ISSN 2223-2125

PES

PHYSICAL EDUCATION OF STUDENTS

2013
01

PHYSICAL
EDUCATION
OF STUDENTS

2013
01

Key title: Fiziceskoe vospitanie studentov

Abbreviated key title: Fiz. vosp. stud.

ISSN 2075-5279 (print), ISSN 2223-2125 (online).

Founders: Kharkov Regional Branch of National Olympic Committee of Ukraine. Publishing house KSADA.

A journal is ratified the Higher attestation commission of Ukraine:
physical education and sport,
pedagogical sciences
Decision of Presidium N1-05/3 - 08.07.2009, N1-05/7 - от 10.11.2010.

Journal is reflected in databases:

Academic Journals Database
http://journaldatabase.org

CABI (CAB Direct)
http://www.cabdirect.org/

DOAJ (Directory of Open Access Journals)
http://www.doaj.org

IndexCopernicus
http://journals.indexcopernicus.com

Google Scholar
http://scholar.google.com.ua

Ulrich's Periodicals Directory
http://ulrichsweb.serialssolutions.com/login

V.I.Vernadskiy National Library of Ukraine
http://www.nbuv.gov.ua/portal/Soc_Gum/PPMB/texts.html

Electronic Library of Russia (Russian science citation index)
http://elibrary.ru

Library of the Russian state university of physical culture, sport and tourism
http://lib.sportedu.ru/Press/FVS

Certificate to registration:
KB 15179-3751 PR от 25.03.2009.

Frequency - 6 numbers in a year.

Address of editorial office:
Ukraine, 61068, Kharkov-68, P.O.Box 11135.
Tel. /fax: (057) 706-15-60;
http://www.sportedu.org.ua
e-mail: sportart@gmail.com

CONTENTS

IMPROVMENT OF PHYSICAL TRAINING OF STUDENTS OF EDUCATIONAL INSTITUTIONS OF MINISTRY OF HOME AFFAIRS OF RUSSIA

Alekseev N.A., Kutergin N.B., Kulinichev A.N.
Belgorod Law Institute of the Russian Ministry of Home Affairs

Abstract. Directions of perfection of students' physical training and listeners of educational establishments of Ministry of Internal Affairs of Russia are considered. These statistical Ministries are resulted on crimes. It is marked that criminals perfect the actions constantly, apply the new methods of commission of crime, all more frequent utillize different armaments and explosive devices. The necessity of increase of professionalism and capacity of students is marked. The comparative analysis of normative acts of Ministry is resulted. The elements of alertness of employees are selected to implementation operatively-official tasks. Technical descriptions of equipment which is utillized by employees at implementation of the special operations are considered. The chart of distributing of clock is offered in the section of the program on a body-conditioning. It is suggested to extend the section of general and special endurance, utillize the methods of preparation of weightlifters. Directions of increase military efficiency of organs of internal affairs are shown through perfection of physical qualities: force, endurance, quickness, adroitness.
Keywords: police, physical training, criminality, physical qualities, teaching method.

Introduction.

On all stages of its development society faces "Thieves World" (TW) which is manifold by its nature, motive powers, aims and forms. The statistics of Home affairs ministry of Russia gives the following data: in the period from January to November 2012, 2 136.1 thousand of crimes were registered. From them there were 584 terrorist crime (by 1.4% more than (by 1,4% more than APPG) and 670 extremists crimes. (by 19,4% more than APPG). In public places there were registered 652.8 thousand of crimes (by 13.7% more than APPG).On streets, squares in parks and public gardens 428.6 thousand of crimes were registered that is by 14.6% exceeds. This figure includes: 192.4 thousand of larcenies (by 22.3% more the APPG)), 6.9 of armed robberies (by 2.8% more than APPG). On out of centers of population roads and highways there were committed 153 armed robberies (that by 10% exceeds APPG), 346 robberies (by 0.9% more than APPG), 104 acts of illegal acquisition, transfer, selling, storing, transportation or carrying of arm, ammunition, explosives and explosive assemblies (by 48.6% more than APPG) [http://www.mvd.ru/presscenter/statistics/reports]. The statistic data show that criminals permanently improve themselves in their evil deeds, using new methods of committing of crimes. Still oftener criminals use different arms and explosive assemblies, committing, as a rule, most cruel forms of violence.

Police has been called on to guard law, order and lives of Russian citizens. It is consigned to defend lives, health, rights and freedoms of Russian Federation citizens, foreign citizens, stateless persons and to counteract crimes, maintain public order, for protection of property and ensuring of public security. Police officers immediately help to everybody who needs its defense against criminal or other unlawful trespasses [Federal law of Russian Federation № 3-ФЗ, dt. February 7, 2011].

Crime-fighting demands that police personnel should be highly professional and hard-working. Every police officer, fulfilling his service task must be ready to any turn-up both: psychologically and physically; he must rely on himself, his knowledge, skills, his colleagues [1-7, 9, 10].

For young graduates of Russian Home Affairs educational institutions to start crime fighting is more difficult because they, unlike the operating police officers, have no practical experience in arresting criminals yet and the results of their crime-fighting will depend on their physical training.

Purpose, tasks of the paper, material and methods

The purpose of the paper is improvement of physical training of Russian Home Affairs educational institutions students.

The tasks of the research is development and maintaining of Russian Home Affairs educational institutions students' physical abilities (quickness, stamina, strength, dexterity) on appropriate level.

The methods of the research are theoretical analysis, summarizing of special and scientific methodological literature.

Results of the research.

Physical training is the main component of officers' combat readiness to fulfillment of operations and service tasks and it is one of directions Home Affairs bodies fighting efficiency improvement [Order of Russian Home Affairs ministry, № 663, dt. July 3, 2012, "On adoption of preparation procedure of personnel for filling the positions in Home Affairs bodies of Russian Federation"]. Physical training is organized and conducted as per statutory acts of Russian Home Affairs ministry "On adoption of physical training organization Instructions in Home Affairs bodies of Russian Federation".

