moeykens, Davenport, Castillo, & Hansen, 1995).

Alcohol-impaired driving and resultant motor vehicle crashes are also a major public health concern. In 2010, more than 10,000 individuals died in alcohol-impaired driving crashes. National data on motor vehicle crashes indicate a higher prevalence of alcohol involvement in drivers who are younger than 35 years of age (National Highway Traffic Safety Administration [NHTSA], 2012). As a younger subset of the young adult population, college students may be at an even greater risk since they also tend to engage in risky alcohol-related behaviors, such as binge drinking (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Wechsler, Lee, Seibring, Nelson, & Lee, 2002).

National data indicate that nearly a quarter of college students have driven while under the influence of alcohol in the past 30 days (Hingson, et al., 2002; Everett, Lowry, Cohen, & Dellinger, 1999), and an even greater percentage (38.9%) report riding with an intoxicated driver in the past month (Hingson, et al., 2002). Additionally, in 2009, more than one out of every three drivers with blood alcohol concentration (BAC) levels of 0.08% or higher were between 21 and 24 years of age. Alcohol-impaired motor vehicle crashes are also associated with significant financial losses, including an estimated \$37 billion annually (NHTSA, 2012).

Data from the fall 2011 ACHA NCHA – II indicate that 62.0% of students reported consuming alcohol during the previous 30 days. Additionally, 21.4% of students reported consuming five or more drinks in a sitting one to two times within the last two weeks. Furthermore, 25.5% of students reported driving after having any alcohol in the last 30 days (American College Health Association National College Health Assessment, 2011). With regards to 30-day alcohol prevalence, results from the 2012 Core Alcohol and Drug Survey were slightly higher with 69.2% of students reporting that they consumed alcohol during the previous 30 days (CORE Alcohol and Drug Survey, 2012).

Harm Reduction Strategies

Harm reduction is a public health approach aimed at reducing the harmful consequences associated with substance use for both the user and the community (Tatarsky & Marlatt, 2010). In terms of public health approaches, there has been an increase in the number of programs that emphasize the concept of harm reduction. For instance, Rosenberg et al. (2011) examined confidence to engage in 17 harm reduction strategies when drinking among 498 college students. According to the findings of this study, women reported significantly higher harm reduction confidence compared to men. Additionally, LaBrie, Migliuri, and Cail (2009) reported on the success of a harm reduction 21st birthday card program in reducing risky drinking among a sample of 81 college students. Students

who received the card consumed fewer drinks and reached lower blood alcohol content (BAC) levels on their birthday compared to those that did not receive the card. Additionally, female college students who received the card consumed 40% fewer drinks and reached nearly 50% lower BAC levels compared to females who did not receive the card. Furthermore, a qualitative study of 47 first-year freshman conducted by Howard, Griffin, Boekeloo, Lake and Bellows (2007) found that college students implement a variety of coping strategies to protect themselves and their friends from harm when drinking. Some of these protective strategies included: planning to stay with the same group of friends; keeping at least one person sober throughout the night; and taking care of someone who has consumed too much alcohol.

Social Norm Strategies

The social norms approach highlights the gap found on most college campuses between student-perceived levels of alcohol consumption and most students' actual consumption. According to several theories, misperception of peer norms contributes significantly to the alcohol and other drug-related problems on college and university campuses. Glider, Midyett, Mills-Novoa, Johannessen, and Collins (2001) reported an overall 29.2% decrease in binge drinking rates over a three-year period in a southwestern university campus as a result of a social marketing media campaign. Additionally, a social norms intervention targeting student athletes at an undergraduate college was successful in reducing alcohol misuse among student-athletes. The intervention substantially reduced misperceptions of frequent alcohol consumption and high-quantity social drinking as the norm among student-athlete peers. Frequent personal consumption, high-quantity consumption, high estimated peak blood alcohol concentrations during social drinking, and negative consequences all declined by 30% or more among ongoing student athletes after the program (Perkins & Craig, 2006).

