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Polish National Cadet Wrestling Team for 2010 Youth Olympic Games (YOG) – social, somatic and psychological characteristics

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Abstract

Background & Study Aim: The issue of selecting competitors for particular sports disciplines and the programming of the training process requires comprehensive evaluation of the athletes. The aim of the presented study is a many-sided description of social, somatic and psychological characteristics of wrestlers from the Polish National Cadet Team, in relation to the process of selection and programming a modern, interdisciplinary sport training.

Material & Methods: Twenty competitors took part in the research (10 girls and 10 boys - the members of the cadet national team taking part in the European Qualifications for Singapore 2010 Youth Olympic Games YOG). All the competitors underwent anthropometric examination with the aim of identifying their body build type, and tests using the EAS questionnaire allowing to assess temperamental features. Additionally, a questionnaire of the authors' own design has been applied, containing inquiries about the competitors' social situation and their background.

Results: For the majority of the participants, wrestling is the only discipline they have practised so far. The average period of practising wrestling is 5 years, and the period of the membership in the national team is 20 months. The majority of the surveyed wrestlers are young people at the age of 16. The observation of individual results in typological analysis indicates that the body build of the examined boys is marked by domination of the mesomorphic factor. In the examined girls, one can observe a definite domination of the mesomorphic, balanced meso-endomorphic and meso-ectomorphic types. As it appears from the comparative analysis of the examined female wrestlers' temperaments with the temperaments of the members of general population, none of the differences achieved statistical significance on the level p=0,05.

Conclusions: When encouraging children and teenagers to take up sports training, one should bear in mind the influence of their social environment on their participation in physical culture. On the basis of typological analysis one can definitely corroborate the utility of body build types with considerable massiveness for sports. The results of psychological tests did not disclose any considerable differences in the temperamental development either between wrestlers and the general population or between female and male wrestlers practising this sports discipline. Thus, empirical data provide evidence that increased competition of the selected group of young wrestlers does not cause negative consequences in their mental structure.

Key words: body build type • combat sport • temperamental features • Sheldon's Somatotypology

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Body build type (constitution type) – or somatotype; is the most comprehensive rating of a person's body build. Body type refers to a number of classification or typology systems used to empirically or theoretically classify body shape. The systems are believed to provide some guidance to creating medical, nutritional, psychotherapeutic, or exercise programs for the person so classified [2].

Sheldon's Somatotypology (Sheldon's typological system) – the method of somatotyping devised by William Herbert Sheldon in the USA in 1940 on the basis of the sample of 4000 students. The author distinguished three basic components of body build: (1) endomorphy assessing the content of body fat, (2) mesomorphy relating to stockiness, (3) ectomorphy evaluating slenderness. The most well-known modification of Sheldon's model is a method by Heath and Carter (1967) [9].

Somatocard – a graphic representation of the numerical values of each component presented on Sheldon's somatograph [6].

Temperament – according to A. H. Buss and R. Plomin it is a set of inherited personality traits which become visible at an early stage of an individual's life [12].

INTRODUCTION

Wrestling is a combat sport dating back to Antiquity. The goal of the wrestling bout is winning by fall (pinning the opponent's shoulders to the mat) or by achieving lead according to the technical points scored. In Greco-Roman style only the holds by means of the upper body are allowed, while in freestyle wrestling it is permitted to hold the opponent by the legs as well. In a wrestling bout it is prohibited to employ any techniques posing a potential threat to the opponent's health. In wrestling, the features that matter most are strength, speed, cunning and instinct of the competitor.

The issue of selecting competitors for particular sports disciplines and the programming of the training process requires comprehensive evaluation of the athletes. Previously, there was a focus on the physical aspect of a human, on medical assessment of health, and on defining the motoric and morphological features [1-6]. However, the requirements of contemporary sport bring about the necessity for action of a more interdisciplinary character, which demands particular cooperation between the representatives of studies in physical culture, medical sciences, and specialists in social science dealing with physical culture.

