Colloquium 2(58)/2025
ISSN 2081-3813, e-ISSN 2658-0365
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DOI: http://doi.org/10.34813/24coll2025

SPORT ACTIVITY AND ALCOHOL USE AMONG ADOLESCENTS. CHALLENGES TO THE EDUCATION AND PREVENTION MANAGEMENT

Aktywność sportowa a spożywanie alkoholu wśród młodzieży. Wyzwania dla edukacji i zarządzania profilaktyką

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Abstract

Research shows that patterns of alcohol use among young people are still alarming, despite changes in consumption trends reported in certain countries. Youth are more fragile when considering alcohol-related harm. Sport is commonly regarded a health-promoting behaviour and a protective factor against alcohol consumption in specific groups, such as youth. The objective of the literature review was to analyse the relationship between sport participation and alcohol consumption and the resulting conclusions for education and prevention management. A literature review of publications acquired from the electronic databases (JSTOR, ProQuest Central, and EBSCO) was conducted for the period from 2000 to 2019. A total of 600 unique records were identified and, after screening of titles and abstracts, 67 articles were examined for relevance. A final selection of full texts meeting eligibility criteria has given a sample of 32 documents. The results are heterogeneous. Twenty-three studies found a positive association between sports participation and alcohol consumption. In eight studies, no association was observed, and only one indicated a negative association. Longitudinal studies suggest that risky behaviours performed at a young age have significant consequences on drinking patterns in adulthood. The protective element of sport appears contentious, particularly for certain activities, such as team sports or athletics. Careful examination is recommended when preventive programs are planned. More research is essential to better understand the relationship between alcohol consumption, participation in youth sports, and health promotion alternatives.

Keywords: alcohol, sport, youth, alcohol-related harm, alcohol policies, underage drinking, binge drinking, alcohol, and sports.

Streszczenie

Badania pokazują, że wzorce spożywania alkoholu wśród młodszych osób nadal są alarmujące, pomimo zmian w trendach konsumpcyjnych odnotowanych w niektórych krajach. Najbardziej narażona na szkody wynikające z używania alkoholu jest młodzież. Sport jest często postrzegany jako zachowanie prozdrowotne i czynnik chroniący przed spożyciem alkoholu. Celem przeglądu literatury było poszukiwanie związków między zaangażowaniem w sport a spożywaniem alkoholu i wynikających z tego wniosków dla edukacji i zarządzania profilaktyką. Do przeprowadzenia przeglądu literatury wykorzystano elektroniczne bazy danych: JSTOR, ProQuest Central i EBSCO. W przeglądzie uwzględniono artykuły opublikowane w latach 2000–2019 w języku angielskim. Zidentyfikowano łącznie 600 unikalnych tekstów, spośród których po wstępnej selekcji dalszej analizie pod kątem przyjętych kryteriów kwalifikacji poddano 67 artykułów. Do ostatecznej analizy zakwalifikowano 32 artykuły. Przeprowadzone analizy dają niejednoznaczne wyniki. Dwadzieścia trzy badania wykazały pozytywny związek między zaangażowaniem w sport a spożywaniem alkoholu. W ośmiu badaniach nie zaobserwowano żadnego związku, a tylko jedno wykazało związek negatywny. Badania podłużne sugerują, że ryzykowne zachowania w młodym wieku mają znaczące konsekwencje dla wzorców picia w wieku dorosłym. Założenie o ochronnym oddziaływaniu uprawiania sportu wydaje się kontrowersyjne, zwłaszcza w przypadku niektórych rodzajów aktywności, takich jak sporty zespołowe czy lekkoatletyka. Zaleca się dokładne badanie, gdy planowane są programy profilaktyczne. Dalsze badania są niezbędne, aby lepiej zrozumieć związek między spożyciem alkoholu, uczestnictwem w sportach młodzieżowych i alternatywami promocji zdrowia.

Słowa kluczowe: alkohol, sport, młodzież, szkody związane z alkoholem, polityka alkoholowa, picie nieletnich, upijanie się, alkohol i sport.

FUNDING: The FYFA project has been financed by the European Commission's –3rd Health Programme – HP-PJ-2016. For more information, see: https://www.fyfaproject.eu/

Introduction

Research shows that patterns of alcohol use among young people (12-20) are still alarming, despite certain changes in consumption trends reported in particular countries (Johnston et al., 2013; Windle, 2016; Hnilicová et al., 2017; Livingstone, 2017; Lechner, 2020). Younger segments of the population appear to be more fragile when considering alcohol-related harm (Scafato et al., 2020).

