

# Alcohol Consumption Behaviors Among Athletic Training Students at Accredited Athletic Training Education Programs in the Mid-America Athletic Trainers' Association

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**Context:** Alcohol consumption among college students has been evaluated at many levels, but assessment of alcohol consumption among collegiate athletic training students has not been substantially reviewed. Understanding the alcohol use of this college-age group adds to the overall literature on alcohol consumption of the college student population.

**Objective:** To assess the prevalence of hazardous and harmful alcohol consumption behaviors in collegiate athletic training students using the Alcohol Use Disorders Identification Test (AUDIT).

**Design:** A cross-sectional survey using the AUDIT.

**Setting:** The AUDIT questionnaire was sent to the program directors of all Commission on Accreditation of Allied Health Education Programs-accredited athletic training education programs in the Mid-America Athletic Trainers' Association.

**Patients or Other Participants:** Fourteen of the 35 athletic

training education programs agreed to take part in the study, yielding a 40% response rate. Three hundred and forty-eight of the 946 athletic training students (36%) solicited agreed to participate.

**Main Outcome Measure(s):** Maximum score on the AUDIT out of a possible score of 40.

**Results:** The mean AUDIT score for the sample was 7.47, with an SD of 5.69. Thirty-seven percent of participants demonstrated an AUDIT score of 9 or above. Nearly 18% of participants reported having 6 or more drinks at one sitting on a weekly basis.

**Conclusions:** It is difficult to compare athletic training students' alcohol consumption with that of other student groups. The greater percentage of athletic training students does not drink in excess on a frequent basis.

**Key Words:** Alcohol Use Disorder Identification Test (AUDIT), college students, substance abuse

Drinking alcohol has been a tradition and expectation of many college students. Alcohol use and abuse and binge drinking have been the focus of many articles, and research into alcohol use among college students has been substantial. As many as 75% to 86% of college students have used alcohol in the last year.<sup>1,2</sup> Further, 61% of college students' noncollegiate peers reported using alcohol in the same time frame. Forty-four percent of the college student population reported binge drinking.<sup>3,4</sup> In a Harvard School of Public Health study, Wechsler et al<sup>5</sup> reported that one third of students at colleges surveyed had a 50% binge rate in the 2 weeks before study participation. Men and women, however, did not tend to have the same binge rate. Binge drinking was reported by 50% of college-aged men but by 39% of college-aged women.<sup>5,6</sup> However, not all college students are bingeing or abusing alcohol. Fifty-six percent of students surveyed said that they abstained from drinking altogether or drank in moderation. Two in 5 students drank but were not binge drinkers.<sup>3</sup>

A number of authors have looked into a variety of behaviors

surrounding college students' use of alcohol as well as characteristics common to many subgroups within the college student population.<sup>1,2</sup> Athletic participation might increase the chance that a student will participate in drinking or bingeing.<sup>3</sup> Turrisi et al<sup>7</sup> found that more sports fans drank alcohol than did non-sport fans. Institutions that emphasize athletics or that have notable athletic traditions are strongly associated with heavy alcohol consumption by students.<sup>7,8</sup>

Involvement as a collegiate athlete has not been shown to be a deterring factor for alcohol use. Eighty-nine percent of collegiate athletes report bingeing.<sup>2</sup> Institutions that were identified as high risk for bingeing were schools with prominent sports teams.<sup>8</sup> Some authors<sup>9-12</sup> concluded that team leaders tended to consume more alcohol, binged more often, and suffered consequences more often than did their teammates. White male team leaders tended to demonstrate the highest occurrence of binge drinking. A total of 8% of male athletes abstained from drinking, whereas 11% of nonathletes abstained.<sup>9</sup> Seventy-three percent of male athletes and 58% of

female athletes have reported getting drunk as a goal when drinking.<sup>9</sup> Alcohol use by collegiate student-athletes has been compared with that of other student groups, including the non-athlete population, and with that of non-college students of similar age. Such comparisons have also included demographic and geographic factors. A range of 44% to 50% of the general student population reported bingeing.<sup>3,9,13,14</sup> Bingeing was self-reported by 50% to 58% of male athletes,<sup>3,15</sup> 30% of female athletes,<sup>3,15</sup> and 42% of nonathlete men.<sup>9,16</sup>

Alcohol use among college students and collegiate student-athletes has been studied extensively. No authors have specifically examined alcohol use by collegiate athletic training students, and few have investigated alcohol use among students in other health care programs. Outside the athletic arena, athletes and athletic training students are exposed to similar social environments as those of students who are not athletes. As part of the increasing body of information in this area and in an attempt to identify if athletic training students are at risk for harmful alcohol consumption behaviors, it seems reasonable and necessary to examine alcohol use by athletic training students.

