

Selected behaviors and health awareness of athletes practicing martial arts

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Summary

Introduction. The aim of the research was to find the answers to the questions of: which health-related behaviors are displayed by martial arts athletes, especially by champions, and what relationships there are between their health-related behaviors and their perception of health-threatening factors.

Material and methods. The study (between 2009 and 2011) involved 134 athletes practicing martial arts. The diagnostic survey method was employed, with the use of the questionnaire technique. In the statistical examination of the results the trait frequency, the χ^2 independence test, and the multiple correspondence analysis were employed.

Results. Most athletes did not smoke (83.6%). The athletes practicing taekwondo declared consumption of alcoholic beverages (85.7%), while those practicing wrestling were most often non-drinkers (87.0%) ($p=0.0000$). Athletes with the highest sporting level (champions) mostly did not smoke (93.3%) and abstained from drinking alcoholic beverages (59.1%). It was observed that those who regularly smoked more often failed to perceive tobacco consumption as a health risk (92.3%) ($p=0.0000$). Athletes who frequently drank alcoholic beverages did not see this behavior as dangerous to their health (41.7%) ($p=0.0000$).

Conclusions. Athletes who display health-oriented behaviors are highly aware of smoking and frequent consumption of alcoholic beverages being health-threatening factors. In reducing the risk factors related to smoking and frequent consumption of alcoholic beverages, martial arts—based on a specific philosophy and lifestyle that requires a reflective attitude towards one's own conduct and respecting the rules of fair play—should become a means of developing health-oriented behaviors among youth.

Introduction

Practicing qualified sport is not only connected with observing sporting rules, but also with the choice of a healthy lifestyle which is conducive to achieving high athletic performance. Choices concerning lifestyle are of great importance, especially in relation to martial arts [1]. Today, many varieties of martial arts are practiced, which attract and fascinate with their mystery, oriental origin, and specific rules, being propagated worldwide e.g. in motion pictures [2,3]. Practicing martial arts is connected not only with a high fitness level, but also with the values of the philosophy of budo, the choice of certain patterns of behavior and the path leading to the achievement of the pursued objectives [4,5,6]. These factors — conducive to the multilateral and comprehensive development of one's personality — make martial arts different from many other sports, despite similar principles of sports rivalry [4,7]. Studying behaviors and health awareness is also significant in search of models of athletes which could be shown to young people as worthy of imitation [4,6,8].

Epidemiological studies have shown negative effects of smoking and multiplied risk of developing neoplastic diseases in smokers [9]. According to the Global Adult Tobacco Survey, conducted in 2009-2010 in Poland, 33.5% of adult men and 21.0% of adult women smoke daily (27.0% of Poles in total) [10]. Ex-smokers represent 16.3% of the population. 14.0% of high school students admit smoking: 22.0% of boys and 10.0% of girls [11].

Consumption of alcoholic beverages, especially by sportspeople, increases susceptibility to injury and incidence of painful muscle spasms, reduces tolerance to effort, slows reaction time and decreases the safety of physical exertion [12]. In light of European health questionnaire survey conducted in 2009 (25.0% of respondents reported abstinence, while alcohol use was declared by 85.0% of men and 65.0% of women [13]. One in five men and one in 22 drinking women admit drinking alcohol more frequently than once a week. Conservative estimates indicate that high-alcohol beverages are being replaced by low-alcohol ones.

Conscious choice and individual responsibility for one's own health is extremely important for athletes' lifestyles, especially for those practicing martial arts, combining the physical with the spiritual improvement. The aim of the research, initiated in 2009 [14] is to find the answers to the questions of: which health-related behaviors are displayed by martial arts athletes, especially by champions, and what relationships there are between their health-related behaviors and their perception of health-threatening factors.

The following hypotheses were assumed:

1. Athletes with a high sporting level (martial arts champions) often exhibit behaviors conducive to health and the achievement of high athletic performance.
2. Perceiving smoking and consumption of alcoholic beverages as health-threatening factors affects athletes' choice of health-oriented behaviors.

Material and methods

The study was conducted between 2009 and 2011 and embraced 134 martial arts athletes, including 96 men and 38 women. The subjects practiced karate (23 people from the Karate Club "Samurai" – Szczecin), taekwondo (14 people from the Sports Club "Tornado" – Szczecin), wrestling (23 people from the Country Sports Club "Fenix" from Stargard Szczecinski) and amateur sumo (74 participants of the Poland Championships in Świdwin and Warsaw and the Poland Cup in Gorzow Wielkopolski). The majority of the respondents were athletes under 18 years of age (56.7%), most often practicing wrestling. Taekwondo athletes were among the oldest. The respondents were mostly city dwellers (82.8%). There was a small number of inhabitants of rural areas. The subjects were characterized by a secondary education or lower (87.3% were school or university students). 12.7% of the respondents had a higher education.

