

## SELECTED PERSONALITY- RELATED DETERMINANTS OF ALCOHOL BEVERAGE CONSUMPTION AMONG POLISH ELITE TEAM SPORT ATHLETES

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### ABSTRACT

**Background.** Many studies documented an increase in the alcohol consumption among athletes, particularly among representatives of some disciplines, such as team sports.

**Objective.** The aim of the study was to analyse the consumption of alcohol beverages among Polish elite team sport athletes, depending on their sex, age and selected personality traits (general self-efficacy and health locus of control).

**Material and Methods.** The study included 517 Polish team sport athletes (251 women and 266 men). The subjects were examined with an original alcoholic beverage intake survey, General Self-Efficacy Scale (GSES) and Multidimensional Health Locus of Control Scales (MHLC). Relationship between the intake of alcoholic beverages and explanatory variables (sex, age, psychological traits) was determined on multivariate analysis of variance and analysis of regression.

**Results.** Beer turned out to be an alcoholic beverage which the surveyed athletes consumed most often (a few times per month on average). Wine, spirits and alcoholic cocktails were consumed less often (once a month on average). Multivariate analysis showed that consumption of wine, including dry wine, increased significantly with age of the study subjects ( $p < 0.001$ ). Women significantly less frequently considered beer and vodka ( $p < 0.001$ ), whereas men significantly less often preferred wine ( $p < 0.05$ ). The level of general self-efficacy did not influence the intake of alcoholic beverages ( $p > 0.05$ ). Lower levels of Internality were associated with less frequent consumption of beer ( $p < 0.001$ ), and lower scores for Powerful Others with lower intakes of dry wine ( $p < 0.001$ ) and vodka ( $p < 0.01$ ). Lower scores for Chance showed a significant association with lesser preference for alcoholic cocktails ( $p < 0.05$ ).

**Conclusions.** The frequency and structure of otherwise relatively limited intake of alcoholic beverages among elite team sport athletes were influenced by their sex, age and health locus of control.

**Key words:** *athletes, team sports, alcoholic beverages, personality traits, self-efficacy, health locus of control*

### STRESZCZENIE

**Wprowadzenie.** Liczne prace wskazują na wzrastające spożycie alkoholu przez sportowców, ze wskazaniem na szczególnie jego rozpowszechnienie w niektórych dyscyplinach sportu, w tym w grach zespołowych.

**Cel.** Celem badań była analiza częstości konsumpcji napojów alkoholowych w zależności od płci i wieku oraz wybranych cech osobowości (uogólnionego poczucia własnej skuteczności i umiejscowienia poczucia kontroli zdrowia) w grupie sportowców wyczynowo trenujących gry zespołowe.

**Material i metody.** Badania przeprowadzono w grupie 517 polskich sportowców trenujących gry zespołowe (251 kobiet i 266 mężczyzn). W badaniach zastosowano: autorski kwestionariusz częstości spożycia napojów alkoholowych oraz Skalę Uogólnionej Własnej Skuteczności (GSES) i Wielowymiarową Skalę Umiejscowienia Kontroli Zdrowia (MHLC). Ocena częstości konsumpcji napojów alkoholowych w zależności od analizowanych zmiennych (płci i wieku oraz cech psychologicznych) przeprowadzono z zastosowaniem wieloczynnikowej analizy wariancji z analizą regresji.

**Wyniki.** Spośród napojów alkoholowych badani sportowcy ogółem najczęściej (średnio kilka razy w miesiącu) spożywali piwo, a rzadziej (średnio raz w miesiącu) wino, napoje wysokoprocentowe i koktajle alkoholowe. Analiza wieloczynnikowa wykazała, że wraz z wiekiem badanych osób wzrastało spożycie wina, w tym wina wytrawnego ( $p < 0,001$ ). Kobiety istotnie rzadziej wybierały piwo i wódkę ( $p < 0,001$ ), a mężczyźni wino ( $p < 0,05$ ). Poziom uogólnionej własnej skuteczności nie wykazywał związku z częstością spożycia napojów alkoholowych ( $p > 0,05$ ). Niski poziom wewnętrznej kontroli zdrowia był istotnie związany z mniejszą częstością konsumpcji piwa ( $p < 0,001$ ), a niski poziom kontroli zdrowia umiejscowionej w innych osobach był istotnie związany z mniejszą konsumpcją wina wytrawnego ( $p < 0,001$ ) i wódki ( $p < 0,01$ ). Niski poziom kontroli zdrowia umiejscowionej w przypadku był istotnie związany z mniejszą konsumpcją koktajli alkoholowych ( $p < 0,05$ ).

