ORIGINAL ARTICLE

Personality traits of athletes practicing eastern martial arts

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Abstract

Background and Study Aim: Among different forms of physical activity, eastern martial arts (EMA) are practiced by part of Polish population. Eastern Martial Arts have a diverse motor structure and rules of sport competition. Traditional karate (KT) is a non-contact sport while taekwondo (Ta) is a contact sport and Ta competitors wear body armours compromising blow impact. Karate kyokushin (KK) competitors do not wear body protectors, which increases the risk of injuries, especially head injuries, resulting from kicks. In aikido (Ai), joint locks and reap techniques are counteroffensive, but they are not body-destructive. The aim of the study was to verify the hypothesis that young men practicing the aforementioned EMA differ in terms of selected personality traits.

Material and Methods: The sample comprised males training KK, TK, Ta and Ai. Each group included 82 athletes (the total of 328 competitors). The mean age of the sample was 19-20 years and their training experience ranged from 5 to 8 years. In order to determine personality profile, two traits, namely: Impulsive-Sensation Seeking (Imp-SS) and Aggression-Hostility (Agg-Ho) assessed using Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) and three traits, namely Neuroticism (Nu), Extraversion (Ex), Psychoticism (Ps) assessed using Eysenck Personality Questionnaire-Revised (EPQ-R) were selected.

Results: Among the four studied groups of EMA athletes, the highest mean values of empirical variables, namely: (Agg-Ho 5.0 ±3.32, Imp-SS 9.89 ±3.00 and Ps 7.87 ±4,96) were noted in KK group, while the lowest values obtained for Agg-Ho 4.67 ±2.34, Imp-SS 9.24 ±2.74, Ps 6.68 ±4.38) were noted in Ai group. The level of Agg-Ho in KK group was statistically significantly higher as compared with that obtained in Ai and KT groups. Moreover, significant between subject differences in the studied variables were noted in each group.

Conclusions: The obtained indicators justify the conclusion that, according to social norms, the highest negative indicators of personality traits were obtained from KK group. A different personality profile was discovered in Ai group where more moderate physical forms of defensive workout are preferred. Thus, aikido and martial arts/combat sports preferring moderate and relatively moderate fighting techniques, referred to as life sports", are recommended for effective enhancement of all health dimensions of survival ability.

Key words: aggression • aggressiveness • kumite • pain tolerance

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INTRODUCTION

For many years, eastern martial arts (EMA) have been moderately popular among Polish population. Slightly more than 3% of physically active population are involved in one of EMA at a recreational and/or competitive level. Over 60% of this group report "enjoying" this sort of activity and physical fitness improvement as the main motives for choosing EMA [1]. In bigger towns and cities, a vast number of private sport clubs offer professional judo, karate, taekwondo or aikido training to people in different age groups (from +10 to +50). The modest requirements concerning physical capacity of the beginners, the motivating atmosphere during the training at any level, either recreational or competitive, as well as opportunities for participation in summer sport camps foster the popularity of EMA. Moreover, the biomedical assessment of EMA participants confirms the favourable effect of these sports on mental health including improvement of cognitive functions such as the pace of information processing and/or the accuracy of decision-making in judo [2] or karate [3] competitors.

Psychological assessment has revealed that recognition of the relation between *kumite* style and the psychological profile of EMA participants, shaped after a several years' long training, is of particular importance. If such a relationship exists, it can be expected that the EMA style-related differences in participants' personalities are either due to the different, style-specifics training structure or the earlier mental predispositions, contributing to their choice of *kumite*. The training may have modified such traits, favourably or adversely from the point of view of social norms.