Athletes with a high sporting level represented 33.6% of the respondents (World, European and Poland Champions, and those with medal positions). Most championship titles in the study groups had sumo and karate athletes: (52.7% and

21.7% respectively). Over $\frac{2}{3}$ were individuals who had no achievements at this level. There were three distinct training period groups identified: below 4 years (38.8%), between 4 and 10 years (43.3%), and above 10 years (17.9%). About 1/4 of the subjects practiced martial arts daily, 56% trained between 3 and 4 times a week, and the remaining 19% - 1 or 2 times a week.

In the study the diagnostic survey method was applied with a questionnaire on health-oriented lifestyle of athletes practicing martial arts [14, 15]. In the statistical analysis of the results the trait frequency and the χ^2 independence test were used. In order to show selected relations in a graphic and combined manner, after application of the χ^2 statistics and ascertaining trait independence, the multiple correspondence analysis was employed. The variables in all their categories were presented on the plane. Comparison of the data from the figure with those from the table containing coordinates of two dimensions, combined with the χ^2 independence test, enables reaching more general conclusions about the interrelations of all the variables and their categories [16].

Results

Most athletes did not smoke (83.6%) (Table 1). Those who practiced taekwondo stopped smoking more often but the differences were statistically insignificant. Among those who had ever smoked there were 18.4% of the women and 15.6% of the men. Women less often gave up the habit (5.3% and 7.3% respectively), but the differences were not significant. 85.7% of the athletes practicing taekwondo declared consumption of alcoholic beverages ($p=0.0000$ for the c^2 test); frequent consumption was reported by almost 64.3% of them (1-2 times a week or more often) ($p=0.0000$ for the c^2 test). Those who practiced wrestling, on the other hand, were most often non-drinkers (87.0%).

Athletes with the highest sporting level (champions) mostly displayed more beneficial health-related behaviors: they did not smoke (93.3%) ($p=0.0435$) and abstained from drinking alcoholic beverages (59.1%) (Table 2). Subjects with no cham-

Table 1. Smoking cigarettes and consumption of alcoholic beverages by athletes practicing martial arts (χ^2 independence test)

Health-related behaviors	Martial arts				n=134	%	p for χ^2 test
	Amateur Sumo	Karate	Wrestling	Taekwondo			
Smoking cigarettes							
Non-smokers	85.1	87.0	82.6	71.4	112	83.6	
Regular smokers	9.5	13.0	8.7	7.2	13	9.7	statistically insignificant
Ex-smokers	5.4	-	8.7	21.4	9	6.7	
Consumption of alcoholic beverages							
No	45.2	43.4	87.0	14.3	65	48.9	
Yes	54.8	56.5	13.0	85.7	68	51.1	0.0000
Frequency of alcoholic beverages consumption							
Non-drinkers	45.1	50.0	87.0	14.3	65	50.0	
Rarely*	32.4	36.7	8.7	21.4	36	27.7	0.0000
Often**	22.5	13.3	4.3	64.3	29	22.3	

* - consuming alcoholic beverages 1-2 times a month or more rarely;

** - consuming alcoholic beverages 1-2 times a week or more often.

Table 2. Smoking cigarettes and consumption of alcoholic beverages in relation to athletic achievements (χ^2 independence test)

Health-related behaviors	Athletic achievements		Total		p for χ^2 test
	Champions	Others	n	%	
Smoking cigarettes					
Non-smokers	93.3	78.7	112	83.6	
Smokers	2.2	13.5	13	9.7	
Ex-smokers	4.5	7.9	9	6.7	0.0435
Consumption of alcoholic beverages					
Non-drinkers	59.1	45.4	65	50.0	
Drinking rarely	25.0	29.1	36	27.7	
Drinking often	15.9	25.6	29	22.3	statistically insignificant

Table 3. Smoking cigarettes and consumption of alcoholic beverages in relation to martial arts athletes' perception of threats to their own health (χ^2 independence test)

Health-related behaviors	Perception of health threats		Total		p for χ^2 test
	Yes	No	n	%	
Smoking cigarettes					
Non-smokers	27.6	2.6	51	75	
Regular smokers	51.7	92.3	9	13.2	
Ex-smokers	20.7	5.1	8	11.8	0.0004
Frequency of alcoholic beverages consumption					
Non-drinkers	75.8	27.1	38	46.9	
Rarely	18.2	31.3	21	25.9	
Often	6.0	41.7	22	27.2	0.0000

