STRUCTURE OF PHYSICAL CONDITION AND CO-ORDINATION SKILLS IN STUDENTS OF THE FACULTY OF PHYSICAL EDUCATION

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Introduction. Motoric skills are indispensable conditions of all motoric activities and they decisively determine the efficiency of motoric actions of a human being. Therefore, the efficiency of human motoric actions depends on the type and level of motoric skills that one has developed, their cooperation and usage level during realization of a given motoric activity. This means that one's motoric skills depend on a number of factors, which jointly form the optimal efficiency structure (Hirtz 1988, Raczek 1991, Mynarski 1995, Szopa et al. 1996, Raczek et al. 1998, Meinel and Schnabel 1998).

The objective of this thesis is to identify important factors in the process of teaching motoric activities. Determining these factors (condition and coordination skills) may enable applying those solutions, which optimise the efficiency of motoric activities teaching and allow for searching for the best method of teaching and mastering technical skills for all levels of motoric efficiency, this also applies to practical classes included in the physical education curriculum

Material and methods. The subjects for the research were 116 students (53 female and 63 male students) of Faculty of Physical Education and Physiotherapy of Opole Technical University, aged 20-23.

At the beginning of the research, basic somatic parameters (height, body mass, percentage of fat content) were measured and flexibility was evaluated by means of body bend in seating position. Motoric skills of all analysed subjects were measured once. All measurements were carried out in standard conditions in compliance with basic procedures valid in sports metrology (Zaciorski 1979).

During coordination skill evaluation, the tests proposed by Raczek, Mynarski and Ljach (2002) were carried out. Condition and comprehensive skills were measured by means of the following popular tests: endurance – 12-minute run (Cooper's test), muscle strength – bar lifting in lying position, squat and leg extension with bar on the shoulders, measurement of squeeze strength of hand, speed – 20-m run from a flying start, 50-m run, agility – X-lane drill, flexibility – body bend in straight squat. Aerobic capacity level (PWC_{170} Test, VO_2 max) and anaerobic capacity level (Wingate Test) was also evaluated.

The level of motoric skills within all sports disciplines was decided by the final grades. In the analysis, the grades from practical subjects, track and field sports, gymnastics, swimming and sports team games (football, volleyball, basketball, and handball) included in the curriculum of the studies at Faculty of Physical education and Physiology of Opole Technical University were used.

Research results. The main objective of statistical analysis is to answer whether motoric skill structure is different in the case of persons with low, medium and high level of motoric skills.

Resultant motoric efficiency was defined as a mean of all motoric skill results. All variables included in the motoric skills and abilities were standardised separately within the group of women and men.

The analysis of parameters defined as physical efficiency (peak power, drop power in Wingate Test, PWC 170, VO_2max, VO_2) and of resultant motoric skills in women shows that the analysed variables are not significant. It means that analysed groups of women are characterised by considerable homogeneity, that is similar levels of aerobic and anaerobic capacity measurement results.

The analysis of the same variables in the case of groups of men shows significant difference on the level of maximum oxygen intake (VO_2max) only between the average motoric skill group and the high motoric skill group, and differences between other physical efficiency measurement results are not significant (Table 1).

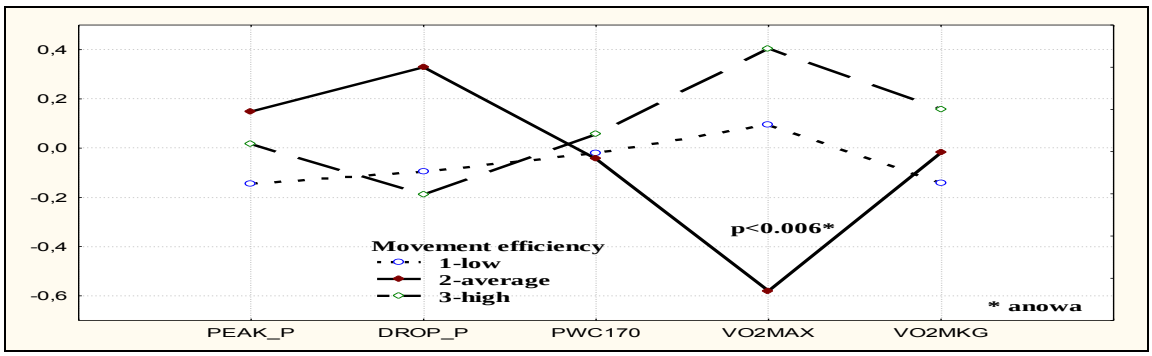

Fig. 1 – Physical efficiency level profiles of men (n=63)

The analysis of coordination skill profile of women shows that there are significant differences between both extreme groups, that is between the group of women with the highest and the lowest motoric skills. There are no such differences between the "low" group and "average" group and between the "average" and "high" group. The above mentioned interrelation is present when we compare variables concerning reaction time and rhythmisation. The analysis of other coordination variables does not show any significant differences (Fig. 2).

In the case of men, standardisation of coordination variables does not show any significant differences among the groups. It may be explained by high homogeneity of achieved results.

