

HOW SPORTS AND EXERCISE AFFECT TOBACCO AND ALCOHOL USE RISKS AMONG MARYLAND HIGH SCHOOLERS

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ABSTRACT

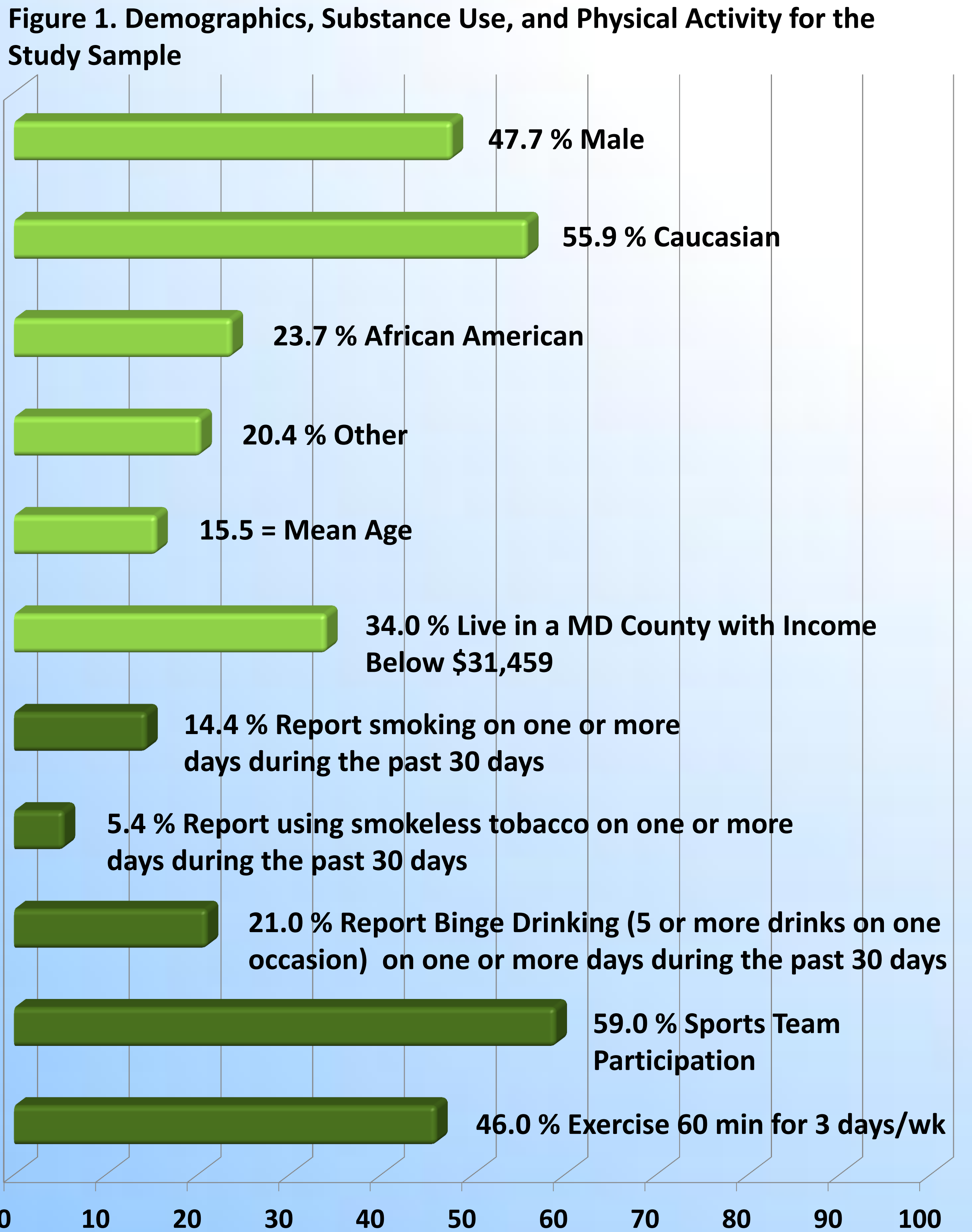
Physical activity generally predicts good physical and psychological health in adolescents; however, some types of physical activity may not be entirely beneficial. Research shows that sports team participation can increase adolescents’ risk for alcohol and smokeless tobacco use, while other exercise may be protective against alcohol, smoking, and smokeless tobacco use. Considering that adolescent substance use significantly increases the risk of adult lifetime substance use, studying substance use risk factors is an important area of research, particularly around a seemingly healthy activity like physical activity.

