
CHANGES IN SOMATIC STRUCTURE AND PHYSICAL FITNESS OF POLICE OFFICERS

Stanisław CIESZKOWSKI, Bartosz DZIADEK

Faculty of Physical Education, University of Rzeszow, Rzeszow, Poland

Key words:

- police officers,
- physical fitness,
- somatic structure.

Abstract:

The purpose of this paper is an attempt to define the impact of regular participation in sports and recreation classes on somatic structure and physical fitness of police officers. The research was conducted on a group of 40 police officers from the City Police Department in Rzeszów, who were divided into two age categories, i.e. from 22 to 26 years and 27 years and older. Somatic structure was evaluated based on measurement of basic somatic features, i.e. body height and body mass (based upon those values the body mass index - BMI - was calculated). In order to evaluate the physical fitness, tests included in the EUROFIT European Physical Fitness Test Battery were used. The evaluation was performed twice. The first one took place in May 2012 and the second one a year later, i.e. in May 2013. The conducted analysis revealed the positive impact of sports classes on the somatic structure, and individual motor tests results. In both age groups, an increase of the discussed motor abilities as well as a statistically significant decrease of body mass index was observed.

INTRODUCTION

Working for the police involves meeting by the officers adequate requirements concerning both body composition and physical fitness. During their service, every officer is obligated to take continuous care of their amorphous-functional image. It concerns especially those officers, who perform their work in intelligence, intervention and criminal sections. According to the regulation of the Polish Minister of Interior and Administration from June 7, 2006 (Dz.U. 2006 no. 121, pos. 841), every police officer is obliged to take part in sports and recreation classes (physical education) at the rate of two hours a week. Those hours are part of the general time of service [4]. The purpose of those classes is both taking care of good physical fitness and the state of mental well-being. The classes are performed based on the training programs and professional development plans approved by the department of the competent organizational unit [5]. The programs are carried out using typical models of physical education classes, sports training units and classes that are specific for officers from the given department or section. The programs include also periodic evaluation of body composition and physical fitness, which is performed at least once a year, according to instructions of the competent training services.

Research results show, that police officers present a higher level of physical fitness compared with other professional groups, and their somatic structure features athletic type. It results of course from the adequate selection and recruitment methods of candidates applying for admission to those formations [1, 2].

The purpose of this paper is an attempt to define the changes in somatic structure and physical fitness of police officers resulting from regular participation in sports and recreation classes.

MATERIAL AND METHOD

Material for this paper is results of the research that was conducted twice: in May 2012 and repeated one year later, in May 2013. The research included a group of 40 police officers from the City Police Department in Rzeszów. The examined officers work daily in intelligence, intervention and criminal sections. The officers were divided into two age groups. The first group included persons aged 22-26, and the other one involved individuals aged 27 years and older. Each group consisted of 20 officers. Somatic structure was evaluated based upon the measurement of basic factors, i.e. body height, body mass and body mass index (BMI). For evaluation of physical fitness, nine tests included in the EUROFIT Physical Fitness Test Battery were used. The following motor abilities were examined:

1. Dynamic power – standing long jump
2. Static balance – balance standing in „flamingo” position
3. Movement frequency – hand tapping
4. Abdominal muscles strength – from lying on the back trunk, bending forward within 30 seconds
5. Arm and shoulder strength – overhang on the stick with bent arms
6. Static power – hand grip on a dynamometer
7. Agility – 10 x 5m shuttle run
8. Flexibility – trunk bending forward
9. Endurance – endurance shuttle run with increasing speed

All tests were performed according to EUROFIT instructions [3].

The collected material was processed by means of basic numerical characteristics used in mathematical statistics. Arithmetic means and variability measurements in the group including all examined persons and separated age groups as well as differences between the 1st and 2nd examination were calculated. The complete results are presented in both tabular and graphical form.

RESEARCH RESULTS AND DISCUSSION

Numerical characteristics of somatic features of the examined officers are included in Table 1. From analysis of those data it follows, that the body mass of examined persons decreased within the discussed period of time by almost 3 kg. As a result, body mass index significantly decreased and in the 2nd examination it equaled to 24,27. The observed difference between the 1st and 2nd examination is statistically significant and equals to $\alpha=0,05$.

Table 1. Numerical characteristics of somatic features of tested police officers

Feature	Examination	X	S	V	R	D	T
Body height	I	181,10	16,25	8,97	172-189	0	-
	II	181,10	16,25	8,97	172-189		
Body mass	I	82,25	21,16	25,73	73-93	-2,93	0,51
	II	79,32	14,66	18,48	77-90		
BMI	I	25,21	1,54	6,11	23,62-28,73	-0,94	2,44*
	II	24,27	1,38	5,70	22,13-27,64		

* Statistically significant difference at the level of $\alpha=0,05$

Table 2 and 3 include numerical data of the individual motor tests. In the static balance test, both in the group including all examined persons and in the separated age groups, a significant progress in that motor ability was observed. Both in the group including all examined officers and in the group of individuals aged 22-26, the observed differences between the 1st and 2nd examinations are statistically significant.

The 1st age group features higher movement frequency level, and the intra-group variability is smaller. In both discussed age groups, an increasing tendency was observed, whereas in the group of older officers, it was slightly larger.

On the other hand, in the 2nd flexibility test examination, a distinct decrease of intra-group disproportions was noted. In both age groups, a progress at the level of 3,0 – 3,5 cm was observed.