The purpose of physical training is the formation of officers' physical and psychological readiness to successful fulfillment of operations and service tasks, skillful application of strength, combat techniques and specials means for suppressing unlawful actions as well as ensuring of officers' high efficiency in their service

doi: 10.6084/m9.figshare.156348

[Order of Russian Home Affairs ministry № 510, dt. May 15, 2010, "On entering amendments and addenda in Home affairs officers' physical training Instructions, adopted by order of Russian Home Affairs ministry № 412, dt. July 29, 1996"].

In order to find a positive trend in physical training of Russian Home Affairs educational institutions cadets, the comparative analysis of two statutory acts of Russian Home Affairs ministry has been made: the current Instruction on organization of physical training in Home Affairs bodies of Russian Federation, which was adopted on November 13, 2012, and Instruction on physical training of Home Affairs bodies' officers, dated July 29, 1996.

The previous program of physical training program, which was adopted by order of Russian Home Affairs ministry, dt. July 29, 1996, consisted of three parts:

Part 1 –"Combat techniques of fighting".

Part 2 – "Chase and accelerated movement".

Part 3. – "Training-combat practice".

The subjects of Part 1, aimed to development of strength:

Subject 1.11. Absolute strength. (Exercises for development of absolute strength of arms, legs body muscles with the help of loads (different weights, gym apparatuses, etc.) The main method: repeated exercises with overcoming of not maximum or close to maximum resistance.

Subject 1.12. "Explosive" strength (Exercises for development of "explosive" strength of legs muscles and sprint speed (jumping on eminence, multi hops, jumps in depth and other). Exercises for development of "explosive" strength of arms' muscles (stones or medicine ball throwing, training on makivara or punching bag and so on). The main method: repeated exercise with highly intensive overcoming of not maximum resistance.

Subject 1.13. Endurance. (Repeated training of wrestling, boxing or martial arts fights in conditions of anaerobic, glycolytic organism operation (pulse 180-195 ictuses per minute). Contact sports and outdoor power games (Rugby, hand ball, basket ball). Main methods: alternative, interval, repeated).

Part 2 consisted of subjects, devoted to development of speed, general and special endurance:

Subject 2.1. Cross country. Accelerated motion (rushes at middle and long distances). Running technique on firm, soft, granular and slippery soil, running uphill, down hill with obstacles' overcoming (trenches, streams, hummocks, fences, etc.). Main methods: even, alternative, repeated).

Subject 2.2. Overcoming of obstacles (fences of different height, motion onnarrow or rocking surface, motion in a crowd, creeping in windows, jumping from different height, swarming up and horizontally a rope. Main method: repeated.

Subject 2.3. Skiing. Middle and long distances skiing. Skiing techniques, hills ascending and descending. Main techniques: even and alternative.

Subject 2.4. Applied swimming (freestyle, swimming crossing, diving at length and in depth, transportation of a drowning. Main methods: even and alternative.

Subject 2.5. Sports games (Contact outdoor games (Rugby, handball, basketball, football, etc.) including games by simplified rules. Main method: repeated.

Approximate quantity of class hours for coping with these subjects was 62 hours [Order of Ministry of Home Affairs of Russia, No. 412, dated July 29, 1996. "On adoption of Instruction on physical training of Home Affairs bodies' officers."

New Instruction on physical training of Russian Federation Home Affairs bodies' officers has similar structure of parts, but Part "General physical training" has less number of class hours. In our opinion their quantity and distribution in the present physical training program is insufficient for improvement of physical abilities and skills, required for Russian police officers to fulfill operations and service tasks in modern conditions. The lack of subjects on development of general and special endurance in new Instructions will negatively influence on maintaining of high officers' efficiency in the period of their service. Because, when fulfilling operations and service tasks police officers have to patrol by foot, to run for long time chasing criminals; they will have to carry out search operations on rugged terrain and so on.

Conducting special operations, Russian police officers, for personal safety, fulfill combat tasks in special bullet proof means. Using of bullet proof means minimizes the percentage of combat losses of sub-units manpower. But using of bullet proof means during fulfillment of service-combat tasks demands the officers' high physical level and special methodology of training planning for improvement of skills, required for efficient execution of tasks without traumas.

For example, performance characteristics of equipment to be worn by an officer during special operation are the following:

1) Bullet proof vest "Korund" is designed for individual protection of man against fire arms. The breast section of it is additionally strengthened by steel elements, which at distance of 5 – 10 meters (protection class 5) protect against bullets with steel, heat strengthened cores of caliber 7.62 mm machine gun AKM and against bullets with steel cores of sniper rifle SVD of caliber 7.62 mm. The mass of the article is 9.7 kg, the time of continuous wearing up to 5 hours.

2) "Maska -1" – steel solid drawn bullet proof helmet with removable face guard with panoramic periscope ensures protection class 2 and is designed as equipment of field and special sub-units. Glass part is of class protection 1. The mass of helmet is 4.73 kg.

3) 5,45 mm Kalashnikov machine gun AK-74 M which is individual weapon and is designed for destruction of enemy's man and fire power. The mass of machine gun with loaded charger is 4.1 kg. Besides, as a unit of machine gun there are four loaded chargers. The weight of one loaded charger is 500 g.

4) 9 mm pistol "Makarov", which is a government issue weapon of protection and attack, is designed for destruction of enemy at short distance. The weight of pistol with loaded charger is 910 g [8].

Summing up the weight of the mentioned above equipment, we see that police officer carries out operations and service tasks during special operation, having equipment of 20 kg weight. Considering the fact that this operation can be conducted during long time, the load on officer's organism will increase very much. This can result in strong traumas of officer's supporting motor system with consequent long term treatment and even dismissal of the officer due to his state of health.

Summary.

To successfully carry out all operative-service and combat tasks officer shall constantly improve his physical level. For this purpose it is necessary to increase the quantity of class hours in part "General physical training" and distribute them so that the improvement of physical abilities should be the most efficient.

We suggest that increasing of the quantity of devoted to the development of physical abilities class hours in the program of Russian Home Affairs educational institutions cadets' physical training and adding the subjects on general and special endurance improvement to part "General physical training"; study of weightlifters' training methods and based on them implementation of innovative methods of Russian police officers' physical training would permit to more efficiently organize physical training classes improving: strength, endurance, quickness and dexterity, which are necessary for police officers to efficiently conduct crime fighting measures.

