Revista Brasileira de Psiquiatria. 2015;37:99–105
Associação Brasileira de Psiquiatria
doi:10.1590/1516-4446-2014-1389

ORIGINAL ARTICLE

Sports practices related to alcohol and tobacco use among high school students

André Bedendo, Ana R. Noto

Department of Psychobiology, Universidade Federal de São Paulo (UNIFESP), São Paulo, SP, Brazil.

Objective: To examine the relationship between alcohol and tobacco use and sports in a national sample of secondary students.
Methods: This cross-sectional study enrolled a representative sample of secondary students from public and private schools from all 27 Brazilian state capitals. Students were assessed in 2010 by a self-report questionnaire including questions on drug use and sport activity in the last month (n=13,872).
Results: Subjects who played sports exhibited a higher frequency of alcohol use and heavy episodic drinking than their peers who did not play sports. Practices that were associated with higher odds of heavy episodic drinking in the last month included gym, weight training (adjusted odds ratio [aOR]: 2.0, 95% confidence interval [95%CI] 1.6-2.4), and soccer (aOR: 1.3, 95%CI 1.1-1.5). Fighting, martial arts, or capoeira were associated with smoking (aOR: 1.9, 95%CI 1.2-3.2).
Conclusion: These results suggest a relationship between some sports preferences and a higher risk of alcohol or tobacco use among Brazilian secondary students. This relationship should be considered in preventive programs.

Keywords: Sports; exercise; alcohol drinking; tobacco; adolescent

Introduction

Adolescence is a critical period in the development of substance use and abuse patterns.[1] Alcohol and tobacco are the psychotropic substances most commonly used by Brazilian students between the ages of 14 and 18 years old.[2]

Since the early 1980s, several studies have explored the association between participation in sports and drug use.[3] Studies point to physical exercise as a possible therapeutic intervention against the abuse of various types of drugs.[4,5] Moreover, the literature presents inconsistent evidence about sports participation as a risk or a protective factor for drug use,[6] particularly among adolescent students.

In several studies, sports participation among high school students was associated with higher alcohol consumption,[7,8] heavy episodic drinking (HED),[9] and tobacco use.[10] Conversely, other studies have observed that participation in sports is associated with decreased use of these substances.[11,12] However, all these studies focused on North American and European populations.

Several characteristics of sports practice seem to influence its relationship with substance use, including the type of sport[4,13] and the frequency of and motivation for participating in sports.[3,8,14] Some authors point out the importance of social and cultural aspects[14-16] in understanding the relationship between sports and drugs. Adolescents are subject to considerable peer influence regarding alcohol and tobacco use.[17,18] Among sports players, alcohol consumption can be encouraged as a way to strengthen group bonds.[19] In contrast, the exact nature of the sport can attract different types of students. For example, men who are interested in more aggressive sports may be more susceptible to high-risk behaviors.[20]

In developing countries, there is still a substantial gap in understanding the relationship between sports and substance use.[21] Thus, nationally representative data that could allow comparisons with other countries are essential for recognizing scenarios related to substance use and for guiding the development or adaptation of preventive strategies.

The present study sought to examine the relationship between alcohol and tobacco use and sport participation as reported by secondary school students from a representative sample of all 27 Brazilian capitals.

Methods

Study design and participants

The present study is part of the VI National Survey on Psychotropic Drug Use among Elementary and Secondary Education Students from Private and Public Schools in 27 Brazilian Capitals conducted in 2010.[2] This study was conducted by the Brazilian Center for Information on Psychotropic Drugs (CEBRID).

Correspondence: Ana Regina Noto, Universidade Federal de São Paulo, Departamento de Psicobiologia, Rua Botucatu, 862, 1° andar, Ed. Ciências Médicas, CEP 04023-062, São Paulo, SP, Brazil.
E-mail: arnpsicobio@gmail.com
Submitted Feb 16 2014, accepted Jul 07 2014.

The sample is representative of secondary school students from public and private schools in 27 Brazilian state capitals. Using the national registry of all educational institutions in the country, all schools were listed, and subsamples of public and private institutions were created. In each subsample, three strata were considered: primary schools, secondary schools, and schools that provided both primary and secondary education. For each stratum, proportional samples were allocated according to the number of students, which was estimated from the number of classrooms. This process resulted in a sample of 50,890 students (31,570 primary and 19,230 secondary) and 789 schools (512 public and 277 private). All students in the selected classes were invited to participate in the study.

