Alcohol Poisoning Among College Students Turning 21: Do They Recognize the Symptoms and How Do They Help?*

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ABSTRACT. Objective: The aims of this study were to (1) determine recognition of and self-reported concern regarding alcohol poisoning symptoms versus other alcohol-related behaviors among students turning 21 years old, (2) assess the frequency of helping behavior among students in situations where peers display alcohol poisoning symptoms, (3) assess sources from which students seek help, and (4) consider reasons why students report reluctance to seek help. **Method:** Students ($N = 306$; 50% male) completed a Web-based self-report assessment during the week before their 21st birthday focusing on drinking behavior, alcohol-related consequences, concern for symptoms of alcohol poisoning, and observations of and experience with helping behavior. **Results:** Results indicated most students report having helped another student with symptoms of alcohol poisoning and show concern about the symptoms.

Students most often seek help from other students and parents. When students do not help their peers, it is most often because of the perception that help is not needed. Heavier drinkers report a greater likelihood to help a peer showing symptoms of alcohol poisoning. **Conclusions:** Prevention professionals should incorporate students, friends, and parents in interventions that provide knowledge and helping strategies for alcohol poisoning symptoms. In addition, prevention efforts regarding alcohol poisoning should focus on heavy drinkers, as they are most likely to be in situations requiring help. Finally, administrators implementing medical amnesty policies should couple those policies with educational strategies aimed at recognition of alcohol poisoning symptoms. (*J. Stud. Alcohol Drugs*, Supplement No. 16: 122-130, 2009)

HIGH-RISK DRINKING BY COLLEGE STUDENTS Has been described as a major public health problem (Office of the Surgeon General, 2007). Rates of alcohol use among college students exceed their non-college-attending peers (O'Malley and Johnston, 2002), and the proportion of college students meeting one or more of the diagnostic criteria for abuse or dependence is nearly triple that of the general population (Knight et al., 2002; National Center on Addiction and Substance Abuse at Columbia University, 2007).

Consequences of college student heavy drinking include injury, violence, sexual assault, academic problems, and death (Ham and Hope, 2003; Hingson et al., 2005; Perkins, 2002). Alcohol-related negative consequences experienced by college students often result from acute heavy drinking episodes rather than chronic heavy use (Hingson et al., 2002; Turner and Shu, 2004). Moreover, Hingson et al. (2005) estimated that 1,700 college students between the ages of 18 and 24 years die from alcohol-related injuries each year.

Although no national database documents the number of alcohol poisoning deaths by college students specifically, reports of such deaths are common in the popular press (Gray, 2008; Parker-Pope, 2008; Walsh and Estrada, 2008; Zernike, 2005). Furthermore, the Centers for Disease Control and Prevention (2007) documents an increase in the number of poisoning deaths in the United States in the years 1999-2004. Although this increase may be the result of drug overdoses, it is a possibility that alcohol was a contributing factor. Yoon et al. (2003) define alcohol poisoning as "an acute toxic condition resulting from exposure to excessive quantities of alcohol within a short period of time" (p. 110).

In response to the perceived risk of death resulting from alcohol poisoning, colleges and universities are implementing medical amnesty policies (also called Good Samaritan policies on some campuses). Medical amnesty policies are intended as a means to encourage college students to seek help when the symptoms of alcohol poisoning are present. These policies provide a student the promise of amnesty for university alcohol policy violations if that student calls for help in a situation where symptoms of alcohol poisoning are present. Although these policies are well meaning and have the potential to reduce harm, they are based on several assumptions: that students (1) can correctly identify the warning symptoms of alcohol poisoning; (2) can understand the risk associated with the symptoms; (3) are sober enough to judge the risk; (4) are afraid to seek help because of a fear of getting in trouble, either for themselves or their peers;

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and (5) are more likely to call for help if an amnesty policy exists (Oster-Aaland and Eighmy, 2007). To our knowledge, the assumptions underlying amnesty policies have not been directly evaluated. Moreover, there is limited empirical data examining factors associated with helping behavior in the context of alcohol poisoning symptoms. The current study addresses Assumptions 1, 2, and 4 as explained in the aims and hypotheses outlined below. It does not attempt to answer Assumptions 3 or 5.