References:

1 Andrianov A.M. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2008, vol.5, pp. 3-5.

2 Barchukov I. S. *Fizicheskaia podgotovka lichnogo sostava specpodrazdelenij* [Physical preparation of personnel of the special divisions], Moscow, SportAkademPress, 2001, 252 p.

3 Grigor'ev I. S. *Boevaia podgotovka professional'nykh telokhranitelej* [Combat training of professional body-guards], Rostov on Don, Phoenix, 2004, 384 p.

4 Kikot' V. Ia. *Osnovy organizacii vospitatel'noj raboty s lichnym sostavom v organakh vnutrennikh del* [Bases of organization of an educate work with a personnel in the organs of internal affairs], Moscow, Ministry of internal affairs of Russia, 2008. - 400 c.

5 Kubyshko V.L. *Osnovy raboty po ukrepleniiu sluzhebnoj discipliny i zakonnosti v organakh vnutrennikh del* [Bases of work on strengthening of official discipline and legality are in the organs of internal affairs], Moscow, Ministry of internal affairs of Russia, 2008, 80 p.

6 Zuikov G.G., Chernenko G. I, Ias'kov E.F. *Nauchnaia organizaciia upravleniia organami vnutrennikh del* [Scientific organization of management the organs of internal affairs], Moscow, 1984, p. 191.

7 Popovich A.I. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports],2010, vol.5, pp. 109-112.

8 Karagodin A.V., Kaniber Iu.N. *Primenenie special'nykh sredstv sotrudnikami OVD* [Application of the special facilities the employees of Ministry of internal affairs], Belgorod, BLI, 2012, 120 p.

9 Geller William A., Guy Swanger. *Managing Innovation in Policing: The Untapped Potential of the Middle Manager*. Washington, D.C.: Police Executive Research Forum. 1995. 240 p.

10 Norm Gledhill, Claire Shaw, Carroll Robinson. *PREP Appraisers from the Toronto Police Service*. Queen's Printer for Ontario, 2002, 28 p.

Information about the authors:

Alekseev N.A.: kutergin-nb@rambler.ru; Belgorod Law Institute of the Russian Interior Ministry; Gor'kiy str. 71, Belgorod, 308024, Russia

Kutergin N.B.: kutergin-nb@rambler.ru; Belgorod Law Institute of the Russian Interior Ministry; Gor'kiy str. 71, Belgorod, 308024, Russia

Kulinichev A.N.: kutergin-nb@rambler.ru; Belgorod Law Institute of the Russian Interior Ministry; Gor'kiy str. 71, Belgorod, 308024, Russia

Cite this article as: Alekseev N.A., Kutergin N.B., Kulinichev A.N. Perfection of physical training of students and listeners of educational establishments of Ministry of Internal Affairs of Russia. *Physical Education of Students,* 2013, vol.1, pp. 3-6. doi:10.6084/m9.figshare.156348

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 15.01.2013
Published: 09.02.2013

PEDAGOGICAL CONTROL OF STUDENTS' PHYSICAL STATE BY RESEARCH RESULTS OF CARDIOVASCULAR SYSTEM'S FUNCTIONAL INDICATORS

Balamutova N.M.
National University «Legal academy of Ukraine»

Abstract. The questions of estimation of bodily condition of students are considered on the basis of study of functional indexes cardiovascular system. 15 students took part in an experiment. The followings parameters were determined: frequency of heart-throbs, arteriotony, shock volume of circulation of blood. Frequency of heart-throbs was registered on electrocardiograph in the second standard taking. Results were processed through the method of variation measurings of pulse Parina - Baevskogo. It is set that at all of examinee the chart of return reaction on the offered loading on every index has S - vivid form, but with the different steepness of charts of return reaction. It is found out that participation of parameters on an irritant at an examinee differently. For one students it shows up in form frequency characteristicness, at other - on a volume. The account of these features allows objectively enough to judge about current functional status cardiovascular system.
Keywords: bodily condition, cardiovascular system, students, prophylaxis.

Introduction

Insufficient motion activity and mental overstrain are typical for students [2, 10, 15]. This conditions the demand of thorough pedagogical and medical control of every student's physical state. Such control will increase the efficiency of disease preventive means and the quality of future specialists' training.

There is a number of unsolved problems in studying of man's physical state with the help of means and methods of pedagogical control [1, 2, 16]. The solution of these problems is connected with certain difficulties. The main of them is the abundance of methods and parameters of physical state diagnostics, which hinders the practical aspect of researches.

In sports physiology three physiological systems: cardiac vascular system (CVS), respiratory and nervous muscular ones are considered for evaluation of students' physical state.

In studying of cardiac vascular system (CVS) the cardiac beat frequency (CBF) is considered the most labile indicator of circulatory system. This indicator changes under quite different influences – emotions, physical and chemical environmental factors, diseases, muscular activity, etc. With that, CBF is one of the most available for control: from the widespread for long time palpation to different electrocardiography methods, telemetry inclusive. Basing on this method it was stated that CBF of skilled sportsmen with high robustness (track and field athletes, swimmers, skiers) in rest is of 40 – 50 beats per minute. For more overall evaluation of cardiac vascular state the indicators of arterial pressure (AP) are used. In some research works, the AP indicators are given as reduced (50/170), the other authors do not find not this phenomenon [8, 12]. There are some observations which state that the development of physical state is accompanied by increasing of blood pressure instead of decreasing [5].

For laboratory research precise recording equipment like mechanical cardiograph by Savitskiy N.N. and different oscillograph and tachyooscillograph attachments with multi-channel recording equipment are used. For mass AP testing the traditional Korotkov's method of AP examinations is most frequently used.

In sports medicine hemodynamics indicators (stroke volume and cardiac output, vascular resistance and blood velocity) are used for more overall evaluation of CVS functional state [4, 7, 13, 14].

The present researches have been executed in accordance with the plan of scientific research work of National university "Legal academy of Ukraine named after Yaroslav the Wise".

Purpose, tasks, materials and methods.

The purpose of the research is to evaluate the students' physical state on the base of studying of cardiac system functional state indicators.