The problem of analyse of health potential among competitors from the wrestling national team, was undertaken by authors of this paper. At the analyse particular reference to their body composition, health valuation, and selected health behaviours were considered [7]. At previous publication the characterization of personality and the coping style of wrestlers from the Polish National Cadet Wrestling Team was done, also to investigate the relation between wrestlers' personality factors and different ways of handling stress in a difficult situation [8]. Following work is an expansion of research result analyse of the same material of wrestlers from the Polish National Cadet Team.

Because of this, the aim of the presented study is a many-sided description of social, somatic and psychological characteristics of wrestlers from Polish Cadet National Team, in relation to the process of selection and programming a modern, interdisciplinary sport training.

MATERIAL AND METHODS

Participants

The participants of the research were the members of the cadet national team taking part in the European Qualifications for Singapore 2010 Youth Olympic Games (14-26 August 2010). FILA (The International Federation of Associated Wrestling Styles) organised qualification tournaments on each continent in May 2010. Polish Wrestling Federation supported by the city of Poznań submitted the Polish application in 2008, and during FILA Congress Poland was awarded the organisation of the qualification tournament. It was the only competition of this type in Europe. The participants of the qualification tournament competed in Greco-Roman, freestyle and female wrestling. The prerequisite for qualifying to YOG was the age of the competitor – only the people born between 1 January 1993 and 31 December 1994 were allowed to take part. The competitor also had to be a member of a National Federation belonging to FILA and have 2010 FILA licence.

The research was conducted in "Sobieski" Poznań sports club, where the wrestlers were staying during the training camp directly preparing them to the start in the European Qualifications for YOG. 20 competitors took part in the research (10 girls and 10 boys). For the majority of the participants (14 people), wrestling is the only discipline they have practised so far. The average period of practising wrestling is 5 years (5.5 years for girls and 4.4 years for boys), and of the membership in the national team it is 20 months (30 months for girls and 15 months for boys). The average age of the sample group was 16.5 years for boys (M=16.50; Sd=0.53) and 15.6 years for girls (M=15.60; Sd=0.52).

All the competitors underwent anthropometric examination with the aim of identifying their body build type, and tests using the EAS questionnaire allowing to assess temperamental features. Additionally, a questionnaire of the author's own design has been applied, containing inquiries about the social situation and background of the competitors.

In order to identify the body build type, we employed the graphic method of typological assessment by W.H. Sheldon, modified by B. Heath and J.L. Carter. Sheldon [9], formulating the principles of his typological method, made an assumption that the body build of an individual is characterised by three factors (endomorphic, mesomorphic and ectomorphic) occurring with varied intensity. Depending on the domination of any factor, the phenotype of an individual takes the form approximating the extreme manifestation of this factor to a greater or lesser extent.

Accomplishing the assessment of human body build in the interpretation of B Heath and J.L. Carter [10] requires measuring ten somatic features in the given individual. The component of body fat deposition, called endomorphic component, can be estimated by determining the thickness of four cutaneous folds. Measuring height and weight of the body allows to calculate the factor informing about the slenderness degree of the individual. This factor is called ectomorphic. Next, measuring the width of long bone epiphyses and muscle perimeters of the arm and shin allows to estimate the individual's degree of massiveness, called the mesomorphic factor. Determining the three factors allows to establish two coordinates (x and y), by the use of which we present an individual as a point on a triangular somatocard depicting the diversity of human population. The vertices of the triangle represent the extreme body build types: the endomorphic, mesomorphic and ectomorphic type. The closer to the middle of the figure, the intensity of each factor diminishes. An individual with a balanced share of all the elements is placed in the centre of the somatocard [2,9-11].

The EAS temperament questionnaire consists of 20 positions, forming 5 scales: Distress, Fear, Anger, Activity, and Sociability. Each scale contains 4 positions. They have the form of statements concerning the predilections of the respondents, their feelings and tendencies towards particular reactions (behaviour). Using the 5-point scale (1-5), the respondents determine, to what extent each statement describes them – where 1 stands for the smallest, and 5 for the biggest extent in which the statement relates to the respondent. The score of the assessment by questionnaire scales may therefore assume the values from 4 to 20 points [12,13].