Table 4. Data for Figure 1 along with explanations

Arrangement of column and row coordinates for n=80							
Symbol	Explanation	Dimension 1	Dimension 2	Symbol	Explanation	Dimension 1	Dimension 2
Wrestling	Wrestling	-1.971	-1.143	1b	Non-smokers	-0.296	-1.652
4a	Perceiving alcohol consumption as a health threat	-1.173	-0.498	Wrestling	Wrestling	-1.971	-1.143
2a	Perceiving smoking cigarettes as a health threat	-0.919	-0.751	Taekwon-do	Taekwondo	1.072	-0.802
3a	Non-drinkers	-0.812	0.627	2a	Perceiving smoking cigarettes as a health threat	-0.919	-0.751
A	Champions	-0.756	0.897	1c	Ex-smokers	-0.175	-0.647
Sumo	Amateur sumo	-0.338	0.227	4a	Perceiving alcohol consumption as a health threat	-1.173	-0.498
1b	Non-smokers	-0.296	-1.652	B	Other athletes	0.378	-0.449
1c	Ex-smokers	-0.175	-0.647	3c	Drinking often	0.770	-0.399
1a	Smokers	0.061	0.308	3b	Drinking rarely	0.201	-0.330
3b	Drinking rarely	0.201	-0.330	Karate	Karate	0.568	0.091
B	Other athletes	0.378	-0.449	4b	Not perceiving alcohol consumption as a health threat	0.503	0.213
4b	Not perceiving alcohol consumption as a health threat	0.503	0.213	Sumo	Amateur sumo	-0.338	0.227
2b	Not perceiving smoking cigarettes as a health threat	0.532	0.435	1a	Smokers	0.061	0.308
Karate	Karate	0.568	0.091	2b	Not perceiving smoking cigarettes as a health threat	0.532	0.435
3c	Drinking often	0.770	-0.399	3a	Non-drinkers	-0.812	0.627
Taekwon-do	Taekwondo	1.072	-0.802	A	Champions	-0.756	0.897

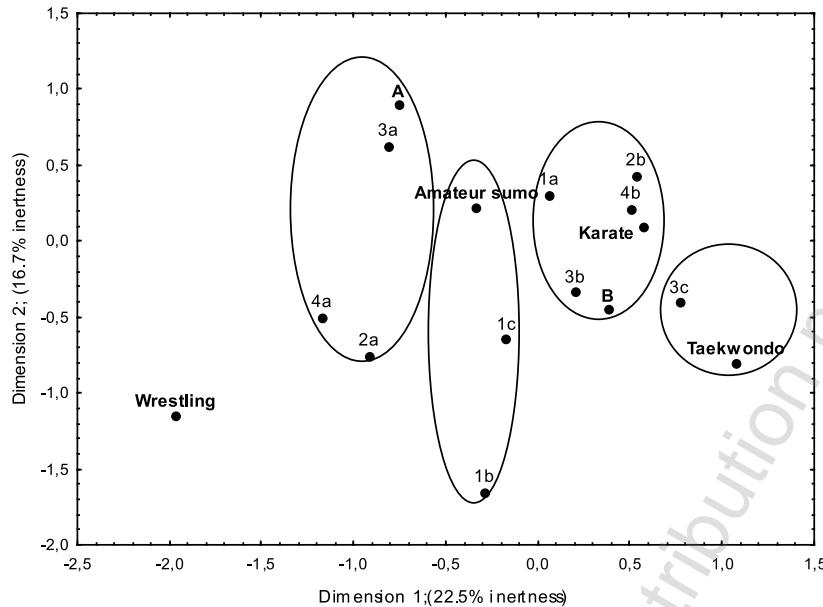


Fig. 1. Relationships between health-related behaviors and risk factors and the sporting level and type of martial arts practiced. See Table 4 for the data for the figure along with explanations of symbols

pionship titles more often declared smoking (13.5%) and frequent consumption of alcoholic beverages (25.6%).

It was observed that those who regularly smoked more often failed to perceive tobacco consumption as a health risk (92.3%) ($p=0.0000$ for c^2 test) (Table 3). A similar situation occurred in relation to alcohol consumption. Athletes who frequently drank alcoholic beverages did not see this behavior as dangerous to their health (41.7%) ($p=0.0000$ for c^2 test).

Relationships between health-related behaviors and perception of health risks and the sporting level and type of martial arts practiced by the respondents are shown in Fig. 1. The data for the figure along with explanations of symbols are provided in Table 4.

It was found that:

1. Athletes with the highest sporting level (medalists) (A) were more often non-drinkers (3a) and saw the consumption of alcoholic beverages and smoking as threats to their health: (2a and 4a respectively);
2. Amateur sumo wrestlers were mostly non-smoking athletes (1b) and ex-smokers, who had used to smoke every day but had quit (1c);
3. Martial arts athletes with no championship titles (B) and karate athletes were characterized by smoking cigarettes (1a), not considering smoking a threat to their health (2b), infrequent consumption of alcoholic beverages (1-2 times a month or more rarely) (3b);
4. Taekwondo athletes were among those who consumed alcoholic beverages frequently (1-2 times a week or more often);
5. Athletes who practiced wrestling were in peripheral position, far from any of the groups analyzed.