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**Wnioski.** Relatywnie ograniczona skala konsumpcji napojów alkoholowych wśród sportowców wyczynowo trenujących dyscypliny zespołowe wykazywała zróżnicowaną częstość i strukturę w zależności od płci i wieku oraz umiejscowienia poczucia kontroli zdrowia.

**Słowa kluczowe:** sportowcy, gry zespołowe, napoje alkoholowe, cechy osobowości, poczucie własnej skuteczności, poczucie kontroli zdrowia

## INTRODUCTION

Drinking alcohol by athletes causes metabolic, somatic and psychological dysfunction, increases the incidence of injuries and lowers the effectiveness of training [5, 23, 32, 33].

Athletes usually consume alcohol occasionally or for stimulation. Frequently their drinking patterns are the result of cultural influences [24]. Since 2004, alcohol is included on the "List of Prohibited Substances and Methods". However, many authors reported an increase in alcohol consumption among athletes [1, 4, 20, 24, 34, 35], especially in certain sports disciplines, inter alia team sports [21, 24].

Health behaviors of various populations are determined by a wide spectrum of socioeconomic, cultural and personality-related factors. General self-efficacy and health locus of control play an important role among personality traits that determine health culture of a human being. Self-efficacy, an optimistic belief on the self-ability to achieve one's objectives, allows to predict intentions and activities in various spheres, including health behaviors. Self-efficacy correlates positively with internal health locus of control. The latter is also a measure of self-efficacy; this distinguishes it from external health locus of control, i.e. the disbelief that one can function effectively and the sense of dependence on external environment, inter alia good luck, chance or other persons [15].

We undertook this study to explain a role of the abovementioned personality traits as predictors of health behaviors, specifically alcohol consumption, among athletes. The aim of the research was to analyze the intake of alcohol beverages among elite team sport athletes, and a relationship between this parameter and sex, age, general self-efficacy and health locus of control.

## MATERIAL AND METHODS

The study was conducted in 2010-2013 and included a group of Polish elite team sport athletes practicing handball (n=172), volleyball (n=169), football (n=125) and basketball (n=51). The majority of the participants were handball (33.27%) and volleyball players (32.69%); the proportions of football (24.18%) and basketball (9.86%) players were relatively lower. The study group included 251 women aged 19-34 years (mean 22.59±3.27 years) and 266 men between 19 and 34 years of age (mean 23.72±4.02). Years of sport experience ranged from 3 to 22 (mean 11.21±3.42) for women and from 3 to 23 (mean 12.10±3.95) for men.

The intake of alcohol beverages was determined with an original survey based on a 7-item scale: a few times per day (7 points), once a day (6 points), 4-6 times per week (5 points), 2-3 times per week (4 points), a few times per month (3 points), once a month (2 points) and rarer/never (1 point). Mean alcohol beverage intake in the study group was interpreted as follows: a few times per day (7.00-6.50 points), once a day (6.49-5.50 points), 4-6 times per week (5.49-4.50 points), 2-3 times per week (4.49-3.50 points), a few times per month (3.49-2.50 points), once a month (2.49-1.50 points) and rarer/never (1.49-1.00 points). Prior to the proper study, the survey was validated in a group of 23 participants, with a retest after 6 weeks. The reliability of the survey turned out to be high with the Pearson's test-retest correlation coefficient  $r=0.5578$  ( $p<0.01$ ).