Data derived from the 2010 Maryland Youth Tobacco Survey, conducted in middle and high school classrooms, were used to perform binary logistic regression analyses to explore predictors of substance use among a subsample of high school youth. Specifically, this study examined whether past year team sports participation, exercising for 60 minutes three or more days/week, sex, and socioeconomic status were predictors of current substance use by high school grade level. Results showed that both sports participation and exercise were associated with increased risk for binge drinking and smokeless tobacco use, whereas both activities were protective for smoking cigarettes. This study did not support previous findings of a differential effect between exercise and sports team participation.

INTRODUCTION

- Sports team participation and general exercise have been shown to affect adolescents’ substance use.
 - Research has demonstrated that physical activity can be protective against substance use.
 - General exercise and sports team participation are protective against cigarette smoking for both males and females in high school (Audrain-McGovern et al., 2012; Simantov et al., 2000; Terry-McElrath et al., 2011).
 - High school students engaging in physical activity also tend to exhibit decreased levels of alcohol use and smokeless tobacco use (Terry-McElrath et al., 2011).
- However, other studies have found that exercise within organized sports teams does not always demonstrate the same protective effect for high school students.
 - High schoolers participating in athletic sports teams generally have reported increased levels of alcohol use, binge drinking, and smokeless tobacco use (Terry-McElrath et al., 2011).
- To help explicate the differential effects of exercise and sports team participation, the current study examined how exercise, sports team participation, sex, and socioeconomic status predicted current cigarette use, binge drinking, and smokeless tobacco use across high school grade levels.

SAMPLE SELECTION



METHODS

- The 2010 Maryland Youth Tobacco Survey (MYTS) was a classroom-based survey, conducted in randomly selected public middle and high schools throughout the state of Maryland.
- The survey included responses from adolescents enrolled in grades 6-12 (N=86,098); however, the current study only included students from grades 9-12 (N=49,183). Demographics for the study subsample are presented in Figure 1 under Sample Selection.
- Binary logistic regressions were performed using SPSS (version 20.0) on:
 - Three substance use outcomes: 1) current binge drinking, 2) cigarette smoking, and 3) smokeless tobacco use, and
 - Four predictors : 1) past year team sports participation, 2) exercising for 60 minutes 3+ days/week, 3) sex, and 4) socioeconomic status (SES) by each high school grade level.

For both outcomes and predictors, survey responses were recoded to make dichotomous variables:

Outcomes:

- Binge Drinking:** Whether students reported none or 1-30 days of 5 or more drinks in the last 30 days
- Cigarette Smoking:** Whether students reported none or any smoking in the last 30 days
- Smokeless Tobacco Use:** Whether students reported none or any smokeless tobacco use in the last 30 days

Predictors:

- Exercise:** Whether students reported at least 60 minutes of physical activity to the point of sweating and/or breathing hard for either 0-2 or 3-7 days/week
- SES:** Whether students reported living in a county in which the average income was below or above \$31,459, the overall average income in Maryland in 2010

RESULTS

Table 1. Predictors of binge drinking (any days of 5 or more drinks) in the last 30 days												
	9th Grade			10th Grade			11th Grade			12th Grade		
Predictors	Odds Ratio	[95% CI]	Φ	Odds Ratio	(95% CI)	Φ	Odds Ratio	(95% CI)	Φ	Odds Ratio	(95% CI)	Φ
Any Sports Team	1.17**	[1.04, 1.31]	.023	1.28**	[1.16, 1.42]	.059	1.39**	[1.27, 1.53]	.091	1.44**	[1.31, 1.57]	.112
Any Exercise	1.05	[.93, 1.19]	.013	1.24**	[1.12, 1.38]	.054	1.30**	[1.18, 1.43]	.083	1.34**	[1.21, 1.47]	.105
Male Gender	1.10	[.99, 1.22]	.017	1.02	[.93, 1.12]	.011	1.18**	[1.08, 1.28]	.046	1.22**	[1.12, 1.33]	.066
Low SES	1.48**	[1.34, 1.65]	.062	1.15**	[1.05, 1.26]	.019	0.99	[.91, 1.08]	.011	0.87**	[.80, .96]	.037
Note: **p < .01, *p < .05; CI: Confidence Interval (lower limit, upper limit)												