The research (of Legal academy of Ukraine students) had been carried out from September 2011 to May 2012. 15 persons took part in experiments.

Cardiac vascular system was examined with the help of determination of the following parameters: cardiac beat frequency, arterial pressure, stroke volume of circulation.

Cardiac beat frequency was recorded by electrocardiograph in the second standard leads. The results were processed with the help of Parin – Bayevskiy's variation pulse metering method for plotting of variation pulsegram. The essence of this method is estimation of distribution of the most frequently met frequencies of cardiac beat. For this purpose one hundred of ECG cycles were recorded and the cardiac beat frequency was determined by the distance between peaks R – R. The obtained values were plotted on the graph in the reference system: X- axis –frequency of cardiac beat, Y-axis – the number of beats with the given frequency. The evaluation of current state was carried out by the shape of the obtained distribution.. The skewness of distribution shows that the processes of fatigue or restoration dominate and it permits to judge if further physical load is possible. These examinations were carried out with one and the same student in different states (in rest, under load and etc.) All diagrams of every tested student were plotted on

doi: 10.6084/m9.figshare.156349

one graph. This made possible to estimate the variation of most frequently repeated frequencies depending on the load, and to obtain general characteristics of skewness's distribution for different functional states.

AP examinations were carried out with the help of automatic tonometer aimed for measuring of systolic and diastolic blood pressure by Korotkov's method.

Hemodynamic parameters were recorded by means of rheography with the help of tetrapolar, two way rheoplethysmograph РПГ2 – 02.

The examinations of CVS functional state were carried out with one and the same student in different states (in rest, i.e. without load and under load). The following loads were used:

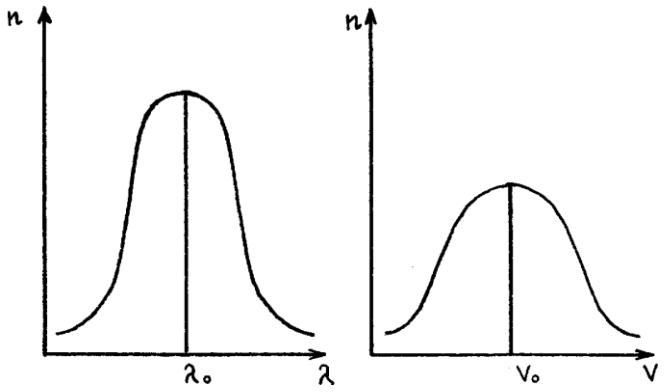
1) "Rebreathing" in the system "bag in box" with accumulation of CO 2 (O2 content in the bag within 30-50%). The creation of progressive "pure" hypercapnic stimulation was ensured during 5 - 6 minutes;

2) "Rebreathing" in the same system with permanent decreasing of O2 content from the atmospheric level in the bag from the atmospheric level. Equalization of PaCO2 by CO_2 absorption system was ensured, i.e. the progressive isocapnic stimulation was created for 6 – 7 minutes.

3) "Rebreathing" in system "from bag to bag" [3, 6, 11].

The results of researches

As far as the circulatory function of CVS is conditioned not only by its frequency response we made an attempt to find an interconnection between the changes of cardiac beat frequency (CBF) and stroke volume (SV) in different states of the tested students' organisms (before, during and after loads). Breathing in closed space of big volume and breathing from vessel with standard gas mixture [3] were used as loads. The choice of these loads was conditioned by the fact that the increasing of CO2 concentration in exhaled air at every step of breathing in system "from bag to bag" corresponds to steady states, which were compared each with other [11]. The analysis of the obtained results of CVS examinations permitted to find that CBF and SV indicators comply with normal law of distribution (Fig.1).

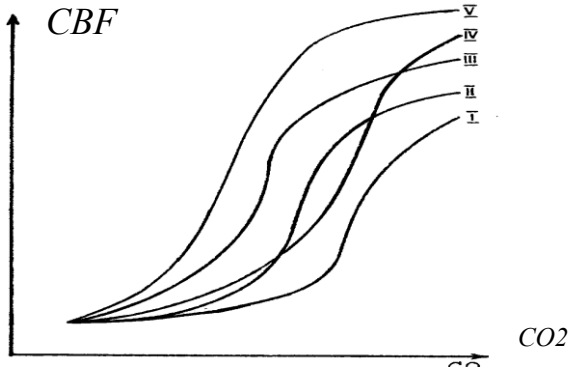


λ – CBF; V – SV

Fig.1. Diagram of CBF and SV indicators' normal distribution.

As a result we observe complete adequacy of Parin – Bayevskiy's method concerning these characteristics of CVS with their being measured in different states of the tested student.

If to create different steady states (like it was done in the example of step-by step rebreathing) and observe the changes of CVS frequency and volume responses to one and the same irritant (CO2), it can be noted that CBF and SV of every tested student have strongly individual characteristics. The difference between these responses lies, first of all, in the fact that all tested students show different speed of answer to irritant. This difference was especially expressed when plotting diagrams of response of the studied CV indices (Fig.2).



I – V – numbers of the tested

Fig.2. Diagrams of the tested students' CBF response to increase of CO2%.

From the given material it is clear that the increasing of frequency heart rate and stroke volume takes place unevenly that is expressed by the different slopes of these curves. With this on every curve there are peculiar "sites" which characterize steady states for their stage of load. The analysis of the results showed that with one and the same value of irritant the curve of CBF response of tested student No.5 is steeper than of tested student No.1. Probably, it occurs as a result of different adaptation "value" by CVS frequency response of the mentioned individuals.

Besides, it should be noted that with every subsequent transition to new state the transition phase becomes less and the dispersion of control indicators of the tested students restricts (Fig. 3).