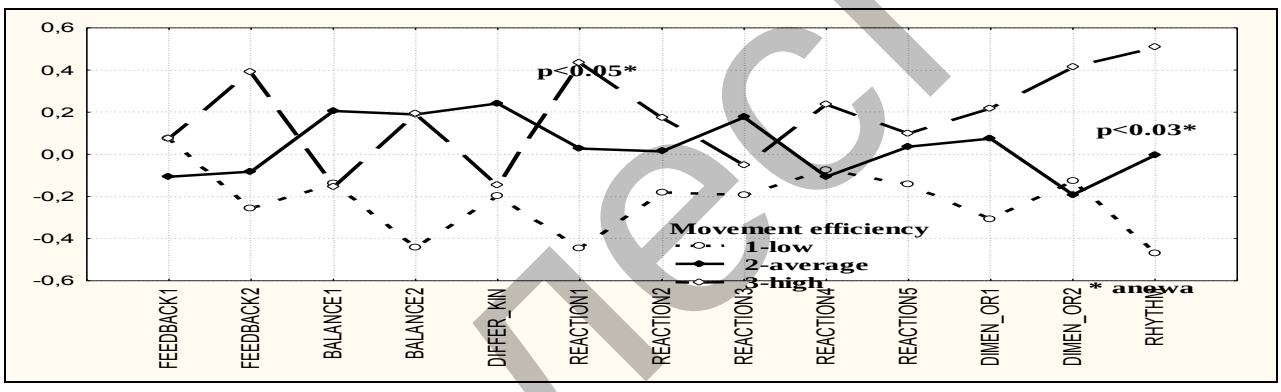

Fig. 2 – Coordination skill profile of women

The analysis of variance of variables included in the condition skill profile of women (Fig. 3) shows significant interrelations between the groups in the case of results of the following measurements: Cooper's test, reaction time and agility. There are no significant differences between variables when we compare the level of variables concerning flexibility and squeeze strength of hand. The results are also similar in the case of measurements concerning chest and lower limb strength.

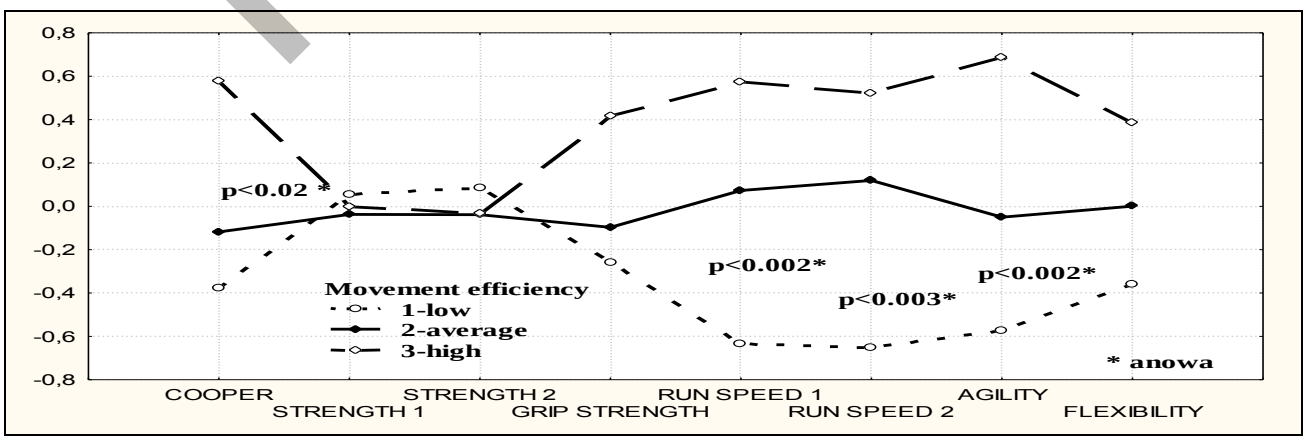

Fig. 3. Condition skill profile of women

The analysis of condition skill profile of men, similarly as the analysis of their coordination skill profile, does not show any significant differences among analysed groups.

Conclusions. The results of statistical operations carried out in order to determine motoric skill structure in the case of persons with low, average and high level of motoric skills show that there are differences in the level of certain motoric skill measurements. In the case of women, there are significant differences only as far as reaction time and rhythmisation is concerned. Differences in the level of these skills are observed only between two extreme groups, that is the group with the lowest motoric skill level and the group with the highest motoric skill level. There are no statistically significant differences when we compare the lowest motoric skill level group and average motoric skill level group, or average motoric skill group and the highest motoric skill level group, which may indicate that the above-mentioned skills in analysed groups are highly homogenous. It is also confirmed by the fact that there are no significant differences in analysed female student groups in the case of other coordination skills and all analysed physical efficiency parameters. In the case of condition and coordination skill levels, differences between the groups of women are observed only between the "extreme" groups. The above-mentioned skills may be referred to as "running" factor, since the results come from tests based on running: Cooper's test, speed in 50-m run and 20-m run with a flying start and agility. "Strength factor" and flexibility is the same in all groups.

Standardisation of variables and profiles created in order to analyse motoric skill structure in men allow for stating that maximum oxygen limit is the only parameter which differentiates the level of motoric skills. It confirms the conclusion, which has been already formed during the analysis of female group, that students are specific "research material" as through selection carried out during recruitment for the first year study they become quite homogeneous as far as their motoric skill level is concerned.

Conclusions. On the basis of results of our own research and their comparison with current knowledge about interrelations between motoric skills and motoric abilities, the following conclusions may be drawn:

1. Particular elements of motoric skill structure and their combinations differentiate persons with low, average and high level of motoric skills.
2. There are differences in correlations between motoric skills and motoric abilities depending on sex.

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