Protective Alcohol-Use Behaviors

Although the effectiveness of harm reduction and social norm strategies are well documented,

additional research on protective alcohol-use behaviors and how these behaviors can be integrated into alcohol prevention interventions on college campuses is needed. These protective alcohol-use behaviors include, but are not limited to: alternating non-alcoholic with alcoholic beverages; avoiding drinking games; choosing not to drink; determining, in advance, not to exceed a set number of drinks; eating before and/or during drinking; having a friend let you know when you have had enough; keeping track of how many drinks you are having; pacing your drinks to one or fewer per hour; staying with the same groups of friends the entire time you are drinking; sticking with only one kind of alcohol, and using a designated driver (American College Health Association, 2009). Previous research has primarily focused on the relationship between these protective behaviors and negative alcohol-related consequences (Lewis, Rees, Logan, Kaysen, & Kilmer, 2010; Martens, Talyor, Damann, Page, Mowry, & Cimini, 2004; Lewis, Patrick, Lee, et al., 2012; Araas, & Adams, 2009).

Additionally, authors examined gender, racial, and ethnic differences in relation to these behaviors. According to a study conducted by Delva, Smith, Howell, Harrison, Wilke, and Jackson (2004), a greater proportion of the female students reported relying on self-protective behaviors. Additionally, female African American students were more likely than White and Hispanic females to abstain from alcohol. Martens, Cimini, Barr et al. (2007) examined the relationship between protective behavioral strategies and negative alcohol-related consequences and found that less frequent use of protective behavioral strategies was related to a greater likelihood of experiencing negative alcohol-related consequences, even after accounting for the effects of gender and alcohol consumption. In the present study, we expand upon this work to analyze additional variables of interest, specifically age and year in school, in a Hispanic-serving institution.

Research Purpose

This study contributes to the current literature on protective alcohol-use behaviors among college

students at a Hispanic-Serving California State University institution. This institution is primarily a commuter campus with approximately 20,000 students. In this study, we aim to predict the utilization of protective alcohol-use behaviors by using age, gender, and year in school as predictor variables.

Methods

Study Design

We used a cross-sectional study design to assess the variables in this study. The NCHA is a self-administered, voluntary, and anonymous paper or online assessment that asks students about a wide range of health issues including - alcohol, tobacco, and other drugs; sexual health; weight, nutrition, and exercise; mental health; and personal safety and violence. Demographic questions such as age, gender, year in school, etc. are also included (American College Health Association, 2009).

Sample

This study was based on data collected in spring 2011 from a random sample of students at one of the 23 California state universities. The NCHA – II, developed by the ACHA, was administered to 3,771 students. The inclusion criteria included enrolled students at least 18 years of age. Of the 3,771 students, 1,082 (29% response rate) completed and returned the assessment, which is above the web-based national average response rate of 22%.

Data Collection

University institutional review board approval was granted prior to the administration of the assessment. Digital Campus, an entity on campus that supports campus community learning, teaching, and collaborating online, compiled a list of randomly selected students in February 2011. The compiled list was forwarded to the ACHA, who administered the NCHA survey and sent emails out to the selected students. The first email informed the students that they were selected for the assessment, introduced the assessment, and stated the following: “participation in the assessment is voluntary; there is no penalty for not participating; individual results will not be

traceable by name or other identifying information; and the assessment is confidential.” The first email also contained information on the incentive drawing for an Apple iPad and Flip UltraHD Camcorder for those that completed the survey before the conclusion date. An email reminder to complete the assessment was sent out approximately one week later, and a second email reminder was sent out the following week.

Measures

This study was based on data from the NCHA – II. The independent variables assessed included gender (in the categories male and female), age (recoded into under 21 and over 21 categories), and year in school (recoded into first and second year undergraduates, third and fourth year undergraduates, and graduate categories). The following question was used to assess the dependent variable: “During the last 12 months, when you ‘partied’/socialized, how often did you... alternate nonalcoholic with alcoholic beverages; avoid drinking games; choose not to drink alcohol; had a friend let you know when you’ve had enough; keep track of how many drinks you were having; pace your drinks to one or fewer per hour; stay with the same group of friends the entire time you were drinking; stick with only one kind of alcohol when drinking; and use a designated driver?” Responses for each item included: “not applicable/don’t drink”; “never”; “rarely”; “sometimes”; “most of the time”; and “always” (American College Health Association, 2009). The “not applicable/don’t drink” category was excluded before data analysis since the aim of this study was to assess protective behaviors among students who drink. Additionally, each dependent variable was recoded into one (practiced the protective behavior) and zero (did not practice the protective behavior) before data analysis.