The temperamental features of the boys and girls practising wrestling were aggregated in comparison to the whole population. In order to compare the examined group to general population members of the same age group, a one-sample *t*-test was employed. Also, the differences in the intensity of temperamental features between male and female competitors were estimated with the use of an independent samples *t*-test.

Table 1. Demographic, social and environmental characteristics of the surveyed wrestlers` of Polish National Cadet Team

Socio-environmental characteristics	Total n=20	Girls n=10	Boys n=10
AGE			
15 years	4	3	1
16 years	11	5	6
17 years	5	2	3
SCHOOL TYPE			
Lower secondary school (Gimnazjum)	9	3	6
Vocational school	3	1	2
Secondary school (Liceum Ogólnokształcące)	7	5	2
Specialised secondary school (Liceum Profilowane)	1	1	0
MOTHER'S EDUCATIONAL BACKGROUND			
Primary	2	1	1
Vocational	5	2	3
Secondary	11	6	5
Higher	2	1	1
FATHER'S EDUCATIONAL BACKGROUND			
Primary	1	0	1
Vocational	9	6	3
Secondary	8	2	6
Higher	2	2	0
PLACE OF RESIDENCE			
Village	3	0	3
Town up to 10,000 citizens	1	1	0
City from 10,000 to 100,000 citizens	8	5	3
City over 100,000 citizens	8	4	4
ECONOMIC SITUATION			
Very good	7	4	3
Good	10	4	6
Average	3	2	1
Bad	0	0	0
Very bad	0	0	0
THE NUMBER OF CHILDREN IN THE FAMILY			
1	2	0	2
2	6	5	1
3	4	2	2
More than 3	8	3	5

RESULTS

The description of the members of cadet national wrestling team commenced from considering basic social variables (detailed in Table 1).

The majority of the surveyed wrestlers are young people at the age of 16, studying at lower secondary school (Gimnazjum) or secondary school (Liceum

Ogólnokształcące). It has been noticed that the respondents' parents had usually received secondary or vocational education. The biggest number of the competitors dwell in big or medium-sized cities. None of the surveyed individuals describes their economic status as bad or very bad. In their own estimation their financial situation is good or very good.

The prevailing motives for choosing wrestling as the practised sports discipline were: the possibility to develop the interests (9 people), contacts with sportspeople (8 people), but also suggestions, advice or family traditions (8 people). The less important issues in the opinion of the respondents are: a convenient location of the club (3 people), Physical Education teacher's opinion (3 people), and peers' advice (2 people). No diversification with regard to the sex of the respondents has been observed. Ninety percent of the respondents have stated that both mother and father accept their decision about it. The following results have been obtained: no: 6 people; yes, mother: 1 person; yes, father: 10 people; yes, mother and father: 3 people. When considering the respondents' sex, it can be observed that in the practising girls' families it was the father who used to be a sportsperson more frequently.

The body build of the examined boys is marked by domination of the mesomorphic factor. The assessment of the changes in points' distribution on the somatocards depicting the subsequent competitors also indicates that the type of the wrestlers' body build shifts from the centre of the somatocard towards the vertex of mesomorphy (Table 1-2, Figure 1).

The statistical description of particular elements (endo-, meso-, and ectomorphic factors) confirms observations based on the visual assessment of a somatocard (Table 3). The predominant element of the body build is the mesomorphic factor (M = 4.4), the factor of slenderness having adequately smaller share (ectomorphic, M = 2.7), while endomorphy, defining the development of fat deposition, assumes the lowest value, M = 1.9.

