

LEVELS OF SELECTED COORDINATION SKILLS OF 11 UP TO 15 YEAR OLD FEMALE ATHLETES

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ABSTRACT

Groups of young sportswomen (track and field, basketball, handball and volleyball) were tested for selected coordination skills. Sufficient amount of test subjects (n = more than 200 in each age group) allows us to monitor changes in the age of balance, orientation, rhythm, reaction and space-orientation skills. The test results were compared with general population of the same age group. Based on these results, we are able to formulate conclusions for training practice in these age groups.

Keywords: coordination skills, young female athletes, population, comparison

INTRODUCTION

Coordination skills (CS) forms important but still little appreciated part of the physical preconditions for human motoric activity and took specific position in system of human motoric abilities (Zimmermann, 1986; Gierat-Górska-Raczek, 1997). Coordination skills are rarely encountered in isolation and represent a mosaic of different and interconnect related skills. CS forms the basis for the acquisition of motor skills and improvement of their level is closely linked with the process of improving sports technique (Košťal, 2003). Minimal influence of the physical development is observed on the coordination skills, conversely most affected are power, power-strength, endurance and speed abilities (Kampmiller, 2002). Knowledge of the relationship between sports performance analysis or motoric testing performance and physical development are characterized by specifics, which depend on sport discipline, age, level of physical performance and sexual dimorphism (Košťal-Lednický-Doležajová, 2006; Doležajová-Lednický, 2011). Each sport specialization stresses importance of coordination skills and their specific requirements. From ages 11 to 15, in general sports training preparation, we should be focused on the general development of all basic coordination skills necessary for later specialization (Team of authors, 2008). Broďáni and Šimonek (2010) presented conclusions, that the 11 up to 15 year old subjects showed different structure of partial coordination skills during coordination performance. The authors conclude that the results are differentiated by age and gender. In team sports, the most common coordination skills are: rhythmic skills, space-orientation skills and ability of time estimation. In track and field, most often skills are: rhythmic and kinesthetic differentiation of leg performance.

The aim of presented research was to determine the level of performance of 11 up to 15 years old female athletes in selected coordination tests and compare it with the population.

It was expected that: 1. With increasing age of young female athletes there will be found increased level of tests performance. 2. In groups of young female athletes from 11 up to 13 years are expected statistically significant differences in more tests than in the groups from 14 up to 15 year. 3. Statistically significant differences will be found in most coordination tests between population and young female athletes.

METHODS

We monitor groups of 11 up to 15 years old young female athletes, regularly engages in basketball, volleyball, handball and track and field training (11-years n = 153, 12-years n = 205, 13-year n = 216, 14-years n = 205, 15-years n = 201). Population norms in coordination tests (11 to 15 - year old girls in each category n = 45) and testing methodology we took from Sedláček (2009). We focused on four coordination skills: balance (run through the bench with 3 turnovers - LAVOBR), reaction (stopping the rolling ball - LAVLOP), rhythmic (rope skipping for 20 seconds - ŠVIHAD) and space-orientation ability BEHMET (pointing run - BEHMET). In data processing, we used basic mathematical and logical characteristics. Statistical significance of differences was evaluated at 1%, 5% and 10% level of statistical significance. The significance of differences between groups we analyze with t-test.

RESULTS

Comparing the results in the different age groups of young female athletes (Fig. 1-4), we found diversity in performance. Results show that skills performance of 12 and 13 years old subject was lower than in 11 years old subjects group. Expected higher skills performances were receive only in group of 14 up to 15 years old subjects. After stagnating, which was observed between 11 and 12 years old subjects (Tab. 1.) we can concluded improving of skills performance in next age groups. When comparing the 12 and 13 years old subjects, we found a statistically significant difference in the skills performance of the two tests. The highest differences in skills performance we occurred between 13 and 14 year of life (statistically significant difference in the skills performance of the three tests). Between 14 - and 15 year olds there was statistically significant only in the balance test. We did not confirm the hypothesis 1, skills performance among different age groups had fluctuating nature. Hypothesis 2 was confirmed in particular, in comparison of 12 and 13 years old subjects (two tests at $p < 0.01$) and 13 to 14 year old subjects (statistically significant results on the three tests).

