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Examining Potential Substance Use Disorders among Former Interscholastic Athletes

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Abstract

Background—Despite numerous studies examining the association between competitive sports participation and substance use behaviors among adolescents and young adults, the use of standardized measures to assess potential substance use disorders has been largely neglected. The objective of this study was to examine if past involvement in interscholastic sports (competitive school-sponsored sports) was associated with potential substance use disorders in young adulthood.

Methods—Data for this study were taken from the Student Life Survey (SLS). A total of 3442 young adults participated in the SLS during the spring semester in 2013, with 74% of males and 71% of females indicating participation in interscholastic sport during high school.

Results—Respondents who participated in interscholastic sports during high school had higher odds of positive screens for potential alcohol use disorders, when compared to their peers who did not participate in interscholastic sports. No association was detected between interscholastic sports participation and potential drug abuse disorders. Moreover, previous involvement in certain types of sports was found to be associated with positive screens for potential alcohol use disorders (i.e., crew and football), and positive screens for potential drug abuse disorders (i.e., lacrosse) among the sample of young adults.

Conclusions—School and community sport organizations should be aware of the potential link between sports participation and potential substance use disorders, and may consider brief substance use screeners during yearly physicals to monitor potential substance use problems among athletes.

INTRODUCTION

Many studies have found that participation in sports is beneficial for adolescents' academic achievement and health.^{1–6} However, despite the research that has found teen athletes to be at a lower risk to engage in cigarette use, marijuana use, and other types of illicit drug use when compared to their nonparticipating peers, many of these same studies have also found

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AUTHOR CONTRIBUTIONS

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that participation in sports among adolescents is associated with a greater risk of alcohol consumption, use of smokeless tobacco, and performance enhancing drugs.⁷⁻¹⁰

Moreover, other recent studies have also noted that substance use may be sport-specific.¹¹⁻¹⁷ Studies using nationally representative data of U.S. adolescents have found that teen athletes who participated in certain types of high-contact (e.g., wrestling) or anaerobic sports (e.g., weightlifting) were more likely to have engaged in various types of substance use (i.e., alcohol use, cigarette use, marijuana use, and nonmedical prescription drug use), when compared to their peers who did not participate in these sports.^{11,12,15-17} Moreover, it has also been found that teen athletes who participated in noncontact sports (e.g., cross-country) were less likely to have engaged in cigarette use and marijuana use, when compared to their peers who did not participate in these types of sports.¹⁷ While there may be many possible explanations to describe the patterns regarding the association between substance use and participation in certain sports, the direction of these associations may be linked to the normative practices embedded within certain sports that may facilitate or deter substance use (e.g., 'play through pain').¹⁸

Despite the numerous studies examining the association between sports participation and substance use behaviors among adolescents and young adults, none of the studies in the empirical literature have used standardized measures that assess potential substance use disorders.⁸ Very little is known about the potential role that sports participation may have on preventing substance use disorders (or facilitating substance use disorders) within the population and constitutes a major gap in the sports participation/substance abuse literature.^{8,19}

Accordingly, the purpose of this study was to assess whether there was an association between past involvement in interscholastic sports (competitive school-sponsored sports) and indicators of substance use disorders among a sample of young adults. Although differences may exist across the association between participation in sports and different types of illicit drug (e.g., steroid use versus heroin use) or alcohol use (e.g., binge drinking versus occasional use), the findings from past research suggest that involvement in sports may put participants at a greater risk to engage in increased alcohol use and lower the risk among participants to engage in illicit drug use.⁷⁻¹⁰ Given these findings from past research, it is expected that there will be a positive association between past involvement in interscholastic sports and indicators of alcohol use disorders, and a negative association between past involvement in interscholastic sports and indicators of drug use disorders (other than alcohol).

METHODS

Design and Sample

The data for this study comes from the 2013 Student Life Survey (SLS). The SLS is a web-based survey that has been conducted biennially since 1999 at a large university located in the Midwestern region of the United States.^{20,21} The web-based survey for the SLS questionnaire includes previously tested items and scales measuring several student life characteristics and behaviors, including alcohol and drug use. For the 2013 SLS, a random

sample of 12,000 full-time undergraduate students was selected from the Registrar's Office records. The final response rate from the 2013 SLS was roughly 35% (n = 4187).