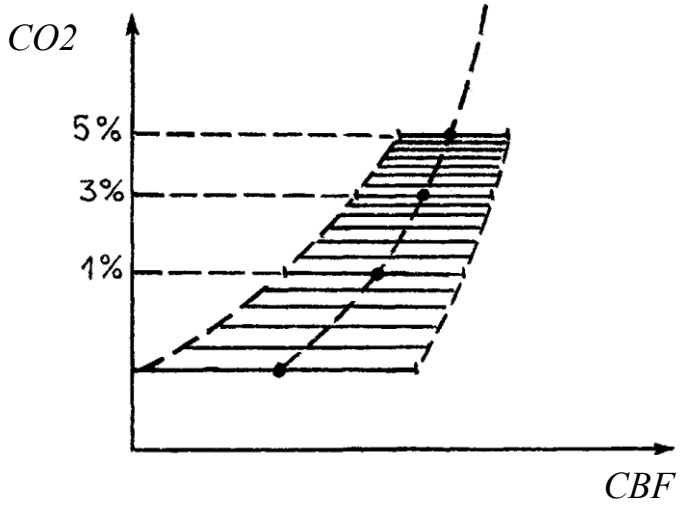


Fig. 3. Dispersion of CBF indicators as the response to the increasing of CO2%

In order to determine the connections between CBF and SV indicators the comparison of them was made. The successive combination of these characteristics shaped a domain of their dispersion in every steady state.

See fig.4.

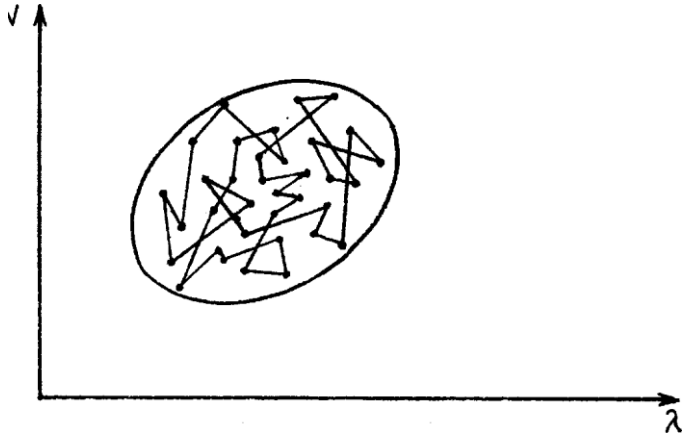


Fig.4. Domain of combinations dispersion of CBF and SV indicators in steady state.

If to compare the combinations dispersion domains of CBF and SV indicators in different steady states we obtain the domain of possible states for every tested student. (See fig. 5). On this figure we see the tapering of the parameters dispersion domain with increasing of irritant strength. Besides, it should be noted that different tested students display different response of CVS control indicators to one and the same irritant. For example: the CVS response of tested student No.1 to load is expressed mainly in frequency characteristics, in case of tested student No. 3 it is expressed by the volume characteristics. The most typical determination of CVS indicators aptitude is observed under more strong irritants.

Such method of reflection of the obtained information permits both: to quantitatively estimate the level of the system's activity and to find the individual peculiarities of its participation in response to irritant, which consist of clearly expressed uneven manifestation of the response form by some tested students, either in frequency characteristics or in volume one. This makes possible to suggest that under equal impact of environment, the persons with aptitude to manifestation of definite response will develop the appropriate adaptation mechanisms.

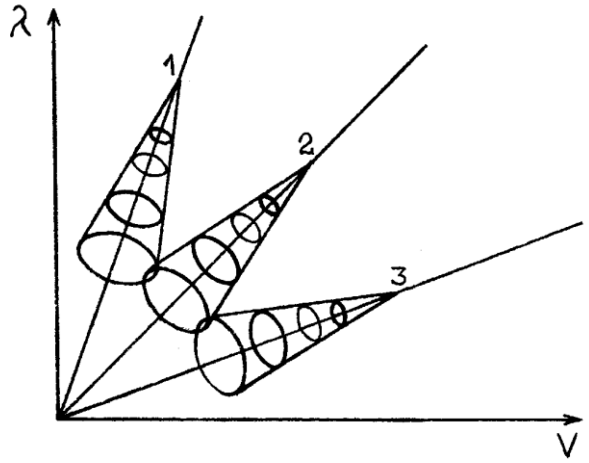


Fig. 5. Domains of combinations dispersion of CBF and SV indicators in different steady states

Summary

The results of research of cardiac vascular system's functional state showed that in CVS characteristics, which are most frequently used in physical culture and sports practice, hemodynamics indicators are more notable [4, 7]. That is why in the present paper the dynamics of its most typical parameters: CBF, SV and AP under different loads were studied.

The following was found with the help of the obtained results. For all tested students the diagrams of response to load have "S" shape by every CVS parameter. With this, different tested displayed individual unequal steepness of response diagrams. It is connected with the fact that individuals transfer from one state to other with different speed and it confirms the authors' opinion [5, 6, 9, 12] about unequal "value" of CVS adaptation parameters. Thus, for some tested CBF response diagram was steeper than SV one, for the other tested the picture was quite different. It permits to judge about different participation of the studied characteristics in response to load.

When comparing the results of CVS frequency and volume characteristics studies the domains of these combinations dispersion were plotted. The comparison of the domains, obtained from different persons, resulted in discovering their different location. In diagrams of some individuals it is located nearer to CBF axis, in the diagrams of others it was nearer to SV axis. It permits to conclude that CVS of some students responds by its frequency characteristics and CVS of the others responds by volume one. Determination of this peculiar participation of different CBF indicators in response to load gives possibility to reveal the aptitude to different forms of disturbance in this system's activity [6, 9].

More objective method of control over current physical state can be determined in the course of further research of respiratory and nerve - muscular system functional state for discovering general regularities of different parameters responding to loads.