Scientific research underlines the fact that substance abuse is deeply associated with absenteeism, dropout rate, and academic failure (Dawkins et al., 2006). On the contrary, sport activity is commonly seen as (an almost) unquestionable way to address health problems of children and adolescents (Loprinzi et al., 2012). Physical activity may play an important positive role in the health-related development of young people (Donnelly et al., 2007). It is not surprising that these two concepts are bound together in the concept of sports activity as a protective factor against "crime, delinquency, and deviance" (Hartmann & Massoglia, 2007, p. 485). This approach finds its reflection in school activities that treat sport during lessons and additional classes as preventive measures. This process is aided by decision makers of public policies and those responsible for allocating finances from public funds meant for youth sports municipality.

It may come down to an even simpler equation: "more sports activity would reduce alcohol usage", which seems to be embedded more in common sense thinking than in scientific research. This idea was already challenged in the 1980s when researchers faced the problem of finding evidence for such a correlation. Important criticism was intensified when the hypothesis that sport may increase the level of antisocial behaviours emerged in the 1990s (Hartmann & Massoglia, 2007). However, the assumption that sports participation is related to a personality that is more resistant to alcohol addiction is still patent in certain research (Kirkcaldy et al., 2002, p. 544), and therefore debate goes on (Veliz et al., 2017).

However, research that focuses (only) on the relationship between sports activity and substance use is surprisingly low. Today, we know that the picture obtained from the research is not black and white. All age range studies have revealed that the frequency of physical activity appears to correlate negatively with alcohol dependence (Omorou et al., 2013; Henchoz et al., 2014), but this relationship may be mediated by different factors, and may also vary depending on the intensity of alcohol use (Kalaydjian et al., 2009) and age (Kopp et al., 2015). The quality of engagement in sport is also of key importance (Trulson, 1986 in Dawkins et al., 2006; Bobrowski, 2007; Mahoney et al., 2004). Likewise, athletes would appear to be more vulnerable to the negative influence of substance use on their academic performance in a long-term perspective (Crosnoe, 2002). Systematic reviews and meta-analyses conclude that a simplified and uniform positive effect of sports activity on reducing alcohol and other substance consumption in young people is unlikely (Kwan et al., 2014).

To our knowledge, no meta-analysis or systematic reviews have focused solely on the triad: youth, alcohol, and sports, however, several projects on sports participation and substance use have included alcohol. Lisha and Sussman (2010) identified 29 studies from the period 1991-2007, but most of them were based on the samples of college students. Alcohol-related studies enclosed in this review revealed a positive correlation between sports involvement and alcohol usage. Furthermore, two articles noted that an increase in sports activities would be correlated with a decrease in alcohol consumption, but two other studies did not find a relationship between these variables. Three articles provided a more nuanced picture, suggesting a dependence on the type and gender of the sport. In the subsequent systematic review and meta-analysis of sports activity and substance use in adolescents, 24 alcohol-related studies were identified, of which 15 indicated a higher risk of alcohol consumption among athletes, six did not present correlation, and one reverse relationship. The meta-analysis (on selected articles with data available) revealed a significant positive correlation between sports participation and alcohol use (Diehl et al., 2012). Finally, a systematic review by Kwan et al. (2014) indicated 18 studies showing a positive association and only three in which no significant relationship was found.

The aim of the conducted literature review was to seek answers to the question of the relationship between involvement in sports and alcohol consumption among adolescents, as well as the factors that moderate these relationships. The results of the review were particularly interesting to us in the context of conclusions for education and prevention management.

Methods

A literature review was conducted in the following databases: JSTOR, ProQuest Central and EBSCO. Systematic searches of the literature published between 2000 and 2019 were carried out, and various combinations of the following keywords: sport, youth, athlete, alcohol. We also identified eligible studies by checking the reference lists of studies that met the criteria of the literature review.

The results of the searches of each database were exported to Covidence© database file and merged to identify and delete duplicates. Initially, the titles and abstracts of the identified studies were screened for eligibility. At this stage, specific articles described previous research, reviews, and commentaries were rejected. The full texts of the articles identified as "relevant" for the review were then downloaded and checked against the inclusion/exclusion criteria. Full text screening was completed by two researchers independently of each other. Disagreements were discussed at team meetings until consensus was reached.