Data about sports participation was collected among secondary students. Approximately 79% of the students agreed to participate (20.5% were absent on the day of the survey and 0.3% refused). To reduce false-positive answers, one question involving fictitious drugs was inserted. Students were asked if they had already used "Holoten," "Carpinol," or "Medavane" to feel "different/high," and 98 subjects who answered this question positively were excluded.

The present study considered only secondary school students aged 14 to 18 years who answered questions about the main sport activity in which they participated during the last month (n=13,872).

Informed consent procedures

All questionnaires were completed in the classroom under the supervision of a group of trained researchers. The researchers' training included classroom presence, ethics, and procedures for addressing possible questions from the participants. The questionnaire took approximately 50 minutes to administer. To ensure confidentiality, no school employee or officer was present during this stage. All of the questionnaires were completed on a single day, and the completed questionnaires were sealed. All participants were informed about the research objectives and about the voluntary nature of their participation. Students could stop participating at any time, and the data collected were used exclusively for research purposes. The study was approved by the Research Ethics Committee of Universidade Federal de São Paulo (UNIFESP), Brazil (process 0348/08).

Measures

The questionnaire used in the present study was adapted to Brazilian culture from self-report instruments available from the World Health Organization[22] and the European School Survey Project on Alcohol and Other Drugs (ESPAD).[23]

Sports activity

The data collected referred to the month prior to the survey, and were obtained using three questions: a) "Which sports activity did you participate in the most in the last 30 days?" (0 = not a participant; 1 = gym, weight training; 2 = track and field, cycling, or swimming; 3 = basketball, volleyball, or handball; 4 = dancing; 5 = soccer; 6 = gymnastics; or 7 = fighting, martial arts, or capoeira); b) "In the last 30 days, how many times have you participated in the sport reported above?" (0 = not a participant; 1 = 1 to 5 days; 2 = 6 to 19 days; or 3 = 20 days or more); and c) "Why do you participate in the sports activity reported above?" (0 = not a participant; 1 = for fun; 2 = to stay fit or for health reasons; or 3 = professionally). To study the differences between sports participants and sedentary students, a dichotomous variable was created, which included all of the sports mentioned (0 = not a participant; 1 = sports). Gymnastics and dancing were pooled for the purpose of analysis. In some cases, the sports were also classified as individual (gym, weight training; track and field, cycling, or swimming; dancing or gymnastics; and fighting, martial arts, or capoeira) or team (basketball, volleyball, or handball and soccer). In the present study, the terms "sports activity," "sports practice," and "sports" are used interchangeably.

Alcohol consumption in the last month

Information about alcohol consumption was obtained through the following question: "In the last 30 days, have you consumed any alcoholic beverage?" (0 = no; 1 = yes, I drank 1 to 5 days during the month; 2 = yes, I drank 6 to 19 days during the month; or 3 = yes, I drank 20 days or more). For analysis, this variable was coded as dichotomous (0 = no, 1 = yes).

Heavy episodic drinking in the last month

Information about HED was obtained using the following question: "In the last 30 days, how many times have you consumed 5 or more drinks on the same occasion?" (0 = never; 1 = 1 time; 2 = 2 times; 3 = 3 to 5 times; 4 = 6 to 9 times; or 5 = 10 times or more). The questionnaire included an explanatory table about dose equivalence. For the purpose of analysis, this variable was also considered dichotomous (0 = no, 1 = yes).

Tobacco use in the last month

Information about tobacco use was obtained using the following question: "In the last 30 days, have you smoked a cigarette?" (0 = no; 1 = yes, I smoked 1 to 5 days in the last month; 2 = yes, I smoked 6 to 19 days in the last month; or 3 = yes, I smoked 20 days or more in the last month). This variable was coded in the present study as a dichotomous variable (0 = no, 1 = yes).

Control variables

Gender, age (years), and school type (sociodemographic variables) were used as adjustments in the logistic regression models. The type of school (public or private) was used as a substitute for socioeconomic status.

Table 1 Prevalence of alcohol and tobacco use in the last month, sociodemographic characteristics, and sports practice (n=13,872)

