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Physical Activity Versus Alcohol Consumption Among Teenagers in Chosen Middle Schools From Cities Central And South-Western Poland*

Aktywność fizyczna a spożycie alkoholu wśród gimnazjalistów uczących się w wybranych szkołach miast położonych w centralnej i południowo-zachodniej Polsce

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A – research concept and design; **B** – collection and/or assembly of data; **C** – data analysis and interpretation; **D** – writing the article; **E** – critical revision of the article; **F** – final approval of article; **G** – other

Abstract

Background. Alcohol consumption is becoming increasingly popular among teenagers in Poland and affects younger and younger people. Many government promotional campaigns are aimed at reducing this phenomenon. There is an opinion that encouraging young people to practice sports and promoting a healthy lifestyle through sports and physical recreation could be helpful in solving this problem.
Objectives. The aim of this study was to determine the relationship between physical activity declared by the Junior High Schools students and alcohol consumption.
Material and Methods. The study was carried out on a group of 450 students from six Junior High Schools from central and south-western Poland. The Core Questions Global Youth Tobacco Survey (GYTS) – extended by authors of this paper with the descriptive part on the declared level of physical activity – was used to survey the teenagers.
Results. Physical activity is an important factor influencing alcohol consumption and consumption frequency by Junior High Schools students. The study has shown that physical activity is related to alcohol consumption declared by the Junior High Schools students – the number of days they drink alcohol and the number of days when they are drunk, particularly girls. In fact, girls are more prone to consuming large amounts of alcohol and get drunk, especially when they belong to a group of physically passive subjects. The lowest alcohol consumption has been observed in Junior High Schools students, who had declared irregular physical activity, but the highest and the most frequent one has been observed in students, who had declared physical passivity. The students, mostly boys, who declared the regular physical activity (they most commonly practiced sports), had not abstained from alcohol, especially beer and had got drunk often.
Conclusions. The physical activity may be an important factor in preventing excessive alcohol consumption. Participation in physical activity is beneficial especially to girls, since when they remain physically passive, they often turn to alcohol. However, one should take into account the type of physical activity and the nature of the effort, as the authors of similar studies point out (**Adv Clin Exp Med 2013, 22, 2, 273–281**).

Key words: alcohol consumption, junior middle school students, sport, recreation, physical activity, urban environment.

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Streszczenie

Wprowadzenie. Spożywanie alkoholu staje się w Polsce coraz bardziej popularne wśród młodzieży i dotyczy coraz młodszych osób. Wiele rządowych akcji promocyjnych jest nakierowanych na ograniczenie tego zjawiska. Istnieje opinia, że zachęcanie młodzieży do uprawiania sportu i promowanie aktywnego trybu życia przez udział w sporcie i rekreacji ruchowej może być pomocne w rozwiązaniu tego problemu.
Cel pracy. Określenie relacji między aktywnością ruchową deklarowaną przez uczniów gimnazjów a konsumpcją alkoholu.
Materiał i metody. Badania przeprowadzono na grupie 450 uczniów sześciu gimnazjów z terenu centralnej i południowo-zachodniej Polski. Do pozyskania opinii badanej młodzieży wykorzystano kwestionariusz ankietowy Core Questons Global Youth Tobacco Survey (GYTS) rozszerzony przez autorów niniejszego artykułu o część opisową dotyczącą deklarowanego poziomu aktywności fizycznej.
Wyniki. Aktywność fizyczna jest istotnym czynnikiem, mającym związek z ilością wypijanego alkoholu oraz z częstością jego spożywania przez młodzież gimnazjalną. W przeprowadzonych badaniach stwierdzono, że aktywność fizyczna ma związek z deklarowaną przez gimnazjalistów konsumpcją alkoholu – liczbą dni, kiedy piją alkohol oraz liczbą dni, kiedy są pijani, szczególnie w odniesieniu do grupy dziewcząt. To właśnie one są bardziej podatne na spożywanie dużej ilości alkoholu i upijanie się, szczególnie wtedy, gdy deklarują przynależność do grupy osób biernych ruchowo. Najmniej alkoholu spożywali gimnazjaliści, którzy deklarowali sporadyczną aktywność fizyczną, a najwięcej i najczęściej pili alkohol uczniowie deklarujący bierność ruchową. Uczniowie, głównie chłopcy, którzy deklarowali regularną aktywność fizyczną (najczęściej uprawiali jakiś sport) nie stronili jednak od alkoholu, a w szczególności od piwa, nierzadko też się upijając.
Wnioski. Aktywność fizyczna może być istotnym czynnikiem, który mógłby być skuteczny jako środek zapobiegania nadmiernemu spożyciu alkoholu. Udział w aktywności fizycznej jest korzystniejszy dla dziewcząt, gdyż te, pozostając bierne ruchowo, częściej sięgają po alkohol. Należy jednak brać pod uwagę rodzaj aktywności i charakter wysiłku, na co zwracają uwagę również autorzy podobnych badań (**Adv Clin Exp Med 2013, 22, 2, 273–281**).