Our purpose was to determine the occurrence of binge drinking and to identify hazardous or harmful alcohol consumption behaviors among college-aged athletic training students. We wanted to learn if there were any significant differences in athletic training student drinking behaviors based on sex, year in school, and competition level of the student's institution. We also wanted to evaluate whether sex, year of study, or competitive level were predictors of score on the questionnaire. Finally, we compared our findings with alcohol consumption data in other college-aged students and populations. The region of the United States represented by the Mid-America Athletic Trainers' Association (MAATA) was identified for solicitation for participation in this study.

## METHODS

The goal of our survey research project was to gain insight into collegiate athletic training student alcohol consumption behaviors using the Alcohol Use Disorders Identification Test (AUDIT). Students participating in the study were provided interpretation guidelines so that they could understand their results. The guidelines also provided information that assisted each participant in addressing potentially hazardous or harmful drinking patterns. Subjects were given Action Cards providing information to which they could refer in the event a drinking problem or tendency toward a drinking problem was uncovered by participation in the study. The Action Cards were not part of the AUDIT questionnaire but were suggested for use by the host institution's institutional review board. The research protocol and instrument used for this study were approved by the institutional review board at the host institution.

## Subjects

Member institutions of the MAATA within the National Athletic Trainers' Association that hosted a Commission on Accreditation of Allied Health Education Programs-accredited athletic training education program were selected for participation in this study. The underlying population for this study consisted of athletic training students enrolled in the accredited athletic training education programs at MAATA institutions. Program directors at each of the MAATA member institutions

were asked to solicit their students for participation. All students accepted into the program at each of the institutions were eligible to participate. The initial solicitation to each program was conducted via an e-mail to the academic program director. If the program director did not respond with an indication to participate, we contacted him or her via phone call or e-mail to determine participation.

Once the program director at each institution received notification of agreement to participate, he or she was provided an electronic copy of the instrument, instructions for administration, and all subject participation forms. Program directors were also offered the opportunity for all paper documents to be mailed if they chose not to use the electronic format. One school requested that paper forms be sent with return postage to comply with standard procedures.

## Instrumentation

The AUDIT was developed by the World Health Organization to identify persons whose alcohol consumption has become hazardous or harmful to their health. We selected the 10-item AUDIT questionnaire because of its brevity, ease of use, and existing validation and reliability.<sup>17-19</sup> A number of authors have evaluated the reliability and validity of the AUDIT as a quality tool in screening for hazardous or harmful alcohol consumption behaviors. The instrument has a Cronbach coefficient alpha of .80 to .86 and is widely accepted as a reliable instrument.<sup>20-22</sup> The AUDIT is also a valid measure of risk and prediction of problematic social behaviors associated with alcohol consumption.<sup>23</sup>

The AUDIT questionnaire contains 10 questions aimed at determining alcohol consumption behaviors. Questions have been designed to permit the subject to choose from responses on a scoring continuum from 0 to 4. For example, if asked how many alcoholic beverages one drinks at one setting, the subject could answer 1 or 2 = 0, 3 or 4 = 1, 5 or 6 = 2, 7 to 9 = 3, or 10 or more = 4. Other questions elicited Likert-type responses such as *never*, *less than monthly*, *monthly*, *weekly*, and *daily* or *almost daily* and were also scored 0 to 4, respectively. Completion of the questionnaire yielded a score that could be used as an indicator of harmful or hazardous alcohol consumption behaviors. The total possible score an individual can obtain is 40. Binge rate is determined by the number of drinks a person consumes at a single sitting in a given amount of time. Scores in the range of 8 to 13 for men or 7 to 13 for women can indicate that one might be at risk for hazardous or harmful alcohol consumption behaviors and might consider altering drinking patterns.<sup>20</sup> Dawson et al<sup>24</sup> used the AUDIT to identify 4 drinks for men and 3 for women as an indicator. We chose to follow the World Health Organization guidelines, which identify 6 drinks in one sitting as an indicator of binge drinking.<sup>25</sup>

The survey was slightly modified to add demographic questions, which did not influence the potential total score. Demographic information was added because one of our objectives was to identify any relationship between the participants' scores and sex, their year in college, or their college size. Because college-aged men and male athletes have been reported to tend to binge more than college-aged women or female athletes, we wanted to see if that trend held true for athletic training students. Also, the literature supports the notion that athletes at larger institutions with larger athletic traditions tend to drink more often.<sup>7,8</sup> We questioned whether or

not athletic training students at institutions that had athletic programs competing at the Division I level might be more predisposed to alcohol consumption than their counterparts at smaller schools. We added appropriate additional questions to the AUDIT survey in a manner that would not interfere with the score elicited by the participant's responses to the actual AUDIT questionnaire.