	Alcohol			Heavy episodic drinking			Tobacco		
	n (total)	wgt% (95%CI)	p-value*	n (total)	wgt% (95%CI)	p-value*	n (total)	wgt% (95%CI)	p-value*
Age (years)									
14-15	5,100	24.9 (22.1-27.9)	0.000	5,050	11.9 (9.7-14.4)	0.000	5,155	4.9 (4.2-5.8)	0.000
16-18	8,547	37.3 (35.3-39.4)		8,387	23.0 (21.3-24.7)		8,657	9.7 (8.5-11.2)	
Gender									
Female	7,906	31.5 (29.7-33.3)	0.013	7,798	16.6 (15.0-18.4)	0.000	8,008	6.9 (5.9-8.1)	0.001
Male	5,714	34.4 (31.9-36.9)		5,612	21.9 (19.9-24.0)		5,778	9.4 (8.2-10.9)	
School type									
Public	8,095	30.6 (28.5-32.7)	0.000	7,993	17.5 (15.8-19.3)	0.004	8,218	7.9 (6.8-9.1)	0.764
Private	5,552	40.8 (38.0-43.6)		5,444	23.9 (21.4-26.6)		5,594	8.2 (6.9-9.8)	
Sports (in last month)									
Not a participant	4,857	30.1 (27.9-32.5)	0.002	4,783	16.7 (14.7-18.9)	0.004	4,925	7.6 (6.4-9.1)	0.41
Sports	8,790	34.3 (32.2-36.4)		8,654	20.1 (18.4-22.0)		8,887	8.2 (7.2-9.3)	
Individual	3,611	38.7 (35.8-41.6)	0.000	3,551	22.8 (20.4-25.3)	0.004	3,648	9.0 (7.4-10.9)	0.20
Team	5,179	31.7 (29.2-34.2)		5,103	18.6 (16.5-20.8)		5,239	7.7 (6.5-9.0)	
Gym, weight training	1,697	49.3 (49.6-53.7)	0.000	1,648	31.5 (27.4-36.0)	0.000	1,720	10.1 (7.9-12.9)	0.001
Track and field, cycling, or swimming	751	28.5 (24.3-33.2)		745	14.7 (11.5-18.7)		755	8.1 (5.2-12.3)	
Basketball, volleyball, or handball	1,808	27.9 (24.5-31.5)		1,788	13.9 (11.2-17.1)		1,822	5.6 (4.2-7.6)	
Gymnastics or dance	764	30.3 (26.2-34.7)		762	15.8 (12.5-19.9)		771	5.3 (3.4-8.2)	
Soccer	3,371	33.6 (30.7-36.6)		3,315	21.0 (18.6-23.6)		3,417	8.7 (7.2-10.5)	
Fighting, martial arts, or capoeira	399	33.9 (25.3-43.6)		396	19.3 (14.1-26.0)		402	14.2 (9.7-20.3)	
Frequency of practice (in last month)									
1 to 5 days	4,006	31.8 (29.2-34.6)	0.006	3,952	16.8 (14.8-19.0)	0.000	4,048	7.5 (6.1-9.3)	0.365
6 to 19 days	2,218	37.2 (33.2-41.3)		2,188	22.9 (19.3-26.8)		2,236	8.8 (6.9-11.2)	
20 or more days	2,363	37.2 (34.2-40.4)		2,312	24.4 (21.8-27.2)		2,395	8.9 (7.5-10.6)	
Motivation for practice									
For fun	3,533	31.9 (29.3-34.8)	0.000	3,477	18.7 (16.5-21.2)	0.000	3,566	8.6 (7.2-10.2)	0.598
To stay fit or for health reasons	2,347	40.6 (37.1-44.1)		2,307	24.7 (22.0-27.6)		2,380	9.0 (7.2-11.2)	
Professional	299	27.8 (21.0-35.9)		295	14.4 (9.8-20.5)		305	10.7 (6.8-16.5)	

95%CI = 95% confidence interval; wgt% = weighted proportions.
* Chi-square test.

Statistical analyses

Chi-square tests were used to identify differences in substance use. Univariate and multivariate logistic regression models were used to predict alcohol consumption, HED, and tobacco use. Sports practice, frequency, and motivation were treated as independent variables. Gender, age, and school type were included in multinomial models as control variables. Sample weights were calculated and respected all stages of the sample design. Non-response was treated with calibration during weight calculation. Simple weights were corrected by sample response rates in each stratum and calibrated for the total number of student admissions at schools (respecting the study population), according to the national school census conducted in 2009 by Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP). All analyses were performed using the subpop command in Stata software version 11[24] and the minimum level of significance was set at 5%.

Results

The sample consisted of 78.9% (95%CI 75.7-81.8) public school students and 57.8% girls (95%CI 56.7-59.0). The participants had a mean age of 15.9 years (standard error: 0.03). Of the 13,872 students interviewed, 62.9% (95%CI 61.2-64.6) reported having practiced some sports activity in the last month, and 63.0% had participated in team sports (95%CI 60.9-65.0). Soccer was the sport most frequently mentioned by the students (41.9%, 95%CI 39.8-44.0), followed by basketball, volleyball, or handball (21.1%, 95%CI 19.0-23.4) and gym or weight training (16.1%, 95%CI 14.9-17.5).