Słowa kluczowe: spożycie alkoholu, młodzież gimnazjalna, sport, rekreacja ruchowa, aktywność fizyczna, środowisko miejskie.

Alcohol consumption in Poland is growing. According to GUS (Central Statistical Office) data, in 2011 it amounted to 13 liters-plus per capita per year. Given that high-proof alcohol is becoming more and more accessible because of its price – which increases much slower than the population revenue growth – more and more Poles currently drink too much alcohol. It is estimated that nearly 3 million people in Poland get drunk every day, including a growing group of young people for whom alcohol consumption has become fashionable [1]. According to the World Health Organization (WHO), the social consequences of excessive alcohol consumption put the excessive alcohol consumption in third place among the greatest risks to the health of the population. This demonstrates the importance of this phenomenon. There are about 800 thousand people living in Poland who are addicted to alcohol, and about 1.5–2 million children, who live in families with alcohol problems [2]. Alcohol consumption in Junior High Schools students in Poland has increased by 20% in 2000–2003 [3]. Moreover in 2010 use of vodka and other strong alcohol was declared by 61% of high school pupils in the age of 16 [4].

The three-year Junior High School period is related to the great changes in students' bodies and mentality and presence the passage to adolescence. These changes are related to the biological and psychological development. Adolescence is characterized by extreme attitudes and behaviors – the proverbial "shades of gray" do not exist, everything is either "black" or "white" – deep sensitivity, the search for identity, and the collapse of authority. Girls are affected by the sudden emotional changes, experiencing new desires and feelings, while boys are affected by increased aggressiveness, the desire to dominate or take the lead. Due to the size, speed and violence of the transformations taking place, adolescence is regarded as a deep crisis, which could be greatly alleviated by the people around – family, peer group, and teachers – but who may also exacerbate it. They are responsible to a large extent for whether the young man can go from upbringing to self-bringing and can be able to overcome the crisis in order to achieve the ability to set and execute adult tasks. If this process does not go correctly, then the young person can turn to psychoactive substances [5].

Physical activity is one of the most important elements of a healthy lifestyle, and its absence or insufficient quantity can lead to serious health disorders. It is particularly dangerous in the case of children and adolescents because the lack of physical activity can disrupt the proper development of the young generation [6]. Sports and physical education are factors supporting the development of children's and adolescents' socio-educational traits. Physical exercises usually eliminate addictions, for physiological reasons and because of the development of other values, when drinking (occasional and chronic) is not harmless to the athletes' exercise capacity [7].

Physical fitness as a part of a modern (healthy) lifestyle is increasingly incompatible with addic-

tions, which can be regarded as evidence of weakness and backwardness. In many countries (including Poland) one launches various programs in which physical activity is part of alcohol abuse prevention. For example, in Toledo (Spain) one has carried out research on alcohol abuse in Spanish young people; among 625 of respondents as much as 93% have contact with alcohol at the age of 16, giving various reasons for this [8]. Sports could be an alternative to alcohol, which can be highly questionable in light of the results provided by many reports. Opinions on the relationship between the level of physical activity in youth and the use of various drugs and alcohol are divided in fact. Several authors have proved the beneficial effects of physical activity on reducing or limiting alcohol consumption [9, 10]. For example, Brettschneider reports that the study shows that sports-active people are less prone to drugs, alcohol and smoking [9]. Woitas-Ślubowska [10] says that physical activity and sports can to be an alternative for youth who, when busy, become less prone to the negative influence of those around them. Woitas-Ślubowska, according to research carried out in Poland, has drawn a conclusion that promoting participation in competitive sports and LTPA (leisure time physical activity) could support the intervention campaigns addressed to men and focused on the reduction or elimination of smoking and alcohol consumption [10].

However, there are many opinions that young people who exercise regularly do not shun alcohol, and often abuse it [11–15]. Swiss researchers, Avois et al. [16], recognized it as a serious public problem, which requires dedicated education campaigns. University NCAA basketball coaches have had such training courses among others [17]. Zorzoli [18] even claims that the problem of alcohol consumption, smoking or drug use counteracting is similar to the fight against doping in sports problem. The thesis that sports restrict the use of various drugs and alcohol has also been largely confirmed in French studies by Laure et al. [19].