The study included also two validated questionnaires used in psychology and health promotion. The level of general self-efficacy was determined with the General Self-Efficacy Scale (GSES) by Schwarzer, Jerusalem and Juczyński [15]. The scale includes 10 statements that are scored in such way that the higher the global GSES score (ranging from 10 to 40 points), the stronger one's sense of self-efficacy. Based on the median raw GSES score for our participants, we classified them as presenting with lower and higher levels of self-efficacy. Median GSES score for both women and men taking part in the survey was 31. Health locus of control was determined with the Multidimensional Health Locus of Control Scales (MHLC) developed by Wallston and adapted into Polish by Juczyński [15]. The scale includes 18 diagnostic statements characterizing the health locus of control in three dimensions: Internality (MHLC-I), Powerful Others (MHLC-P) and Chance (MHLC-C), reflecting influences of the subject himself/herself (I), other people (P), chance and other extrinsic factors (C). High MHLC-P and MHLC-C scores correspond to more external health locus of control. The scores for each scale may range between 6 and 36 points with higher values corresponding to greater contribution of a given factor to one's health. In line with the established methodology [15], based on median MHLC-I, MHLC-P and MHLC-C scores, the subjects were stratified into subgroups presenting with higher and lower values of these dimensions. Median raw scores for women and men were as follows: 27 and 28 for MHLC-I, 22 both for MHLC-P, 18 and 17 for MHLC-C.

Statistical analysis was conducted with PQStat ver. 1.4.2.324 software and R-package. The intake of alcoholic beverages was expressed with descriptive statistics (arithmetic mean, standard deviation, median, upper and lower quartile, minimum and maximum). Relationship between this parameter and cumulative effect (interaction) of explanatory variables (sex, age, psychological traits: general self-efficacy and health locus of control) was tested on multivariate analysis of variance and analysis of regression. The results of all the tests were considered significant at  $p < 0.05$  and highly significant at  $p < 0.001$ .

## RESULTS

Beer turned out to be an alcoholic beverage which the surveyed athletes consumed most often (a few times per month on average). Wine, spirits and alcoholic cocktails were consumed less often (once a month on average) (Table 1).

The relationships between explanatory variables and intake of alcoholic beverages are summarized in Table 2. Multivariate analysis showed that both con-

sumption of wine in general ( $p < 0.001$ ) and the intake of dry wine ( $p < 0.001$ ) increased significantly with age of the study subjects. Women considered beer ( $p < 0.001$ ) and vodka ( $p < 0.001$ ) significantly less frequently than men, and significantly more often consumed wine ( $p < 0.05$ ). The level of general self-efficacy was not associated with the intake of alcoholic beverages ( $p > 0.05$ ). Lower levels of Internality turned out to be associated with less frequent consumption of beer ( $p < 0.001$ ), and lower scores for Powerful Others correlated with lower intakes of dry wine ( $p < 0.001$ ) and vodka ( $p < 0.01$ ). Lower scores for Chance showed a significant association with lesser preference for alcoholic cocktails ( $p < 0.05$ ). The analysis of effect size (eta-squared values) showed that age explained the largest proportion of variance in wine intake (7.62%) of all the factors included in the multivariate model. Athlete's sex explained 11.37% of variance in the frequency of beer consumption. Among the MHLC dimensions, Internality contributed to 3.11% of variance in beer intake, Powerful Others to 2.96% of variance in dry wine and Chance to 1.06% of variance in alcoholic cocktail consumption.

Table 1. Intake of alcoholic beverages among elite team sport athletes, stratified according to their sex (descriptive statistics)

Alcoholic beverage	Sex	Descriptive statistics						
		X	SD	Min	Q25	Me	Q75	Max
Beer	F	2.62	0.79	1	2	3	3	4
	M	3.42	1.07	1	3	3	4	6
	Total	3.03	1.03	1	2	3	4	6
Wine (overall)	F	2.13	0.65	1	2	2	3	4
	M	1.92	0.92	1	1	2	2	5
	Total	2.02	0.81	1	1	2	2	5
Red dry wine	F	1.60	0.73	1	1	1	2	4
	M	1.72	0.77	1	1	2	2	4
	Total	1.66	0.75	1	1	2	2	4
Spirits (vodka)	F	1.92	0.68	1	1	2	2	3
	M	2.28	0.66	1	2	2	3	4
	Total	2.10	0.69	1	2	2	3	4
Alcoholic cocktails	F	2.16	0.61	1	2	2	3	3
	M	2.09	0.73	1	2	2	2	4
	Total	2.12	0.68	1	2	2	3	4