Statistical Tests

Descriptive statistics, including percentages and frequencies, were conducted to describe the sample and the protective alcohol-use behaviors. Logistic regression analysis was conducted to assess the associations between protective alcohol-use behaviors with age, gender, and year in school. To establish the appropriateness of

applying logistic regression analysis to this data set, a model fit was assessed by examining the Hosmer and Lemeshow test. Results that were not statistically significant for this test, $p > 0.05$, indicated a good fit of the model. The Statistical Package for the Social Sciences (version 18.0) software was used to perform all statistical analyses.

Results

Demographic Data

Participants were predominately White (37.2%) and junior status (28.1%). The majority of the participants were female (68.0%) and 21-24 years of age (40.4%), which is comparable to the university population statistics for spring 2011 of 58.3% and 40.2%, respectively (see Table 1).

Table 1

Summary of Demographic Variables (n = 1,082)

Variables	Sample n (%)	University Population Spring 2011
Age		
Under 21	354 (33.4)	6,889 (34.5)
21-24	428 (40.4)	8,018 (40.2)
25-29	151 (14.3)	2,756 (13.8)
30-34	52 (4.9)	957 (4.8)
35 and older	74 (7.0)	1,328 (6.7)
Gender		
Females	719 (68.0)	11,645 (58.3)
Males	339 (32.0)	8,323 (41.7)
Ethnicity		
African American	42 (3.6)	982 (4.9)
American Indian	17 (1.5)	132 (0.7)
Asian/Pacific Islander	192 (16.6)	2,975 (14.9)
Hispanic (Non-White)	356 (30.7)	7,226 (36.2)
White	431 (37.2)	6,476 (32.4)
Other	61 (5.3)	1,831 (9.2)
International	60 (5.2)	346 (1.7)
Grade Level		
Freshman	133 (15.2)	2,667 (13.4)
Sophomore	147 (16.8)	2,707 (13.6)
Junior	246 (28.1)	4,761 (23.8)
Senior	195 (22.3)	6,946 (34.8)
Graduate/ Postbaccalaureate	153 (17.5)	2,887 (14.5)

Frequency of Alcohol Use and Protective Alcohol-Use Behaviors

For this study, 754 of the 1,069 (70.5%) students surveyed reported alcohol use, with 21%

reporting alcohol use on 1 to 2 days within the last 30 days. Additionally, Table 2 illustrates the percentage of students using alcohol who indicated “most of the time” or “always” for each of the protective alcohol use behaviors. The three most prevalent protective alcohol-use behaviors were: staying with the same group of friends the entire time you were drinking (61.9%); using a designated driver (59.3%); and eating before and/or during drinking (56.2%).

Table 2

Frequencies for Each Protective Alcohol-Use Behavior (n = 1,033)

Protective Alcohol-Use Behavior	Number of Responses n (%)	Percent Responding "Most of the Time" or "Always"
Alternate non-alcoholic with alcoholic beverages	1,022 (98.9)	24.5
Avoid drinking games	1,023 (99.0)	33.5
Choose not to drink	1,014 (98.2)	26.2
Determine, in advance, not to exceed a set number of drinks	1,015 (98.2)	38.1
Eat before and/or during drinking	1,020 (98.7)	56.2
Have a friend let you know when you have had enough	1,019 (98.6)	31.4
Keep track of how many drinks you were having	1,020 (98.7)	51.1
Pace your drinks to one or fewer per hour	1,020 (98.7)	29.6
Stay with the same group of friends the entire time you were drinking	1,021 (98.8)	61.9
Stick with only one kind of alcohol	1,018 (98.5)	40.0
Use a designated driver	1,019 (98.6)	59.3

Associations between Age, Gender, and Year in School and Each Protective Alcohol-Use Behavior

Table 3 presents the logistic regression analysis of each protective alcohol-use behavior by age, gender, and year in school. Age was not a statistically significant predictor for any of the behaviors. However, although not statistically significant, students under the age of 21 were more likely to report utilizing the majority of the protective behaviors compared to those over the age of 21. Overall, compared to females, males

were more likely to report utilizing each of the protective behaviors, with one behavior statistically significant at the .05 level (odds ratio [OR] = 5.5; 95% confidence interval [CI] = 1.4 – 21.9), and eight behaviors statistically significant at the .001 level (range of odds ratios: 1.1 – 5.5). Year in school was a statistically significant predictor at the .05 level for the protective behavior of having a friend let you know when you have had enough, with first and second year undergraduate students being 0.58 times less likely to use the behavior compared to graduate students (CI = .19 - .92). See Table 3 for a complete listing of values.