Longitudinal studies are required to address this issue. The observational studies carried out in neo gladiators [athletes training mixed master arts (MMA)] and Brazilian ju-jitsu competitors are the examples of such research schemes. Higher levels of aggressiveness were noted in MMA practitioners as compared with ju-jitsu athletes prior to the start of training sessions and the differences increased after short, 5-month trainings [4]. Such results may suggest that full-contact martial arts and/or combat sports are more attractive for the men who are more inclined to taking risk and aggression, and involvement in such activities results in aggressiveness levels increase within a short period of time. MMA is possibly believed to be an extremely brutal form of physical activity (never a sport [5]), allowing athletes to use multiple destructive techniques. In neo-gladiator competitions, winning involves grounding the opponent by causing acute pain and physical injury. For this reason, MMA practitioners are more exposed to contusions, but, paradoxically, their pain tolerance is higher [6].

Studies on personality profiles are of particular importance as regards the youngest participants of training sessions, whose personality is not fully shaped yet and emotional reactivity is to a high extent influenced by "raging hormones" during the adolescence period. It particularly concerns boys with increased levels of testosterone, the hormone responsible for domination, tendency to physical aggression, violence or other antisocial behaviours [7]. We may thus suspect that the young martial art practitioners easily acquire and fix behaviour patterns from martial arts. For this reason, psychological studies performed in the martial art competitors are focused on the assessment of overall aggressiveness and its components, such as: rage, hostility, physical and verbal aggression while explorations of personality profiles are more seldom undertaken. The majority of comparative assessments of personality profiles in athletes practicing different martial sports and arts neglect the effect of social environment and socioeconomic status on personality development.

Basic offensive techniques used in martial arts include gripping (judo, ju-jitsu) and striking (karate, kickboxing). Young practitioners of

Personality – according to trait theories human personality consists of various traits, which account for an individual's relatively coherent behaviour.

Aggression – is defined as behaviour aimed at causing harm or pain, psychological harm, or personal injury or physical distraction.

Aggressiveness – a human characteristic manifesting itself in inclinations to hurt others, to destructive behaviour. Aggressive = virulent, truculent, attacking.

Eastern martial arts (EMA) – are systems of fight practices (practised for many reasons: self-defence, competition, self-improvement, physical health and fitness, mental and physical development).

Combat sports – are competitive contact sports with one-on-one combat. Determining the winner depends on the particular contest's rules. In many combat sports, a contestant wins by scoring more points than the opponent or by disabling opponent.

Kumite – is a semi-contact karate competitive concurrence, where two athletes perform various kicking, punching and blocking techniques towards each other with maximum control in order to gain points and win the match. Destruction is fictive.

Kata – predetermined and choreographed physical exercises, which together with free exercises (randori), lectures (kōgi) and discussions (mondō) form the four critical pillars of Kōdōkan jūdō educatinn [35].

Training session – *noun* a period of time during which an athlete trains, either alone, with a trainer or with their team [36].

the above martial arts have been most often assessed for the degree/extent of aggressiveness. The results obtained from boys using gripping techniques indicate increased aggressiveness levels and inclinations to abuse after two-years' training [8, 9] while karate practitioners are characterised by somehow lower levels of aggression [8-13]. Researchers suggest that the inclusion of karate in physical training of meditation techniques and *kata* exercises contributes to a decrease in aggressiveness levels, improves cognitive processes, self-esteem and emotional control [13]. However, several karate styles such as kyokushin allowing full contact, the non-contact traditional karate and Shotokan should be considered. The inclusion of different styles to the entire karate group may distort the mean value corresponding to personality traits. For this reason, a separate analysis of personality traits for different karate sub-styles is intentional as it discloses style-related differences in personality profiles [14]. In traditional Japanese martial arts, not only technique training, but also implementation of moral principles plays a major role in martial arts. The research on the impact of sport on personality requires the inclusion of the non-training control group. Such methodology has been applied by Hungarian researchers [15] whose results show lower levels of aggressiveness in combined groups training Japanese martial arts (aikido, iaido, judo, kendo and karate) and gender-related differences in the results corresponding to this trait in both groups. Comparative studies on psychoticism, neuroticism and extrovertism levels in athletes participating in ju-jitsu with kick boxing training [16] have found no significant between-group differences, but slightly lower extrovertism levels and higher neuroticism levels in ju-jitsu group. The aggressiveness levels in baseball and ju-jitsu practitioners were almost the same [17].

