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PHYSICAL FITNESS INVESTIGATIONS IN HUNGARY: EXPERIENCES AND POSSIBILITIES

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Abstract: *The Hungarian National Growth Study (Eiben et al. 1991) and its recently published reference data gave current informations also on physical fitness status of Hungarian youth of 1980's. During last decades, however, several EUROFIT seminars were organised, and when the investigations of national studies started, there were only sporadic informations about it. In 1991, after the Izmir Research Seminar – where Hungary was officially delegated – a new research project started to establish EUROFIT reference values on a national basis of school-age children and young adults. The randomly selected sample consist of every age groups and both sexes approximately 150 subjects. The aim of this paper is to present the first results of investigations of young adults and reflect experiences and possibilities in the future.*

Key words: *Physical fitness; Young adults.*

Introduction

The Hungarian National Growth Study (Eiben et al. 1991) and its recently published reference data give us current information biological development and physical fitness of 3-18 year old children and youth in the 1980's. The reference data of physical performance abilities are presented in percentiles too and they are very useful in the daily practice of paediatricians, physicians, physical education teachers.

While the anthropometrical methods are established on common agreement and they have common scientific basis, the methods of assessment of physical performance abilities are under discussion. Formerly every country had its own measurement methods so called national test-battery. The project of Hungarian National Growth Study was designed in 1980, field work started in 1981 when EUROFIT tests for measuring of physical fitness of children were at the finishing stage in order of European Council. The slightly modified motor test battery of Hungarian National Growth Study is to serve that the results of Hungarian National Growth Study correspond to the results of other European EUROFIT investigations.

In 1991 a new research project stated in Hungary to assess the physical fitness of Hungarian youth on the basis of EUROFIT tests. After distribution of the idea and materials of EUROFIT the field work was started 1992 and data collection has just been finished. However the European Tests of Physical Fitness were designed to assess the fitness of children between 7-18 years of age there are some successful investigation to adapt EUROFIT tests to the investigation of young adults (Prat et al. 1992).

The physical education curriculum and the entrance examination system are under reorganisation at the Police Academy in Hungary, which partly caused by social changes and because of the prestige of this occupation is increasing.

To become a policeman must to have an excellent physical fitness capacities. This condition play an important role in this profession beside other abilities. In the new practical entrance examination the physical fitness status of candidates is the most important selection

factor. Because of increased interest to this profession the number of candidates changed ten times, increased from 300 to 3000. To investigate such a big number of candidates during a relatively short test-period is a big challange. The EUROFIT based entrance examination system seemed to be practical because of its advantages (tests are simple and practical: cost-effective, can be administered in a reasonable time, provide immediate data, this combination of tests provide comprehensive data relevant to the whole range of physical fitness, EUROFIT Handbook, 1993). To develop the reference scales for young adults a pilot study was carried out.

In this paper we report the results of pilot study, the draft of practical entrance examination in the Hungarian Police Academy and the statistical results of physical fitness investigation of candidates. About 20% of the candidates are women. The results of pilot study are those concerning both genders while results of practical entrance examination are in case of men.

Material and methods

Subjects: Subjects of pilot study were 260 men and 54 women. Their mean age was 22.11 and 23.50 year, respectively. The number of candidates, however, was much greater. Table 1. shows basic data in subjects of pilot study, table 2 does the same in subjects of candidates.

Table 1. Subject of pilot study

	Men N=260		**Women N=54**	
	Mean	**SD**	**Mean**	**SD**
Age (years)	22.11	2.73	23.50	3.62
Height (cm)	178.23	7.84	164.72	5.04
Weight (kg)	74.97	9.95	61.17	7.93
Sum of 4 skinfolds (mm)	38.21	16.72	55.69	22.99

Table 2. Subject of candidates (Men)

Age (years)	**N**	**Height (cm)**		**Weight (kg)**		**Sum of 4 skinfolds**
		Mean	**SD**	**Mean**	**SD**	**(mm)**
18	475	177.71	6.46	71.30	10.36	36.0
19	330	177.10	6.16	71.79	09.31	36.6
20	138	177.16	6.34	71.57	09.29	36.3
21–22	181	178.15	6.39	78.37	11.41	46.6
23–24	178	177.42	6.12	78.90	11.70	50.0
25–26	191	177.85	6.50	79.00	12.00	52.2
27–28	132	177.98	7.09	80.99	12.09	53.8
29–30	100	176.65	6.29	82.00	11.80	56.0
31–35	83	175.67	6.30	83.79	12.25	60.0

Methods: The EUROFIT tests battery was applied in the practical entrance examination of the Hungarian Police Academy. As it is written in the concept of EUROFIT, these tests are suitable to assess physical fitness, physical abilities of different groups and for young adults too.

Tests were in the pilot study: Endurance shuttle run; Hand grip; Standing broad jump; Bent arm hang; Sit-ups; 10x5 metre shuttle run; Plate tapping; Sit and reach (EUROFIT 1993); Trunk strength (Prat et al. 1992).

Tests were in the entrance examination: Endurance shuttle run; Standing broad jump; Bent arm hang; Sit-ups; 10x5 metre shuttle run; Platte tapping; Sit and reach; Swimming (Sebestyén et al. 1993).