Helping behavior

Helping behavior among college students can be understood in the context of bystander behavior. Latané and Darley's seminal work on bystander behavior (1970) determined that individual's helping decisions increased if fewer people were present, other observers expressed concern, others were helping, and the individual was not in a hurry. Fischer et al. (2006) found that individuals were more likely to help in group situations when the emergency was perceived as more dangerous. In studies of helping behavior in situations involving drug overdoses, fear of police was reported as a common reason for not seeking help (Tobin et al., 2005; Tracy et al., 2005). Steele et al. (1985) examined the role of alcohol on helping behavior, finding that at low doses alcohol increased helping behavior, especially in high-conflict situations where individuals were pressured to help others. In a self-report survey, Rabow et al. (1990) determined that college students were more likely to intervene in a drunk-driving situation if they knew and liked the driver but only if the driver was evaluated to be dangerous and the participants felt able to help. Thomas and Seibold (1995) similarly found that college students were likely to intervene in drunk-driving situations when they knew the person well or when they perceived potential harm to the driver or others. Students were less likely to intervene when they felt less powerful, they were drunk themselves, or they were afraid of how the intervention would affect their relationship with their peers. Finally, with respect to gender, previous research suggests women engage in more personal protective behaviors (Delva et al., 2004) and are more likely to help another person in trouble with alcohol (Howard et al., 2007).

Helping behavior for alcohol poisoning symptoms

Two peer reviewed studies describe helping behavior among college students in the presence of alcohol poisoning symptoms. Lewis and Marchell (2006) evaluated the impact of a medical amnesty policy and alcohol poisoning education campaign at Cornell University, finding that student calls to friends, residence assistants, or 911 for alcohol-related assistance increased after this policy/program was implemented. The percentage of students who listed "I didn't want to get the person in trouble" as a reason for not calling for help

decreased from 3.8% to 1.5% following implementation of the policy. The proportion of students who indicated "I didn't want to get myself in trouble" as a reason for not calling for help decreased from 1.3% to 1.0% following the policy implementation. No tests of statistical significance were reported for these findings. Because the amnesty policy and the alcohol poisoning educational campaign were simultaneously implemented, it is difficult to know the extent to which results were specifically attributable to the amnesty policy. In addition, this study did not assess the relationship between the fear of getting in trouble and the likelihood of helping. Colby et al. (2000) evaluated a policy mandating treatment for students with dangerously high blood alcohol concentrations and the policy's impact on helping behavior. They found 98% of the students in their sample reported helping a peer in an alcohol-related emergency and that most (88%) helped on their own without seeking outside assistance. It was not clear in the study, however, what type of assistance was provided by the student. Although both of these studies describe helping behavior among college students in alcohol-related emergencies, they do not increase our understanding of students' recognition of or concern for alcohol poisoning symptoms, nor do they assess the sources from which students seek help or the extent to which fear of reprisals is an important barrier to seeking help in these situations. In an effort to extend previous considerations regarding the utility of medical amnesty policies, the present study was aimed at evaluating factors associated with students' reasons for seeking or not seeking help in the context of situations where symptoms of alcohol poisoning may be present.

Aims and hypotheses

The current study seeks to explore the assumptions articulated by Oster-Aaland and Eighmy (2007) and describe general helping behavior. First, because very little research has specifically evaluated factors associated with helping behavior in the context of alcohol emergencies, part of the goal for this research was to collect descriptive information. We were interested in describing the conditions under which helping occurs and the nature of the assistance sought. Second, we wished to evaluate students' ability to identify symptoms of alcohol poisoning (agreement with symptoms vs agreement with nonsymptoms). We expected that students would show more agreement for alcohol poisoning symptoms than nonsymptoms based on Howard et al.'s (2007) findings that many students reported intervening to assist their friends when they exhibited signs of severe intoxication. Third, we were interested in evaluating predictors of helping behavior (observation of alcohol poisoning symptoms, ability to identify symptoms, concern for others experiencing symptoms of alcohol poisoning). We expected that all three factors (observation of, identification of, and concern for alcohol poisoning symptoms) would predict

helping behavior. We also were interested in gender and typical drinking as potential factors associated with helping, as well as whether these factors might moderate the influence of predictors of helping. Consistent with previous research, we expected that men would drink more than women (Johnston et al., 2005; O'Malley and Johnston, 2002; Read et al., 2002; Valliant and Scanlan, 1996; Wechsler et al., 1994) and that women would engage in more helping behaviors, consistent with Howard et al. (2007). Regarding typical drinking, we hypothesized that heavier drinkers would report more helping behaviors, because they would be more likely to witness heavier drinking.