Discussion

In pursuit of high athletic performance one of the necessary conditions to be met by athletes is the avoidance of behaviors which reduce their physical fitness and efficiency [17]. Complying with sporting rules also involves constant choices of values and behaviors in everyday life, i.e. choosing a particular lifestyle [4,6,18]. The hypothesis that athletes who achieve a high level of sporting excellence smoke cigarettes more rarely and avoid drinking alcoholic beverages was confirmed, but this group is not totally free from addictions either [19].

Smoking does not occur so commonly among martial artists as in Polish youth population. It concerned 16.4% of the athletes (aged 15 to 33), including ex-smokers who accounted for 6.7%. Studies on Polish youth showed that the proportion of young daily smokers was higher and increased steadily from 16% at age 15 to about 25.0% among eighteen-year-olds [20]. According to the results of the GATS smoking affected 23.4% of men and 12.1% of women aged 15-19, and 36% of men and 27.2% of women aged 20-29 [10].

Negative relationships between smoking and sporting activities have been shown in a study of a selected group of runners. The number of smokers decreased with the increasing number of training hours [21]. There were also fewer smokers among female students who had taken exercise several times in the previous two weeks [22]. Young people who engaged in physical activity, less often took up the smoking habit, proportionally to the intensity, frequency and duration of exercise [23]. Research into health-related behaviors of 707 athletes practicing eastern martial arts found that tobacco was smoked by 15.9% of the population [24]. Unfortunately,

the authors of the study did not analyze how many of the athletes had given up smoking.

Female martial art athletes were found to take up smoking slightly more often than men, and they were less likely to give up the habit. This behavior, justified by girls' conviction that smoking is conducive to weight reduction, had been observed in previous research [25,26]. Such beliefs were also expressed in the interviews by the respondents, especially those practicing amateur sumo.

Physical activity is also associated with other health-oriented behaviors (in addition to avoiding smoking – abstinence from alcohol or consumption of alcoholic beverages in moderate amounts and frequency) [27, 28, 29].

In the present study, 50% of athletes practicing martial arts reported abstinence, compared to 25.0% of the Polish population [13]. In light of some research findings, physical activity is associated with moderate consumption of alcoholic beverages [30], and it is believed that practicing sport at a competition level might help to avoid alcohol abuse [31]. According to other research, there is no apparent correlation in this regard. There was no significant reduction in consumption of alcoholic beverages among physically active people [32]. With increasing training experience, the number of subjects declaring consumption of alcoholic beverages among those who practiced martial arts grew [24]. It should be assumed that in this last case age had a greater impact on consumption of alcoholic beverages, as in relation to studied taekwondo athletes. In comparisons of alcoholic beverages consumption by 343 athletes and 400 students not practicing sport, in similar age categories, it was found that athletes drank less and more rarely [33].

On the other hand, the correlation between smoking and not perceiving this behavior as a threat to one's own health is high. A similar situation occurred regarding frequent consumption of alcoholic beverages (1-2 times a week or more often) and the perceived lack of health hazards. These results demonstrate the deficiency in health awareness among martial arts athletes. The hypothesis that the perception of risk factors as health-threatening or not health – threatening af-

fests the choice of either health – oriented or anti – health behaviors was confirmed. Research findings confirm lower awareness of health threats involved in consumption of alcoholic beverages among sportspeople, compared with Physical Education students [33].

In all studies, researchers underline difficulty in determining the prevalence of alcoholic beverages consumption. It was encountered in the present study as well. In the question about consumption of alcoholic beverages, the majority reported that they did not drink. However, a comparison of these answers with those to the next question, concerning frequency of alcohol consumption, revealed that subjects who considered themselves non-drinkers consumed alcohol 1-2 times a month or less frequently. In this situation, they were classified as rarely consuming alcoholic beverages. An analysis of prevalence of anti-health behaviors among martial arts athletes requires extraordinary inquisitiveness and caution in drawing conclusions.

Conclusions

1. Martial arts athletes with a high level of sporting excellence more often display health-oriented behaviors: they smoke cigarettes more rarely and avoid drinking alcoholic beverages.
2. Athletes who display health-oriented behaviors are highly aware of smoking and frequent consumption of alcoholic beverages being health-threatening factors. Anti-health behaviors are taken up by athletes with low health awareness.
3. In reducing the risk factors related to smoking and frequent consumption of alcoholic beverages, martial arts – based on a specific philosophy and lifestyle that requires a reflective attitude towards one's own conduct and respecting the rules of fair play – should become a means of developing health-oriented behaviors. Patterns of behavior of chosen athletes who practice martial arts should be popularized among youth.

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