X – arithmetic mean, SD – standard deviation, Min – minimum, Me – median, Max – maximum, Q25 – lower quartile, Q75 – upper quartile, K – women, M – men

Table 2. Influence of explanatory variables on the intake of alcoholic beverages among elite team sport athletes

Alcoholic beverage	Explanatory variable	B	Error of B	-95% CI	+95% CI	<i>p</i>	Eta-squared
Beer	Age	0.0130	0.0120	-0.0105	0.0365	0.2773	0.0025
	Sex (F : M)	-0.3354	0.0434	-0.4206	-0.2502	<b>0.0000</b>	0.1137
	GSES (lower : higher)	-0.0696	0.0432	-0.1545	0.0153	0.1081	0.0055
	MHLC-I (lower : higher)	-0.1660	0.0428	-0.2502	-0.0818	<b>0.0001</b>	0.0311
	MHLC-P (lower : higher)	0.0241	0.0430	-0.0604	0.1085	0.5757	0.0006
	MHLC-C (lower : higher)	-0.0543	0.0432	-0.1392	0.0306	0.2091	0.0033
Wine	Age	0.0624	0.0101	0.0426	0.0822	<b>0.0000</b>	0.0762
	Sex (F : M)	0.1801	0.0365	0.1085	0.2518	<b>0.0000</b>	0.0497
	GSES (lower : higher)	-0.0247	0.0363	-0.0961	0.0467	0.4964	0.0009
	MHLC-I (lower : higher)	0.0206	0.0360	-0.0502	0.0914	0.5673	0.0007
	MHLC-P (lower : higher)	-0.0133	0.0361	-0.0842	0.0577	0.7139	0.0002
	MHLC-C (lower : higher)	0.0182	0.0363	-0.0531	0.0896	0.6161	0.0005
Dry wine	Age	0.0394	0.0090	0.0218	0.0571	<b>0.0000</b>	0.0397
	Sex (F : M)	-0.0256	0.0325	-0.0894	0.0383	0.4321	0.0013
	GSES (lower : higher)	-0.0137	0.0324	-0.0773	0.0500	0.6732	0.0003
	MHLC-I (lower : higher)	-0.0106	0.0321	-0.0737	0.0526	0.7425	0.0002
	MHLC-P (lower : higher)	-0.1215	0.0322	-0.1848	-0.0582	<b>0.0002</b>	0.0296
	MHLC-C (lower : higher)	0.0475	0.0324	-0.0161	0.1111	0.1430	0.0045
Vodka	Age	0.0035	0.0089	-0.0139	0.0210	0.6919	0.0003
	Sex (F : M)	-0.1645	0.0322	-0.2277	-0.1013	<b>0.0000</b>	0.0531
	GSES (lower : higher)	0.0004	0.0320	-0.0625	0.0634	0.9899	0.0000
	MHLC-I (lower : higher)	-0.0219	0.0318	-0.0843	0.0405	0.4907	0.0010
	MHLC-P (lower : higher)	-0.0971	0.0319	-0.1597	-0.0345	<b>0.0024</b>	0.0195
	MHLC-C (lower : higher)	-0.0167	0.0320	-0.0797	0.0462	0.6016	0.0005
Alcoholic cocktails	Age	-0.0034	0.0082	-0.0194	0.0127	0.6808	0.0003
	Sex (F : M)	0.0323	0.0296	-0.0259	0.0905	0.2759	0.0025
	GSES (lower : higher)	0.0258	0.0295	-0.0321	0.0838	0.3814	0.0016
	MHLC-I (lower : higher)	-0.0482	0.0292	-0.1056	0.0093	0.1003	0.0057
	MHLC-P (lower : higher)	0.0333	0.0293	-0.0244	0.0909	0.2576	0.0027
	MHLC-C (lower : higher)	-0.0661	0.0295	-0.1240	-0.0082	<b>0.0254</b>	0.0106

F – women, M – men, GSES – General Self-Efficacy Scale, MHLC – Multidimensional Health Locus of Control Scales (I – Internality, P – Powerful Others, C – Chance), B – intercept, CI – confidence interval, *p* – test probability, Eta-squared – effect size

Interpretation of relationships presented in the table: + in front of B intercept corresponds to higher intake of a given beverage in women, older persons, individuals presenting with lower levels of the analyzed personality traits (GSES and MHLC scores), – in front of B intercept corresponds to lower intake of a given beverage in women, older persons, individuals presenting with lower levels of the analyzed personality traits (GSES and MHLC scores)

## DISCUSSION

This study showed that consumption of alcoholic beverages is a component of lifestyle in Polish elite athletes, and the frequency of drinking is modulated by sex, age and personality (specifically, health locus of control).