Method

Participants and procedures

The study took place at a midsize, public research university in the Midwest. Participants were students turning 21 years of age during the 2006-2007 academic year, obtained from the university's student records system. The list included 497 students, all of whom were invited to participate in a larger study evaluating an intervention to reduce 21st birthday drinking. Invitations were emailed with a link and confidential personal identification number for use in completing the survey. Of the students turning 21, 61.57% agreed to participate in the survey, resulting in a sample of 306 students (50% male, 95.8% white). Participants were demographically similar to the larger student body (54% male, 93% white). As part of the larger study, students completed a 50-minute Web-based survey during the week before their 21st birthday, and we used responses to this survey in the present analysis. Participants provided informed consent on the Web and were assured of the confidentiality of their data. Participants were compensated \$50 for completion of each survey (pre-21st birthday and post-21st birthday). All procedures were approved by the university's institutional review board.

Measures

Alcohol consumption. Typical drinks per week was measured with the Daily Drinking Questionnaire (Collins et al., 1985), which asks students to indicate the average number of drinks consumed over the previous 3 months for each day of the week. Drinks per week was scored as the sum of the typical number of drinks consumed on each day of the week from the Daily Drinking Questionnaire. Drinking frequency was assessed by asking students, "How many days of the week did you drink alcohol during the past 3 months?" (Dimeff et al., 1999). Response options ranged from 0 (I do not drink at all) to 7 (every day).

Alcohol-related negative consequences. Alcohol-related negative consequences were measured with the Young Adult

Alcohol Problems Screening Test (YAAPST), which measures both acute and long-term problems associated with college student drinking during the past year (Hurlbut and Sher, 1992). The YAAPST consists of 27 items, including "Have you had a headache (hangover) the morning after you had been drinking?" "Have you felt very sick to your stomach or thrown up after drinking?" and "Have you awakened the morning after a good bit of drinking and found that you could not remember a part of the evening before?" The YAAPST has demonstrated good internal consistency and test-retest reliability, as well as support for criterion validity, concurrent validity, and construct validity (Hurlbut and Sher, 1992). In the present study the YAAPST was scored as the number of items endorsed ($\alpha = .86$).

Helping behavior. Helping behavior was measured with a scale developed by the authors, adapted from one designed by Colby et al. (2000) and drawing on concepts from Latané and Darley (1970). This scale measured five constructs using a parallel format: concern for alcohol poisoning symptoms, observing alcohol poisoning symptoms, recognition of alcohol poisoning symptoms (i.e., agreement/nonagreement with symptoms that are/are not indicative of alcohol poisoning), helping behavior for alcohol poisoning symptoms, and sources of help sought.

Concern for alcohol poisoning symptoms was assessed with 11 items representing actual alcohol poisoning symptoms (Adinoff et al., 1988). The 11 items included seizures, bluish skin color, cannot be roused, low body temperature, irregular breathing, pale skin color, slow breathing, passed out, vomiting, nausea, and confusion. Students reported their level of concern when witnessing these alcohol-related symptoms on a 4-point Likert scale (1 = not at all concerned to 4 = extremely concerned). In addition to the 11 actual symptoms of alcohol poisoning, the scale contained 7 other options that are *not* symptoms of alcohol poisoning (e.g., violent behavior, withdrawal symptoms, memory loss, headache). Concern for alcohol poisoning symptoms was scored by taking the mean of the 11 actual alcohol poisoning symptoms ($\alpha = .87$).