References:

1 Abramov M.S. *Teoriia i praktika fizicheskoj kul'tury* [Theory and practice of physical culture], 1993, vol.3, pp. 34 – 43.
2 Bakanova A.F. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2012, vol.1, pp. 8 – 13.
3 Balamutova N.M.*Fiziceskoe vospitanie studentov* [Physical Education of Students], 2012, vol.3, pp. 11 – 15.
4 Buianov P.V. *Voenno – medicinskij zhurnal* [Military medical magazine], 1985, vol.2, pp. 68 – 73.
5 Vasil'eva V.V. *Fiziologicheskij zhurnal* [Physiological journal], 1989, vol.12, pp. 160 – 168.
6 Viru A.A. *Uspekhi fiziologicheskikh nauk* [Successes of physiological sciences], 1990, vol.11, pp.27 – 46.
7 Gurevich M.I., Solov'ev A.I. *Impedansnaia reopletizmografiia* [Impedance rheoplethysmography], Kiev, Scientific opinion, 1982, 174 p.
8 Dembo A.G. *Arterial'noe davlenie u sportsmenov* [Arteriotony for sportsmen], Moscow, SRI, 1978, 47 p.
9 Iskhakova S.Iu., Zemlianskaia L.G. *Aktual'nye voprosy kardiologii* [Actual questions of cardiology], 1977, vol.2, pp. 39 – 41.
10 Marinchenko A.L. *Teoriia i praktika fizicheskoj kul'tury* [Theory and practice of physical culture], 1998, vol.6, pp. 47 – 52.
11 Matov V.V., Surkina I.D. *Vynoslivost' u sportsmenov* [Endurance for sportsmen], Moscow, 1971, pp. 24 – 31.
12 Ozolin' P.P. *Adaptaciia sosudistoj sistemy k fizicheskim nagruzkam* [Adaptation of the vascular system to the physical loadings], Riga, Zinatne, 1988, 94 p.

13 Marwan F. Abu-Hijleh, Salah Kassab, Qasim Al-Shboul, Pallab K. Ganguly. Evaluation of the teaching strategy of cardiovascular system in a problem-based curriculum: student perception. *Advances in Physiology* Education. 2004, vol.28, pp. 59–63. doi:10.1152/advan.00010.2003

14 Mary W. Arnaudin, Joel J. Mintzes. Students' alternative conceptions of the human circulatory system: A cross-age study. *Science Education*. 1985, vol.69(5), pp. 721–733. doi: 10.1002/sce.3730690513

15 Prusik Krzysztof, Prusik Katarzyna, Iermakov S.S., Kozina Zh.L. *Pedagogika, psihologia ta medико-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2012, vol.12, pp. 113-122.

16 Ruslanov D.V., Prusik Krzysztof, Prusik Katarzyna, Gorner Karol. Pedagogika, psihologia ta medико-biologicni problemi fizicnogo vihovanna i sportu *[Pedagogics, psychology, medical-biological problems of physical training and sports],* 2011, vol.3, pp. 134-139.

Information about the author:

Balamutova N.M.: sombrefermata@gmail.com; National University «Legal academy of Ukraine»; Pushkin str., 77, Kharkov, 61024, Ukraine.

Cite this article as: Balamutova N.M. Pedagogical control of students' physical state after research results of cardiovascular system functional indicators. *Physical Education of Students,* 2013, vol.1, pp. 7-11. doi:10.6084/m9.figshare.156349

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 09.01.2013
Published: 09.02.2013

STUDY RESULTS ON ESTIMATION OF NON-SPECIALIZED PHYSICAL TRAINING UNIVERSITY STUDENTS IN HUNAN PROVINCE

Wang Lihua, Zhang Wei Shou
Hebei Physical Culture Institute

Abstract. Highlights the results of the implementation of national standards of physical fitness assessment of students specialized universities Chinese province of Hunan. Discovered that the main negative factors that reduce the effectiveness in this area are the following: lack of unified management of the process of introducing national standards of physical fitness assessment of students; shortcomings in the quality and quantity of equipment for evaluation, the low level of mastery of the teaching staff of the methodology and insufficient use the results of monitoring the health of the students in the further education; misallocation of time for testing and evaluation in terms of physical health. Substantiates the importance of the rational organization of the assessment system, outlined the main directions of improving the effectiveness of the implementation of national standards of physical fitness of students.
Keywords: evaluation, physical fitness, standards, student.

Introduction

As the level of education in PRC progresses and becomes more profound, the interest of higher educational institutions, society and family to the problem of students' physical training and health widens, the attention to the researches in this field increases. The period of study at university is one of the most important in the life of a man. This period is not only the time of man's views of people and the world gradual formation but also the period of his physical and health peak level. Thereby a positive foundation for happy and healthy life, future study and work is embedded. Usual age of students is within 18-22 years, i.e. the basic period of organism's growth and development has already passed. At this stage, the factors, worsening physical status, inevitably influence on subsequent life quality and personality development. That is why, the study of students' physical training and health is of significant practical importance.

In China, large-scale work on study of physical training began in 1970-s. In July, 2007 Ministry of education, State administration on physical culture and sports published "State standards of students' physical training". The five years experience of their implementation in the students' physical training of non specialized higher educational institutions of Hunan province permits to generalize the results of work in this sphere.

In China, Tsyn Kay [1], Tsi Lunbo [2], Sun Sue [3], Van Hun [4], Fu Tsilan [5] deal with analysis of different aspects of realization of governmental programs on implementation of higher educational students' physical training standards. In Japan, the same problems are raised in works by K. Khirata [6]. In Ukraine, some questions, connected with determination of local population's physical level, are touched upon in the work by V. Mudrik [7]. This problem has been sufficiently studied in detail on example of other countries [8-12]. And with it, the necessity to use the experience of other research workers with regard to Hunan province is quite evident, that requires carrying out the corresponding researches.

Puprose, tasks of the work, material and methods.

The purpose of the research is generalization of experience of state standards of non specialized higher educational institutions students' physical status estimation implementation in province Hunan.

Results of the research.

The present paper is devoted to non specialized higher educational institutions of Hunan province (Hebay and Chansha cities and districts). We use the method of selective analysis. In the research the data of the following higher educational institutions have been used: 1) Southern university, Pedagogical university of Hunan province; 2) trade institute of Hunan province, southern university of forestry; 3) university of management, Chansha city, agrarian university of Hunan province, first pedagogical institute of Hunan province, trade and economical college of Hunan province, trade and technical institute of Hunan province, institute of labor safety of Hunan province. Among ten of these higher educational institutions there are educational institutions of different types and levels.

A special sociological questioning of 20 scientists, 30 vice chancellors on sports, heads of physical and health status of higher educational institutions students centers in Hunan province was carried out. A questioning among the students of 48 non specialized higher educational institutions (12 institutions of bachelor level and 36 higher special technical institutions) was conducted.