Studies were eligible for inclusion if they met the following strict criteria:

1. Original studies that employed a quantitative research design.
2. Sample age eligibility: aged between 13 and 18 years (in some cases, we were able to identify age through the school level of the respondents only).
3. Included at least one objective or subjective measure of involvement in sports. Measures of participation in sports included: dichotomous variables to identify involvement in a sports activity, frequency of practicing sports, intensity of participation, number of sports, dichotomized school, and out-of-school participation.
4. Distinguished alcohol from other substances.
5. Included at least one objective or subjective measure of alcohol consumption. Measures of alcohol consumption included: dichotomous variables to identify alcohol usage, past 30 days alcohol usage, the frequency of heavy episode drinking (binge drinking, getting drunk).
6. Analysed the relationship between involvement in sports and alcohol consumption.

Results

600 articles matching the search criteria were identified in the databases, and their eligibility was evaluated. Based on a screening of titles and abstracts, 67 papers were selected for a full text review. Finally, 32 publications meet the eligibility criteria.

Results will be presented in this section according to three main themes: relationship between sport practice and the use of alcohol, the particularities of sport participation, and moderators.

Relationship between sport practice and alcohol consumption

A total of 23 of the 32 studies examined found that engagement in sports activities increases the tendency to drink alcohol, both in school and later life. Contrary results are scarce (Moulton et al., 2000; Pate et al., 2000; Kirkcaldy et al., 2002; Sabo et al., 2002; McHale et al., 2005; Leaver-Dunn et al., 2007; Mays et al., 2010; Badura et al., 2017). It should be noted that two of these papers (Kirkcaldy et al., 2002; McHale et al., 2005) used non-random samples, while Moulton and others (2000) measured consequences and not practices of drinking alcohol. Furthermore, one study suggested a decrease in alcohol use among sports practitioners (Thorlindsson & Bernburg, 2006).

The selected literature will be examined in the following part of the article.

The study by Bigelow (2008) is based on a vast-scale project in the United States (almost 40.000 respondents), where a positive correlation between physical activity and alcohol usage was found. Bigelow (2008) argued that significantly more of the variance of alcohol consumption is found/present among high-level practitioners when compared with low-level practitioners. Also, Crosnoe and Riegle-Crumb (2007) work on a life course model of alcohol use contained the identification of an athlete's status (here understood as someone engaged in at least one sport). Here, it was treated as a control variable only (see next section for other Crosnoe's work), but from the models presented in their article we learn that there is a positive influence of being considered an athlete on regular drinking after finishing high school. Being involved in a sports activity is a stronger predictor than academic achievements in high school or living with parents as a young adult, but weaker than gender or ethnicity. Similar conclusions were drawn from a Romanian study by Medruţ, where the authors noted that youth exercising in gyms or outdoors, consume alcohol more regularly than those who do not exercise. The authors reported a weak but significant correlation ($r = 0.108$) (Medruţ, 2015).

The results of Eccles and colleagues' (2003) longitudinal study shows that drinking and getting drunk was significantly higher among students engaged in team sports after controlling gender, class allocation, and intellectual abilities. This outcome was valid for both male and female athletes. Moreover, athletes reported having more friends using alcohol than students not engaged in team sports. Although Eccles and coauthors' samples were not random and represented a specific group of students (whites from

working- and middle-class families that originated in ten schools), their conclusions were supported by a later longitudinal study – this time random sample-based – by Hartmann and Massoglia (2007), which also revealed that sports participation in high school increases the probability of later-life drunk driving. Students who participated in any extra-curriculum sports activity were approximately 65% more likely to report driving drunk than their peers. The relationship is present even if factors such as prior crime and social background were controlled.

Does involvement in sports differ from the other extra-curriculum activities? Generally, extra-curriculum activities are seen as a factor reducing the risk of substance use and increasing academic performance (Feldman & Matjasko, 2005; Behtoui, 2019). However, Eccles et al. (2003) showed that involvement in sport does not decrease the level of substance use, while engagement in other extra-curriculum activities does. Darling (2005) indicated that while students involved in extra-curriculum activities were less plausible to use nicotine, marijuana, and other drugs, no statistically significant difference could be found when it came to alcohol usage.

Sport and alcohol use particularities

Hartmann and Massoglia (2007) found that the higher the students evaluated the importance of sport for them (on a four-grade ordinal scale) the higher the probability of reporting drunk driving was. There was an approximately 20% increase for each unit change. The analysis of the duration of the involvement led to the same conclusions. Every additional year would mean a 19% increase in the probability of driving drunk.