Table 2. The statistic description of somatic features 20 wrestlers` of Polish National Cadet Team

Feature	Body height	Body weight	Fold brachii muscle	Fold scapula	Fold hip	Fold shin	Width elbow	Width knee	Perimeter arm	Perimeter shin
					Boys n=10					
Min	158.00	45.00	3.00	6.00	5.00	3.00	6.40	8.70	27.00	31.00
Max	183.50	89.00	6.00	16.00	13.00	5.00	8.20	10.30	40.00	45.00
Average	171.57	65.90	4.70	8.00	6.90	4.00	7.15	9.30	32.60	35.65
Sd	9.12	14.94	0.95	2.98	2.28	0.67	0.65	0.59	4.14	5.08
m (M)	2.88	4.72	0.28	0.95	0.73	0.22	0.22	0.19	1.30	1.61
m (Sd)	2.03	3.33	0.20	0.67	0.51	0.16	0.16	0.13	0.92	1.14
					Girls n=10					
Min	154.50	44.00	6.00	7.00	7.00	6.00	5.60	7.90	25.50	29.00
Max	179.00	70.00	11.00	14.00	16.00	14.00	6.60	9.20	32.00	39.00
Average	164.13	57.40	8.30	9.20	10.60	7.30	5.99	8.55	28.90	34.25
Sd	7.17	9.57	1.83	2.39	2.91	2.45	0.34	0.44	2.63	2.97
m (M)	2.27	3.03	0.58	0.76	0.92	0.77	0.11	0.14	0.83	0.94
m (Sd)	1.60	2.14	0.41	0.53	0.65	0.55	0.08	0.10	0.59	0.66

Girls domination of the mesomorphic, balanced meso-endomorphic and meso-ectomorphic types (Figure 2). The arithmetic means of the intensity of endo- and ectomorphy are similar, and they oscillate around 2,7. Mesomorphy, on the other hand, assumes the highest value (M = 3.6), which confirms the massiveness of the female wrestlers' body build (the mesomorphic type). However, it is perceptible that the development of the mesomorphic component is weaker in the examined women in relation to boys, which confirms the genetic determination of a bigger amount of fatty tissue in females.

Table 3. The statistic assessment of somatic features 20 wrestlers` of Polish National Cadet Team

Factor	ENDO	MESO	ECTO	ENDO	MESO	ECTO
	Boys n=10			Girls n=10		
Min	1.50	3.58	0.50	2.00	2.89	1.00
Max	3.50	6.36	4.00	4.00	4.68	4.50
Average	1.90	4.36	2.70	2.80	3.64	2.65
Sd	0.61	0.94	1.09	0.63	0.48	1.00
m (M)	0.19	0.30	0.34	0.20	0.15	0.32
m (Sd)	0.14	0.21	0.24	0.14	0.11	0.22

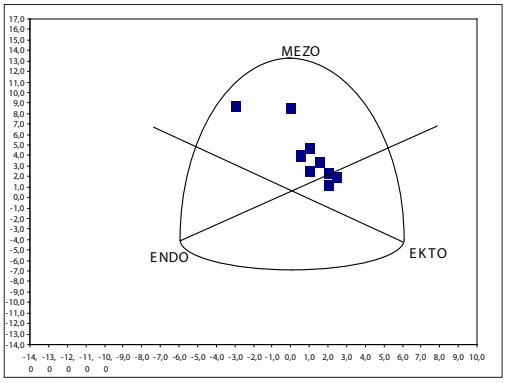

Fig. 1. The distribution of somatotypes in 10 male wrestlers` Polish National Cadet Team

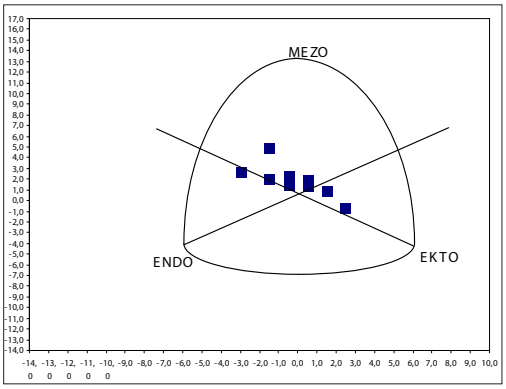

Fig. 2. The distribution of somatotypes in 10 female wrestlers` Polish National Cadet Team

As it appears from the comparative analysis of the examined female wrestlers' temperaments with the temperaments of the members of general population (Table 4), none of the differences achieved statistical significance on the level p=0.05.