We restricted our sample by removing respondents with any missing information on the variables used in the analysis; leaving a final sample size of 3442 respondents. It should be noted that when the demographic information provided by the registrar was compared to assess differences between the sample used for this study (n = 3442) and the sample that was excluded due to missing data (n = 745), no statistically significant differences were detected between these two groups based on class year and cumulative GPA. However, statistically significant differences were identified in regards to race, gender, and age (i.e., the respondents used for this study were more likely to be White, female, and to be 21 years of age or younger). Approval was obtained from the Institutional Review Board for this study.

Measures

CAGE—Students who used alcohol were asked how many times in the past year they had experienced each of the four CAGE criteria: (C) “Felt that you should cut down your drinking”; (A) “Been annoyed by people criticizing your drinking”; (G) “Felt guilt or remorse after drinking”; (E) “Had a drink first thing in the morning as an ‘eye opener’”.²² Students who indicated drinking during the past year were given the standard, four-item alcohol abuse screener that is commonly used across college campuses.^{23,24} Students who indicated experiencing two or more of the criteria on the CAGE were considered as providing a *positive screen* for potential alcohol use disorders, the standard scoring for the CAGE instrument.²⁵ When using the recommended cutoff of two positively endorsed items, the CAGE has been validated with alcohol use items that are commonly used to screen problem drinkers.²⁵ Nineteen percent (18.6%) of the sample used for this analysis had a positive screen on the CAGE.

DAST-10—Potential drug abuse problems were assessed using the modified version of the Drug Abuse Screening Test (DAST-10).²⁶ Respondents who used drugs other than alcohol during the past year were asked whether they had experienced any of 10 drug-related problems in the past 12 months. Based on past research, if a respondent positively endorsed three or more DAST-10 items, this was considered a positive screen that signified a possible risk for drug abuse or dependence.^{26,27} The DAST-10 has been shown to have good reliability, temporal stability, concurrent validity, and predictive validity when using the standard cut point of three positively endorsed items.²⁸ Eight percent (7.9%) of the sample used for this analysis had a positive screen on the DAST-10.

Interscholastic Sports Participation—Several specific questions were used to measure past participation in interscholastic sports during high school. Respondents were asked whether they participated in junior varsity (J.V.) or varsity sports during high school (participation in J.V. sports is reserved for younger or less experienced athletes, while varsity represents older or higher skilled athletes). Respondents who indicated participating in sports were then asked to select the different types of sports they participated in during high school. The sports respondents could select included baseball, basketball, cross country, field hockey, football, golf, gymnastics, ice hockey, lacrosse, crew (i.e., rowing),

soccer, softball, swimming and diving, tennis, track and field, volleyball, water polo, wrestling, and “other sport (not listed)”. These different sports were included in the 2012 SLS based on the questions provided by the Monitoring the Future that measure participation in different types of competitive sports among adolescents (see table 1 of these sample characteristics).²⁹

Sociodemographic Covariates—Several demographic questions were also included to measure the students’ sex, race, class rank, age, and cumulative grade point average (GPA); all of these measures were obtained from the Registrar’s Office records. Moreover, other self-reported demographic measures were collected that included (but not limited to) activities that students were involved with on campus, like participation in intercollegiate varsity athletics and participation in fraternities or sororities (see table 1).

Analysis

The analyses used multiple logistic regression to examine if respondents who formerly participated in interscholastic sports had higher odds for positive screens on the CAGE and DAST-10 during the past year. One set of logistic regression models was estimated to assess the odds of a positive screen on the CAGE and DAST-10 among respondents who participated in interscholastic sports (the reference group consisted of nonparticipants). A second set of logistic regression models was estimated to examine the odds of a positive screen on the CAGE and DAST-10 among respondents who participated in multiple sports (i.e., number of different sports). Finally, a third set of logistic regression models was estimated to analyze the odds of a positive screen on the CAGE and DAST-10 among respondents who participated in specific types of interscholastic sports during high school (i.e., respondents who did not participate in a specific type of sport served as the reference group). Adjusted odds ratios (AOR) and their 95% confidence intervals (95% CI) were estimated while controlling for sex, race, class rank, age, cumulative GPA, intercollegiate varsity athletic status, and involvement in greek life (i.e., fraternities or sororities) for all of the analyses.