Note: ***p* < .01, **p* < .05; CI: Confidence Interval (lower limit, upper limit)

Table 2. Predictors of any cigarette smoking in the last 30 days												
	9th Grade			10th Grade			11th Grade			12th Grade		
Predictors	Odds Ratio	[95% CI]	Φ	Odds Ratio	(95% CI)	Φ	Odds Ratio	(95% CI)	Φ	Odds Ratio	(95% CI)	Φ
Any Sports Team	0.87*	[.77, .99]	.031	0.77**	[.69, .86]	.041	0.76**	[.68, .85]	.041	0.81**	[.73, .90]	.027
Any Exercise	0.84*	[.74, .96]	.031	1.03	[.92, 1.16]	.010	1.10	[.99, 1.23]	.004	1.09	[.98, 1.22]	.013
Male Gender	1.23**	[1.10, 1.39]	.028	1.22**	[1.10, 1.35]	.031	1.32**	[1.20, 1.46]	.050	1.46**	[1.33, 1.62]	.074
Low SES	1.39**	[1.24, 1.57]	.052	1.18**	[1.06, 1.31]	.030	1.11	[1.00, 1.22]	.018	1.09	[.98, 1.20]	.015
Note: **p < .01, *p < .05; CI: Confidence Interval (lower limit, upper limit)												

Note: ***p* < .01, **p* < .05; CI: Confidence Interval (lower limit, upper limit)

Table 3. Predictors of any smokeless tobacco use in the last 30 days												
Predictors	9th Grade			10th Grade			11th Grade			12th Grade		
	Odds Ratio	[95% CI]	Φ	Odds Ratio	(95% CI)	Φ	Odds Ratio	(95% CI)	Φ	Odds Ratio	(95% CI)	Φ
Any Sports Team	1.25*	[1.02, 1.53]	.021	1.23*	[1.03, 1.48]	.027	1.19*	[1.00, 1.41]	.036	1.34**	[1.14, 1.59]	.064
Any Exercise	1.01	[.81, 1.25]	.015	1.09	[.90, 1.32]	.027	1.32**	[1.10, 1.60]	.055	1.26*	[1.05, 1.51]	.068
Male Gender	3.53**	[2.88, 4.32]	.115	3.31**	[2.76, 3.97]	.122	4.48**	[3.71, 5.41]	.158	4.62**	[3.86, 5.54]	.184
Low SES	1.95**	[1.63, 2.32]	.065	1.77**	[1.51, 2.08]	.058	1.28**	[1.10, 1.50]	.022	1.40**	[1.20, 1.63]	.035
Note: ** <i>p</i> < .01, * <i>p</i> < .05; CI: Confidence Interval (lower limit, upper limit)												

Note: ***p* < .01, **p* < .05; CI: Confidence Interval (lower limit, upper limit)

- In general, sports team participation and exercise outside of team sports showed similar trends, as they were both associated with increased odds of binge drinking and smokeless tobacco use, but appeared protective for cigarette smoking.
- For 9th graders in particular, exercise was not associated with increased risk for substance use, and was protective for cigarette smoking.
- However, most of the effect sizes for these associations were negligible (.00 - .01) or weak (.10 - .20). The sample size was very large, so results should be interpreted with caution.

DISCUSSION

- Results suggest that exercise 3+ days/week and sports team participation are similarly associated with
 - increased past month binge drinking and smokeless tobacco use
 - protective for past month cigarette smoking among HS students.
- Our findings are consistent with previous results that students involved in organized sports report higher levels of alcohol and smokeless tobacco use and lower levels of cigarette smoking.
- However, the current study found that, rather than being protective, exercise outside of team sports was also associated with higher odds of binge drinking and using smokeless tobacco.
- Substance use prevention efforts should not necessarily target students on the basis of involvement in team sports, as students involved in different types of physical activity may be at risk. Male students and students of lower SES may also have greater odds of substance use throughout high school.
- More research is still necessary to explore the previous findings that type of physical activity may have differential effects on substance use outcomes.

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