Observing alcohol poisoning symptoms was assessed by asking students whether they had observed each symptom of alcohol poisoning. Response options were truncated to reflect "never" versus "one or more times" because of relatively low base rates. Scores reflect the number of symptoms that students had ever observed, with possible values ranging from 0 to 11 ($\alpha = .82$).

Recognition of symptoms and nonsymptoms of alcohol poisoning. Students were asked the extent to which they agreed that the list of 18 drinking outcomes were symptoms of alcohol poisoning. Agreement with symptoms of alcohol poisoning was scored as the level of agreement from 1 (strongly disagree) to 5 (strongly agree) with the 11 actual alcohol poisoning items ($\alpha = .85$). Agreement with nonsymptoms of alcohol poisoning was similarly assessed by

a student's level of agreement from 1 (strongly disagree) to 5 (strongly agree) regarding whether each of the seven non-symptoms were symptoms of alcohol poisoning ($\alpha = .84$).

Helping behavior for alcohol poisoning symptoms was similarly assessed by asking students whether they had engaged in helping another student who was experiencing alcohol-related symptoms. Response options ranged from 1 (never) to 6 (more than 10 times). Scores reflect the sum of the 11 items ($\alpha = .84$).

Sources of help sought. Students who reported having helped a peer who was exhibiting alcohol poisoning symptoms or other alcohol-related symptoms were asked to report which of the following sources of help they had used from the following list: resident assistant, hall director, another student, campus police, city police, parent, hospital/emergency department, or other (which allowed them to enter in responses that were not on the list).

Reasons for not seeking help. Students who reported never helping a peer who experienced alcohol-related symptoms were asked to indicate their level of agreement (1 = strongly disagree to 4 = strongly agree) with a list of 23 reasons for not seeking help for both alcohol poisoning symptoms and other alcohol-related symptoms (e.g., did not believe the student was at risk, did not want my friend to be angry, was afraid of getting in trouble myself, was afraid my friend would get in trouble, no one else seemed concerned). These 23 reasons were adapted from Colby et al. (2000) as well as concepts drawn from Latané and Darley (1970).

Results

Analysis overview

Analyses are presented in three sections. First, we descriptively examined factors conceptually associated with helping behaviors and examined correlations among them. Second, we evaluated whether students were able to correctly identify symptoms of helping behavior. Third, we conducted regression analyses evaluating (1) helping as a function of exposure to, concern regarding, and identification of the

symptoms of alcohol poisoning; (2) helping as a function of gender and typical drinking; and (3) the degree to which gender and typical drinking moderated the influence of exposure, concern, and identification on helping behavior.

Descriptive information

Table 1 provides means and standard deviations for drinking behavior, concern for alcohol poisoning symptoms, observing alcohol poisoning symptoms, helping behavior for alcohol poisoning symptoms, and agreement/nonagreement of alcohol poisoning symptoms for men and women. Consistent with our hypothesis, women demonstrated more concern for alcohol poisoning symptoms and had higher overall agreement that symptoms were signs of alcohol poisoning than did men. Zero-order correlations are presented in Table 2. Overall, greater drinking behavior (drinks per week and drinking frequency) was associated with showing less concern for alcohol poisoning symptoms and lower recognition of symptoms of alcohol poisoning. However, greater drinking behavior was also associated with observing more alcohol poisoning symptoms and greater helping behavior for alcohol poisoning symptoms.

Sources of help

Findings indicate 86% of students reported using a source of help for symptoms and nonsymptoms of alcohol poisoning. Table 3 presents the percentages of students who report using various sources when seeking help. More than half (57.8%) of students indicated they had helped another individual without seeking outside help. When seeking outside help, students were most likely to seek help from another student, followed by a parent. Students were least likely to seek help from on-campus and off-campus police. When asked to indicate other sources, several students listed the Internet as a source of help. For example, students stated, "I may use the Internet for signs or symptom help" and "I once Googled alcohol poisoning for the symptoms just to make sure my friend didn't have it."