### Data Collection

The program director at each institution was asked to administer the questionnaire to all subjects who volunteered to participate. Each subject was provided with a Potential Participant Letter, which assured the subjects that their confidentiality would be protected to the fullest extent and that the results would only be used for the purposes of this study. The letter also explained the scoring process for the questionnaire. Participants were instructed that they must be 19 years of age or older to complete the survey without parental permission. Subjects were informed that their decision to complete and subsequent completion of the instrument implied informed consent to participate in the study. All subject participation was anonymous, and subjects could not be identified on the questionnaire.

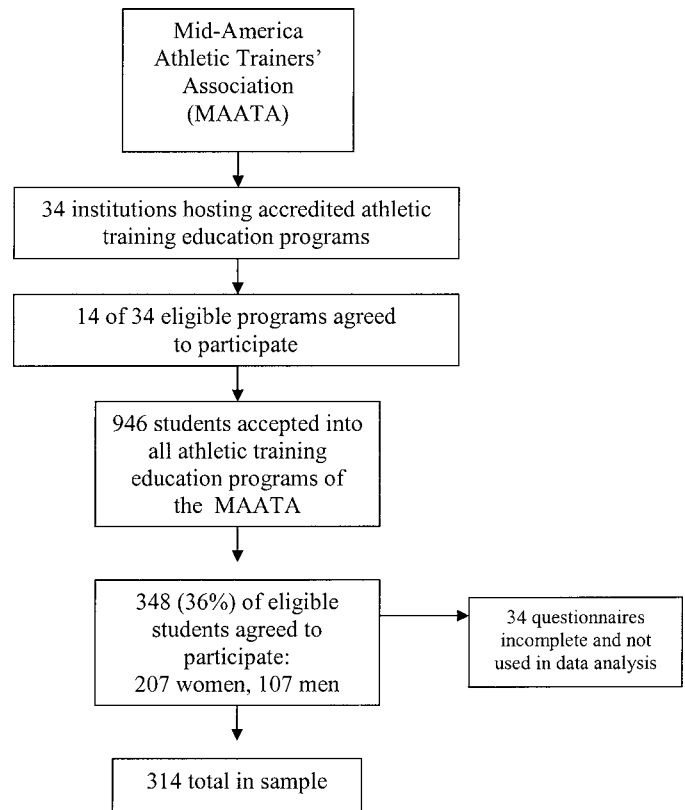
Upon completion of the questionnaire, a cumulative score was determined for each subject, who was given a Recommended Action Card providing a classification of scores. The scores reflected behavioral tendencies with recommendations for intervention. The card gave a score of 13 as an indicator of a hazardous or harmful drinking problem. All participants with scores that demonstrated potentially hazardous or harmful drinking problems were given response cards providing options for seeking assistance. The instructions provided directions for contacting the campus student health or counseling program, the Alcoholics Anonymous Web site, or a national 1-800 hotline number. Participants were also informed that Alcoholics Anonymous lists local chapters in local phone books. Subjects were never required to identify their scores to another person, and all data were confidential.

### Statistical Analysis

Our primary focus was to determine the number and percentage of athletic training students whose AUDIT scores demonstrated a hazardous or harmful drinking problem or tendency to binge drink. Frequency analysis provided statistical measures for assessing variations in responses to individual questions, percentages of responses among subgroups within our sample, and subject demographics. We also wanted to determine if there was a significant difference in mean AUDIT scores between male and female athletic training students, among students at different academic levels (first year, second year, etc), and among students at institutions of various levels of competition. An analysis of variance was used to compare the mean scores of groups. To assess whether any of these factors was a predictor of score, we used a binary logistic regression analysis. All data were assessed for significance at the .05 level.

### RESULTS

Thirty-four accredited athletic training education programs are represented in the MAATA, with a total of 946 enrolled



**Selection process for subject participants.**

students. All students fully accepted in the accredited programs were eligible to participate. Of these, 348 surveys were returned by 14 curriculum directors, yielding a 36% participation rate among eligible participants. The participation rate among solicited programs was 41%. Thirty-four surveys (0.97%) returned were incomplete and were not included in the statistical analysis. A total of 314 subjects (207 women, 107 men) were included in the data set used for statistical analysis (Figure).