Opinions relating to the excessive consumption of alcohol concern not only people playing sports at a high level, as it seems earlier. Drinking alcohol usually begins in fact in high school, and sometimes even in junior high school [11]. Unfortunately, the consequences of alcohol consumption apply also to younger, lesser-known athletes from high schools. Such data may terrify in the context of promoting the upbringing in sobriety and education through sport ideas. That is why one should verify widely-held opinions and determine whether there is a real positive relationship between an active lifestyle and alcohol consumption.

The aim of this study was, therefore, an attempt to determine the relationship between the level of declared physical activity and the frequency, quantity and type of consumed alcohol. Although the studies were carried out on a small population of students, their results may indicate some trends existing in the Polish young people population.

Material and Methods

The study was carried out using a diagnostic survey (where a questionnaire survey was a tool). To obtain results the Core Global Youth Tobacco Questions Survey (GYTS) – modified by the authors – was used. The modification consisted in additional questions determining the physical activity declared by respondents and their attitude to smoking, alcohol drinking or drug use in the context of sports or other forms of physical activity.

The GYTS is intended to be performed on pupils aged 13–15 years [20]. Most students could complete the questionnaire within 35–45 minutes. The survey took place in selected classes. The students and parents were not informed about the survey because of the non-sensitive nature of the survey, the absence of invasive investigations or physical measurements, the allowance for declining participation given to all children, and the anonymous nature of the questionnaire ensuring confidentiality of all answers by all pupils. The research committee of the Ministry of Health and the Ministry of Education approved the study including the questionnaire and the fact that informed consent by parents was not necessary.

The research material includes students from six public Junior High Schools from cities situated in central and south-western Poland. They were: high school nr 2 in Oleśnica, high school nr 1 in Nysa, high school nr 3 in Dzierżoniów, high school nr 12 in Leśnica, high school nr 7 in Zgierz and high school nr 16 in Kielce. The choice of schools resulted from the cooperation between the University School of Physical Education in Wrocław and these schools, which were situated in cities of medium size (between 20 000 and 100 000 citizens). The amount of subjects was determined by statistical demands to use a representative group for regional range research [21]. Thus, the group of 500 subjects were taken into account. Finally 487 subjects agreed to complete the survey questionnaires but 43 questionnaires were incomplete and, therefore, were not included in this study; thus, finally 444 questionnaires were analyzed. They were pupils of classes 1–3 mainly in age of 13–16, but five subjects aged 17 were also involved in this research (mean age – 14.32, SD – 1.635). After analyzing the answers to questions about declared physical

activity of respondent students, the frequency of this activity, as well as preferred forms of activity the respondents were divided into 4 groups (Table 1). If a respondent declared participation in sport a minimum of three times a week, he or she was qualified to the ”sport” group. In case the person declared systematic physical activity or sport but less than three times a week, he or she was described as a “regularly physically active” subject. The third group – ”irregularly physically active” qualified subjects declared irregular activity of any sort. The last group was a compound of others subjects. Participation in obligatory PE lessons was not taken into consideration. The next analysis was carried according to these groups division.

The gathered data was statistically analyzed. The chi^2-test for independent samples available in Statistica 7.1 (Stat Soft Inc., St. Tulsa, USA) was used to determine the significance of differences between groups. All “p” values under 0.05 were considered significant.

Results

The number of students in groups indicates clearly that students rarely declared occasional physical activity. After the division into four groups according to the physical activity declared by the students the significant differences in the number of girls and boys in each group ($p < 0.05$) were also observed. It turned out that girls more often declare physical passivity. After analyzing the answers to several questions about the frequency, amount and type of consumed alcohol, the authors obtained very surprising results. One of them concerned the alcohol consumption frequency declared by the students. For example, it turned out that students from the “active irregularly” group drank alcohol in the last 30 days significantly less than subjects from the “passive”, the “athletes”, and the “regularly active” groups (Figure 1). Moreover, subjects from the “irregularly active” group did not drink alcohol at all in the last 30 days significantly often than subjects from the “passive” group.

Also, the declared by students number of days, when they were drunk, is related to the physical activity level of Junior High School students. Subjects from the “irregularly active” group declared the significantly greater number of days, when they were not drunk, in last 12 months, than subjects from the “passive”, the “athletes” and the “regularly active” groups (Figure 2). The differences, though smaller, are also observed between the group of “athletes” and the group of “physically passive” students and between the “regularly active” and the group of “passive” students.