Similarly as in the girls' group, also among the boys (Table 5) none of the differences achieved statistical significance on the level p=0.05. It appears from the comparative analysis of the temperamental features in female and male wrestlers (Table 6) that none of the differences achieved statistical significance on the level p=0.05.

DISCUSSION

While describing the cadets of the national wrestling team, the social aspects of physical culture were considered first, since the participation in physical culture is a socially determined process and is diversified by social factors. One can observe relationships between the position occupied in the social stratification and the engagement in sports: members of the middle and upper classes practise sport more frequently than members of the lower social strata "the higher the achievement, the more frequently he or she (a leading sportsman) comes from a parental home of high social status and income above average" [14]. Engagement in sports of particular social groups also reveals qualitative differences: "the newer some kind of sport is, the higher is the social position occupied by those who practise it first", "the higher the importance of an individual achievement is, the higher is also the social status", "the more physical contact a sport requires, the lower is the class affiliation of the sportsperson" [14]. In the author's survey, when analysing the social background of young wrestlers, it has been observed that their parents are characterized by above average economic status. As far as education is concerned, they are placed in the middle of social stratification.

Another issue within the scope of social aspects concerned the family socialisation to participation in physical culture. Imitation and the personal patterns connected with it are very significant from the perspective of this process. However, as studies show, a contemporary Polish family does not always provide positive patterns concerning physical activity [15,16,17] emphasize that the most advisable form of motivating children to exercise is their parents' physical activity, determining the children's participation in sport and recreation at different ages. It appears for

Table 4. A comparative analysis of the examined 10 female wrestlers' temperament and the temperament of members of general population in the same age group

Feature	One-sample t-test					
	Group average	Standard deviation	Population average	t	df	p
Distress	5.500	2.273	5.500	0.000	9	1.0000
Fear	5.500	1.716	5.500	0.000	9	1.0000
Anger	5.500	1.581	5.500	0.000	9	1.0000
Activity	6.500	1.716	5.500	1.842	9	0.0984
Sociability	6.300	1.889	5.500	1.339	9	0.2132

Table 5. A comparative analysis of the examined 10 male wrestlers' temperament and the temperament of the members of general population in the same age

Feature	One-sample t-test					
	Group average	Standard deviation	Population average	t	df	p
Distress	5.800	1.549	5.500	0.612	9	0.5554
Fear	6.400	1.713	5.500	1.662	9	0.1309
Anger	6.200	1.619	5.500	1.367	9	0.2047
Activity	5.900	2.183	5.500	0.579	9	0.5765
Sociability	6.200	1.813	5.500	1.221	9	0.2532

Table 6. A comparative analysis of female (n = 10) and male (n = 10) wrestlers with regard to the temperamental features.

Feature	Independent samples t-test						
	Average Girls	Sd	Average Boys	Sd	t	df	p
Distress	5.500	2.273	5.800	1.549	-0.345	18	0.7341
Fear	5.500	1.716	6.400	1.713	-1.174	18	0.2557
Anger	5.500	1.581	6.200	1.619	-0.978	18	0.3410
Activity	6.500	1.716	5.900	2.183	0.683	18	0.5031
Sociability	6.300	1.889	6.200	1.813	0.121	18	0.9052

instance, that for children of physically active parents, the likelihood of an active lifestyle is 2-6 times higher [18]. The parents' influence on their offspring's physical culture is proved by the examples of families of former sportspeople, mountaineers, sailors and sports coaches [19], or even, according to W. Pawlak "a sports chromosome is so active that in the sub-consciousness of the former competitors there is a necessity to infect the grandchildren with it" (cit. after: K. Piech, A. Iwanowska) [20]. In the light of the research on Polish Olympians B. Krawczyk [21] claims that we are dealing with a peculiar kind of inheritance of sports behaviour, which clearly occurs in skiing, swimming, archery and canoeing. In the study presented here one can also observe intergenerational transmission of the behaviour related to participation in physical culture. In the majority of young wrestlers' families at least one of the parents used to be a sportsperson.

