

ANTROPOMOTORYKA

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DISSERTATIONS AND ARTICLES

*Mohsen Ghanbarzadeh, Abdul Hamid Habibi, Mohammad Reza Zadkarami,
Mehdi Bustani, Maryam Mohammadi*

The effect of an anaerobic test on lung indices in some elite basketball players

Aim of the work. The main goal of this research was comparing the lung indices of 20 outstanding basketball players in Khouzestan province in Iran before and after the RAST test. Actually, the study examined the possible presence or absence of bronchial spasms among the athletes who had had several years of background in intense athletic activities. The subjects consisted of 20 elite basketball players from the eight teams which were present in Khouzestan basketball league. Their average age, weight, and height ranges were 26.55, 82.34 kg, and 186.35 cm; respectively. The average BMI was 23.69 kg/m². The research made a cross comparison among the pulmonary function indices MVV, FEF25-75, PEF, FEV1/FVC, FVC, FEV1 which were measured both before and after the RAST test.

Material and methods. Before and after the RAST test, the pulmonary function indices were measured. The sample population was given light basketball exercises for 10 minutes prior to the RAST test.

Results. In order to compare the obtained results, they were subjected to a t-test. The final results revealed no significant difference between the values related to MVV FEV1/FVC ($p > 0.05$); however, a significant decrease was observed in the values FEF25-75, PEF, FVC and FEV1 being respectively 12.60%, 10.28%, 7.82% and 5.41% ($p < 0.05$).

Conclusions. Based on the definition of bronchial spasms arising from athletic exercise, the existence of such bronchial spasms in the sample population could be defined only based on a single value, that is a 19% decrease in FEV1 in over 60% of the sample population.

Bojan Jošt, Janez Pustovrh, Janez Vodičar

Philosophy of expert modeling of sport performance of high level athletes

Aim of the work. Successful performance in sport is presently much more than a result achieved by the athlete; it is an element in organizational culture of sports with its values and achievements. Since the basic goal of organization of sports lies in this culture, the process of managing must consider various invisible and visible constituents important for the development of organizational culture of sports. The invisible constituents are those that attract people to sport, while among the visible ones are such as competition rules, execution of competitions, response to sports competitions, staff engaged in sport, technology of sports, transformation processes, sports events, etc.

Material and methods. Theory of performance in sport studies will enable the attainment of the set target criteria on individual performance standards. It can be studied only by means of analysis of a set of a variety of variables that, in the relationship of cause and effect, influence the criterion states on individual performance standards. At the Faculty of Sports of the University of Ljubljana, we have started with the formulation of an expert system called SPORT EXPERT, application of which will enable reaching more efficient decisions in the management of the various sources involved in performance in sports.

Results and conclusions. The results of expert systems are only an aid that can enable better management of people in terms of elevation of performance on the selected standards and criteria. In this way, the expert decisions will be based on more scientific grounds; the value of information will be higher, and the system itself will be permanently oriented towards the growth of the quality of the organizational culture of sports.

Ryszard Litkowycz, Kajetan Słomka, Monika Grygorowicz, Henryk Król

The influence of plyometrics training on the maximal power of the lower limbs in basketball players aged 16–18

Aim of the work. The study was aimed at assessing the influence of plyometric training on explosive strength development dynamics in running and jumping among basketball players, since basketball is a sport discipline dominated by strength and speed abilities. The combination of these two constitutes explosive strength enables the athletes of various sport disciplines to perform at the highest level of their technical and tactical skills.

Material and methods. Thirty-six basketball players aged 16–18 participated in the study. They were divided into experimental (E) and control (K) group. Running speed (5 m, 15m, 20m and 30m distance), speed endurance (10 × 30 m run), explosive strength of trunk and legs (recorded on a dynamometric platform) as well as strength endurance of leg flexors and extensors in isokinetic conditions were measured at the beginning and at the end of the experiment.

Results. The training regimen did not result in any significant changes in the examined motor abilities of basketball players in the control group. The introduction of plyometric training in the experimental group resulted in a statistically significant strength torque increase in knee flexors and extensors of both joints (measured at 60°/s, 120°/s, and 240°/s angular velocity). Moreover, changes were observed in the conventional ratio of hamstrings and quadriceps muscles of the right extremity. Specific training activities positively influenced the speed endurance assessed with the use of a shuffle run (10 × 30 m). There were no significant differences in the level of running speed and explosive strength of legs.