Taking the type of consumed alcohol as the criterion of analyzes, one can also observe important relationships. A significant relationship between declared by students contact with beer and the physical activity level of Junior High Schools students ($chi^2 = 16.61$; $p = 0.001083$) was observed. Once more, students from the “irregularly active” group do not drink beer at all more often than the subjects from the “athletes” ($chi^2 = 12.76$; $p = 0.000467$), the “passive” ($chi^2 = 16.23$; $p = 0.000127$), and the “regularly active” ($chi^2 = 11.83$; $p = 0.000412$) groups.

What is also declared by the students is that contact with wine is related to the physical activity level of Junior High Schools students. Irregularly active subjects significantly more often do not drink wine at all than the athletes, the passive, and the regularly active students. It is observed also that students who declare participating in sports drink less wine than the “physically passive” students. Consumption of high-proof alcohol, namely vodka, is also related to belonging to a particular group of students, because the irregularly active students significantly more often do not drink vodka at all than athletes, passive and the regularly active subjects. “Athletes” drink less vodka than “passive” students, but more than the “irregularly active” subjects. The results above show that the least contact with alcohol have students declaring “irregular activity” and thus the smallest group in the study ($n = 35$) and the most dominated by girls (71%).

Discussion

According to the WHO, for men and women under the age of 35, the level of alcohol consumption with the lowest health risk is zero grams per day [22]. That is why contact of any sort with alcohol is undesired and should not be acceptable for teenagers. Thus, the ideal model is no alcohol at all. But if this contact happens, some preventive actions are to be introduced, conducted from other models that have been worked out. A conception described as an ”alternative model” is one of three traditional directions of preventive actions, beside health education and affective education [23]. The ”alternative model” was positively verified in work with youth from so called “high risk environments”. However, Bobrowski states [24] there is not enough proof of the effectiveness of such a model for the whole youth population. The same author shows the unreliability of organized sport exercises as a factor to decrease risky behavior among the youth (including psychoactive substance abuse). His study gave unexpected results

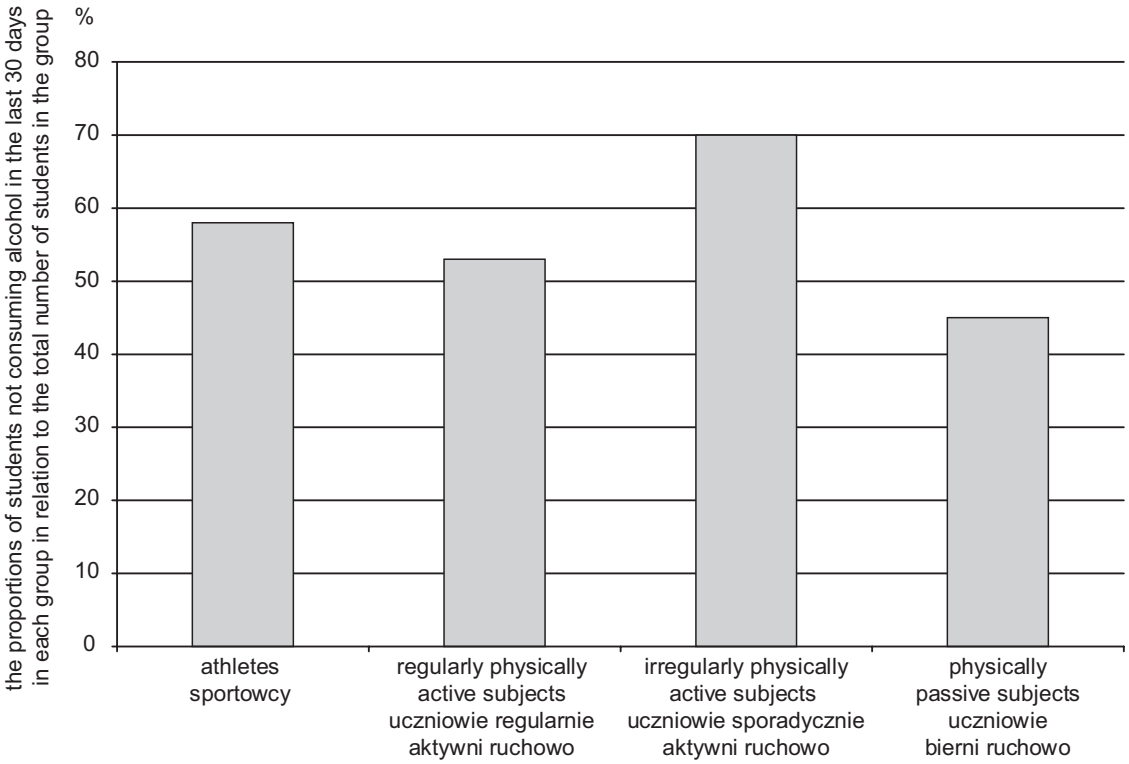

Fig. 1. The proportions of students not consuming alcohol in the last 30 days in each group in relation to the total number of students in the group