Discussion

The purpose of this study was to examine the effects of age, gender, and year in school on each of the protective alcohol-use behaviors. Additionally, we examined the frequency with which students utilized each of the behaviors. For those students who reported alcohol use, staying with the same group of friends the entire time they were drinking, using a designated driver, and eating before and/or during drinking were some of the most commonly reported behaviors. Similarly, other authors found using a designated driver and eating before and/or during drinking to be among some of the most prevalent protective alcohol-use behaviors utilized (Sutfin, Light, Wagoner, McCoy, & Thompson, 2009).

Age

Age was not a statistically significant predictor for any of the protective behaviors. However, although not statistically significant, students under the age of 21 were more likely to report utilizing the majority of the protective behaviors compared to those over the age of 21. These study findings, however; are in contrast to findings from Barry, Stollefson, and Woolsey (2014) who examined differences in beliefs, motives, self-efficacy, barriers, and intentions among underage and legal age drinkers. According to these findings, underage drinkers reported significantly less confidence to perform responsible drinking behaviors during their next drinking episode, and significantly lower behavioral intentions to perform responsible

drinking behaviors the next time they consumed alcohol compared to their legal age drinking counterparts. Although underage drinking remains a significant problem among colleges and universities, each of the four Harvard School of Public Health College Alcohol Studies found underage students were less likely to drink

any alcohol in the past year, to drink any alcohol in the past month, and to engage in binge drinking in the past two weeks compared to those 21 through 23 years of age (Wechsler et al., 2002).

Table 3

Odds Ratios of Protective Alcohol-Use Behaviors

Protective Behavior	Age ¹	Gender ²	Year in School ³	
Alternating non-alcoholic with alcoholic beverages	Under 21	Male	1st and 2nd undergraduate	3rd, 4th, 5th undergraduate
<i>OR (95% CI)</i>	.65 (.34, 1.2)	1.1 (.76, 1.7)	1.1 (.48, 2.4)	.73 (.45, 1.2)
<i>p</i>	0.188	0.511	0.860	0.207
Avoiding drinking games				
<i>OR (95% CI)</i>	1.6 (.81, 3.2)	2.3 (1.4, 3.5)	1.2 (.43, 3.1)	1.2 (.59, 2.4)
<i>p</i>	0.172	< 0.001	0.770	0.644
Choosing not to drink				
<i>OR (95% CI)</i>	.84 (.30, 2.4)	3.6 (2.0, 6.6)	.67 (.18, 2.5)	.70 (.33, 1.5)
<i>p</i>	0.745	< 0.001	0.550	0.338
Determining, in advance, not to exceed a set number of drinks				
<i>OR (95% CI)</i>	1.8 (.96, 3.5)	2.0 (1.3, 3.1)	.63 (.26, 1.5)	.68 (.38, 1.2)
<i>p</i>	0.067	0.001	0.312	0.192
Eating before and/or during drinking				
<i>OR (95% CI)</i>	2.6 (.29, 23.5)	3.8 (.88, 16.0)	1.0 (.004, 2.2)	.27 (.05, 1.4)
<i>p</i>	0.388	0.074	0.141	0.117
Having a friend let you know when you have had enough				
<i>OR (95% CI)</i>	1.3 (.71, 2.2)	2.1 (1.4, 3.0)	.42 (.19, .92)	.74 (.46, 1.2)
<i>p</i>	0.441	< 0.001	0.030	0.222
Keeping track of how many drinks you were having				
<i>OR (95% CI)</i>	2.5 (.99, 6.1)	2.4 (1.3, 4.5)	.41 (.11, 1.6)	.78 (.32, 1.9)
<i>p</i>	0.051	0.007	0.194	0.583
Pacing your drinks to one or fewer per hour				
<i>OR (95% CI)</i>	1.3 (.66, 2.6)	2.6 (1.7, 4.1)	2.0 (.72, 5.5)	1.8 (.83, 3.7)
<i>p</i>	0.436	< 0.001	0.182	0.140
Staying with the same group of friends the entire time you are drinking				
<i>OR (95% CI)</i>	3.3 (.62, 17.2)	5.5 (1.4, 21.9)	.12 (.01, 2.2)	.71 (.13, 3.7)
<i>p</i>	0.160	0.014	0.154	0.681
Sticking with only one kind of alcohol				
<i>OR (95% CI)</i>	1.1 (.32, 4.0)	3.4 (1.5, 7.5)	2.1 (.37, 12.3)	1.2 (.35, 4.5)
<i>p</i>	0.851	0.002	0.397	0.002
Using a designated driver				
<i>OR (95% CI)</i>	1.6 (.47, 5.5)	4.6 (1.9, 11.1)	.49 (.05, 4.8)	2.4 (.54, 10.7)
<i>p</i>	0.453	0.001	0.538	0.253