Table 2. Numerical characteristics of motor abilities of tested police officers

Test	Examination	x	s	V	R Min -max
General balance*	I	3,50	1,79	51,14	1-12
	II	2,77	0,86	31,05	2-8
Movement frequency*	I	10,40	1,25	12,02	8,85-13,25
	II	10,26	1,18	11,50	8,92-12,39
Flexibility	I	33,84	34,41	101,68	19-43
	II	37,10	23,25	62,67	22-45
Explosive power	I	211,40	12,66	5,99	155-259
	II	225,27	13,08	5,81	161-272
Static power	I	23,79	9,72	40,86	18-31
	II	25,30	5,43	21,46	20-28
Strength of abdominal muscles	I	25,70	11,47	44,63	20-32
	II	28,22	7,35	26,04	22-35
Functional power	I	35,14	27,36	77,86	20-52
	II	36,81	20,82	56,56	24-53
Agility *	I	20,66	1,98	9,58	17,6-24,4
	II	20,29	1,75	8,62	17,2-23,3
Endurance	I	8,06	2,44	30,27	5-13
	II	10,06	2,75	27,34	6-15

* The greater the absolute value, the worse the test result

** Statistically significant difference at the level of $\alpha=0,05$

Standing long jump test, evaluating the level of explosive power resulted in definitely higher values in the group of officers aged 22-26. Both in the group including all examined officers and in the separated groups, an increase of discussed motor ability was noted and the observed differences between the 1st and 2nd examination were statistically significant.

In the static power, abdominal muscles strength and functional power tests, a small increase of those abilities level was observed, whereas within the younger age group it was slightly larger. In both separated age categories, the intra-group variability decreased in the next examination.

In the 10x5 m shuttle agility run, some progress in both age groups was observed, whereas in the younger group it was larger. Similarly as in the strength tests, in the 2nd examination the intra-group variability definitely decreased.

Analysis of results obtained in the endurance shuttle run with increasing speed shows a significant progress in that motor ability. In the group including all examined officers and in

both age groups, the observed differences between the 1st and 2nd examination are statistically significant, at the level of $\alpha=0,05$.

Table 3. Numerical characteristics of fitness tests of separated age groups

Test	Examination	Group 1			Group 2		
		x	s	V	x	s	V
General balance *	I	2,9	1,36	46,89	4,1	2,24	54,63
	II	1,95	1,48	75,89	3,6	1,17	32,5
	II-I	0,95	t=2,12**		0,5	t=0,89	
Movement frequency*	I	10,36	1,19	11,49	10,46	1,32	12,62
	II	10,22	0,96	9,39	10,32	1,27	13,52
	II-I	0,14	t=0,41		0,18	t=0,44	
Flexibility	I	35,84	36,16	100,89	31,77	33,41	105,16
	II	39,46	25,51	64,64	34,75	21,88	62,96
	II-I	3,62	t=0,37		2,98	t=0,33	
Explosive power	I	219,66	13,76	6,26	203,41	11,44	5,62
	II	233,68	14,07	6,02	216,84	12,81	5,91
	II-I	14,02	t=3,19**		13,43	t=3,30**	
Static power	I	25,63	10,79	42,09	21,95	8,88	40,46
	II	27,54	6,05	21,97	23,07	5,12	22,19
	II-I	1,91	t=0,69		1,12	t=0,49	
Strength of abdominal muscles	I	27,28	12,33	45,19	24,35	10,87	44,64
	II	29,74	7,72	25,96	26,71	7,05	26,39
	II-I	2,46	t=0,76		1,36	t=0,47	
Functional power	I	37,74	29,29	76,61	32,55	26,14	80,31
	II	39,89	22,24	55,75	33,93	19,47	57,38
	II-I	2,15	t=0,26		1,38	t=0,19	
Agility *	I	19,92	1,89	9,49	21,41	2,22	10,37
	II	19,48	1,72	8,83	21,1	1,77	8,39
	II-I	0,44	t=0,77		0,31	t=0,49	
Endurance	I	8,81	2,84	29,66	7,28	2,29	31,46
	II	11,17	3,02	27,04	9,02	2,57	28,49
	II-I	2,36	t=2,54**		1,74	t=2,26**	

* The greater the absolute value, the worse the test result

** Statistically significant difference at the level of $\alpha=0,05$

SUMMARY

To sum up, it can be concluded, that systematic participation of police officers in mandatory sports and recreation classes impacts the level of analyzed motor abilities. All examined policemen as well as both age groups feature progression of results, whereas in the static balance tests, explosive power and endurance tests, the noted progress is statistically significant. It is also characteristic, that in the 2nd examination, the intra-group variability becomes decidedly equal. The positive impact of systematic sports and recreation activities is also visible in the statistically significant decrease of body mass index.

BIBLIOGRAPHY

1. Cieszkowski S., Bachórz M., Lenik J., Lenik P., Przednowek K., Ocena budowy somatycznej funkcjonariuszy Komendy Miejskiej Policji w Rzeszowie. *Przegląd Naukowy Kultury Fizycznej* UR 2008,2,103-106
2. Cieszkowski S., Bachórz M., Lenik J., Lenik P., Przednowek K., Ocena poziomu sprawności fizycznej funkcjonariuszy Komendy Miejskiej Policji w Rzeszowie. *Przegląd Naukowy Kultury Fizycznej* UR 2008,2,107-111
3. Grabowski H., Szopa J., Eurofit. Europejski Test Sprawności Fizycznej. Wydawnictwo Skryptowe AWF Kraków 1991
4. Regulation of the Minister of Interior and Administration from June 7, 2006, concerning tasks in the field of physical culture to be conducted in Police, State Fire Department and Government Protection Bureau. *Dz.U.* 2006 no. 121, pos.841
5. Regulation of the Minister of National Education and Sports from February 20, 2002, concerning model programs of physical education classes for organizational units subordinate to Minister of National Defense, Minister of Interior and Administration, Chief of State Protection Office and Chief of Country Civil Defense *Dz.U.* 2002, no. 23, pos. 226.