Also 5 educational levels were considered and sorted, then two higher educational institutions were selected from every level and on the base of these institutions questionnaires were developed and prepared.

In order to ensure the reliability of questioning, the research was conducted twice with time gap of 15 days. The reliability level of the second questioning was r-0.95, $p<0.01$, thus the repeated indicators coincided with the above mentioned.

On the base of new "Standards" the level of physical and health status is estimated by the indicators of body development, body functioning, physical and athletic abilities. The content of estimation and students' participation in the estimation of physical status are shown in tables 1& 2.

doi: 10.6084/m9.figshare.156350

Table 1

Indicators of "State standards of students' physical status" control

Description of program	Indicators of control	Mark	Notes
Body	Height & weight indicators	10	Mandatory measurement
Body functions	Indexes of weight and lung volume	20	Mandatory measurement
Endurance	1000m running (male), 500m running (female), exercises with ladder	30	One item by choice
Flexibility, strength	Bending in sitting position, ball throws to target, torso lifting abdominal muscles training (female), chin-ups (male), index of weight lifting.	20	One item by choice
Speed, dexterity	50m running, long jumps, skipping, basketball, football, volleyball	20	One item by choice

Table 2

Percentage of students' participation in estimation of Physical status

Control indicators	Mark	Notes	Estimation in %-
Height & weight indicators	10	Mandatory measurement	88.3
Indexes of weight & lung volume	20	Mandatory measurement	83.4
1000m running (male), 800m running (female), exercises with ladder	30	One item by choice	47.2 \ 52.8
Bending in sitting position, ball throws to target, torso lifting abdominal muscles training (female), chin-ups (male), index of weight lifting.	20	One item by choice	22.6 \ 13.9 \ 24.7 \ 38.8
50m running, long jumps, skipping, basketball, football, volleyball	20	One item by choice	22.1 \ 35.5 \ 6.7 \ 18.0 \ 5.2 \ 12.5

Table 2 shows that there is no clear understanding of estimation program in higher educational institutions; though indicators of height & weight, index of weight & lung volume are mandatory for control, percentage of their measurement is 88.3%, 83.4%, i.e. in some institutions these indicators are not estimated. At the same time, the measurements of some optional items of program are repeated.

Application of reliable equipment for estimation promotes accuracy of estimation, statistics, analysis, creating of feedback and etc. That's why availability of reliable equipment can ensure successful estimation of physical and health status. The research showed that during estimating there were 40.95 of equipment faults from time to time and 7.9% of regular faults. The data show that practically in half of cases, when equipment is used for estimation, technical faults, that significantly hinders the estimation of physical status, appear. On the base of our observations it can be noted that in some higher educational institutions students could not receive digital estimation data in due time, because the malfunctioning of equipment had not been eliminated in proper time. That is why control over equipment in the process of estimation is a basic condition of its successful conducting and the pre-condition of its efficiency and data reliability. For long time, when technical equipment was used for estimation, the level of data accuracy and reliability was too low to ensure successful estimation. It is necessary to choose the program items which can be replaced or change the method of estimation. If to achieve the aim of the students' health improvement, higher educational institutions shall mandatory ensure provision of proper equipment and its quality.

The results of the researches showed that 50.3% of higher educational institutions did not provide the students with "Handbook on qualifying standards and exercises for students' physical training". In many institutions only one form of informing about physical status estimation exists: this is professionals' information during classes. That is why instructive work is mandatory among students, they should be assisted to understand the significance of their health and the aims of sports exercises; they should understand that estimation of physical status is carried out in order to promote their classes by tempering, to raise their health level. If not to pay attention to instructive work, the aim of students' health improvement will not be achieved.

The research discovered that 77% of higher educational institutions carried out control during estimation process. When answering the question, whether students resort to abuses during estimation, positive answers were received only from 3.7% of students.

The researches showed that 34.3% did not execute any control after estimation physical status; 51.2% have no

system of informing about estimation of students' physical and health status. With this, 61.1% provide feedback with students about the results of their physical status estimation, 12.5% and 4.3% submit estimation results to higher authorities and to parents. As per "Standards" "after finishing of estimation it is necessary to execute statistical calculations, analysis of results and summarizing; ensure continuous functioning of feedback, guarantee that higher educational institutions, professors, students and parents should know the results of estimation; the inspiring role of estimation must be completely realized". Thus, it is possible to control students' physical and health status in proper time and eliminate eventual problems.

The research showed: 13.2% of professors have clear understanding of estimation criteria and 10% have clear understanding of separate items of estimation program (see table 3).

Table 3

The level of professionals' knowing of qualifying standards

Professor can give clear answers to the questions about qualifying standards of physical status estimation.					Professor can give clear answers to the questions about separate items of estimation program				
Very clear	Clear	Usual	Not clear	Quite vague	Very clear	Clear	Usual	Not clear	Quite vague
57	192	142	31	8	43	148	188	37	14
13.2%	44.7%	33.1%	7.2%	8%	10.0%	34.5%	43.8%	8.5%	3.2%

If to judge by the results of the research the professors' skill to use technical equipment still do not meet the requirements of physical status estimating. One of the reasons is that professors, probably, were not specially trained, the other reason is that in spite of the fact that estimation operations are not difficult, the requirements to some of them are extremely strong and it calls for special professor's attention

Only 37.5% of professors made corrections of educational process considering students' achievements after estimation of their physical status. Considering different aspects, it can be noted that as on to day the professors' level does not meet the requirements of physical status estimation. The only chance to ensure favorable conditions of physical status estimation is to conduct professors' training, which should cover the modern content of physical status estimation.