The mean AUDIT score for all participants was  $7.47 \pm 5.69$  (Table 1). Men demonstrated significantly higher mean scores, at  $8.94 \pm 5.91$ , than did women ( $6.74 \pm 5.44$ ,  $P = .002$ ). Of the 314 participants, 29 (9.2%) did not drink alcohol at all and reported a total score of 0. Three participants had total scores of 25, which was the highest score recorded and represented 0.009% of all total scores.

Forty-one percent of participants ( $n = 128$ ) in our study demonstrated a score of 5 or less. Thirty-one students (9.8%) had a score of 6, 20 (6.3%) had a score of 7, and 16 (5.1%) had a score of 8. Sixty-three percent ( $n = 198$ ) demonstrated a score of 8 or less; 37% of participants ( $n = 116$ ) demonstrated an AUDIT score of 9 or higher. A total of 254 athletic training students (80.9%) reported scores of 12 or less, and 60 students (19.1%) reported scores of 13 or higher. No significant difference was noted in AUDIT scores among participants based on different years in school ( $P = .73$ ) or level of education ( $P = .69$ ) or the institution's level of competition ( $P = .43$ ; Table 1).

Because the men's mean score of 8.94 was significantly different from the women's mean score of 6.74, we chose 8 as a cut-off score to determine if sex, year in school, or institutional competitive level was a predictor of the AUDIT score. The results of the logistic regression confirmed the findings of

**Table 1. Results of Analysis of AUDIT Scores by Sex, Years in School, Class Status, and Competition Level**

Variable	n	Mean AUDIT Score, Mean ± SD*	F Value	P Value
<b>Sex</b>				
Female	207	6.74 ± 5.44	10.25	.002
Male	107	8.94 ± 5.91		
<b>Year in school</b>				
1	4	4.50 ± 3.87	0.496	.73
2	58	7.96 ± 6.35		
3	99	7.54 ± 5.79		
4	149	7.28 ± 5.44		
5	4	9.00 ± 3.55		
<b>Status</b>				
Underclass	62	7.74 ± 6.26	0.166	.69
Upper class	252	7.41 ± 5.55		
<b>Competition level</b>				
National Collegiate Athletic Association				
Division I	201	7.56 ± 5.61	0.95	.43
Division II	88	7.63 ± 6.15		
Division III	9	4.11 ± 1.69		
Mixed divisions	5	5.80 ± 4.60		
National Association of Intercollegiate Athletics				
	11	8.09 ± 5.46		
Overall AUDIT score	314	7.47 ± 5.69		

\* AUDIT indicates Alcohol Use Disorders Identification Test. Score range = 0 to 25.

**Table 2. Effects of Sex, Class Status, and Competition Level on AUDIT Score\***

Variable	n	Odds Ratio	95% Confidence Interval (Referent)	P Value
<b>Sex</b>				
Female	207	1.00	1.37–3.55	.001
Male	107	2.20		
<b>Status</b>				
Underclass	62	1.0	0.423–1.33	.321
Upper class	252	0.75		
<b>Competition level</b>				
Division I	201	1.0	0.65–1.14	.283
Other divisions	113	0.86		

\* AUDIT indicates Alcohol Use Disorders Identification Test.

comparative mean AUDIT scores. After adjusting for a student's status as either underclass or upper class and for competitive level, we found that not only was sex a predictor of a score of 8 or more on the AUDIT questionnaire ( $P = .001$ ), but men were more than 2 (exp  $\beta = 2.20$ ) times likelier than women to score an 8 or higher on the AUDIT questionnaire. Although status of student ( $P = .321$ ) and institution competitive level ( $P = .283$ ) were not significant predictors of a score of 8 or more (Table 2) on the AUDIT, underclass students and students at Division I schools were more likely to engage in hazardous drinking behaviors.

When we looked at the responses to the individual ques-

**Table 3. Subject Responses to Individual AUDIT Questions\***

	%	n
<b>How often do you have a drink containing alcohol?</b>		
Never	9.2	29
Monthly	21.9	69
2–4 times/mo	41.0	132
2–3 times/wk	24.7	78
≥4 times/wk	1.9	6
<b>How many drinks containing alcohol do you have on a typical day when you are drinking?</b>		
1 or 2 in one sitting	26.1	82
3–4 in one sitting	25.0	80
5–6 in one sitting	23.4	74
7–9 in one sitting	17.8	56
≥10 in one sitting	7.0	22
<b>How often do you have 6 or more drinks on one occasion?</b>		
Never	24.2	76
< Monthly	32.6	103
Monthly	25.2	79
Weekly	17.7	56