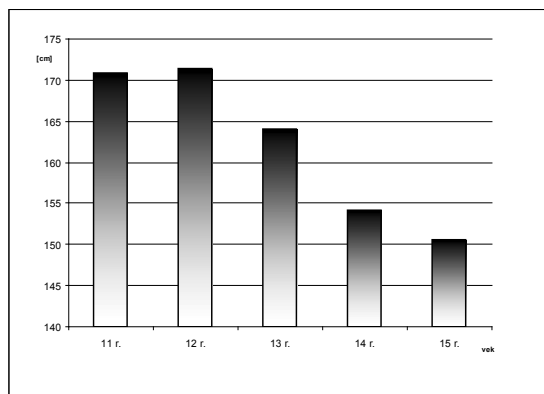


Fig. 1 Skills performance of young women (LAVOBR)

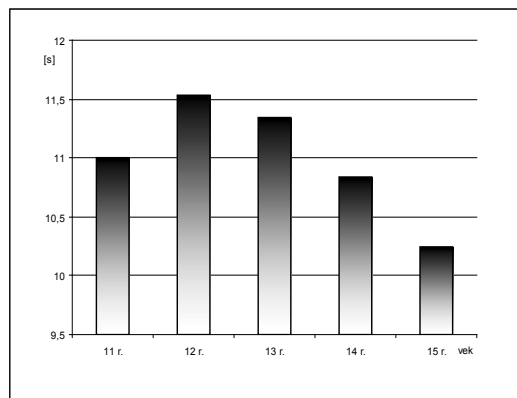


Fig. 2 Skills performance of young women athletes in balance abilities athletes in reaction abilities (LAVLOP)

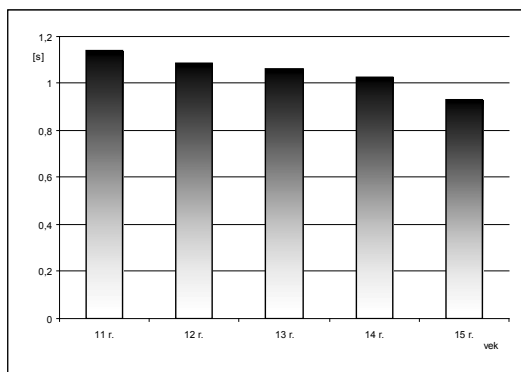


Fig. 3 Skills performance of young women Athletes in rhythmic abilities (ŠVIHAD)

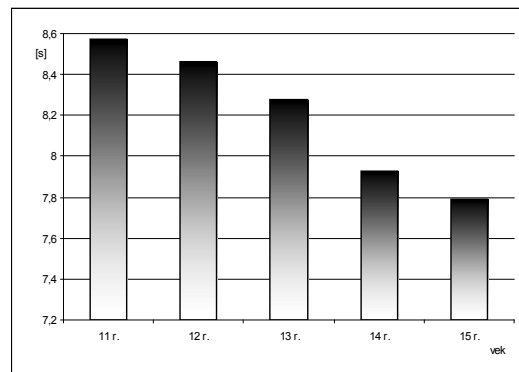


Fig. 4 Skills performance of young women athletes in space-orientation abilities (BEHMET)

Tab. 1 Statistical comparison of skills performance of young female athletes in different age groups (** p<0,01, * p<0,05, °p<0,1)

Age Tests	LAVOBR [s]	LAVLOP [cm]	ŠVIHAD [s]	BEHMET [s]
11 – 12	1,652	0,169	0,501	1,113
12 – 13	0,662	2,931**	0,275	2,045*
13 – 14	1,762°	3,897**	0,394	4,200**
14 – 15	2,132*	1,307	1,031	1,634

Results indicate smallest changes of performance in skills test of rhythmic abilities. This confirms the thesis, that every individual has an innate rhythm, and sports training only maintained specific level or slightly improved level of rhythmic abilities. In tests with greater improvements of skills performance (reaction, space-orientation skills), we conclude that improved level of physical abilities (higher explosive leg power, acceleration rate) is contributed to these results.