TABLE 1. Means and standard deviations, by gender

Variable	Men (<i>n</i> = 153) Mean (SD)	Women (<i>n</i> = 153) Mean (SD)	<i>t</i>
Drinks per week	9.49 (10.48)	5.13 (6.25)	-4.12 [‡]
Drinking frequency	0.96 (0.99)	0.71 (0.78)	-2.43*
Negative consequences	5.15 (4.17)	4.72 (4.03)	-0.91
Concern for alcohol poisoning symptoms	2.89 (0.48)	3.03 (0.55)	2.44*
Observe alcohol poisoning symptoms	5.12 (2.58)	5.09 (2.61)	-0.09
Helping behavior	21.16 (7.96)	21.85 (9.08)	-0.70
Symptom agreement	3.91 (0.51)	4.16 (0.49)	4.21 [‡]
Nonsymptom agreement	2.91 (0.76)	2.99 (0.70)	0.92

**p* < .05; [‡]*p* < .001.

TABLE 2. Zero-order correlations ($N = 306$)

Variable	1	2	3	4	5	6	7	8	9
1. Gender	—	.25 [‡]	.14*	.05	-.14*	.05	-.04	-.24 [‡]	-.05
2. Drinks per week	.25 [‡]	—	.80 [‡]	.63 [‡]	-.19 [‡]	.27 [‡]	.29 [‡]	-.03	-.21 [‡]
3. Drinking frequency	.14*	.80 [‡]	—	.72 [‡]	-.23 [‡]	.37 [‡]	.31 [‡]	-.04	-.24 [‡]
4. Negative consequences	.05	.63 [‡]	.72 [‡]	—	-.24 [‡]	.46 [‡]	.43 [‡]	-.01	-.15 [‡]
5. Concern for alcohol poisoning symptoms	-.14*	-.19 [‡]	-.23 [‡]	-.24 [‡]	—	-.14*	-.08	.57 [‡]	.30 [‡]
6. Observe alcohol poisoning symptoms	.05	.27 [‡]	.37 [‡]	.46 [‡]	-.14*	—	.75 [‡]	-.05	-.09
7. Helping behavior	-.04	.29 [‡]	.31 [‡]	.43 [‡]	-.08	.75 [‡]	—	-.02	-.06
8. Symptom agreement	-.24 [‡]	-.03	-.04	-.01	.57 [‡]	-.05	-.02	—	.44 [‡]
9. Nonsymptom agreement	-.05	-.21 [‡]	-.24 [‡]	-.15 [‡]	.30 [‡]	-.09	-.06	.44 [‡]	—

* $p < .05$; [†] $p < .01$; [‡] $p < .001$.

Reasons not to seek help

Students were asked to indicate how many times, if ever, they had sought help for another student who was experiencing specific alcohol-related symptoms. Both actual symptoms of alcohol poisoning and nonsymptoms were included on the list. Findings indicated 14% of students reported never having helped someone with symptoms or nonsymptoms of alcohol poisoning. Table 4 presents the means and standard deviations for reasons why students might be reluctant to seek help. Students were most likely to agree that the reason they had never helped was that they did not perceive the student needed help. Students confirmed this by stating, "Never was in a situation where my friend was really bad where I had to contact a hospital!" and "I have not witnessed any of these problems; therefore, I have not helped!" Overall, students indicated that fear of getting themselves or a friend into trouble was not the reason that prevented them from helping a peer.

Are college students able to distinguish alcohol poisoning symptoms from nonsymptoms?

Table 5 presents means and standard deviations for symptoms and nonsymptoms of alcohol poisoning. The difference between the means for symptom agreement versus nonsymptom agreement was statistically significant ($t = 27.74$, 305 df, $p < .001$), which indicates students show stronger agreement for symptoms than nonsymptoms, with the excep-

tion of confusion. The average (SD) level of agreement for symptoms was 4.04 (0.51). The average level of agreement for nonsymptoms was 2.95 (0.73). However, it is important to note that the mean of nonsymptoms coincides with "not sure" on the Likert scale response. Findings indicate students on average are able to identify alcohol poisoning symptoms but have a more difficult time distinguishing which alcohol-related symptoms are not signs of alcohol poisoning.