Ryc. 1. Proporcje uczniów niespożywających alkoholu w ostatnich 30 dniach w poszczególnych grupach w stosunku do ogółu uczniów z danej grupy

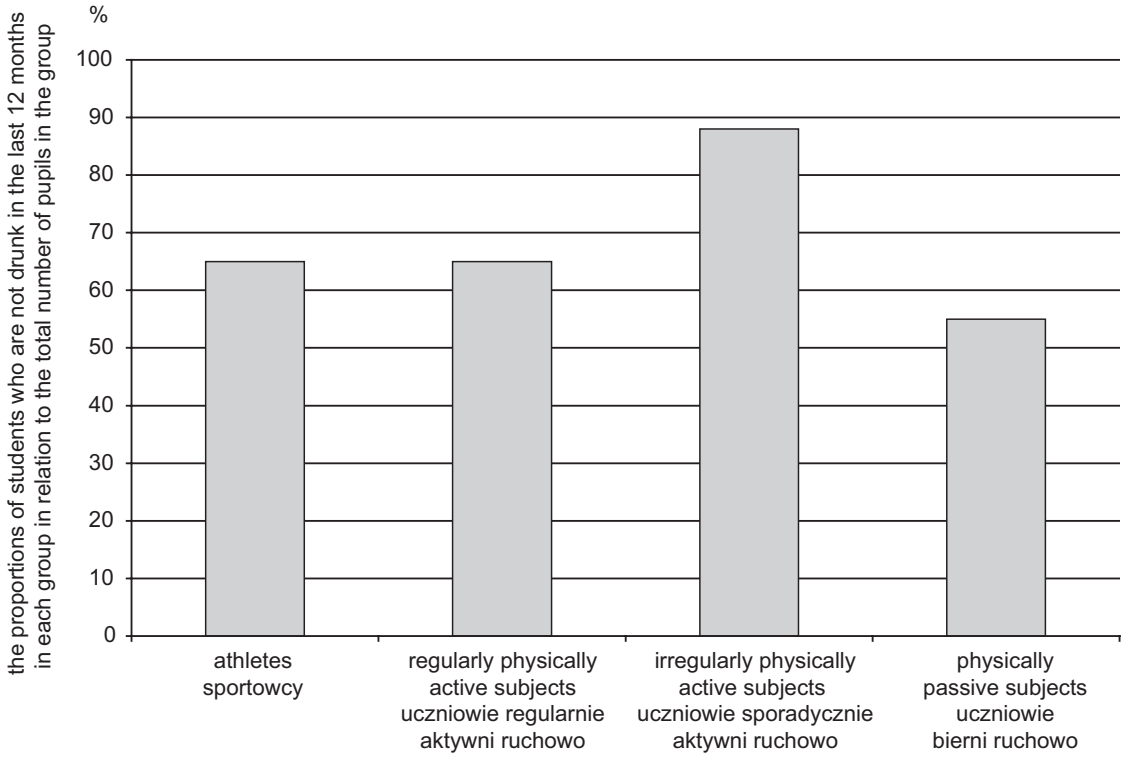

Fig. 2. The proportions of students who have not been drunk in the last 12 months in each group in relation to the total number of pupils in the group

Ryc. 2. Proporcje uczniów niebędących pijanymi w ciągu ostatnich 12 miesięcy w poszczególnych grupach w stosunku do ogółu uczniów z danej grupy

Table 1. The division of respondents into four groups according to the declared level of physical activity

Tabela 1. Podział badanych na cztery grupy według deklarowanego poziomu aktywności fizycznej

Athletes (Sportowcy)		Regularly physically active subjects (Uczniowie aktywni ruchowo)		Irregularly physically active subjects (Uczniowie sporadycznie aktywni ruchowo)		Physically passive subjects (Uczniowie bierni ruchowo)	
n = 147		n = 150		n = 34		n = 113	
girls	boys	girls	boys	girls	boys	girls	boys
n = 55	n = 92	n = 79	n = 71	n = 25	n = 9	n = 66	n = 47

Table 2. Selected responses, for which significant differences were observed on the declared quantity, frequency and type of alcohol consumed by young respondents

