

Solving the problem of individualization of assessment of physical possibilities of students by means of physical culture.

The article determination of main conditions for complying individual potentials of physical condition and students' physical fitness for practicing appropriate kind of sports. For satisfaction of students' individual interests to definite kinds of sports it is necessary to have professional graphs of motor functioning in sports and ergo-graphic characteristic of competition exercises

The problem of students' physical education at modern stage of its re-organization implies realization of individual approach, which would consider characteristics of physical condition, initial fitness, interest to definite motor functioning and degree of its importance understanding. In all cases it is necessary to determine compliance between demand in motor functioning and possibility of its satisfaction with definite motor actions [1, 2]. Solution of problems of students' physical education is shown in some other directions: - Study of students' professional-technical maturity [6]; -Study of students' attitude to physical activity and their intentions to be physically active [11]; Analysis of students' psychic health in globalized world [7, 8]; -Influence of internet and computer habits on students' health [4]; -Students' leisure motor activity [9]; Sport and health related competition activity [5, 10]; Solution of the mentioned tasks require consideration individual physical condition (biological age), which, to large extent, differs from chronological age. Special aspects of individual physical growth determine bent and succession of certain motor functioning's specificities. With it, it is necessary to consider that physical load's feasibility is determined by current functional state of an individual. All mentioned requirements for individual approach realization in physical education building is based on mean static indicators, which do not permit to ensure its individualization. The purpose of the research is to solve the problem of individualization of students' physical potentials assessment.

Results of the research One of the most urgent problems in any professional field is clear definition of professional graph and ergo-graphic characteristic of its motor component. Solution of this problem is especially acute for theory of physical culture and sports. The first studies in this direction were made by I.M. Sechenov in 1964. In the fulfilled ergo-graphic studies of arm's work he found dependence of workability reduction on duration and intensity of the fulfilled work. However this work had descriptive character. More profound analysis was practically impossible, because up to the middle of 19th century the conception "energy" was vague. Characteristic of term "Energy" was based on its translation from Greek and meant power, value or efficiency of something. "Energy" was defined so in the first edition of British encyclopedia, published in 1771. In 1783 J. Watt introduces the unit of work, expressed in horse power. In 19th century conceptions of kinetic and potential energy appear; laws of one energy kind transformation to other are found; ways of

energy description in particular cases are determined; energy starts to be applied to human physical functioning and to its motor component. In existing studies of motor functioning in different kinds of sports the most attention is paid to kinematic energy consumption. It is explained by feasibility of its measurement, providing body mass and velocity of its traveling are known. Determination of potential energy consumption with fulfillment static work is not possible with the help of the above mentioned expression, because there is no velocity value and indicators of body movement under impacting force. Static efforts require great consumption of potential energy. It is necessary to consider that in structure of any movement there is static tension. Potential energy is directly connected with power or speed of work fulfillment. In step-by-step method of force measurement it is possible to make a sequence of force impulse with every correlation of unbending angle between appropriate biokinematic links. Such measurements of force impulse in respect to unbending angle carry two informational characteristics: 1) Position of bio-kinematic links in respect to each other (to be measured by angle between them; value of effort with every observed position; 2) Period of its preservation, permitting to determine force impulse. Consequent measurement of maximal effort (with fixed position between connected bio-kinematic links) and ranging of their values (with uniform increment of unbending angle) permitted to find law of effort's increment at unbending angle of joint. This value points at velocity of maximal force increment at unbending angle. Characteristic aspect of this dependence's individual features is flexion of logarithmic dependence, which does not change with every current state. The changes in the state of fatigue are registered only in force. The same dependence is noticed with velocity of this dependence growing in time.

Determination of time of muscular tension duration (force impulse in every fixed position of bio-kinematic pair) was fulfilled with its different value in respect to maximum. Velocity of potential energy consumption in respect to duration of muscular tension is in exponential dependence. This manifests in different physiological processes. Its individual features are noticed only in coefficient of exponent's flexion. Such dependence of force impulse behavior permits to find its highest value with definite force of static muscular tension. Analysis of the received dependence permits to find that the most optimal regime of static tension (with which maximal impulse of force is observed) corresponds to force from its maximal manifestation. With it force impulse in static tension contains maximal quantity of movement, which can be transferred to body. Maximal force with static tension I function of state and taken as "one". With physical workability weakening the value of maximum reduces. It reflects consumption of potential energy. This force is manifested under different angles of bio-links' unbending. If to observe consequent reduction of physical workability then, in respect to every state, it would be possible to obtain cross point of appropriate logarithmic spiral with radius of force vector. The ranged sequence of these points will compose logarithmic sequence of workability potential's weakening. Individual aspects of these regularities are noticed only in coefficients, reflecting curvatures' flexion. The mentioned regularity and "function of state" is observed in all directions of vectors radii. In this case for control of current physical condition it would be quite enough to determine the character of behavior of ranged force change sequence in different physical