Predicting helping behavior

Hierarchical regression analysis was used to evaluate predictors of helping behavior. At Step 1, we examined helping as a function of observing symptoms, concern for symptoms, symptom agreement, and nonsymptom agreement. Gender and typical drinking (drinks per week) were added at Step 2 to evaluate whether either of these factors accounted for unique variance in helping. Gender was dummy coded (0 = female and 1 = male). Two-way product terms evaluating gender and typical drinking as potential moderators of helping-related factors were entered in a subsequent step but revealed no interactions between helping factors and gender or drinking and are thus not presented. All continuous predictors were mean centered to facilitate interpretation of parameter estimates (Cohen et al., 2002). Regression results are presented in Table 6.

Results at Step 1 indicated roughly half of the variance in helping behavior related to symptoms of alcohol poisoning was accounted for by observing symptoms, concern for symptoms, symptom agreement, and nonsymptom agreement. However, only the observation of symptoms of poisoning was uniquely associated with helping behavior. Results at Step 2 revealed that neither gender nor drinking was uniquely associated with helping, over and above the effects of variables entered at Step 1.

Discussion

This study sought to describe the nature of helping behavior in the presence of alcohol poisoning symptoms among college students. Three assumptions underlying medical amnesty policies were addressed (Oster-Aaland and Eighmy,

TABLE 3. Sources of help for alcohol poisoning symptoms and nonsymptoms ($n = 263$)

Source	%
I have helped other students, but I have not sought outside help	57.8
Another student (not a residence advisor)	38.6
Parent	12.4
Hospital/clinic/emergency department	7.5
Other	5.9
Resident advisor	2.3
Hall director	1.6
Off-campus police	1.3
Campus police	0.3

TABLE 4. Reasons not to seek help for alcohol poisoning symptoms and nonsymptoms ($n = 43$)

Item	Mean (SD)
I did not believe that the student was at risk	3.53 (1.29)
I did not think the student needed help	3.41 (1.25)
Someone else was already helping	2.83 (1.19)
I was not sure what to do	2.34 (1.08)
No one else seemed concerned	2.30 (0.98)
I was not sure how to help	2.27 (1.09)
I was afraid of my friend getting into trouble with legal system/police	2.18 (1.13)
I was afraid of my friend getting into trouble with residence hall staff	2.11 (1.05)
I was afraid of my friend getting into trouble with university administration	2.11 (1.02)
I did not think it was my responsibility	2.09 (0.97)
No one else was helping	2.09 (0.86)
I was afraid of my friend getting into trouble with his/her parents	2.02 (0.96)
I was afraid of my friend getting into trouble with his/her academic program	2.02 (0.93)
I was afraid of myself getting into trouble with the legal system/police	2.02 (1.01)
I assumed someone else would help	2.00 (0.89)
I was afraid of myself getting into trouble with my academic program	1.95 (0.99)
Other people discouraged me from getting help	1.93 (0.85)
I did not want my friend to be angry	1.90 (0.99)
I was afraid of myself getting into trouble with university administration	1.90 (0.92)
I thought the help would cost too much money	1.83 (0.89)
I was afraid of myself getting into trouble with residence hall staff	1.81 (0.85)
I was afraid of myself getting into trouble with my parents	1.76 (0.86)
I was in a hurry	1.69 (0.74)

Notes: Response options were 1 = “strongly disagree”; 2 = “disagree”; 3 = “not sure”; 4 = “agree”; 5 = “strongly agree.”

2007). Results upheld Assumption 1, as students had higher agreement when identifying symptoms of alcohol poisoning than nonsymptoms. However, results suggest that students in general had a more difficult time distinguishing nonsymptoms of alcohol poisoning. The mean level of agreement for nonsymptom items corresponded with “not sure.” This

TABLE 5. Level of agreement for whether item was a symptom of alcohol poisoning ($N = 306$)