Combat sport & martial art – relation according to the theory of combat sport: "every combat sport is martial arts but not vice versa" [37, p. 18].

The ambiguous conclusions from the cited studies pertaining to personality indicate the significance of the comparison of more complete personality profiles in martial art practitioners, differing in their physical requirements, the level of exposure to such physical contacts, injury risk and pain. Four sport disciplines were selected, differing in the following attributes: kyokushin karate (KK) – full-contact striking style, without blow-absorbing protectors, entailing a high risk of head injuries, traditional karate (KT) – a non-contact striking style, taekwondo (Ta) – a contact striking style using head, trunk and forearm protectors and aikido (Ai) not-striking kumite style. The aim of the study was to verify the hypothesis assuming the differences in selected 6 personality traits in young men participating in the aforementioned Budo styles.

Table 1. Physical characteristics of male martial arts practitioners (n = 328).

Sport	Statistical indicators	Age (years)	Experience (years)	Body mass (kg)	Height (cm)	BMI
Kyokushin karate (n = 82)	Mean	19.5	7.0	71.0	177.6	22.7
	SD	0.2	0.7	5.0	6.0	1.1
	Minimum	19.1	6.0	60	165	20.6
	Maximum	20.3	8.0	81	189	26.9
Traditional karate (n = 82)	Mean	19.4	6.7	70.2	177.6	22.2
	SD	0.4	0.8	7.1	5.5	1.5
	Minimum	18.5	5.0	51	162	19.0
	Maximum	20.2	8.0	81	186	24.6
Aikido (n = 82)	Mean	19.4	6.7	68.2	176.3	21.9
	SD	0.2	0.7	8.1	6.5	1.7
	Minimum	19.0	5.0	51	162	18.3
	Maximum	19.9	8.0	80	187	24.6
Taekwondo (n = 82)	Mean	19.5	6.8	70.4	176.5	22.5
	SD	0.3	0.8	6.4	7.3	1.1
	Minimum	19.0	5.0	52	152	20.6
	Maximum	20.6	8.0	80	189	26.9

MATERIAL AND METHODS

Participants

The sample included 82 participants practicing one of the four martial arts: kyokushin karate (KK), traditional karate (TK), aikido (Ai) and taekwondo (Ta). The following inclusion criteria were applied: similar age, from 18 to 20 years and training experience >5.0 years. The participants trained in sports clubs, guided by different coaches, 3-4 times a week and every year they participated in 2-week sports camps. The demographic-anthropometric parameters are presented in Table 1.

Research project

The levels of selected personality traits were studied. The assessed traits included: Neuroticism (Ne), Extraversion (Ex) and Psychoticism (Ps) using Eysenck Personality Questionnaire-Revised (EPQ-R) [18]. Two personality traits were assessed using Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). These were: Impulsive-Sensation Seeking (Imp-SS), Aggression-Hostility (Agg-Ho) [19].

Statistical analysis

Descriptive statistics for personality traits comprise mean values, standard deviations, median values, the range of studied parameters (minimum-maximum), variability coefficients (mean value/standard deviation) *100% and skewness of the data set. Normality of variable array distribution was verified using Shapiro-Wilk test. Leven's test was applied to assess array homogeneity. Statistical correlations between the variables were determined using Pearson correlation coefficients. Differences in the mean values corresponding to each of the four personality traits were analysed using one- way ANOWA variance analysis and next, post-hock NIR test (Fisher). Probability level was set at $p<0.05$. All the calculations were done using STATISTICA program, version 13.