Low-alcoholic beverages, especially beer (consumed a few times per month on average), turned out to be the most commonly consumed alcohols in the study group. Other alcoholic beverages were chosen less often, once a month on average. The abovementioned structure of consumption, as well as relatively

low popularity of alcoholic beverages among Polish elite team sport athletes should be considered positive findings in the context of harmful effects exerted by alcohol on health and physical capacity. Also the authors of previous studies documented occasional consumption of alcohol among athletes [24]. However, available evidence suggests that the popularity of alcoholic beverages among athletes varies. For example, the studies conducted in the United States and New Zealand showed that consumption of alcohol among athletes from college and university sports teams was higher than among their peers [25]. Similar tendency was documented in another American study in which student athletes were shown to be more prone to drink alcohol than their peers [4]. The vast popularity of alcoholic beverages was also recorded among French student athletes [20]. However, different tendencies were documented in other study populations, including French, Spanish and Slovenian athletes [19, 27, 36]. Australian [22] and French [24] studies demonstrated high alcohol consumption among football players, especially after games. A Polish study, including professional athletes practicing various sport disciplines, showed that up to 95% of the participants drank high-alcoholic drinks at least several times a month, and 83.7% consumed low-alcoholic beverages with similar frequency [7]. Another Polish study, conducted in a group of professional team sports players from Krakow, showed that 47.3% of the participants consumed alcoholic beverages at least once a week [8]. Less frequent consumption of alcoholic beverages (less than several times a month on average) was documented among youth footballers (15-17 years of age) from Krakow football clubs [9]. Previous research on alcohol drinking patterns and its determinants among professional Polish athletes showed that the most popular mode of consumption corresponds to the so-called German model (33.2%), i.e. frequent consumption of beer; the least popular mode in turn represented the so-called Scandinavian model (1.8%), i.e. consuming large quantities of alcohol in one sitting [31].

The hereby documented variance in the frequency and structure of alcohol consumption, namely greater popularity of beer and vodka among men and wine among women, is consistent with the tendencies observed in other groups of athletes, including Polish [31] and South African sportsmen [29]. More frequent consumption of alcoholic beverages among men was also reported among Slovenian non-professional gymnasts [36] and among American college athletes [3]. However, another study, conducted among professional athletes practicing various sport disciplines, did not demonstrate a significant gender-specific difference in alcohol consumption frequency [7]. The abovementioned less frequent consumption of alcoholic beverages among female athletes should be considered

a positive finding in view of postulated higher toxicity of alcohol for women [33]. However, unfavorable effects of moderate (10-30 g/day) and high (>30 g/day) alcohol consumption on blood triglyceride levels were also documented among men [30].

The hereby documented tendency to an age-related shift in the structure of consumed alcoholic beverages, specifically more frequent consumption of wine, including a dry wine, and generally low intake thereof, should be assessed positively owing the well-established cardioprotective properties of red dry wine. Moderate consumption of alcohol, especially red wine, was shown to lower the risk of cardiovascular diseases, due to optimization of blood lipid profile, decrease in blood viscosity and activity of pro-inflammatory cytokines [2]. Our findings are consistent with previously published data on the dietary behaviors in this group of athletes. Previous studies showed that age of male and female team sport athletes correlates positively with dietary intake of some recommended products, such as vegetable juices, mineral water, moderate- and low-glycemic-index foods and meals rich in unsaturated fatty acids; further, an inverse correlation was observed between age and dietary intake of high-glycemic-index cereal products, atherogenic animal fats and trans fatty acid isomers [12].