¹Reference category is over 21; ²Reference category is females; ³Reference category is graduate students.

Gender

A major finding of our study was that males were more likely than females to report utilizing a number of the protective alcohol-use behaviors, and these differences were statistically significant at the .01 and .05 levels. This pattern of males being more likely than females to utilize protective alcohol-use behaviors is in contrast with findings from Benton, Downey, Glider, and Benton (2008) in their study on college student protective strategies and drinking consequences. Additionally, with regards to drinking game participation, Pederson and LaBrie (2006) found that males and females engage in drinking games at similar rates, which is also in contrast to the findings of this study as males were 2.2 times as likely to report avoiding drinking games compared to females.

Year in School

We found year in school to be a statistically significant predictor at the .05 level for the protective behavior of having a friend let you know when you have had enough, with first and second year undergraduate students being less likely to use the behavior compared to graduate students. This finding is in contrast to findings from a qualitative study conducted by Howard et al. (2007) which reported undergraduate students, specifically freshmen, preventing further alcohol consumption in a friend who has already had enough to drink. The freshmen in this study also engaged in other protective strategies including helping friends stick to pre-determined amounts of alcohol, making sure groups of friends stayed together, and giving friends non-alcoholic beverages. DeMartini, Carey, Lao, and Luciano (2011) conducted a study examining perceived approval of protective alcohol strategies among undergraduate students. Although our study did not examine perceptions, the findings from this study also indicate a common trend toward freshmen approving of protective behaviors more than their upperclassmen counterparts.

Limitations

A number of limitations are associated with this study. Similar to the majority of existing research on college students and alcohol use, our

results are based on self-reported data which is subject to fabrication and/or inaccurate participant recall. Additionally, although the students were randomly selected to participate in the survey, it is possible that those who responded to the survey are different from those that chose not to respond, i.e. more health conscious and/or healthy. This sample was also largely female and 21-24 years of age. Although comparable to the university population with regard to these two demographic variables, it was not possible to make definite inferences on populations that were not as well represented in this sample, including males and those within other age categories (see Table 1). All of these factors call into question the likelihood our sample is representative of all students who attend this university and/or other universities, therefore; caution must be used when interpreting the results of this study.

Implications of the Study

This study, although preliminary in scope, can be used to identify potential strategies for future interventions. These interventions can be implemented in different sectors of the university, including dormitory living and fraternity/sorority life. For instance, dormitory and fraternity/sorority sectors would be ideal to reach younger college students and lower classmen since they are more likely than their counterparts to live in on-campus housing and/or to be a member of a fraternity or sorority. Additionally, interventions implemented in university orientation courses, which are designed to guide students through the academic process, could be used to reach the entire population since students typically enroll in this course early in their college career.

Future efforts might also include the integration of substance abuse prevention strategies into already-existing programs, such as those offered by health centers on college campuses. According to the NIAAA (2005), evidence exists to support using a combination of three strategies: cognitive-behavioral skills; norms clarification; and motivational enhancement interventions. Larimer and Cronce (2002) reported on the effectiveness of these three strategies in reducing alcohol consumption and

associated negative consequences among college students. Motivational enhancement interventions have also been successfully used in medical settings, therefore; the potential exists for the incorporation of these strategies within health centers on college campuses.