RESULTS

Descriptive statistics show a very high dispersion of individual values corresponding to personality traits in each studied group (Table 2). It is expressed by high relative values of the coefficients of variation (CV). The highest between-subject variability was noted for Ne, ranging from 78.2% to 89.2%. Moreover, the data sets corresponding to this trait show the highest skewness coefficients.

The only statistically significant between-group differences were noted in the feature accounting for aggression and hostility (Agg-Ho). The values

Table 2. Descriptive statistics of personality traits among EMA practitioners (n = 328).

Statistics	Variable	Eastern Martial Arts			
		KK	KT	Ai	Ta
Mean±SD	Ne	5.24 ±4.26	6.32 ±4.87	6.36±5.13	5.20 ±4.65
	Ex	12.81±5.72	13.37±5.55	14.05±5.58	13.09±5.48
	Ps	7.87 ±4.96	7.74 ±5.00	6.68±4.38	7.62 ±5.19
	Imp-SS	9.89 ±3.00	9.66 ±2.51	9.24 ±2.74	9.65 ±2.68
	Agg-Ho	5.70 ±3.32	4.68 ±2.39	4.63 ±2.34	5.38 ±3.02
Median	Ne	4	5	4	4
	Ex	13	13,5	16	14
	Ps	7	7	4	7
	Imp-SS	9	9.5	9	9
	Agg-Ho	6	4	4	6
Min-Max	Ne	1-19	1-19	1-19	1-19
	Ex	4-22	4-22	4-22	4-22
	Ps	2-18	2-18	2-18	2-18
	Imp-SS	6-17	3-14	2-14	6-17
	Agg-Ho	1-14	1-10	1-11	1-12
CV (%)	Ne	81.3	78.2	80.5	89.2
	Ex	44.7	41.5	39.7	42.0
	Ps	62.9	65.5	65.5	68.1
	Imp-SS	30.4	26.0	29.6	27.8
	Agg-Ho	58.2	50.9	50.5	56.2
Skewness	Ne	1.411	1.280	1.178	1.680
	Ex	−0.397	−0.308	−0.623	−0.415
	Ps	0.798	0.805	1.030	0.872
	Imp-SS	0.840	−0.046	−0.369	0.884
	Agg-Ho	0.653	0.375	0.835	0.624

Table 3. Results of variance analysis for between-group comparisons of selected personality traits in the eastern martial arts practitioners (n = 328).

Personality trait	F-value	p-value	Effect size (η-square)	Observed power (α)	Between group differences
Ne	1.472	0.222	0.013	0.389	non sig.
Ex	0.747	0.524	0.006	0.210	non sig.
Ps	1.000	0.393	0.009	0.272	non sig.
Imp-SS	0.788	0.501	0.007	0.219	non sig.
Agg-Ho	2.875	0.036	0.026	0.685	KK>Ai. KT

corresponding to this trait were very similar in groups Ai and TK and about 5% lower than the highest value obtained in KK group. The slight between-group differences in other variables were statistically insignificant with their values ranging from several to over a dozen percent of extreme values (Table 3).

The overall coefficient values are low and the statistical significance is due to the large sample size. The strongest negative correlation was noted between extroversion and neuroticism, indicating a high probability of lower extroversion levels in the participants with high values corresponding to neuroticism. In this case, the coefficient of determination, R = 0.22, obtained in 22% of the studied population, indicates that the extroversion parameters are influenced by the parameters corresponding to neuroticism and vice-versa (Table 4).

DISCUSSION

The data presented in Table 2 reveal a significant higher dispersion in individual results, or between-subject variability, than the between-group differences corresponding to the same personality traits. A similar phenomenon was noted in the study on extroversion, neuroticism and psychoticism as regards the values obtained from the comparison of kick-boxing vs ju-jitsu competitors [16] and the comparison of aggressiveness levels in baseball and ju-jitsu competitors [17]. In both cases, the big between-subject differences in the obtained values, as well as relatively small groups, explain the lack of statistically significant between-group differences. Significant between-group differences are found only in larger and more homogenous data sets [15, 20]. In this study and the earlier cited papers, the fact that involvement in different martial arts is not the only and probably not the dominant factor determining personality traits, has been omitted.