A longitudinal study by Mays et al. (2010) measured the intensity of sports engagement (by a number of disciplines in which respondents participated) and used a comprehensive set of indicators of alcohol use. Participation in sports without participation in other academic activities, significantly increased alcohol consumption in subsequent waves. Respondents who confirmed engaging in intensive sports activity were significantly more likely to report problematic alcohol use than those who engaged in it less frequently.

A slightly more complex indicator of sports activity was used in the ESPAD-based study by Peretti et al. (2002). The authors divided students (14-19 age-old) depending on the number of hours spent on out-of-school sports activity and distinguished between those registered and not registered in sports clubs, as well as types of sport (team, athletic, strength and combat, other individual sports). The intensity of participation in a sport activity coincides with repeated use of alcohol among boys and girls, but not with episodes of drunkenness. Interestingly, the most engaged athletes, both males and females, seemed also the most frequent users of alcohol, while the moderate practitioners were the lowest alcohol-consuming group. The relationship between sports engagement and alcohol use was apparently not linear, and both genders followed the same

pattern. No evidence was provided for the significance of club attendance, but some interesting dependencies were found with respect to the types of sport. Logistic regression models revealed that the probability of repeated use of alcohol decreased by 25% for moderate male sports practitioners compared to non-practitioners and increased by 58% for intense female practitioners. Association was significant for all types of sports, except strength and combat sports. Regular practice in athletic sports decreased the probability of repeated use of alcohol among females by 27%, while involvement in team sports increased it by 40% for girls and 24% for boys. Engagement in individual sports other than athletics caused a 29% increment in repeated alcohol usage for females and 20% for males. Recent episodes of drunkenness were significantly correlated with specific types of sport. For boys: team sports increased the risk by 25%, individual sport by 20%, and athletic sports decreased it by 24%. For girls, only one significant relationship was found: engagement in strength or combat sports, which increased the probability of being drunk by 48%. Another study based on these data reported a 127% increase in the probability of using alcohol 10 or more times a month, among girls practicing the sport at least four hours a week compared to non-athletes (Beck et al., 2001).

Similar conclusions were drawn in a Croatian study (Sekulic & Zenic, 2014), where alcohol consumption was found to be higher among athletes engaged in team sports, in contrast to those practicing individual sports. Furthermore, a recent Canadian study conducted by Boyes et al. (2017) underlined that boys and girls involved in team sports, or practicing both teams and individual sports, are more likely to report binge drinking (for boys RR = 1.33 and RR = 1.38, respectively; for girls RR = 1.21 and 1.23, respectively) (Boyes et al., 2017). This point is congruent with data from a Canadian study (Lau et al., 2019) focusing on female students. Engagement in team sports was associated with higher odds of using alcoholic beverages (OR = 1.51) (Lau et al., 2019). A Norwegian study (Wichstrøm & Wichstrøm, 2009) showed that while participation in team sports increases alcohol intoxication ($\beta = 0.06$) participation in endurance sports reduces risk ($\beta = -0.06$). The study by Eitle et al. (2003) revealed that playing football in high school significantly changes the probability of alcohol dependence or abuse. According to their data, an average unmarried white male has a 20% probability of abusing alcohol or being dependent on alcohol. But if he played football in high school, the likelihood would increase dramatically to 51%. Comparison between middle school and high school students led by Terry-McElrath et al. (2011) revealed that the substantial influence of participation in team sports activity starts to be significant in high school age. Interestingly, even in high schools, students engaged in exercising are less likely to use alcohol or to drink excessively, unless they start participating in sports, such as in athletic teams. Wichstrøm, Wichstrøm (2009) argued that engagement in team sports increases the risk due to the fact, that it enlarges social networks and therefore makes alcohol more accessible to the group.

However, a Czech study conducted by Badura et al. (2017) found no influence of participation in team sports, while participating in individual sports resulted in a significant reduction of the probability of alcohol use by over 50% (OR 0.42–0.48 depending on the model complexity) (Badura et al., 2017). Moore's research (2005) provided a more detailed typology of sports, revealing a more nuanced pattern. No significant associations were found for team sports or sport participation in both sexes. School-sponsored male swimmers were more likely to use alcohol and drink heavily, while out-of-school swimmers were less likely to drink heavily. Out-of-school tennis male players were significantly more likely to use alcohol occasionally and less likely to drink heavily. As for females, out-of-school dancers, cheerleaders, and gymnastics were more likely to use alcohol, while among their counterparts practicing at school, this tendency was reversed. A significant increase in the probability of drinking was observed among out-of-school surfers, and heavy drinking among skateboarders. Denham (2011) examined precise disciplines in his study. He measured involvement in baseball, basketball, football, soccer, track & field, and weightlifting among males and softball, basketball, soccer, swimming and diving, track & field, and volleyball among females. The results from his analysis, after controlling a set of variables including ethnicity and noncompetitive exercise, revealed that male students engaged in baseball, football, and weightlifting are more likely to consume more alcohol, while for women this association was significant for all the sports enclosed in study. Denham's conclusions show that a possible explanation should be given for each sport separately and that it is always based on the ethnic structure, fitness requirements and social rituals of the participants, such as the use of alcohol as a "rite of passage". Another study conducted by Veliz et al. (2017) revealed that a significant increase in alcohol consumption in early adulthood was significantly associated with participation in competitive high-contact sports at the end of high school.