In sports sciences, body build type of the competitors practising various sports disciplines has been analysed for a long time [22,23]. It can be assessed by considering the criterion of two basic morphological features, namely body height and weight, through the proportions of various body parts and its main components. Moreover, there are numerous acknowledged methods of body build type assessment. Among them, the most objective typology appears to be Heath and Carter's one, being a modification of Sheldon's system, which lately enjoys great popularity in ontogenetical research and may be employed to describing sports groups. Definite domination of the mesomorphic

types ascertained among the examined male and female competitors corresponds with the reports of other authors dealing with these issues [2,24,25,26]. A substantial development of endomorphy component observed among some girls is not an exceptional phenomenon. Numerous studies proved a considerable body fat deposition among female competitors, exceeding the acknowledged sexual dimorphism of this feature [22,27,28]. The decrease of this component's share in the somatotype has been observed among girls with the highest sports qualifications [11]. The differences between males and females practising wrestling that were observed in this study correspond with the results of elite Spanish Judoka, as reported by Franchini et al. [29]. The dominance of ectomorphy component over endomorphy component ascertained in this work in a few female competitors, also corroborates the results of other researchers [30]. As it looks from previous works of authors systematic physical activity as a regulator of energetic balance may be an effective method in preventing fat tissue accumulation by wrestling girls and boys. In concern about current and future health of sportsmen and sportswomen it is essential to include elements of pro-health education in the process of sports training. This may be a good way not only to achieve momentary sports success, but also to shape favourable long-term attitude towards health and fitness [7].

The results of the research allow to assume that in the process of sports career development, the selection of wrestling competitors does not concern the temperamental (psychic) factors. The selection may in the first place be related to the factors which are more directly connected to sport, and which determine success, for instance the physical conditions, motor ability etc. Only when the competing opponents are equal with respect to these variables, the temperamental features may play significant role [31-33]. However, the precondition of an optimal selection with regard to psychological traits is a sufficiently large group of individuals training, in which there remain only the best prepared for the requirements of a sports competition – in the approach of Buus and Plomin - the people of low emotionality and high activity. Thus, small group of individuals practising wrestling does not allow for an optimal selection [34]. In previous works the authors have stated that the model of personality makes a very clear distinction between highly effective wrestlers and people from the general population. This framework can be employed for predicting the level of effectiveness in wrestlers. According to "The Big Five", contestants exhibiting low levels of neuroticism and openness as well as higher levels of conscientiousness and extraversion had a greater chance to be effective in a fight. The study has shown that personality can, actually, be a good predictor for an individual style of a wrestler's coping with stress. A successful diagnosis in the type of personality a wrestler has in an early period of training can help identify less adaptive tendencies to cope with stress. The less adaptive coping style defined in this study is the emotion-oriented coping, which might contribute to excessive emotional agitation in stressful situations. Especially prone to developing such a style of relieving stress are contestants exhibiting the relation between a higher level of neuroticism and a lower level of conscientiousness, as was observed in female wrestlers from the study [8].

CONCLUSIONS

1. When encouraging children and teenagers to take up sports training, one should bear in mind the influence of the social environment on participation in physical culture. One should particularly cooperate with the parents, who form their children's attitude to physical activity by their own attitudes and behaviour.

2. On the basis of typological analysis one can definitely corroborate the utility of body build types with considerable massiveness for sports. The group of high level sportsmen and women constituted by the examined wrestlers is characterized by mesomorphic body build.

3. The results of psychological tests did not disclose any considerable differences in the temperamental development either between wrestlers and the general population or between female and male wrestlers practising this sports discipline. Thus, empirical data provide evidence that increased competition of the selected group of young wrestlers does not cause negative consequences in their mental structure.

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