Tabela 2. Wybrane odpowiedzi, dla których zaobserwowano istotne różnice dotyczące ilości, częstości oraz rodzaju spożywanego alkoholu deklarowane przez ankietowaną młodzież

	Athletes (Sportowcy)	Regularly physically active subjects (Uczniowie aktywni ruchowo)	Irregularly physically active subjects (Uczniowie sporadycznie aktywni ruchowo)	Physically passive subjects (Uczniowie bierni ruchowo)	chi^2
Selected questions and answers (Wybrane pytania i odpowiedzi)	Group 1 %	Group 2 %	Group 3 %	Group 4 %	
How often do you drink beer now? (Jak często pijesz obecnie piwo?) I don't drink at all (Nie piję wcale)	46	45	76	39	p = 0.0011
How often do you drink wine now? (Jak często pijesz obecnie wino?) I don't drink at all (Nie piję wcale)	72	65	88	54	p = 0.0331
How often do you drink vodka or drinks now? (Jak często pijesz obecnie wódkę lub drinki?) I don't drink at all (Nie piję wcale)	66	66	88	59	group 3 versus 4 p = 0.0167
How many days, in the past 30 days, have you used alcohol? (W ciągu ostatnich 30 dni ile było takich, w których spożywałeś alkohol?) None (Żadnego)	56	53	68	45	group 3 versus 4 p = 0.0305
How often have you been drunk in the past 12 months? (Jak często byłeś pijany w ciągu ostatnich 12 miesięcy?) never (nigdy) yes, one time (tak, jeden raz) yes, 2–3 times (tak, 2–3 razy) yes, 4–10 times (tak, 4–10 razy) more than 10 times (więcej niż 10 razy) The difference between group 3 and others (Różnica między grupą 3 i pozostałymi) The difference between group 3 and 4 (Różnica między grupą 3 i 4) The difference between group 1 and 3 (Różnica między grupą 1 i 3) The difference between group 2 and 3	 63 19 9.5 3 5.5	 65 17 11 4 3	 83 11.7 5.3 0 0	 53 28 9 5 5	 p = 0.0150 p = 0.0000 p = 0.0128 p = 0.0144

when the amount of physical exercise and hours of sport were taken into account. It happened that pupils who were more aggressive than others spent one hour more on organized physical activities than less aggressive ones. Moreover, the higher intensity of these exercises the bigger was the percentage of youth abusing psychoactive substances [24]. It is necessary to add that the same results were gathered among French youth, where a very large group of students have been surveyed [25].

Alcohol is the most frequently consumed mind-altering substance among adolescents. In addition to its independent negative health effects and contributions to unintentional injury, alcohol abuse is identified as a correlate of chronic disease. There is a need to understand factors that may influence adolescents' decisions to engage in, or adopt, risky behavior and to assess differences in these influencing factors [26].

There are different views on the possibility of using sports for addiction prevention, especially to prevent alcohol consumption and abuse. Results of studies carried out in USA, in Michigan, indicate that children involved in sports are more likely to consume alcohol [12]. A similar position is represented by Gryczynski and Ward [13] who state in their report that students who participated in recreational sports used alcohol at a greater frequency and intensity than those who were not involved in recreational sports [13]. Research carried out also in USA, in Atlanta, on a sample of more than 8 thousand students shows that after taking into account time-invariant covariates, including demographics and other predictors of alcohol use, greater involvement in sports during adolescence was associated with faster average acceleration in problem alcohol use over time among youths who took part in only sports.

Drinking alcohol within the last 30 days was taken as a factor of relative frequent alcohol consumption. According to research results conducted by PARPA (Polish National Agency for Solving Alcohol Problems) alcohol was consumed by 65.8% of all surveyed third year high school students [27]. Research by Sierosławski at al. was nationwide in coverage, and it was much higher than the factor in the present study, where in the highest "drinking group" this factor was 45%.

The findings also suggest that the relationship between sports participation and problematic alcohol use depends on participation in sports in combination with other activities, but it does not differ between men/boys and women/girls [14], which is contrary to the results obtained by the authors of this work. Recent studies confirm above suggestions and the results of previous reports. Research review of existing literature has been conducted in 2009; it has been based on 34 peer-reviewed quantitative data-based studies completed on high school and college sports involvement and drug use. The studies reviewed suggest that participation in sport is related to higher levels of alcohol consumption, but lower levels of both tobacco smoking and illegal drug use [15].