The moderators

A longitudinal study by Dawkins et al. (2006) revealed that race and gender significantly mediate the effects of sports involvement on alcohol usage. They found statistically significant but weak, positive correlations between participation in a school sport and alcohol use for white males ($\beta = 0.08$), females ($\beta = 0.08$), no correlation for African-American males, and negative correlation ($\beta = –0.1$) for African-American females. It seems that sports activity could be considered as a risk factor for white students and a protective factor for Afro-American female students (Dawkins et al., 2006), even though the role of sport was smaller than patterns brought from the family or from peers. Similar results regarding race were obtained by Eitle and colleagues (2003). Taking part in sports would increase the probability of alcohol consumption ($R^2 = 0.26$) for white non-Hispanic males only. Neither for white females nor for other ethnic groups, this

relation was observed. In France, regional research proves that an increase in alcohol usage among athletes is more likely for males, attending technical schools (as opposed to academic ones), perceiving their health as poorer. Furthermore, the use of alcohol was also correlated with smoking cigarettes (Lorente et al., 2004). A more nuanced picture was presented by a Canadian study by Boyes et al. (2017). For their research, girls appeared to be more vulnerable to social involvement in sports, which significantly (RR = 1.57) increased the risk of binge drinking, while for boys a combination of high social and physical involvement was needed to increase this risk (RR = 1.48) (Boyes et al. 2017).

Another indication of gender role was provided by Crosnoe (2002). He found that at the beginning of high school, the level of alcohol use is similar for students involved in sport and those not involved in sport activities, but it starts to fluctuate quickly in the later years. There was a significantly higher increment in alcohol usage among female athletes than among other females or male athletes. The use of alcohol trajectories by female athletes "resembled boys more than other girls" (Crosnoe, 2002, p. 330). There were some visible consequences in Crosnoe's research. He noted that the risk of negative influence of alcohol consumption on academic achievement among female athletes was greater than among male athletes or students who were not involved in any extracurricular sports activity. In other words, female students involved in sports activity seem more vulnerable to the negative consequences of substance usage. It should be noted that the indicator used by Crosnoe measured heavy alcohol use and not occasional drinking (Crosnoe 2002; see: Feldman & Matjasko, 2005, p. 185). Similarly, a Croatian study found that alcohol consumption is negatively related to male participation in sports, but positively related to female sports achievements (Sekulic & Zenic, 2014). In contrast, a US study (Mays, Thompson, 2009) revealed that male athletes report heavier drinking (OR = 1.204) and drunk driving (OR = 1.288), but their alcohol initiation age is higher (OR = 0.704) than non-athletes. Female athletes were less likely to ever drink alcohol (OR = 0.807), to drink in the past months (OR = 0.843), and to drink for the first time at the age of 12 or earlier (OR = 0.824). Similarly, in a Ukrainian study, male students who are involved in sports appeared more likely to report drinking alcohol (OR = 5.21) but not recent drinking. No dependency was found for females (Hryhorczuk et al., 2019). In contrast, in high school graduates' research (Wetherill & Fromme, 2007) no significant differences between male and female athletes were identified. The frequency of drinking episodes was higher for athletes than non-athletes, both among women and men. Graduates engaged in sports reported larger amounts of alcohol consumed per episode.

Hoffmann (2006) identified the role of the school context in the relationship between alcohol use and sports participation. Although, as was found in other studies shown above, a significant increase in alcohol use was observed among white girls and boys only, the wealth of the community would play a significant role. An increase in

alcohol use was reported for female students from schools with a low mean SES only and for male students from high-SES schools.

Discussion

Despite the heterogeneous results, some general conclusions may be drawn from our review. The main points are as follows.