Ireneusz Cichy, Andrzej Rokita, Marek Popowczak, Karolina Naglak

Psychomotor development of grade I primary school children who are educated by means of traditional and non-traditional program

Aim of the work. In our study, we attempted to define the level of the general body coordination and acquisition of chosen educational competences by children taking part in one-year-long pedagogical experiment with educational balls “edubal”.

Material and methods. Our research comprised children from one of primary schools in Wrocław. The experimental group I was represented by 8 girls and 8 boys. The experimental group II included 7 girls and 7 boys. Subsequently, the control group was composed of 8 girls and 12 boys. The general body coordination was examined with General Body Coordination and Control Test by Kiphard and Schiling for children aged 5–4, while for determination of acquisition level of chosen educational competences we used test elaborated in Competence Examination Institute in Wałbrzych.

The obtained results underwent a statistical analysis with Statistica 8.0.

Results and conclusions. Girls from experimental group I achieved better results than girls from two other groups EII and K in almost all trials in the range of general body coordination. The tests were conducted at the beginning and at the end of the experiment. The results of the second part of the research regarding general body coordination were much worse (both for girls and boys) than the results of the same groups in the first examination. Girls from the first experimental group obtained the best results among all groups in Competence Examination Institute Test. It was also the only group which improved their first results in the second part of our research. It is worth mentioning that the employment of games and exercises with the educational balls did not substantially influence the results in the test of the researched competence.

Łukasz Jadczyk, Andrzej Kosmol, Andrzej Wieczorek, Robert Śliwowski

Motor fitness and coordination abilities vs. effectiveness of play in sitting volleyball

Aim of the work. To find relations between coordination abilities, motor fitness and effectiveness of play of sitting volleyball players.

Material and methods. The study material consisted of sixty players of the Polish sitting volleyball league. The test of general motor fitness included: dynamic strength of upper limbs, static strength of hand, muscular endurance of upper limbs, muscular strength of body, body flexibility (back muscles), endurance-speed. For the measurement of special motor fitness the following tests were used: attack, serve, overhand pass, forearm pass, tip. For the assessment of coordination abilities computer tests of coordination abilities were used which included measurement of time of simple reaction to visual stimulus (simple reaction), time of complex reaction to visual stimulus (complex reaction), effect of visual-motor coordination (Piórkowski test), orientation ability (a cross matching test), attention divisibility, orientation ability – perception. The assessment of effectiveness of play was performed according to the formula proposed by Coleman [1].

Results. The analysis of correlation between general and special fitness as well as coordination abilities and effectiveness of play indicates that the greatest impact on effectiveness of play of players in the Polish sitting volleyball league was exerted by the results of the following tests: body flexibility with endurance-speed in general fitness, ball passes, both overhand and forearm, and attack in special fitness, and in terms of coordination abilities particularly great impact was noted in the test of attention divisibility, orientation-perception and complex reaction.

Conclusions. The level of majority of tested properties of motor fitness and coordination abilities shows a statistically significant relation with the effectiveness of basic technical and tactical actions applied when playing sitting volleyball.

*Bożena Królikowska, Michał Rozpara, Władysław Mynarski,
Bogusława Graczykowska, Daniel Puciato*

The calorific cost of young women's leisure activity

Aim of the research. The aim of the research is an attempt to compare a weekly calorific cost of leisure activity of women regularly and irregularly physically active in the everyday and habitual activity.

Material and method. The research covered 34 women aging 18–35 and residing on the territory of the Opole province. For the research two groups of women were selected. The first one was made up of women who did not undertake a regular physical activity and the other one was made up of women exercising regularly. In this research a method of an indirect observation was applied and a weekly calorific cost of the two groups of women was measured with an accelerometer – Caltrac Monitor. The results of the monitoring of the weekly energetic expense done by women were expressed in kilocalories (kcal) per week and kilocalories per day.

Results. The total calorific cost of everyday (habitual) activity done by women in their ordinary week was various in the compared groups. The women exercising regularly achieved almost twice higher calorific cost than the other research group, which was a result of their different lifestyles. In both groups of the women the calories spent on physical activity constituted approximately 70% of their total caloric cost of habitual activities and it exceeds the energetic cost accompanying passive forms of leisure activities.

Conclusions. It should be noticed that the caloric expense of a physical leisure activity done in a free time per week by the researched women was too low to meet the health recommendations taken by Paffenbarger (about 2000 kcal per week and 300 kcal per day pro physical activity). Definitely, those who were close to meet the above recommendations were the women regularly physically active.

Bartłomiej Sokołowski, Maria Chrzanowska

Changes in somatic and motor development in children and adolescents in the years 1980–1988 and in 2000

Aim of the work. Comparison of body height and weight and the development of selected motor abilities in children and adolescents from Cracow population on the basis of examinations performed from 1980 through 1988 and in 2000.