Item	Mean (SD)
Seizures	4.51 (0.72)
Bluish skin color	4.31 (0.79)
Cannot be roused	4.26 (0.90)
Low body temperature	4.21 (0.75)
Irregular breathing	4.19 (0.75)
Pale skin color	4.13 (0.79)
Slow breathing	4.10 (0.80)
Passed out	4.07 (0.79)
Vomiting	4.01 (0.81)
Nausea	3.77 (0.85)
Memory loss	3.65 (0.99)
Withdrawal symptoms	3.24 (1.06)
Headache	3.13 (1.05)
Violent behavior	2.95 (0.99)
Confusion	2.88 (0.97)
Argumentative	2.68 (1.02)
Went to work drunk or high	2.52 (1.02)
Were late to work due to drinking	2.51 (1.02)
Total symptom agreement	4.04 (0.51)
Total nonsymptoms agreement	2.95 (0.73)

Notes: Symptoms of alcohol poisoning are in **bold**. Response options were 1 = “strongly disagree”; 2 = “disagree”; 3 = “not sure”; 4 = “agree”; 5 = “strongly agree.”

finding suggests that further alcohol poisoning education is needed so that students can fully distinguish symptoms from nonsymptoms of alcohol poisoning. It is plausible that students would be more likely to call for help in an alcohol-related emergency if there was less hesitation and clearer distinction as to whether the student was displaying a symptom or nonsymptom of alcohol poisoning. Some doubt was cast on Assumption 2—that students understand the risk associated with the symptoms. Although it was true that women showed more overall concern for alcohol poisoning symptoms, the mean of 3.03 indicates an answer of “somewhat concerned.” Furthermore, because drinking behavior was associated with less concern, it is possible that students underestimate the risk of alcohol poisoning symptoms because of their own impaired judgment. It is also possible that

TABLE 6. Hierarchical regression results for helping behaviors for alcohol poisoning symptoms ($N = 306$)

Predictor	<i>B</i> (SE)	β	<i>d</i>
Step 1			
Observe SOP	2.30 (0.12)	.77 [‡]	2.26
SOP agreement	-0.37 (0.25)	-.07	-0.17
Non-SOP agreement	-0.18 (0.15)	-.05	-0.14
Concern SOP	0.67 (0.23)	.14 [†]	0.33
Step 2			
Gender	0.31 (0.20)	.06	0.18
Drinks per week	-0.02 (0.01)	-.06	-0.15

Notes: SOP = symptoms of alcohol poisoning. R^2 at Step 1 = .56[‡]. $R^2\Delta$ at Step 2 = .01*.

* $p < .05$; [†] $p < .01$; [‡] $p < .001$.

heavier drinkers minimize the potential risks of drinking as a means of self-justification. Alternatively, heavier drinkers who witness more alcohol-related problems may become desensitized to the urgency of alcohol poisoning. Assumption 4—that students are afraid to seek help because of a fear of getting in trouble—was not supported by this study. The relatively small percentage (14%) of students who reported never seeking help indicated that the primary reason was a lack of perceived risk, not a fear of getting in trouble. Assumptions 3 (students are sober enough to judge the risk) and 5 (students would be more likely to call for help if a medical amnesty policy existed) were not explored in this study. Measurement of Assumption 3 would require assessing the participant's own level of intoxication at the time that the helping took place. Assumption 5 would require experimental design to determine students' helping behavior actions in the presence or absence of a medical amnesty policy. These may be areas for future research.

The majority of students in the study (57.8%) had helped a fellow student exhibiting signs of alcohol poisoning, although most did so without outside help. When they did seek outside help to respond to a peer alcohol emergency, students most often sought help from a friend or parent. Help provided by friends or parents in alcohol poisoning situations may be inadequate. Unless those individuals are trained in recognizing alcohol poisoning symptoms and understand the urgency in receiving medical attention, the help sought may fall short.

Several practical implications can be drawn from this study. First, more alcohol poisoning education is needed for students to be able to confidently distinguish symptoms from nonsymptoms. Students assessing alcohol poisoning risk need a better understanding of which symptoms require immediate action and what that action should be (i.e., calling 911). Students should not be expected to triage their friends' medical conditions. Education should focus on erring on the side of caution. Second, that the top three sources of help in this study included students themselves (57.8%), other students (38.6%), and parents (12.4%) demonstrates the potential importance of incorporating friends and parents in prevention interventions, as well as making sure students, friends, and parents are able to identify symptoms and know how to intervene. This might be accomplished through social marketing campaigns on campus, in residence halls, and during summer orientation programs. Parent-specific education on alcohol poisoning could occur during orientation programs, family weekend events, or through parent newsletters and Web sites. Third, prevention professionals should focus on the Internet as a source of help for students in alcohol-related emergencies. Students reported using the Internet to find quick and credible information on alcohol poisoning. University Web sites should contain easily accessible information on alcohol poisoning symptoms with clear instructions on when and how to help.