Male college students use a variety of protective alcohol-use behaviors. Some of these behaviors are also influenced by age and year in school variables. Although our study contributes support to the impact of age, gender, and year in school variables on these behaviors, analysis of the impact of additional variables should be further investigated. Authors examined the impact of race and ethnicity in relation to

alcohol-related consequences (Devla, Smith, Howell, Harrision, Wilke, & Jackson, 2004), yet a further examination of how this variable influences the utilization of these behaviors within other institutions might be beneficial. Additionally, an examination of the impact of social norms on these behaviors might be warranted since authors report relationships between these misperceptions and frequent alcohol consumption (Glider et al., 2001; Perkins & Craig, 2006). Educating all college students on the importance of utilizing these behaviors can be an effective harm-reduction approach in reducing problems associated with alcohol use among college students.

References

- American College Health Association. National College Health Assessment, 2009. Available at: <http://www.achanca.org>. Accessed August 11, 2012.
- American College Health Association National College Health Assessment, 2011. Reference group executive summary fall 2011. Available at: <http://www.achanca.org/>. Accessed August 11, 2012.
- Araas, T.E., & Adams, T.B. (2009). Protective behavioral strategies and negative alcohol-related consequences in college students. *Journal of Drug Education*, 38(3), 211-224.
- Barry, A.E., Stellefson, M.L., & Woolsey, C.L. (2014). A comparison of the responsible drinking dimensions among underage and legal drinkers: Examining differences in beliefs, motives, self-efficacy, barriers and intensions. Short Report. *Substance Abuse Treatment, Prevention, and Policy*, 9:5.
- Benton, S.L., Downey R.G., Glider, P.J., & Benton, S.A. (2008). College students' norm perception predicts reported use of protective behavioral strategies for alcohol consumption. *Journal of Studies on Alcohol and Drugs*, 69(6), 859-865.
- Cameron, J.M., Heidelberg, N., Simmons, L., Lyle, S.B., Mitra-Varma, K., & Correla, C. (2010). Drinking game participation among undergraduate students attending national alcohol screening day. *The Journal of American College Health*, 58(5), 498-506.
- Centers for Disease Control and Prevention, 2012. Alcohol and public health. Available at: <http://www.cdc.gov/alcohol/>. Accessed August 11, 2012.
- CORE Alcohol and Drug Survey, 2012. Executive summary. Available at: <http://www.core.siu.edu>. Accessed May 20, 2012.
- Delva, J., Smith, M.P., Richard, M.A., Howell, R.L., Harrison, D.F., Wilke, D., Jackson, D.L. (2004). A study of the relationship between protective behaviors and drinking consequences among undergraduate college students. *Journal of American College Health*, 53(1), 19-26.
- DeMartini, K.S., Carey, K.B., Lao, K.L., & Luciano, M. (2011). Injunctive norms for alcohol-related consequences and protective behavioral strategies: Effects of gender and year in school. *Addictive Behaviors*, 36, 347-353.
- Everett S.A., Lowry, R., Cohen, L.R., & Dellinger, A.M. (1999). Unsafe motor vehicle practices among substance-using college students. *Accident Analysis and Prevention*, 31 (6), 667-673.
- Glider, P., Midyett, S.J., Mills-Novoa, B., Johannessen, K., & Collins, C. (2001). Challenging the collegiate rite of passage: A campus-wide social marketing media campaign to reduce binge drinking. *Journal of Drug Education*, 31(2), 207-220.