Other authors stress the importance of the type of physical activity or sports for the alcohol abuse reducing. Martens et al. indicate significant sport type differences on alcohol consumption variables, with athletes from the sports of swimming and diving reporting the highest levels of alcohol consumption [28]. Their position is not isolated, Peretti-Watel et al. emphasize that there is a correlation between the type of sports activity and the propensity for alcohol abuse [25, 29]. However, these same authors stress the need to carefully look at the results of research conducted among young people, as these results differ significantly depending on the age and gender of respondents. The authors above examined in 1999, in France, over 10 thousand students aged 14–19; the study has been part of a national program [26].

Wichstrøm and Wichstrøm [30] claim that sports participation in adolescence, and participation in team sports in particular, may increase the growth in alcohol intoxication during late adolescent and early adult years, whereas participation in team sports and endurance sports may reduce later increase in tobacco and cannabis use, although practicing endurance sports, as opposed to technical or strength sports, predicted reduced growth in alcohol intoxication and tobacco use [30]. Maybe, the fact and the consequences of being part of a team are the reason for turning to stimulants, because other authors show the importance of team membership and significant relationships between group membership and the amount of alcohol and marijuana use [31]. Whereas some sports seem to be protective (e.g. endurance and fitness sport) for risky alcohol use, the majority are not [32].

The results of research carried out by the authors of this study confirm the adverse phenomenon observed in recent years also by other researchers and practitioners of sports, namely the increase in alcohol consumption by athletes and people who declare going in for sports. The presence of alcohol advertisements on many sports arenas are certainly not without significance for the intensification of this phenomenon. For example, in the United States, where research has been carried out, the clear relationship between the sports sponsorship by the alcohol producers and the number of young people – consumers of these products – is observed. A lot of reports published in scientific journals in recent years concern

this subject. In one of them authors of the paper discuss the negative effects of alcohol sponsorship on the sports image and athletes' health. It references a study by Kerry O'Brien et al., published in a 2009 issue of the "Addiction" journal. Findings allow inferring that alcohol sponsorship is associated with alcohol problems in athletes [29].

From the perspective of the present study, and the studies of other researchers, the authors should consider young sportspeople as a group for special treatment and thus they need educational protection and preventive action. The fact that teenagers take part in physical exercise organized in schools and sports clubs, very spontaneously gives the unique opportunity for preventive actions.

The authors concluded that physical activity may, but toned not be an important factor, which could be effective mean of the alcohol abuse prevention. The physical activity as a mean of the alcohol abuse prevention is more favorable to girls, since those who remain physically passive (inactive) use alcohol more often.

References

[1] **Gil R, Dziedziczko A:** Nałogi młodzieży szkół gimnazjalnych i ponadgimnazjalnych, In: Pacjent przedmiotem troski zespołu terapeutycznego. Tom 1. Eds.: Krajewska-Kułak E et al. Akademia Medyczna, Białystok 2005, 133–142.

[2] Problemy alkoholowe w rodzinie (Alcohol problems in family). Wydawnictwo Państwowej Agencji Rozwiązywania Problemów Alkoholowych. Rozdział VI s. 67. http://www.parpa.pl/download/rozdzial06.pdf

[3] **Bobrowski K:** Adolescents' free time activities and substance use. Med Wieku Rozw 2003, **7**, 91–104.

[4] Opinie i diagnozy nr 19. Młodzież 2010 (Opinions and diagnosis. Youth 2010) Centrum badania opinii społecznej. Krajowe biuro ds. przeciwdziałania narkomanii. Warszawa 2011

[5] **Król T:** Wędrując ku dorosłości. Przewodnik do życia w rodzinie dla klas I–III gimnazjum. (Towards adulthood. Guidbook for life in the family) Wydawnictwo Rubikon. Kraków 2009.

[6] **Eberhardt A (ed.):** Fizjologiczne Podstawy Rekreacji Ruchowej. Almamer, Wyższa Szkoła Ekonomiczna, Warszawa 2007, 5.

[7] **Gutgesell M, Canterbury R:** Alcohol usage in sport and exercise. Addict Biol 1999, 4, 373–383.

[8] **Orgaz Gallego MP, Segovia Jimenez M, Lopez de Castro F, Tricio Armero MA:** Alcohol consumption in Toledo schoolchildren: reasons and alternatives. Aten Primaria 2005, 36, 303–305**.**

[9] **Brettschneider WD:** Efekty psychologiczne i korzyści społeczne zaangażowania w sport i aktywność fizyczną (Psychological effects and social benefits of involvement in sport and physical activity). Implikacje dla wychowania fizycznego. Światowy kongres wychowania fizycznego, Berlin 1999, Wydawnictwo AWF Wrocław 2002, 61–66.