Table 1 shows the prevalence of alcohol and tobacco use within the previous month in relation to the participants' sociodemographic characteristics and sports. Older age and male gender were associated with higher alcohol and tobacco use, while private school attendance was more associated with alcohol consumption. A higher proportion of students who reported

participating in sports activities reported alcohol consumption within the month compared with the students who did not participate in sports. The same finding was observed in the comparative analyses in relation to HED. There were no significant differences in tobacco use between sports participants and nonparticipants, nor were there significant differences between those who participated in team vs. individual sports. Regarding the types of sports, gym or weight training was significantly more associated with alcohol consumption and with at least one HED episode within the last month. Fighting, martial arts, or capoeira practice were more strongly associated with tobacco use within the last month compared with other sports. Participation in sports activities for 6 or more days per month was more closely associated with alcohol consumption within the month, including HED, while sports practice for professional reasons was less associated with HED (Table 1).

A series of analyses were performed to determine whether the practitioners of each sport differed in relation to alcohol and tobacco use when categorized according to practice frequencies or motivations. However, no statistically significant differences were observed (results not shown).

Logistic regression models adjusted for socioeconomic variables confirmed that gym or weight training and soccer were more associated with alcohol consumption, including HED, within the past month, when compared with no sports participation (Figures 1 and 2). Furthermore, tobacco use was more associated with fighting, martial arts, or capoeira practice than with no sports practice (Figure 3). Although there was no statistical significance, the following sports types had the lowest association with alcohol and tobacco use compared with no sports participation: track and field, cycling or swimming; basketball, volleyball, or handball; and dance or gymnastics.

Interaction terms were also tested for gender and sports practices. The analyses showed interaction effects only for sports and gender for HED ($F_{6,484} = 2.97$, $p > 0.01$) and tobacco use ($F_{6,484} = 2.88$, $p > 0.01$). When observing the logistic regression models, only the interaction of track and field, cycling, or swimming with gender was statistically significant for HED (adjusted odds ratio [aOR]: 2.65, 95%CI 1.46-4.80) and tobacco use (aOR: 2.90, 95%CI 1.10-7.65). However, these sports were not statistically associated with the outcomes of the logistic regressions presented in Figures 2 and 3. Therefore, we assumed those regression models were reliable.

Discussion

The present study investigated the relationship between sports practice and alcohol and tobacco use in the last month among students from public and private secondary schools in the 27 Brazilian capitals. Sports practice was associated with alcohol consumption, including HED; however, the same finding was not observed for tobacco use. Gym/weight training and soccer were associated with both alcohol use patterns that were studied, while fighting, martial arts, or capoeira practice was related to tobacco use. More frequent sports practice was more closely associated with alcohol use within the month. Professional sports practice was less related to alcohol consumption.

There was a greater association between private school attendance and alcohol consumption in our sample. This result corroborates the findings of another study that examined the influence of socioeconomic factors on alcohol use patterns, and found that HED was more prevalent among Brazilian students from higher social classes.[25]

Sports practitioners have been described as a group with a higher rate of alcohol consumption than nonpractitioners.[9,26] Our study reinforces these findings, and suggests that sports practice is not always associated with healthy behaviors. Thus, preventive measures should bear in mind that the practice of certain sports, such as soccer and gym/weight training, for example, might be associated with health risk behaviors (such as HED) in Brazil.

Our findings concerning the association between alcohol consumption (including HED) and individual sports differs from those of other studies that have demonstrated a relationship between alcohol consumption patterns and team sports practitioners.[26,27] It is noteworthy that even individual sports are associated with social contact, which may favor interactions that involve the consumption of alcoholic beverages. Moreover, our results may reflect a peculiarity of the sample in terms of the high prevalence of alcohol consumption among individuals who go to a gym or weight train. Gym and weight training was one of the most popular sports among our participants; consequently, it influenced the overall comparison of team and individual sports participants.

Gym or weight training was associated with increased alcohol consumption. The prevalence of alcohol consumption observed in this group was particularly high. Approximately one-half of the students practicing gym/weight training reported having consumed alcohol in the past month, and nearly one-third reported HED. This finding is even more relevant given that the sale, supply, or delivery of alcoholic beverages to individuals under 18 years old, which is the population included in the present study, is prohibited in Brazil and that the law demands the arrest of offenders. Our findings reflect a serious social and legal problem, because, although the prohibition of alcohol sales to minors has been in effect since 1990, it has failed to be effective, possibly due to a lack of population awareness about the consequences of consuming alcohol at this age and to deficient enforcement of the law.