Flamingo balance test is not involved in the test battery because it needs very much time. Dynamometers were not enough reliable to get valuable results in hand grip and trunk strength tests, these test are not in the entrance examination test battery. Additionally the swimming ability was a minimum criteria.

Results and Discussion

Anthropometrical variables of subjects (in the Pilot study and the candidates of entrance examination) concerning to the referential values of Hungarian National Growth Study (18 year old boys and girls) are between P75 and P90. The students of Police Academy are higher and heavier than the Hungarian average of the 18 year old boys and girls (mean heights are: 175,34 and 162,28 cm; mean weights are: 67,19 and 55,31 kg). The Police Academy students' height are close to the P90 value while their weight to the P75 value. The investigated subjects are slimmer than 18 years old Hungarian boys and girls: their sum of 3 skinfolds (over triceps, subscapular, supra-iliac) are: 38,87 and 57,64 mm.

Table 3. Tests results of Pilot study

Tests	Men			Women		
	N	Mean	SD	N	Mean	SD
Plate trapping (s)	260	9.51	0.89	50	10.37	1.01
Sit and reach (cm)	260	24.88	7.33	53	29.77	6.40
Standing broad jump (cm)	256	232.74	19.96	54	178.22	22.53
Hand grip (kg)	186	56.17	10.70	41	33.81	6.49
Bent arm hang (s)	259	34.24	14.94	49	8.05	7.45
Sit-ups (N/30 s)	259	27.08	4.02	54	23.35	2.71
10x5 m shuttle run (s)	251	18.61	1.20	50	20.75	1.72
Shuttle run (laps)	244	57.50	14.70	50	34.7	11.3
Stage (min)		8			5	

Table 3. shows tests results of students of the Police Academy. Their performances are better than the referential values of the corresponding tests of 18 year old boys and girls in Hungarian National Growth Study (mean values are follows – in standing broad jump: 206 and 160 cm, in hand grip test: 41 and 27 kg, in sit up test: 20,1 and 16,3 number/30 sec). Based on the means and standard deviations of Pilot Study's physical fitness test results referential tables were established to make differences between candidates. The tables were different for man and woman, under 30 or over 30 years of ages. The importance of physical tests were different: endurance shuttle run (20 m shuttle run) test had the highest value, informing about the cardio-respiratory endurance; second priority was the group of the tests of strength and muscular endurance strength; at the third priority was a set of tests of agility, flexibility.

Table 4. Statistical variables of physical fitness tests of candidates (men)

Age (years)	Plate tapping (s)		Sit and reach (cm)		Standing broad jump (cm)		Sit-ups (N/30 s)		Bent arm hang (s)		10x5 m shuttle run (s)		Endurance shuttle run (laps)		stage
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
18	8.80	1.00	28.02	6.99	219.01	23.82	27.22	3.66	36.18	15.64	20.61	2.64	95.78	16.71	10
19	9.08	1.07	28.50	7.08	220.61	23.53	27.54	4.63	34.70	15.78	20.45	1.96	94.88	17.70	10
20	9.11	1.21	27.31	6.30	219.81	22.36	26.83	3.97	32.80	16.09	20.97	1.68	92.80	15.60	10
21–22	9.16	1.05	27.19	7.06	216.27	23.66	25.97	3.76	29.17	16.45	21.26	1.35	87.08	19.86	10
23–24	9.29	1.15	25.81	7.12	211.13	24.92	24.48	4.42	24.80	14.19	21.60	1.53	78.90	21.00	9
25–26	9.50	1.39	27.22	6.41	207.65	22.84	23.87	4.06	23.69	15.10	21.71	1.37	74.14	18.17	8
27–28	9.34	1.15	24.97	8.23	205.40	22.17	23.12	4.16	22.58	12.62	21.82	1.56	72.68	19.88	8
29–30	9.33	1.19	24.18	7.02	197.17	26.11	22.00	4.53	23.07	16.16	22.00	1.69	68.57	19.40	8
31–35	9.95	1.44	24.33	7.26	195.63	26.36	20.43	3.69	17.43	11.53	22.20	2.64	61.67	17.28	7

The selection based on referential tables was successful in case of physical abilities because this way we could make differences and it was helpful to choose the best 200 students.

Table 4. contains tests results of practical entrance examination at the Hungarian Police Academy. These are comparable with the data of investigation of Catalonian police- candidates (Prat et al. 1992). Hungarians are significantly better in cardio-respiratory test, their results are higher in standing broad jump test, however, they are very slow in 10x5 meter shuttle run test and weaker in functional strength test (bent arm hang) than the Catalonian counterparts.

Conclusion

Physical fitness and physical activity are important determinant of health and have selection criteria in certain occupation.

Assessing the physical fitness is very difficult and complicated because of its complexity.

The first statistical results of practical entrance examination have not enough information for a deep analysis and to know more details of health-status of Hungarian young adults.

EUROFIT tests were suitable to get information of physical abilities of young adults too and to make selection among them.

To work with this test-battery could be an important health- education effect of EUROFIT tests, which would be the secret of healthy generation in the future. Based on the recent experiences it seems clear that fitness testing can have an important role in certain professionals and more general in the promotion of health.

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