\* AUDIT indicates Alcohol Use Disorders Identification Test.

tions, we found some interesting variations within the subject pool. Forty-one percent of athletic training students ( $n = 128$ ) reported having a drink containing alcohol 2 to 4 times a month, and 24.7% of those ( $n = 78$ ) indicated that they drink 2 to 3 times during the week. A total of 25% ( $n = 79$ ) reported having 3 to 4 drinks of alcohol at one sitting when they were consuming alcohol, whereas 23.4% ( $n = 74$ ) reported consuming 5 to 6 drinks at one sitting. When asked how often they have 6 or more drinks on one occasion, 32.6% ( $n = 102$ ) reported doing so on less than a monthly basis, and only 17.7% ( $n = 56$ ) reported doing so on a weekly basis (Table 3).

## DISCUSSION

The results of this study prompted us to draw several conclusions and also raised a number of points that should be further evaluated. Comparing binge rates among athletic training students and other student populations is difficult. The guidelines of the AUDIT survey suggest 6 drinks per sitting as a reference for binge drinking. Other authors<sup>8,16</sup> have used different research methods and cited 5 drinks per setting as a reference for binge drinking. Direct comparison of binge rates among different groups of the college student population is problematic but is provided here in the context of differentiation in research methods.

Although AUDIT scores were higher in male athletic training students than in female athletic training students, such students collectively tended to binge drink much less often than did student-athletes or the general college student population. Athletic training students' binge rate was 17.7% weekly, whereas athletes and general college students binged at rates of 58% and 50%, respectively.<sup>3</sup> Also, athletic training students may consume fewer drinks at a time when they do drink alcohol. A total of 73% consumed 6 or fewer alcoholic beverages on days they drank, and only 1.9% drank 4 or more times a week.

A number of reasons may account for the results in binge drinking among athletic training students. Although we did not measure these factors, athletic training students perform a

number of duties outside regularly scheduled class time as part of their clinical program requirements. Students of non-clinical education-based programs do not spend the same amount of time conducting academic activities outside the classroom. Consequently, students in traditional academic programs have more time for social activities than do athletic training students. Students enrolled in athletic training education programs find themselves following a structured schedule that may inhibit excessive alcohol consumption on a regular or continuing basis. Also, while accompanying athletic teams, athletic training students are subject to fairly structured time constraints and activity schedules, allowing fewer opportunities to consume large amounts of alcohol. It would be interesting to evaluate the overall social behaviors and time allotted to social activities among athletic training students compared with other college student populations. Another consideration is that athletic training students are in the process of becoming highly educated health care professionals. Part of the training they receive concerns proper and healthy lifestyles. One could assume that the education they receive in healthy lifestyles has an effect on their behavior.

Future authors might also focus on comparing athletic training students with other health care profession students. The use of alcohol as a stress reliever or bonding agent and the role of peer pressure on drinking behaviors merit further investigation. Finally, seasonal variations in alcohol consumption by athletes have been identified.<sup>16</sup> Because athletic training students do not always have an in-season and off-season clinical structure, they may not show the variations in consumption noted in athletes. Evaluating the drinking behaviors of these students during times in the academic calendar when their program loads and clinical requirements are lessened would be worthwhile. Cut-off scores similar to those we used would permit more direct comparisons of findings from other alcohol-use studies in the college population.

Certainly our results from this study should be kept in the context of the research project itself. This study was conducted within the central district of the National Athletic Trainers' Association (MAATA) because it was funded by that organization. Although the overall percentage of possible participants did not reach an optimal level, the results can be used as initial indicators of drinking patterns by athletic training students within the MAATA. Further and expanded study, of this same subgroup or across the athletic training student population, is warranted, especially if we are to directly compare drinking behaviors with those of many other college student populations. In spite of the limitations of this study, we feel that our results are valid and have merit in that they represent an initial look at the drinking patterns of this population of college students.

Athletic training educators may use the results of this and further research on this topic as insight into the social behaviors of their students. Such insight can assist educators in addressing the social concerns of their students and enhancing the overall health of the athletic training student population. Athletic training students should be made aware of the potential risks associated with excessive alcohol consumption. Further, athletic training education program directors might consider making alcohol awareness screening available to students for the purposes of recognizing potentially hazardous or harmful alcohol-use behaviors, especially as they pertain to underclass students at Division I institutions.

## ACKNOWLEDGMENTS

This study was funded by a grant from the Mid-America Athletic Trainers' Association.

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