RESULTS

In the binary logistic regression models (see table 2) testing whether respondents who participate in interscholastic sports during high school had higher odds of positive screens on the CAGE and DAST-10 when compared to nonparticipants, the results indicate that participation in sports during high school increases the odds of a positive screen on the CAGE by roughly 50% (AOR = 1.52, 95% CI = 1.22, 1.89). However, no association was detected between participation in interscholastic sports and positive screens on the DAST-10 (AOR = .986, 95% CI = .736, 1.32). Similar results were also found with respect to the associations between the number of different sports respondents participated in during high school and positive screens on the CAGE (AOR = 1.15, 95% CI = 1.06, 1.25) and DAST-10 (AOR = .949, 95% CI = .844, 1.06).

There were also several statistically significant results in the model examining the different types of sports respondents participated in during high school (see table 3). Accordingly, respondents who participated in crew (AOR = 1.85, 95% CI = 1.11, 3.08) and football (AOR

= 1.52, 95% CI = 1.06, 2.17) during high school had higher odds of positive screens on the CAGE when compared to respondents who did not participate in these sports during high school. Moreover, respondents who participated in lacrosse (AOR = 2.03, 95% CI = 1.33, 3.09) during high school had higher odds of positive screens on the DAST-10 when compared to respondents who did not participate in these sports during high school.

DISCUSSION

This study is the first to examine the association between interscholastic sports participation during high school and potential substance use disorders in young adulthood; very few studies to date have assessed the association between sports involvement and measures used to assess potential substance use disorders.¹⁹ The results confirm previous findings that athletes are at a greater risk to engage in problematic drinking behaviors.⁷⁻¹⁰ In fact, the young adults in this study that participated in interscholastic sports during high school were found to have 50% greater odds of having a positive screen on the CAGE during the past year when compared to their college peers who did not participate in this activity during high school. Moreover, and also consistent with the literature that has found the athletes are not at an increased risk to engage in illicit substance use,⁷⁻¹⁰ the former high school athletes in this study did not have higher odds of positive screens on the DAST-10 during the past year.

With respect to the analysis that examined the association with potential substance use disorders and different types of sports participation, respondents who participated in crew and football had higher odds of positive screens on the CAGE. This finding that potential alcohol use disorders were greater for former high school football players parallels other studies that have found that adolescents who participate in football are at a greater risk of engaging in problematic drinking.^{11,17} However, participation in crew has not yet been verified in the empirical literature to be associated with increased alcohol consumption. Although the competitive structure with opponents for these two sports are quite different (e.g., level of contact with opposing teams), they are both team sports that rely on intense coordinated action (e.g., success hinges on strict conformity to orders/plays). Given that participants on these team sports must unquestionably obey commands in order for the team to be successful, participants on these types of teams may feel stronger pressure to conform with the team culture - even if it is a culture that supports risky drinking behaviors. Accordingly, future research should explore these subgroups of athletes with respect to alcohol consumption and the culture that surrounds alcohol use within these sports.

The sport-by-sport analysis also revealed that respondents who participated in lacrosse during high school had roughly two times greater odds of positive screens for potential drug use disorders when compared to respondents who did not participate in this sport during high school. Although the findings from this study cannot determine why former lacrosse participants are at a greater risk for potential drug use disorders, initiation or continued use of illicit drugs may be more susceptible among lacrosse players due to factors like performance enhancement (i.e., illicit use of prescribed stimulants to increase energy or focus on the playing field),¹⁶ pain management (i.e., illicit use of prescribed opioids to manage pain from injuries),¹⁵ or factors motivated by the stress of competition (i.e., illicit

substance use to relax).⁹ These findings indicate the need for additional research, and suggest that closer scrutiny of both male and female adolescent lacrosse players may be warranted in order to understand the drug related practices embedded in this particular sporting culture.