The otherwise relatively low intake of alcoholic beverages among athletes taking part in our study was not modulated by their general self-efficacy levels. Also another study conducted in a group of team sport athletes did not document an effect of general self-efficacy on the consumption of alcoholic beverages overall [9, 14]. However, an American study showed a tendency to more frequent consumption of alcohol among female students presenting with lower self-efficacy levels [18]. Other studies confirmed that general self-efficacy may serve as a predictor of various health behaviors. Individuals with higher levels of this trait were more likely to make rational dietary choices; this phenomenon was observed in various populations, inter alia among athletes [12, 13, 14]. An association between stronger self-efficacy and drinking refusal was previously reported by *Oei et al.* [26]. This evidence is not surprising owing characteristics of this personality trait, namely the fact that it promotes more optimistic attitudes and expectations in terms of health [15].

The relationships between health locus of control and alcoholic beverage intake were not straightforward. Individuals with more internal health locus of control declared drinking beer more often than the subjects with lower levels of this trait. However, owing relatively infrequent consumption of beer in general, its slightly alkalizing properties, stimulatory effect on diuresis and thus, elimination of post-exercise metabolites, this finding does not necessarily put into question the role of Internality as a determinant of more

rational dietary choices [8, 12]. The fact that male and female athletes with more external health locus of control related to others significantly more often declared drinking of both dry red wine and vodka is somehow surprising. Taking into account that these two beverages exert totally different effects on human health, one can hardly conclude on the role of external health locus of control related to others as a determinant of alcohol consumption. In contrast, quite obvious relationship was observed in the case of external health locus of control related to chance: individuals who scored higher on this scale consumed alcoholic cocktails significantly more often than the subjects with lower levels of this trait. This corresponds well with the beliefs of individuals presenting with this health locus of control; such persons believe that their health is determined primarily by extrinsic factors related to chance, and consequently the role of their own choices is fairly limited. Our findings are also consistent with the results of previous studies that showed a tendency to less rational health behaviors of individuals with more external locus of control related to chance [10, 11, 12]. In other studies of team sport athletes, health locus of control did not exert a significant effect on the intake of alcoholic beverages overall [8, 9]. However, these studies did not focus on the consumption of specific alcoholic beverages, included junior football players [9] and were based on a survey with Delta questionnaire which determines general sense of control rather than distinguishes between the external control related to others and chance [8,9]. Furthermore, the tendencies to more rational health behaviors that have been documented in some studies were not always straightforward owing complex and multifaceted character of this domain [15]. One study analyzing the role of health locus of control as a predictor of alcohol consumption and tobacco smoking showed that these two activities were undertaken more often by individuals with higher levels of externality [17].

Markedly limited intake of alcohol should constitute a key component of health culture in athletes, since consumption of alcoholic beverages may markedly deteriorate the effects of training for motor skills and psychological function. Previous studies documented numerous detrimental effects of alcohol, also with regards to the processes being directly connected to exercise abilities [32, 33]. A study of adult Americans showed that reduced alcohol intake was associated with higher levels of physical activity and more rational dietary choices [6]. Both our findings and previously published data imply that athletes should be educated on detrimental effects of alcohol, especially spirits, on exercise abilities and the course of post-exercise restitution. The educational activities should be aimed at elimination of alcohol consumption, especially during the periods of competition and biological

renewal. Importantly, these activities should be adjusted for psychological characteristics of athletes, which was also suggested by other authors [16, 28].

## CONCLUSIONS

1. The frequency and structure of otherwise relatively limited intake of alcoholic beverages among elite team sport athletes were influenced by their sex, age and health locus of control.
2. The least rational choices in terms of alcoholic beverage intake, specifically consumption of vodka, were more prevalent among persons with stronger external health locus of control related to other persons, more frequently in men than in women.
3. The most rational choices, namely consumption of red dry wine, were more common among older athletes presenting with stronger external health locus of control.
4. Educational activities aimed at development of a negative attitude towards alcoholic beverages, especially spirits, and complete elimination thereof from diet, particularly during the periods of competition and biological renewal, should be adjusted for factors determining the prevalence of alcohol consumption in this population, including personality traits.

## Conflict of interest

*The author declares no conflict of interest.*

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