Material and methods. The work includes materials collected by the teams of researchers from the Department of Anthropology and Anatomy, University School of Physical Education in Cracow while implementing “The Cracow Child 2000” project and during former examinations in the years 1980–1988. Results for age groups of 8–16 years were taken into consideration. Body height and weight got examined as well as the results of motor fitness tests: standing broad jump, sit-ups from the lying position for 30 s, and the sit and reach test. The values of arithmetic means were compared and the significance of their differences was calculated.

Results and conclusions. The girls and boys examined in 2000 are characterised by higher body height and weight when compared to the ones tested in the years 1980 through 1988. In the tests of explosive strength of lower extremities, flexibility and dynamic strength of abdominal muscles lower results were achieved by the examined in 2000. Only in the test of abdominal muscles in younger school age, the contemporary teenagers were better. Among children and adolescents from Cracow population, there occurred a tendency to achieve higher indexes of morphological development accompanied by lower motor abilities.

Wanda Pilch, Łukasz Tota, Szczepan Wiecha, Dorota Ambroży

A simple method of assessment of energy expenditure of low-impact aerobic exercises

Aim of the work. Estimating the character, intensity and energy expenditure in young women during one hour of aerobic low-impact training.

Material and methods. The exercise ability of ten women was measured as well as threshold physiological parameters, which determine adaptation of the organism to the physical strain. The exercise test on the laboratory track was performed until subject's refusal. During the test maximal heart rate (HR) and maximal oxygen consumption ($\dot{V}O_2$ max) were measured. In the second stage of the study, during one hour of aerobics exercises, the dynamic changes of HR were observed using the sport-testers produced by Polar Electro Corporation. To estimate energy expenditure indirect calorimetric method was used. To use this method, one minute absorption of oxygen has to be measured, than by knowing caloric equivalent (which is 5 kcal for one liter of oxygen) it is possible to measure the energy output in women during aerobic.

Results and conclusions. According to energy expenditure during one hour of aerobics low-impact (308 kcal) it may be classified as light work.

REVIEW PAPERS

Włodzimierz Starosta

The muscle relaxation ability and results in sport of world elite competitors

In the theory and methodology of sport training there are issues which are extremely important and which are marginal. As a rule, the first kind of issues becomes the subject of intensive research, whereas the second occasionally and fragmentarily are subject to scientific penetration. Sometimes, these extremely important, although not being sufficiently dealt with, cease to be the subject of interest. It seems that the same lot fell upon the **extremely important issue which was and still is – the ability of muscle relaxation**. Despite the significant progress in the

knowledge about sport training, muscle relaxation accounts for a relatively little exploited reserve in the practice of physical education and sport. There are fewer and fewer such reserves, since in contemporary record-seeking sport, more often it is the odds and ends that affect the final result. The ability to relax muscles is not trifle, since according to scientists and coaches the low level of muscle relaxation inhibits the achievement of maximal sport results.

The superficial overview of contemporary literature related to physical education and sport demonstrates that the issue has recently become barely noted, though 30–40 years ago it was a subject of various research works, carried out by specialists of various scientific disciplines in many countries Taking into account the evident shortage of new information, as well as the lack of interdisciplinary interpretation of the issue, particularly **from the point of view of the science about human movement – antropokinesiology**, the work hereby focuses on the achievement of the following **aims**: 1. Definition of the place of the muscle relaxation ability in the science about human movement. 2. Manifestation of the muscle relaxation ability in various sport disciplines. 3. Search for the relationship between this ability and other motor abilities. 4. Establishment of the relation between the level of the ability of muscle relaxation and sport techniques. 5. Attempt to establish the influence of the ability of muscle relaxation on the effectiveness of technique and on the sport success.

DISCUSSIONS

Wacław Petryński, Mirosław Szyndera

Time perception and motor behaviour of living beings

The authors discuss influence of time perception development on behaviour control in living beings, including humans. At first they present “classical” division into energetic and coordinative constituents. Next they add third group, i.e. psychological elements, and then the fourth category, i.e. cultural factors. Unlike divisions made in most scientific papers, which usually take into account energetic and coordinative constituents only, the explanation of the processes involved in human behaviour needs taking into account all four circles of elements: energetic, coordinative, psychological and cultural ones. In the course of evolution they developed along with central nervous system. This development included also the capability of better and better formation of a unique ability, necessary for understanding of reality: the time perception, which significantly influenced all behaviour patterns.