The results of this study suggest that involvement in interscholastic sports during high school may be linked to potential substance use disorders during young adulthood, particularly alcohol use disorders. Although team and individual sports can be viewed as developmentally beneficial for adolescents to become healthy and responsible adults,³⁰ participation in interscholastic sport may also socialize adolescents to a set of normative behaviors that can facilitate various types of substance use (e.g., using performance enhancing drugs to be the best).^{18,31–34} Adolescents may learn risky types of drinking behaviors (or other drug use behaviors) within the context of sport and adopt these behaviors as normative aspects of their athletic-identity.^{35,36} Problematically, these risky drinking and drug use behaviors may persist even after they exit interscholastic sport and could extend into young adulthood.

Accordingly, substance use prevention strategies should consider targeting youth who participate in interscholastic sport. Given that participation in any type of interscholastic sport was found to be positively associated with potential alcohol use disorders among the sample of young adults in this study, state-level interscholastic sports programs and schools may want to provide some basic screening and assessment of potential alcohol and other substance use disorders when athletes receive their yearly physical examinations. Moreover, since certain types of substance use disorders may be sport-specific (i.e., lacrosse), athletes who participate in certain sports could receive targeted interventions to help reduce potential substance misuse (e.g., counseling to discuss the stress associated high-level competition).

Limitations

The cross-sectional data for this study does not allow an examination of the temporal ordering of whether sports participation during adolescence was a precursor for potential substance abuse problems in young adulthood. It is possible that youth who engage in heavier alcohol and other drug use self-select into certain sports similar to those who join social fraternities or sororities.^{37,38} However, the analysis does detect certain sub-populations who may be at risk for potential substance use disorders and could allow for targeted substance use interventions among high risk groups. Another major limitation of this study was that the results cannot be generalized to the rest of the population due to respondents being selected from only one university located in the Midwest region of the United States. This lack of generalizability limits how well we captured the true range of participants in interscholastic sports. Further, we must also acknowledge that the response rate is relatively low and may have biased the results of the study. However, response rates in college web surveys have been dropping over the past several years and some researchers have found no differences in risky health behaviors between respondents and non-respondents.^{39,40} Despite these limitations, the current study provides a unique data set with specific questions regarding interscholastic sport involvement and substance use disorders. Future studies examining sports participation should consider including standardized

measures of substance use in order to help facilitate a guided effort to compare findings across studies that focus on different age groups, different regions in the United States, and other countries.

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References

1. Farb AF, Matjasko JL. Recent advances in research on school-based extracurricular activities and adolescent development. *Dev Rev.* 2012; 32(1):1–48.
2. Feldman A, Matjasko J. The role of school-based extracurricular activities in adolescent development: a comprehensive review and future directions. *Rev Educ Res.* 2005; 75(2):159–210.
3. Holland A, Andre T. Participation in extracurricular activities in secondary school: what is known, what needs to be known? *Rev Educ Res.* 1987; 57(4):437–466.
4. Pate RR, Heath GW, Dowda M, Trost SG. Association between physical activity and other health behaviors in a representative sample of US adolescents. *Am J Public Health.* 1996; 86(11):1577–1581. [PubMed: 8916523]
5. Pate RR, Trost SG, Levin S, Dowda M. Sports participation and health-related behaviors among US youth. *Arch Pediatr Adolesc Med.* 2000; 154(9):904–911. [PubMed: 10980794]
6. Sabo, D.; Veliz, P. *Go Out and Play: Youth Sports in America.* East Meadow, NY: Women's Sports Foundation; 2008.
7. Diehl K, Thiel A, Zipfel S, Mayer J, Litaker DG, Schneider S. How healthy is the behavior of young athletes? a systematic literature review and meta-analyses. *J Sports Sci Med.* 2012; 11(2):201–220. [PubMed: 24149192]
8. Kwan M, Bobko S, Faulkner G, Donnelly P, Cairney J. Sport participation and alcohol and illicit drug use in adolescents and young adults: A systematic review of longitudinal studies. *Addict Behav.* 2014; 39(3):497–506. [PubMed: 24290876]
9. Lisha N, Sussman S. Relationship of high school and college sports participation with alcohol, tobacco, and illicit drug use: a review. *Addict Behav.* 2010; 35(5):399–407. [PubMed: 20100638]
10. Mays D, Gatti ME, Thompson NJ. Sports participation and alcohol use among adolescents: the impact of measurement and other research design elements. *Curr Drug Abuse Rev.* 2011; 4(2):98–109. [PubMed: 21696347]
11. Denham BE. Alcohol and marijuana use among american high school seniors: empirical associations with competitive sports participation. *Sociol Sport J.* 2011; 28(3):362–379.
12. Denham BE. High school sports participation and substance use: differences by sport, race, and gender. *J Child Adolesc Subst Abuse.* 2014; 23(3):145–154.
13. Ford JA. Substance use among college athletes: A comparison based on sport/team affiliation. *J Am Coll Health.* 2007; 55(6):367–373. [PubMed: 17517549]
14. Moore MJ, Werch C. Sport and physical activity participation and substance use among adolescents. *J Adolesc Health.* 2005; 36(6):486–493. [PubMed: 15901513]
15. Veliz P, Boyd CJ, McCabe SE. Playing through pain? sports participation and nonmedical use of opioid medications among adolescents. *Am J Public Health.* 2013; 103(5):e28–e30. [PubMed: 23488520]