Substance use by adolescents is associated with a number of academic and health problems, and our data suggest that special attention should be given to this population. Our data also reinforce the idea that some sport practitioners do not believe that occasional alcohol intoxication hinders their sports activity.[19]

Currently, gym practice in Brazil is strongly associated with socialization and a sense of group belonging.[28] Understanding values, beliefs, and motivations is critical to developing effective policies regarding drug use in sports[29] and improving our understanding of the relationship between sports and substance use; however, because

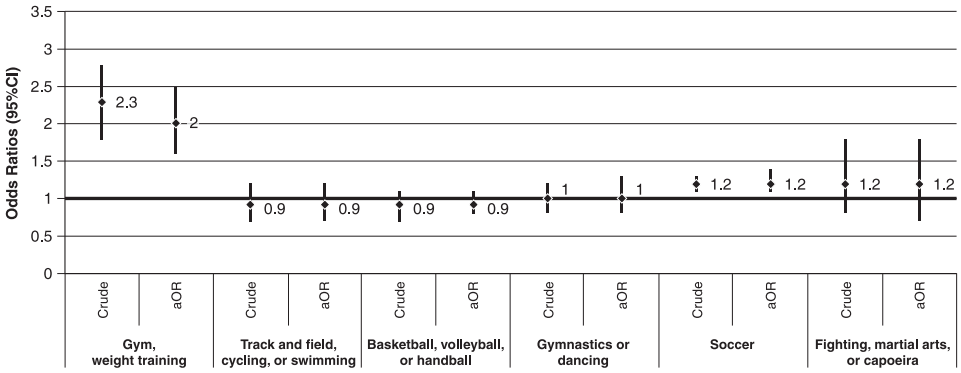

Figure 1 Crude and adjusted[a] odds ratios for alcohol use in the last month for each sport type (n=13,872). 95%CI = confidence interval. Not a participant of sports as reference (n=4,948). [a] aOR = adjusted by age, gender and school type.

of the quantitative methodology applied in the present study, we were unable gain a deeper understanding of this relationship. Thus, future studies are needed to examine the beliefs and values associated with gym training and to develop risk-reduction programs within this context.

Soccer playing was also related to alcohol consumption when compared with no participation in sports. Both soccer and alcohol consumption are widely disseminated in Brazilian culture. Among secondary school students, soccer is one of the most popular sports in physical education classes[30] and alcohol is the most abused drug.[2] Perhaps this result reflects a strong cultural association between these variables, which affects both alcohol consumption and soccer playing among adolescents. The cultural influence on the relationship between sports and substance use has been highlighted elsewhere.[15,29] In contrast, the possible socialization induced by sports practice seems to also mediate drug use.[13] Particularly among college soccer players, drinking for social reasons has been highlighted as one of the most reported motivations for alcohol use.[31]

In our sample, fighting, martial arts, or capoeira practice was associated more strongly with tobacco use compared with nonparticipation in sports activities. Sports practice has been previously identified as a predictor of tobacco use[10] and one previous study associated bodybuilding and fighting sports to daily smoking.[32] Tobacco use can decrease aerobic capacity and impair performance; however, practitioners of fighting, martial arts, or capoeira may not associate tobacco-related impairments with their sport. Adolescents have a lower perception of the risk that certain activities, such as tobacco use, may pose to their health.[33] Moreover, tobacco use may be a characteristic of normative standards normative standards regarding drug use among the fight practitioners in our sample. For example, the approval of tobacco use among individuals in the group can influence the behavior of the other members. However, it is still not clear whether fighting sports are more related to smoking because players perceive this practice as less likely to impair performance or due to peer influence.[32]

High-level sports participation is not always associated with less substance use,[34] and our study reinforces this assumption. We observed that individuals who practiced sports activities more frequently within the previous month (6 days or more) consumed more alcohol. However, when the type of sport was analyzed separately, no statistically significant differences were observed. It is possible that more frequent sports participation gives adolescents more time without adult supervision, thus facilitating substance use.[13] Moreover, engagement in sport can be stressful for participants at different levels of practice.[35] Consequently, substance use may be a strategy to relieve symptoms of anxiety or