[10] **Woitas-Ślubowska D:** Influence of Participation in Leisure Time Physical Activity on Tobacco and Alcohol Consumption among Former Athletes and Non Athletes. J Hum Kinet 2009, 21, 119–126.

[11] **Schwenk TL:** Picie alkoholu wśród młodzieży. Med. Dypl. 2001, 10, 173–182.

[12] **McCarthy-Flynn L:** Sports and alcohol. Family Life 1999, 26–30.

[13] **Ward B, Gryczynski J:** Alcohol Use and Participation in Organized Recreational Sports Among University Undergraduates. J Am Coll Health 2007, 56, 3, 273–280.

[14] **Mays D, DePadilla L, Thompson NJ, Kushner HI, Windle M:** Sports Participation and Problem Alcohol Use: A Multi-Wave National Sample of Adolescents. Am J Prev Med 2010, 38, 5, 491–498.

[15] **Lisha, Nadra E, 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.

[16] **Avois L, Robinson N, Saudan C, Baume N, Mangin P, Saugy M:** Central nervous system stimulants and sport practice. Br J Sports Med 2006, 40, 16–20.

[17] **Shirazi A, Tricker R:** Current drug education policies in NCAA institutions: perceptions of head athletic trainers. J Drug Educ 2005, 35, 29–46.

[18] **Zorzoli M:** Doping and performance among adolescent athletes. Rev Med Suisse Romande 2003, 123, 93–96.

[19] **Laure P, Lecerf T, Friser A, Binsinger C:** Drugs, recreational drug use and attitudes towards doping of high school athletes. Int J Sports Med 2004, 25, 133–138.

[20] **Faeh D, Viswanathan B, Chiolero A, Warren W, Bovet P:** Clustering of smoking, alcohol drinking and cannabis use in adolescents in a rapidly developing country. BMC Public Health 2006, 6, 169. Published online 2006 June 27. doi: 10.1186/1471-2458-6-169.

[21] **Bazarnik J, Grabiński T, Kąciak E, Mynarski S, Sagan A:** Marketing research. Methods and computer software, Canadian Consortium of Management Schools, Akademia Ekonomiczna w Krakowie, Warszawa – Kraków 1992, 16.

[22] **Anderson P, Baumberg B:** Alkohol w Europie – perspektywa zdrowia publicznego – raport dla komisji europejskiej. (Alcohol in Europe – a public health perspective – report for the European Union). Institute of Alcohol Studies, Brussel. ec.europa.eu/health-eu/doc/alcoholineu_sum_pl_en.pdf – Belgia

[23] **Ostaszewski K:** Skuteczność profilaktyki używania substancji psychoaktywnych (Psycho-active substances abuse preventive efficiency), Warszawa. Wydawnictwo Naukowe Scholar 2003.

[24] **Bobrowski K:** Free time activities and adolescents' risk behaviours. Alkohol Narkoman 2007, 20, 3, 267–287.

[25] **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, 6, 707–716.
[26] **Leaver-Dunn D, Turner L, Newman BM:** Influence of sports' programs and club activities on alcohol use intentions and behaviors among adolescent males. J Alcohol Drug Educ 2007, 51, 3, 57–72.
[27] **Sierosławski J:** Europejski program badań ankietowych w szkołach ESPAD (European questionnaire research program in schools ESPAD). Instytut Psychiatrii i Neurologii. 2007 http://www.parpa.pl/index.php?option=com_content&task=view&id=239&Itemid=186
[28] **Martens MP, Watson II JC, Beck NC:** Sport-Type Differences in Alcohol Use Among Intercollegiate Athletes. J Appl Sport Psychol 2006, 18, 2, 136–150.
[29] **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, 1249–1256.
[30] **Wichstrøm T, Wichstrøm L:** Does sports participation during adolescence prevent later alcohol, tobacco and cannabis use? Addiction 2009, 104, 1, 138–149.
[31] **Grossbard J, Hummer J, LaBrie J, Pederson E, Neighbors C:** Is Substance Use a Team Sport? Attraction to Team, Perceived Norms, and Alcohol and Marijuana Use Among Male and Female Intercollegiate Athletes. J Appl Sport Psychol 2009, 21, 3, 247–261.
[32] **Gmel G, Kuendig H, Daeppen JB:** Sport and alcohol: An emergency department study in Switzerland. Eur J Sport Sci 2009, 9, 11–22.
[33] **O'Brien K:** Alcohol and sport are unhappy bedfellows. New Scientist 2009, 204, 2734, 7.

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