Comparison of the performances of young women athletes with a population of the same age allowed us to evaluate the last hypothesis (H3). Hypothesis 3 was confirmed in the groups of 11 years old subjects (three tests), 13 and 14 years old subjects (all the tests). A smaller number of significant connections we found in the age groups of 12 and 15 years old subjects (two tests for each group). An interesting fact is that the test of balance abilities reached significantly better score in the group of 11 years old population subjects than in group of young woman athletes on a level. One of the explanations should be that young women athlete's bodies are higher (155.3 cm) than in population (151.4 cm). Although this difference is not statistically significant, different body height should have significant influence into balance abilities. Comparisons of all tests are presented in Table. 2.

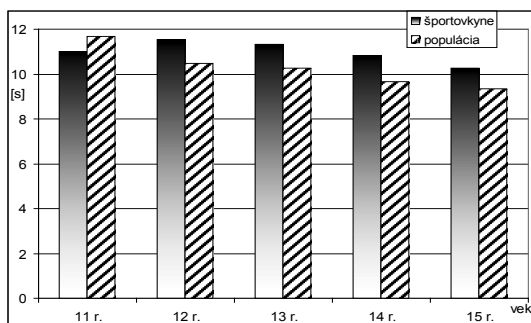


Fig. 5 Skills performance of young women athletes and population in test of reaction abilities (LAVOBR)

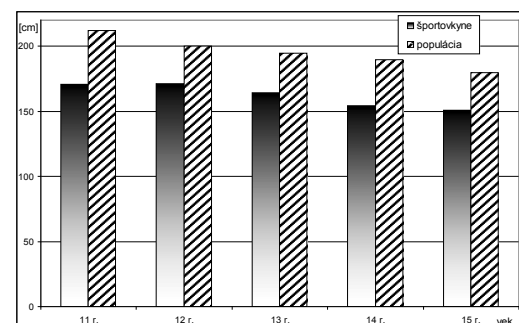


Fig. 6 Skill performance of young women athletes and population in test of balance abilities (LAVLOP)

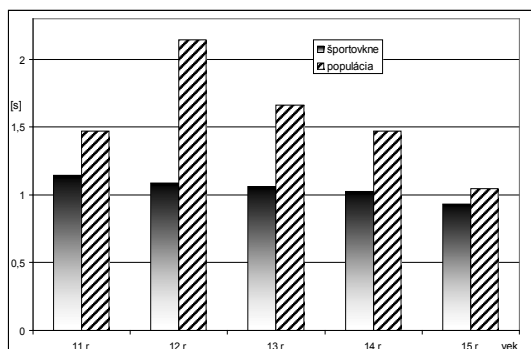


Fig. 7 Skills performance of young women athletes and population in test of rhythmic abilities (ŠVIHAD)

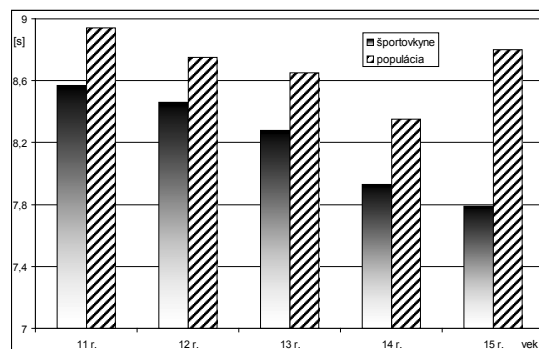


Fig. 8 Skill performance of young women athletes and population in test of space-orientation abilities (BEHMET)

Tab. 2 Statistical comparison of skills performance of young female athletes and population in different age groups (** p<0.01, * p<0.05)

Age Tests	LAVOBR [s]	LAVLOP [cm]	ŠVIHAD [s]	BEHMET [s]
11	1.555	9.149**	2.008**	2.600**
12	1.350	6.942**	6.310**	1.792
13	2.382**	7.641**	3.976**	2.576*
14	2.613**	8.263**	2.748**	3.025**
15	2.240*	6.436**	0.875	1.964

CONCLUSIONS

1. In the early years of youth sports training, it is necessary to include a greater volume of exercise with coordinating nature to actively develop all types of coordination skills.

2. The highest annual increase among young women athletes we had between 13 and 14 years old groups. We identified this period as period ideal for the efficient development of coordination skills especially in the training groups in which for various reasons development failed in beginnings of regular training activities.

3. We confirmed that sports training had a positive impact on the development of coordination skills, which is evidenced by a statistically significant differences compared with the population.

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