- Hingson, R.W., Heeren, T., Zakocs, R.C., Kopstein, A., & Wechsler, H. (2002). Magnitude of alcohol-related morbidity and mortality among U.S. college students ages 18-24. *Journal of Studies on Alcohol and Drugs*, 63, 136-144.
- Howard, D.E., Griffin, M., Boekeloo, B., Lake K., & Bellows, D. (2007). Staying safe while consuming alcohol: A qualitative study of the protective strategies and informational needs of college freshmen. *The American Journal of College Health*, 56(3), 248-254.
- LaBrie, J.W., Migliuri, S., & Cail, J. (2009). A night to remember: A harm-reduction birthday card intervention reduces high-risk drinking during 21st birthday celebrations. *The American Journal of College Health*, 57(6), 659-663.
- Larimer, M.E. & Cronce, J.M. (2002). Identification, prevention, and treatment: A review of individual-focused strategies to reduce problematic alcohol consumption by college students. *Journal of Studies on Alcohol*, Supplement 14, 148-163.
- Lewis, M.A., Patrick, M.E., Lee, C., et.al. (2012). Use of protective behavioral strategies and their association to 21st birthday alcohol consumption and related negative consequences: A between-and-within-person evaluation. *Psychology of Addictive Behaviors*, 26, (2), 179-186.
- Lewis, M.A., Rees, M., Logan, D., Kaysen, D.L., & Kilmer, Jr. (2010). Use of drinking protective behavioral strategies in association to sex-related alcohol negative consequences: The mediating role of alcohol consumption. *Psychology of Addictive Behaviors*, 24(2), 229-238.
- Martens, M.P., Taylor K.K., Damann, K.M., Page, J.C., Mowry, E.S., & Cimini, M.D. (2004). Protective behavioral strategies when drinking alcohol and their relationship to negative alcohol-related consequences in college students. *Psychology of Addictive Behaviors*, 18 (4), 390-393.
- National Highway Traffic Safety Administration, 2012. Impaired driving. Available at: <http://www.nhtsa.gov/>. Accessed August 1, 2012.
- National Institute on Alcohol Abuse and Alcoholism, n.d. College drinking. Available at <http://www.niaa.nih.gov>. Accessed on March 25, 2015.
- National Institute on Alcohol Abuse and Alcoholism, 2005. Recommended strategies. Available at: <http://www.collegedrinkinprevention.gov>. Accessed on March 10, 2015.
- Pederson, E.R. & LaBrie, J. (2006). Drinking game participation among college students: Gender and ethnic implications. *Addictive Behaviors*, 31, 2105-2115.
- Perkins, H.W. & Craig, D.W. (2006). A successful social norms campaign to reduce alcohol misuse among college student-athletes. *Journal of Studies of Alcohol and Drugs*, 67, 880-889.
- Rosenberg, H., Bonar, E.E., Hoffmann, E., et.al. (2011). Assessing university students' self-efficacy to employ alcohol-related harm reduction strategies. *The American Journal of College Health*, 59(8), 736-742.
- Sutfin, E.L., Light, L.S., Wagoner, K.G., McCoy, T.P., & Thompson, M.P. (2009). Protective behaviors and high-risk drinking among entering college freshmen. *American Journal of Health Behavior*, 33(5), 610-619.
- Tatarsky, A., & Marlatt, G.A. (2010). State of the art in harm reduction psychotherapy: An emerging treatment for substance misuse. *Journal of Clinical Psychology*, 66 (2), 117-122.
- Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college. *Journal of the American Medical Association*, 272 (21), 1672-1677.
- Wechsler, H., Lee, J.E., Kuo M., Seibring, M., Nelson, T.F., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from four Harvard School of Public Health College Alcohol Study surveys: 1993-2001. *The American Journal of College Health*, 50 (5), 203-217.
- Wechsler H., Lee, J.E., Nelson, T.F., & Meichum, K. (2002). Underage college students' drinking behavior, access to alcohol, and the influence of deterrence policies. *The American Journal of College Health*, 50(5), 223-236.
- Wechsler, H., Moeykens, B., Davenport, A., Castillo, S., & Hansen, J. (1995). The adverse

impact of heavy episodic drinkers on other college students. *Journal of Studies Alcohol and Drugs*, 56(6), 628-634.

Author Information

*Kara Zografos, DrPH, MPH
California State University, Fresno
Department of Public Health
2345 E. San Ramon Avenue M/S MH 30
Fresno, CA 93740
Work: 559-278-5988; Fax: 559-278-4179; e-mail:
kzografos@csufresno.edu

Vickie Krenz, PhD, MSPH
California State University, Fresno
Department of Public Health

Kathy Yarmo, MPH
California State University, Fresno
University Health and Psychological Services

Emanuel Alcalá, MA
California State University, Fresno
Central Valley Health Policy Institute
* corresponding author