Other determinants, such as the social-family environments and earlier life experience, play an important role in stimulating the inclination towards aggression, still in early childhood. It has been found that in single-parent and dysfunctional families, increased levels of physical aggressiveness are noted in children over 1.5 years of age, followed by a slight decrease in this trait levels after the 10th year of age [21]. Genetic and biochemical factors play a role in the regulation of aggressiveness and impulsiveness [2]. The family and social environments which adversely affect emotional development of a child, as well as stressful life events, interact with specific genotypes, or genetic factors, which additionally enhance the inclination to aggressiveness [23-25]. The relationship between the endogenous testosterone and aggressiveness in young men has also been confirmed [26, 27].

Table 4. Significant correlations (r) and determinants coefficient between selected personality traits for total group (n = 328).

Correlated traits	r	R
Ex•Ne	−0.467	0.22
Ex•Ps	−0.336	0.11
Ex•Agg-Ho	−0.120	0.01
Ps•Imp-SS	0.227	0.05
Ps•Agg-Ho	0.257	0.07
Agg-Ho•Imp-SS	0.207	0.04

A genetically conditioned aggressiveness and antisocial behaviours were confirmed in MMA practitioners (neo gladiators) with two genotypes fostering aggressive behaviours which are different from the genotypes of control group members [27, 28]. The research outcome indicates that a choice of martial arts with dominant rules of brutal sport rivalry partly depends on inborn biological factors.

Assessments of certain personality traits are not totally dependent on each other. This fact has been revealed by correlation analyses conducted by different authors. The obtained values corresponding to psychoticism and extroversion correlate with Zuckerman's temperament trait, defined as Novelty-Seeking [30] while Agg-Ho correlates with Imp-SS [19]. In martial art competitors, neuroticism positively correlates with psychoticism [16]. In judo competitors the values corresponding to neuroticism negatively correlate with extroversion levels, resting testosterone concentration and motivation to achieve goals, and positively correlate with the values corresponding to perseveration and emotional reactivity [31]. In boxers, these values negatively correlate with extroversion and other traits believed to be socially positive in the general personality profile including such traits as self-control and self-efficacy, agreeableness and conscientiousness) [32].

Interestingly, physical, but not verbal, aggressiveness levels increase with training experience and sport class, which has been revealed by correlation analysis of the above-mentioned traits [33, 34]. The outcomes of these studies further confirm the hypothesis that in contact combat sports aimed at physical destruction of the opponent, high levels of aggressiveness can be desirable from the point of view of athletic achievements.

CONSLUSIONS

The novelty of the research project stands at the thesis pertaining to differences in personality profiles in athletes practicing four EMA, differing in two distinct *kumite* styles, involving the intensity of physical contacts. These are: the soft style represented by aikido and traditional karate competitors and the hard style represented by karate kyokushin and taekwondo competitors. Equal age of the competitors, as well as their similar training experience, allowed us to exclude the effect of these traits on personality profile. Besides, our research lacks data corresponding to additional factors affecting personality formation. The reports presented by other authors indicate that these are different environmental and social factors and life experience from childhood and adolescence periods. In our study, aggressiveness was the only trait differentiating EMA competitors. The athletes practicing kyokushin karate were characterised by higher levels of this trait as compared with those practicing in soft style *kumite* (aikido and traditional karate), although there were no big relative differences between the above groups.

The results obtained from this study confirm the working hypothesis that the number of physical contacts in sport competition is directly proportional to aggressiveness. Due to the above, it can be postulated that kyokushin coaches should include mental training in their training sessions, since it increases the level of negative emotion control without suppressing the offensive style of sport competition.

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