A total of 23 studies found a positive association between sports participation and alcohol consumption, no association was observed in 8 studies, only one article indicated a negative association. Sports activities did not appear to be a protective factor, and in certain circumstances (sports specifics, gender and ethnicity) which may increase the risk of alcohol consumption. Gender and ethnicity play a role as mediators. Consequently, a careful examination of the population structure is recommended when a prevention program is planned.

The longitudinal studies revealed that risky behaviours performed at an early (for example, high school) age have significant consequences in adulthood. Furthermore, the deterrence hypothesis (Eitle et al., 2003) was challenged by research carried out before the period considered for this review, but more recent studies brought some new information and particular interpretations. The reasons why participation in sports activities, particularly for team sports, increases the risk of alcohol use and why this influence is mediated by gender and ethnic identity may be answered from a sociological perspective. As noted by Crosnoe (2002), drinking alcohol by athletes may be interpreted as an attempt to maintain/increase their high social status among their peers.

The examined literature offers a puzzling panorama at times. Some authors suggested that sports, in particular teams' sports, are not protective factors (or could even become a risk factor) for alcohol prevention in youth. Should we then exclude sports activities from alcohol usage prevention at all? As underlined by Coakley (2017), positive outcomes can be expected for certain types of sports accompanied by the supervision of specified trainers / teachers. Sports may bring a reasonable alternative to risky behaviours, help to build a stronger relationship with positive role models who do not support involvement in substance consumption, and help schedule the leisure time (Miller et al., 1999). By structuring student leisure activities, sports make parental supervision easier (Darling, 2005). There is evidence from experimental research that even a short-term sport-based alcohol prevention may be successful if sport and prevention are bound together (Werch et al., 2003). Sports activities involving youth should be coached and supervised by properly trained adults. Believing that just allowing youths to do sport, or any other leisure activity, will reduce risky behaviour seems naïve (Mahoney et al., 2004; Hartmann & Massoglia, 2007, p. 500). However, better preventive and health promotion programs appear to be essential for younger segments of the population.

The statistically significant correlation between different forms of sports activity and alcohol consumption may be an example of ecological fallacy. Practising sports, team sports in particular, is a social activity; therefore, a complex set of factors should be taken into consideration. Young people practice under the influence of different, sometimes contradictory, sets of social norms crafted by different social groups: adult coaches and teachers, patterns acquired at home, peers – both engaged and not engaged in sports, media, and advertising, where a link between team sports and alcohol consumption is often strengthened. It seems that focusing solely on a quantitative strategy will not bring the whole picture, and therefore, a qualitative perspective is much needed in this context. We believe that further evaluation of prevention programs should be performed in ad hoc areas targeted to athletes and young people practicing sports in general. As noted by Terry-McElrath et al. (2011) interventions focusing on simply developing levels of general physical activity need to be examined and explored further if those have an impact on the consumption of specific substances, particularly alcohol, in younger populations, but also for specific young athletes. As mentioned above, other aspects should be considered, such as context and gender, but equally the role of other factors such as media and advertising and young people's opinions on its impact on consumption or avoidance. As mentioned earlier, more research is needed in this topic and very limited research complied with our initial query. It seems striking that no examples of programs that could be presented as good practices for prevention-based sports activities were identified within the body of the literature examined. The only exception was an experiment on sports consultations for students, described by Werch and colleagues (2003).

Limitations

This review has a number of limitations that are indicated below.

- Indicators. Both dependent and independent variables are dichotomized in some studies. Some authors do not distinguish the types of sports, the level of engagement on the one hand, nor the types of alcoholic beverages and the intensity of consumption on the other. In these cases, the one-dimensional interpretation of the outcome is at risk of having a "black box" approach.
- Causality. All the studies presented are based on correlation analyses. It should be emphasized that correlation does not prove causation and engagement in sports may be a contextual determinant only (Boyes et al., 2017).
- Change in time. The articles included in the review were published between 2000 and 2019. Within such a range, significant changes in consumption patterns may occur.

- Respondents' specifics. The studies have very diverse roots. This includes different educational systems, diverse social and ethnic background, and at times also different age ranges (e.g. middle school students versus high school students). General conclusions from such a heterogeneous sample should be treated with care.

Conclusions

The majority of the conducted reanalysis indicates a correlation between participation in sports and an increase in alcohol consumption, however, those results are not decisive and need for further studies. While developing sport activities in school and outside of it, appropriate preparations should be made for teachers regarding prophylaxis and its practical application in schools. Most studies indicate the influence of young people's involvement in sport on increasing alcohol consumption, but the results are not clear and require further research.

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