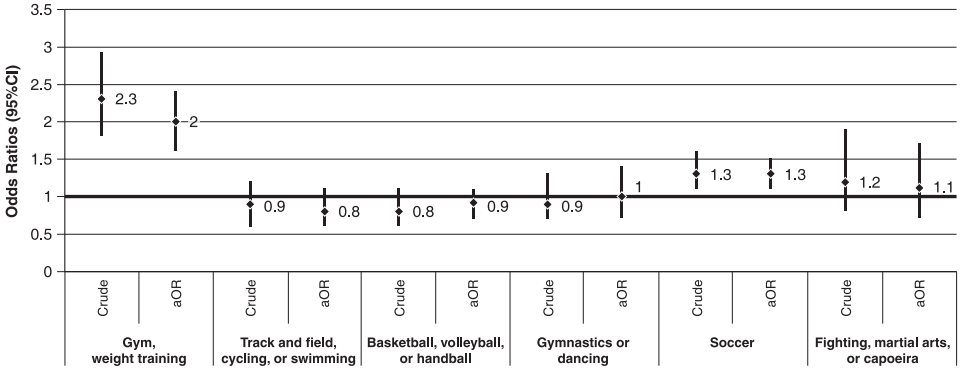

Figure 2 Crude and adjusted[a] odds ratios for heavy episodic drinking in the last month for each sport type (n=13,872). 95%CI = confidence interval. Not a participant of sports as reference (n=4,948). [a] aOR = adjusted by age, gender and school type.

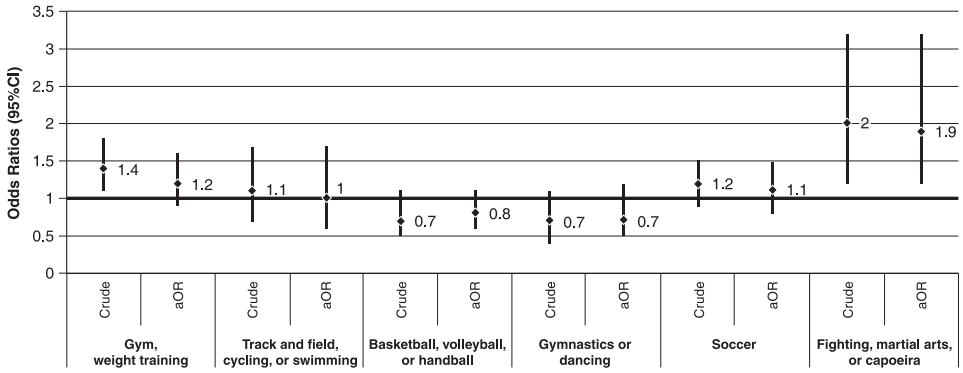

Figure 3 Crude and adjusted[a] odds ratios for tobacco use in the last month for each sport type (n=13,872). 95%CI = confidence interval. Not a participant of sports as reference (n=4,948). [a] aOR = adjusted by age, gender and school type.

even training-related fatigue,[36,37] and alcohol use in particular has been described as a coping mechanism.[35]

Professional sports practice was less associated with alcohol consumption. Currently, adolescents have a large number of sources of information about the risks of substance use through the media, family, or school. Once substance use is recognized as unhealthy, some groups of adolescents can avoid consumption. For example, professional sports players may avoid alcohol and tobacco use because they know that use of these substances may decrease their performance and negatively affect them during competitions or training. In addition, coaches can encourage athletes to avoid substance use,[20] either by repressing such behavior or by creating expectations that the athlete wants to meet.

Adolescents are more susceptible than adults are to peer influences, including risk behaviors for the use of new drugs.[38] Adolescents tend to act like their peers to promote their acceptance and to feel more integrated into the group, even if such behavior can cause them harm. For example, alcohol use among students is associated with an increased number of friendships.[39] Additionally, among sports practitioners, substance use may be encouraged as a way to intensify ties among group members.[19] Consequently, the need for socialization may favor alcohol and tobacco use.

The nature of the sport itself can attract people who already engage in high-risk behavior or can create an environment where such behavior is normative.[20] Individuals who are similar tend to form groups with greater cohesion, and being recognized as a member seems to increase the sense of identification with the group.[40] Thus, this relationship appears to be bidirectional, because individuals tend to be grouped by their common characteristics and perceive themselves as being more similar when they feel like part of a group. Adolescents may choose a particular sports activity because they share a number of similar characteristics or styles with other players, even in terms of substance use preferences and patterns.

Regarding limitations of the present study, although different strategies have been used, biases inherent to self-reporting may have occurred. Furthermore, adolescents who were not attending regular classes during the study period were not evaluated. The results of the present study show no causal relationship between sports and substance use.

Some sports were associated with a motivation to stay fit or were practiced for health reasons; thus, their evaluation was limited. Moreover, only the participants' primary sport was analyzed, which did not take into consideration individuals who practice multiple sports. The generalization of the results to other countries with different cultures may not be valid, as both substance use and sports participation are related to culture.