16. Veliz P, Boyd CJ, McCabe SE. Adolescent athletic participation and nonmedical Adderall use: An exploratory analysis of a performance-enhancing drug. *J Stud Alcohol Drugs*. 2013; 74(5):714–719. [PubMed: 23948530]
17. Veliz P, Boyd CJ, McCabe SE. Competitive sport involvement and substance use among adolescents: a nationwide study. *Subst Use Misuse*. in press.
18. Hughes R, Coakley J. Postive deviance among athletes: the implications of overconformity to the sport ethic. *Sociol Sport J*. 1991; 8(4):307–325.
19. Lisha N, Sussman S, Leventhal AM. Physical activity and alcohol use disorders. *Am J Drug Alcohol Abuse*. 2013; 39(2):115–120. [PubMed: 22992050]
20. McCabe SE. Comparison of web and mail surveys in collecting illicit drug use data: A randomized experiment. *J Drug Educ*. 2004; 34(1):61–72. [PubMed: 15468748]
21. McCabe SE, Boyd CJ, Couper MP, Crawford S, D'Arcy H. Mode effects for collecting alcohol and other drug use data: web and U.S. mail. *J Stud Alcohol Drugs*. 2002; 63(6):755–761.
22. Mayfield D, McLeod G, Hall P. The CAGE questionnaire: validation of a new alcoholism screening instrument. *Am J Psychiatry*. 1974; 131(10):1121–1123. [PubMed: 4416585]
23. Allen JP, Maisto S, Connors GJ. Self-report screening tests for alcohol problems in primary care. *Arch Intern Med*. 1995; 155(16):1726–1730. [PubMed: 7654105]
24. Maisto S, Connors G, Allen J. Contrasting self-report screens for alcohol problems: a review. *Alcohol Clin Exp Res*. 1995; 19(6):1510–1516. [PubMed: 8749818]
25. Heck EJ. Developing a screening questionnaire for problem drinking in college students. *J Am Coll Health*. 1991; 39(5):227–231. [PubMed: 1783706]
26. Skinner HA. The drug abuse screening test. *Addict Behav*. 1982; 7(4):363–371. [PubMed: 7183189]
27. French MT, Roebuck MC, McGeary KA, Chitwood DD, McCoy CB. Using the drug abuse screening test (DAST-10) to analyze health services utilization and cost for substance users in a community-based setting. *Subst Use Misuse*. 2001; 36(6–7):927–946. [PubMed: 11697616]
28. Maisto SA, Carey MP, Carey KB, Gordon CM, Gleason JR. Use of the AUDIT and the DAST-10 to identify alcohol and drug use disorders among adults with a severe and persistent mental illness. *Psychol Assess*. 2000; 12(2):186–192. [PubMed: 10887764]
29. Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the future national survey results on drug use, 1975–2011. Volume I: secondary school students. Ann Arbor, MI: University of Michigan Institute for Social Research; 2012.
30. Crosnoe R. Academic and health-related trajectories in adolescence: the intersection of gender and athletics. *J Health Soc Behav*. 2002; 43(3):317–336. [PubMed: 12467256]
31. Connell, R. *Gender and Power*. Stanford, CA: Stanford University Press; 1987.
32. Connell, R. *Masculinities*. Berkeley, CA: University of California Press; 1995.
33. Messner, MA. *Power at Play: Sports and the Problem of Masculinity*. Boston: Beacon Press; 1990.
34. Messner, MA.; Sabo, DF. *Sport, Men and the Gender Order*. Champaign, IL: Human Kinetics; 1990.
35. Miller KE, Hoffman JH, Barnes GM, Farrell MP, Sabo DF, Melnick MJ. Jocks, gender, race, and adolescent problem drinking. *J Drug Educ*. 2003; 33(4):445–462. [PubMed: 15237868]
36. Miller KE. Sport-related identities and the “toxic jock”. *J Sport B*. 2009; 32(1):69–91.
37. Borsari BE, Carey KB. Understanding fraternity drinking: five recurring themes in the literature, 1980–1998. *J Am Coll Health*. 1999; 48(1):30–37. [PubMed: 10485163]
38. Wechsler H, Davenport A, Dowdall G, Moeykens B, Castillo S. Health and behavioral consequences of binge drinking in college. A national survey of students at 140 campuses. *JAMA*. 1994; 272(21):1672–1677. [PubMed: 7966895]
39. McCabe SE, Cranford JA, Boyd CJ, Teter CJ. Motive, diversion and routes of administration associated with nonmedical use of prescription opioids. *Addict Behav*. 2007; 32(3):562–575. [PubMed: 16843611]
40. McCluskey S, Topping A. Increasing response rates to lifestyle surveys: a review of methodology and ‘good practice’. *Perspect Public Health*. 2011; 131(2):89–94. [PubMed: 21462753]