In addition, these findings suggest that prevention efforts regarding alcohol poisoning should focus on heavy drinkers, because students who consume more alcohol are most likely to be in situations requiring help and are more likely to help. These students also express less concern regarding symptoms of alcohol poisoning and thus may not help effectively. Because heavy-drinking students witness alcohol poisoning symptoms on a more frequent basis, it is possible that they may become desensitized to the level of risk associated with those symptoms. This group of drinkers could benefit from easily accessible information on alcohol poisoning symptoms.

Given that failure to recognize the symptoms and need for intervention, rather than fear of getting in trouble, was the primary reason students reported for not helping their peers, administrators considering implementing medical amnesty policies should couple those policies with educational strategies aimed at recognition of alcohol poisoning symptoms and action steps for students witnessing those symptoms. Helping students understand the risk of severe illness or death is crucial to overcoming this bystander behavior, regardless of whether a medical amnesty policy exists.

Limitations

That the sample included only students turning 21 years old makes it difficult to generalize to other college student populations. It may be that older students are better able to recognize the symptoms of alcohol poisoning because they have been exposed to more campus education and more situations that required help. A primary limitation of this study is the way in which the reasons for not helping and sources of help were assessed. Students who reported never having helped another student for any alcohol-related symptom (whether a symptom or nonsymptom of alcohol poisoning) were asked their reasons for not helping. They were not asked to indicate sources of help. Conversely, students who reported having helped another student for either type of alcohol-related symptoms were asked to indicate their sources of help. They were not asked their reasons for not helping. The imprecise nature of these measurements makes it difficult to know if students helped other students because they believed they witnessed alcohol poisoning symptoms or because they observed other alcohol-related symptoms unrelated to alcohol poisoning. In addition, specific bystander behaviors that have been identified as important in the social psychology literature (e.g., noticing an event, interpreting as an emergency, assuming responsibility) were not assessed in conjunction with a single identifiable event in this research but may provide a fruitful direction for future work in this area.

The cross-sectional nature of this research design limits the scope of the conclusions that can be drawn regarding the relationship between concern for alcohol poisoning

symptoms and heavier drinking and vice versa. In addition, student's reports of helping behavior were gathered as a snapshot in time. It is unclear how these behaviors would differ in the presence or absence of a medical amnesty policy.

Future directions

Future studies should be conducted on all ages of college students to determine the effects across the entire college student population. That the 21st birthday has been documented as a particularly risky drinking occasion, with many students drinking to high blood alcohol concentrations, makes it an appropriate age group to target for intervention (Rutledge et al., 2008). Unfortunately, the 21st birthday card that has been widely used to intervene has shown little impact in reducing drinking or related consequences (Neighbors et al., 2005; Smith et al., 2006). Existing interventions such as the B.R.A.D. initiative (Hembroff et al., 2007) may be strengthened by incorporating and evaluating alcohol poisoning recognition interventions as part of the traditional 21st birthday card intervention.

In addition, future studies should attempt to determine the impact of current medical amnesty policies on help-seeking behavior. Administrators considering implementing medical amnesty policies should be diligent in gathering prepolicy and postpolicy data indicating the frequency of help-seeking behavior. Most importantly, administrators should be advised that a medical amnesty policy is not the only answer to preventing alcohol poisoning deaths among students. Attempts to increase calls for help should include educating students, peers, and family members about the signs of alcohol poisoning, when to take action, and how to take action. Finally, it must be noted that alcohol poisoning is not the only cause of alcohol-related deaths among college students. Many students will die from other alcohol-related causes such as injuries and traffic accidents (Hingson et al., 2005). Future research should explore ways to increase bystander interventions to reduce all types of alcohol-related deaths in college students.

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