Sports practice is commonly associated with healthy behaviors; however, the present study showed that this relationship is not always true regarding alcohol and tobacco use. Certain practices have been associated with the use of these substances. Thus, sports activities should not be viewed as exclusively associated with healthy behaviors.

Certain types of sports can attract adolescents with similar characteristics, which may favor substance use. Thus, it is essential to observe the context in which the sports are played and the characteristics of the group being studied.

Gyms and venues for playing soccer are widely available in Brazil, and our results suggest the importance of preventive measures related to alcohol consumption in these environments. The wide availability of places to practice facilitates the adolescents' access to these activities, which, in turn, increases the number of individuals involved in these sports. Similarly, the association between tobacco use and fighting, martial arts, or capoeira practice suggests that prevention campaigns should focus on these groups of athletes. Teachers may also be encouraged to discuss substance use with their students, especially regarding the context in which sports are played and particular group characteristics.

Acknowledgements

The authors thank the Brazilian Center for Information on Psychotropic Drugs (CEBRID) and the Brazilian National Secretariat on Drugs Policies (SENAD) for authorizing the database analyses and Associação Fundo de Incentivo à Pesquisa (AFIP) for providing institutional infrastructure.

AB is the recipient of a scholarship from Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP). ARN is the recipient of a research productivity grant from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

Disclosure

The authors report no conflicts of interest.