Table 1

Descriptive Statistics: Sociodemographic Variables and Major Independent Variables

Control variables (n = 3442)		Major independent variables (n = 3442)	
Sex	Percent	Previous Involvement in Sports	Percent
Male	43.2%	Yes	72.5%
Female	56.8%	No	27.5%
Race		Number of Sports	
White	68.7%	Average Number of Different Sports that Respondents	M = 1.40
Black	4.1%		
Hispanic	4.1%	Participated in During High School	SD = 1.10
Asian	12.9%		
Other race	10.3%	Previous Involvement - Type of Sport	
Class Position		Participated in Baseball	5.1%
Freshmen	21.4%	Participated in Basketball	12.5%
Sophomore	24.2%	Participated in Crew	2.2%
Junior	25.1%	Participated in Cross Country	13.1%
Senior	29.2%	Participated in Field Hockey	2.1%
GPA		Participated in Football	7.2%
Average Cumulative	M = 3.31	Participated in Golf	5.0%
GPA	SD = .519	Participated in Gymnastics	1.2%
		Participated in Ice Hockey	2.4%
Age		Participated in Lacrosse	5.9%
Average Age at the	M = 19.98	Participated in Soccer	16.2%
Start of Data Collection	SD = 1.53	Participated in Softball	5.1%
		Participated in Swimming	7.8%
College Athlete		Participated in Tennis	13.5%
Yes	3.1%	Participated in Track & Field	20.9%
No	96.9%	Participated in Volleyball	9.2%
Greek Status		Participated in Water polo	2.1%
Greek	21.1%	Participated in Wrestling	2.2%
Non-Greek	78.9%	Participated in 'Other Sport'	13.6%

Table 2

Assessing Positive CAGE and DAST-10 Screens Among Former Interscholastic Athletes