condition. It permits (by single measurement with fixed unbending angle between bio-kinematic pair of links) to find sportsman's current condition. The described regularity of "function of state" changes actually reflects potential energy consumption, resulted from fulfilled work and static tension. Loss of potential energy reflects organism's condition. This loss is an indicator of current workability wakening or fatigue. Determination of current maximal applied force (by corresponding vector) permits to determine degree of fatigue in the given bio-kinematic link. Such methodic permits to find the share of appropriate total bio-kinematic structure's links. It is purposeful to realize in the following conditions: when finding reasons of standard motor actions' technical violations; in optimal regime of muscular group in holistic dynamic stereotype of the fulfilled movement. For determination integral indicator of general fatigue it is purposeful to use single dynamometric static tension, related to its maximal indication. When argument changes by the law of geometrical progression, function will change by the law of arithmetical sequence. Actually, this function is a foundational one in organization of biological, social and physical phenomena [3]. The found analytical connection between endurance and quickness substantially changes the methods of fatigue's study. These methods permit to realize the following: register individual aspects of the process; consider its qualitative characteristics and determine optimal load for achieving maximally possible volume of work to be fulfilled with the given intensity. When making ergo-graphic passport of sportsman's motor functioning this regularity permits to restore complete structure of reaction to different intensity loads by value back strength. In this case by result of standard static force (by standard plio-metric exercise) energy consumption for certain distance is found. From its value kinetic energy, spent for distance overcoming, is deducted. The received difference reflects its consumption for working posture static tension in work's fulfillment.

Conclusions

Computer software tools allow better processing of received sports data. Analytical regularities will allow using the results of processing in actual scientific research. Such regularities are a practical tool in the organization of the educational process, control over the results of the competition and their subsequent analysis. The implementation of such control involves appropriate training of trainer staff and certain logistics. However, with the full availability of the above capabilities, the trainer can not ensure the performance of the full amount of possible work. This requires a specialist who will analyze the results of computer processing. The training of such specialists is dictated by the need to monitor the current status of people in various fields of industrial functioning, medicine, sports and rehabilitation.

References

1. Azhippo AIu, Puhach YI, Zhernovnikova IaV. Problema opredeleniia biologicheskogo vozrasta v sisteme ocenki fizicheskogo razvitiia i fizicheskoi diagnostiki konstitucional'nykh zabolevanij [The problem of biological age determination insystem of physical condition and physical diagnostic of

- constitutional diseases system]. *Slobozhans'kij naukovо-sportivnij visnik*, 2015;3 (47):7-12.
2. Puhach YI. Vliianie individual'noj normy fizicheskogo sostoianii i zony funkcional'nogo optimuma na rabotu v ekstremal'nykh usloviakh ee vypolneniia [Influence of physical condition individual norm and zone of functional optimum for work in extreme conditions]. *Slobozhans'kij naukovо-sportivnij visnik*, 2011;3:123-128.
 3. Gorban' AN, Khlebopros RG, Demon Darvina. Ideia optimal'nosti i estestvennyj otbor [Idea of optimality and natural selection], Moscow: Science; 1988.
 4. Al-Hariri MT, Al-Hattami AA. Utilization of internet by health colleges students at the University of Dammam. *Journal of Taibah University Medical Sciences*. 2015;10(1):66–73.
 5. Buško K, Staniak Z, Szark-Eckardt M, Nikolaidis PT, Mazur-Rózycka J, Łach P, . . . Górski M. Measuring the force of punches and kicks among combat sport athletes using a modified punching bag with an embedded accelerometer. *Acta of Bioengineering and Biomechanics*, 2016; 18(1): 47–54. doi:10.5277/ABB-00304-2015-02
 6. Erman KA, Şahan A, Balci YK. The Vocational Maturity of School of Physical Education and Sports Students. *Procedia - Social and Behavioral Sciences*. 2015 Feb;174:2380–2383.
 7. Gaskov AV, Kuzmin AV, Kudryavtsev DM, Iermakov SS. Successfulness of general and special physical qualities' development on different stage of students-boxers' training. *Physical Education of Students*, 2016;1:4-11. doi:10.15561/20755279.2016.0101
 8. Holm-Hadulla RM, Koutsoukou-Argyaki A. Mental health of students in a globalized world: Prevalence of complaints and disorders, methods and effectivity of counseling, structure of mental health services for students. *Mental Health & Prevention*. 2015;3(1–2):1–4.
 9. Ilchenko SS. Motor and sport components in hierarchy of non physical culture profile pedagogic specialties students leisure. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2016;5:33-37. doi:10.15561/18189172.2016.0505
 10. Kochanowicz A, Kochanowicz K, Niespodziński B, Mieszkowski J, Aschenbrenner P, Bielec G, Szark-Eckardt M. Maximal power of the lower limbs of youth gymnasts and biomechanical indicators of the forward handspring vault versus the sports result. *Journal of Human Kinetics*, 2016; 53(1): 33-40. doi:10.1515/hukin-2016-0008
 11. Kopeikina EN, Drogomeretsky VV, Kondakov VL, Kovaleva MV, Iermakov SS. Modification of Harvard step-test for assessment of students' with health problems functional potentials. *Physical Education of Students*, 2016;4:44-50. doi:10.15561/20755279.2016.0405