References

1 Fraga S, Sousa S, Ramos E, Dias S, Barros H. Alcohol use among 13-year-old adolescents: associated factors and perceptions. Public Health. 2011;125:448-56.
2 Carlini EA, Noto AR, Sanchez ZM, Carlini CMA, Locatelli DP, Abeid LR, et al. VI levantamento nacional sobre o consumo de drogas psicotrópicas entre estudantes do ensino fundamental e médio das redes pública e privada de ensino nas 27 capitais brasileiras. Brasília: CEBRID/SENAD; 2010.
3 Peretti-Watel P. Sports and drugs: Further interpretative hypotheses are necessary. Addiction. 2009;104:150-1.
4 Terry-McElrath YM, O'Malley PM, Johnston LD. Exercise and substance use among American youth, 1991-2009. Am J Prev Med. 2011;40:530-40.
5 Janse Van Rensburg K, Taylor A, Benattayallah A, Hodgson T. The effects of exercise on cigarette cravings and brain activation in response to smoking-related images. Psychopharmacology (Berl). 2012;221:659-66.
6 Peck SC, Vida M, Eccles JS. Adolescent pathways to adulthood drinking: Sport activity involvement is not necessarily risky or protective. Addiction. 2008;103:69-83.
7 Moore MJ, Werch CE. Sport and physical activity participation and substance use among adolescents. J Adolesc Health. 2005;36:486-93.
8 Lorente FO, Souville M, Griffet J, Grelot L. Participation in sports and alcohol consumption among French adolescents. Addict Behav. 2004;29:941-6.
9 Rainey CJ, McKeown RE, Sargent RC, Valois RF. Patterns of tobacco and alcohol use among sedentary, exercising, non-athletic, and athletic youth. J Sch Health. 1996;66:27-32.
10 Davis T, Arnold C, Nandy I, Bocchini JA, Gottlieb A, George RB, et al. Tobacco use among male high school athletes. J Adolesc Health. 1997;21:97-101.
11 Nelson MC, Gordon-Larsen P. Physical activity and sedentary behavior patterns are associated with selected adolescent health risk behaviors. Pediatrics. 2006;117:1281-90.
12 Escobedo LG, Marcus SE, Holtzman D, Giovino GA. Sports participation, age at smoking initiation, and the risk of smoking among US high school students. JAMA. 1993;269:1391-5.
13 Peretti-Watel P, Beck F, Legleye S. Beyond the U-curve: the relationship between sport and alcohol, cigarette and cannabis use in adolescents. Addiction. 2002;97:707-16.
14 Ruiz-Risueño Abad J1, Ruiz-Juan F, Zamarripa Rivera JI. [Alcohol and tobacco consumption in Spanish and Mexican adolescents and its relation to physical and sports-related activity and to the family]. Rev Panam Salud Publica. 2012;31:211-20.
15 Gmel G, Kuendig H, Daeppen J-B. Sport and alcohol: an emergency department study in Switzerland. Eur J Sport Sci. 2009;9:11-22.
16 Bedendo A, Opaleye ES, Andrade AL, Noto AR. Heavy episodic drinking and soccer practice among high school students in Brazil: the contextual aspects of this relationship. BMC Public Health. 2013;13:247.
17 Hoffman BR, Sussman S, Unger JB, Valente TW. Peer influences on adolescent cigarette smoking: a theoretical review of the literature. Subst Use Misuse. 2006;41:103-55.
18 Duan L, Chou CP, Andreeva VA, Pentz MA. Trajectories of peer social influences as long-term predictors of drug use from early through late adolescence. J Youth Adolesc. 2009;38:454-65.
19 Korhonen T, Kujala UM, Rose RJ, Kaprio J. Physical activity in adolescence as a predictor of alcohol and illicit drug use in early adulthood: a longitudinal population-based twin study. Twin Res Hum Genet. 2009;12:261-8.
20 Kulig K, Brener ND, McManus T. Sexual activity and substance use among adolescents by category of physical activity plus team sports participation. Arch Pediatr Adolesc Med. 2003;157:905-12.
21 O'Brien KS. Commentary on Terry-McElrath & O'Malley (2011): Bad sport–exorcizing harmful substances and other problems. Addiction. 2011;106:1866-7.
22 Smart RG, Hughes DPH, Johnston LD, Anumonye A, Khant U, Medina-Mora ME, et al. A methodology for students drug-use surveys. Geneva: WHO; 1980.
23 Hibell B, Guttormsson U, Ahlstrom S, Balakireva O, Bjarnason T, Kokkevi A, et al. The 2007 ESPAD Report - Substance use among students in 35 European countries [Internet]. 2009 [cited 2014 Jul 23]. http://www.espad.org/Uploads/ESPAD_reports/2007/The_2007_ESPAD_Report-FULL_091006.pdf
24 StataCorp. Stata Statistical Software: Release 11. College Station, TX: StataCorp LP; 2009.
25 Locatelli D, Sanchez Z, Opaleye E, Carlini C, Noto A. Socioeconomic influences on alcohol use patterns among private school students in São Paulo. Rev Bras Psiquiatr. 2012;34:193-200.
26 Wichstrøm T, Wichstrøm L. Does sports participation during adolescence prevent later alcohol, tobacco and cannabis use? Addiction. 2009;104:138-49.
27 Peretti-Watel P, Guagliardo V, Verger P, Pruvost J, Mignon P, Obadia Y. Sporting activity and drug use: Alcohol, cigarette and cannabis use among elite student athletes. Addiction. 2003;98:1249-56.
28 Tahara AK, Schwartz GM, Silva KA. Aderência e manutenção da prática de exercícios em academias. Rev Bras Ciência Mov. 2003;11:7-12.
29 Stewart B, Smith ACT. Drug use in sport - Implications for public policy. J Sport Soc Issues. 2008;32:278-98.
30 Santos MAGN, Nista-Piccolo VL. The sport and the school: the vision of physical education teachers from public. Rev Bras Educ Fis Esporte. 2011;25:65-78.
31 Martens MP, Watson JC, Beck NC. Sport-type differences in alcohol use among intercollegiate athletes. J Appl Sport Psycholgy. 2006;18:136-50.
32 Collins RL, Ellickson PL, McCaffrey D, Hambarsoomians K. Early adolescent exposure to alcohol advertising and its relationship to underage drinking. J Adolesc Health. 2007;40:527-34.
33 Cohn LD, Macfarlane S, Yanez C, Imai WK. Risk-perception: differences between adolescents and adults. Health Psychol. 1995;14:217-22.
34 Aleixandre NL, Perello Del Río MJ, Palmer Pol AL. Activity levels and drug use in a sample of Spanish adolescents. Addict Behav. 2005;30:1597-602.
35 Lisha NE, Sussman S. Relationship of high school and college sports participation with alcohol, tobacco, and illicit drug use: a review. Addict Behav. 2010;35:399-407.
36 Bray SR, Martin KA, Widmeyer WN. The relationship between evaluative concerns and sport competition state anxiety among youth skiers. J Sports Sci. 2000;18:353-61.
37 Laure P, Binsinger C. Adolescent athletes and the demand and supply of drugs to improve performance. J Sports Sci Med. 2005;4:272-7.
38 Gardner M, Steinberg L. Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: an experimental study. Dev Psychol. 2005;41:625-35.
39 Hoel S, Eriksen BM, Breidablik HJ, Meland E. Adolescent alcohol use, psychological health, and social integration. Scand J Public Health. 2004;32:361-7.
40 Kiesner J, Cadinu M, Poulin F, Bucci M. Group identification in early adolescence: its relation with peer adjustment and its moderator effect on peer influence. Child Dev. 2002;73:196-208.