Control Variables	Binary Logistic Regression					
	Positive CAGE Screen (+2)		Positive CAGE Screen (+2)		Positive DAST-10 Screen (+3)	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Female	1.18	.988, 1.41	1.18	.993, 1.42	.488***	.378, .631
Black	.740	.455, 1.20	.737	.453, 1.20	.748	.368, 1.51
Hispanic	.635	.385, 1.04	.632	.383, 1.04	1.14	.627, 2.07
Asian	.553***	.402, .761	.557***	.404, .767	.584*	.368, .927
Other race	.844	.624, 1.14	.844	.624, 1.14	1.20	.811, 1.79
Sophomore	1.21	.913, 1.60	1.20	.909, 1.59	1.13	.755, 1.68
Junior	.923	.665, 1.27	.925	.667, 1.28	.951	.606, 1.49
Senior	1.21	.854, 1.72	1.22	.859, 1.73	1.00	.620, 1.62
Average Cumulative GPA	.973	.817, 1.16	.975	.818, 1.16	.801	.633, 1.01
Age	1.10*	1.02, 1.19	1.10*	1.01, 1.19	1.11*	1.01, 1.22
Involved in Greek Like	1.64***	1.35, 2.01	1.67***	1.37, 2.03	1.50***	1.12, 1.99
Participates in Collegiate Athletics	1.57*	1.00, 2.45	1.58*	1.01, 2.47	.317	.099, 1.01
Pervious Involvement in Interscholastic Sports						
Participated in varsity or junior varsity sports during high school (at least one sport)	1.52***	1.22, 1.89	--	--	.986	.736, 1.32
Number of different sports that the respondent participated in during high school	--	--	1.15***	1.06, 1.25	--	--
R2 = .032		R2 = .031		R2 = .035		R2 = .035
Mean VIF = 2.88		Mean VIF = 2.75		Mean VIF = 2.88		Mean VIF = 2.75

Notes.

* p<.05,

** p<.01,

*** p<.001

McFadden's R2 is used for the pseudo coefficient of determination.

Mean VIF report on the average variance inflation factor among the covariates in each model.

Table 3
Assessing Positive CAGE and DAST-10 Screens Among Former Interscholastic Athletes

Type of Sport	Main Model Positive CAGE Screen (+2)			Main Model Positive DAST-10 Screen (+3)		
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Participated in Baseball	.837	.543 1.29	.768	.439 1.34	.768	.439 1.34
Participated in Basketball	1.28	.982 1.67	1.05	.704 1.57	1.05	.704 1.57
Participated in Crew	1.85 *	1.11 3.08	.648	.229 1.84	.648	.229 1.84
Participated in Cross Country	1.21	.916 1.60	.955	.614 1.49	.955	.614 1.49
Participated in Field Hockey	1.02	.559 1.86	.560	.170 1.85	.560	.170 1.85
Participated in Football	1.52 *	1.06 2.17	.977	.609 1.57	.977	.609 1.57
Participated in Golf	1.14	.773 1.67	1.16	.686 1.95	1.16	.686 1.95
Participated in Gymnastics	.921	.431 1.97	1.14	.341 3.84	1.14	.341 3.84
Participated in Ice Hockey	.759	.416 1.39	1.28	.651 2.53	1.28	.651 2.53
Participated in Lacrosse	1.20	.851 1.70	2.03 ***	1.33 3.09	2.03 ***	1.33 3.09
Participated in Soccer	1.20	.950 1.51	1.13	.814 1.58	1.13	.814 1.58
Participated in Softball	.751	.487 1.16	1.30	.700 2.43	1.30	.700 2.43
Participated in Swimming	1.01	.709 1.44	1.30	.798 2.10	1.30	.798 2.10
Participated in Tennis	1.14	.886 1.47	.868	.589 1.28	.868	.589 1.28
Participated in Track & Field	1.00	.790 1.28	.621	.422 .914	.621	.422 .914
Participated in Volleyball	.958	.701 1.31	.766	.449 1.31	.766	.449 1.31
Participated in Water polo	1.29	.694 2.41	.667	.246 1.81	.667	.246 1.81
Participated in Wrestling	.938	.511 1.72	1.52	.772 2.99	1.52	.772 2.99
Participated in 'Other Sport'	1.20	.938 1.54	.653	.419 1.02	.653	.419 1.02
		R2 = .036		R2 = .052		
		Mean VIF = 1.74		Mean VIF = 1.74		

Notes.

* p<.05,

** p<.01,

*** p<.001

All models controlled for gender, race, grade level of college respondent, cumulative GPA, fraternity/sorority status, age, and collegiate athletic status.

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McFadden's R² is used for the pseudo coefficient of determination.
Mean VIF report on the average variance inflation factor among the covariates in each model.