In the course of research it was found that there is connection between students' knowing of estimation program and their self control abilities, e.g.,16.5% of students support and 49.4% do not object to item " if indicators of your lung volume are low do you think that it is necessary to intensify breathing exercises'; 14.5% of students support and 52.6% do not object to item " if indicators of exercises with ladder are unsatisfactory do you think that their intensity and length must be increased"; 14.8% support and 45.59% do not object to item "if the level of your compressing power is low, do your think it is necessary to be more persistent in power exercises". Besides, the research revealed some divergence between students' knowing of the program and their self-control abilities. For example, 26.8% of students object to and 5.6% flatly object to item "if your physical status indicators are higher than usual, do you agree that you have good nutrition and good health". In the whole, by the results of research, we can specify the following problems of physical status estimation, which exist in non specialized higher educational institutions of the province:

1) management;
2) insufficient quality and quantity of equipment for estimation;
3) achievements of estimation;
4) information about estimation;
5) control over estimation;
6) professional adequacy of professors;
7) time of estimation;

In the course of research we determined the difficulties and obstacles, which appear during physical status estimation and among them we may specify both: the factors depending on students and the factors, conditioned by environment. In the present work we request to evaluate these factors as very important, important, relatively important, not very important and unimportant and mark them from 1 to 5. By the results of this questioning average mark for every factor is given in table 4.

Table 4

Factors which influence on estimation of physical status

No	Factor	Mark
1.	Management	4.774
2.	Quality and quantity of equipment for estimation;	4.516
3.	Achievements/ successes of estimation	4.258
4.	Information about estimation	4.232
5.	Control over estimation	4.161
6.	Professional adequacy of professors	4.025
7.	Time of estimation	3.863

Summary.

In the whole, a positive trend in realization of estimation program is observed in Hunan province, in general the items of the program are fulfilled. But in practice some problems are met, such as insufficient quality and quantity of equipment, tardiness of feedback, insufficient control, professors' professional adequacy, inexpediency of estimation time distribution. Exactly analysis of the mentioned drawbacks' reasons and resources for their elimination is considered by us as the future direction of researches of implementation of state standards of students' physical status estimation in higher educational institutions of our province.

References:

1 Czin' Kaj. *Sovremennoe polozhenie i problemy sportivnoj industrii* [Modern position and problems of sporting industry], Beijing, Folk sport, 2001, pp. 165-218.

2 Ci Lunbo. *Problema standartizacii v processe razrabotki kompleksa fizicheskoj podgotovki studentov* [Problem of standardization in the process of development of complex of physical preparation of students], Shitszyachzhuan, 2011, 98 p.

3 Sun' Siue. *Issledovaniia sportivnoj industrii kak novoj tochki rosta kitajskoj ekonomiki* [Research of sporting industry as new point of growth of the Chinese economy], Beijing, Folk sport, 2001, pp. 94-112.

4 Van Khun. *Planirovanie rezhima sportivnoj podgotovki dlia studentov Vuzov* [Planning of the mode of sporting preparation for the students of higher institutions], Tszinan', 2008, 124 p.

5 Fu Czilan. *Issledovanie teoreticheskikh aspektov razvitiia fizicheskoj podgotovki studentov vysshikh uchebnykh zavedenij* [Research of theoretical aspects of development of physical preparation of students of higher educational establishments], Beijing, Folk sport, 2007, 234 p.

6 Hirata K. The evaluation method of physique and fitness its Practical application. *Tokyo International Congress Sports Medicine*, 1968, 132 p.

7 Mudrik V. I., Olijnik M. O., Prikhod'ko I. I., Ashanin V. S. *Teoriia ta metodika fizichnogo vikhovannia* [Theory and methods of physical education], 2002, vol.2-3, pp. 16-18.

8 Abdullah A.S.M. Factors related to non-participation in 21. physical activity among the students in Hong Kong. *International Journal of Sports Medicine*, 2005, мvil.26(7), pp. 611–615.

9 Booth M.L. Assessment of physical activity: an international 15. perspective. *Research Quarterly for Exercise & Sport*, 2000, vol.71(2), pp. 114–120.

10 Fontes A.C.D, Vianna R.P.T. Prevalence and factors related to low 22. level physical activity among university students in a public university in the northeast region of Brazil . *Revista Brasileira de Epidemiologia*, 2009, vol.12(1), pp. 20–29.

11 Haase A. Leisure-time physical activity in university stu11. dents from 32 countries: associations with health beliefs, risk awareness and national economic development. *Preventive Medicine*, 2004, vol.39, pp. 182–190.

12 Musharrafieh U. Determinant of university students physi20. cal exercise: a study from Lebanon. *International Journal of Public Health*, 2009, vol.53(4), pp. 208–213.

Information about the authors:

Wang Lihua: wlh-65@163.com; Hebei Physical Culture Institute; No.82 Xuefu Rd, Shijiahuang Hebei, China

Zhang Wei Shou: wlh-65@163.com; Hebei Physical Culture Institute; No.82 Xuefu Rd, Shijiahuang Hebei, China

Cite this article as: Wang Lihua, Zhang Wei Shou. Study results on estimation of non-specialized physical training university students in Hunan Province. *Physical Education of Students,* 2013, vol.1, pp. 12-16. doi:10.6084/m9.figshare.156350

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 20.12.2012
Published: 09.02.2013

ON THE PROBLEM OF INDEPENDENT PHYSICAL TRAINING APPLICATION IN EDUCATIONAL SPACE OF MODERN HIGHER INSTITUTIONS

Gorelov A.A., Kondakov V.L., Usatov A.N.
National Research University Belgorod State University

Abstract. Information of scale research of size and character of motive activity of students is resulted. All of students are engaged in physical culture in a basic and special medical group, in the group of sporting separation. All of students study, live in town and rural locality. Researches were conducted during 11 years. More than 1500 persons were inspected in all. It is marked that about 50% students of the Russian institutes of higher have rejections in a state of health. As a result of comparison proved, that motive activity renders direct influence on the level of progress and morbidity of students. Authors are offer original technology of adjusting of motive activity of students on the basis of process of the independent physical training control. The independent physical training is recommended duration no less than 15 minutes in a day (in morning, daily or evening time) with periodicity no less than 3-4 one time per a week.
Keywords: motive activity, independent, physical training, progress, morbidity, physical culture, students.

Introduction.

Scientific and technical progress promotes imbalance between mental and physical labor of man. Especially strongly it manifests in educational process of students. Increase of curriculums' scope and complication of their content lead to significant rise of specific figure of students' independent work. In its turn, it leads to nearly 50% reduction of motion activity [17].

Numerous researches, which have already been conducted in our century, show that nearly 50% of Russian higher educational institutions' students have health aberrations [2, 3, 12, 16, 18, 27]. Actual scope of students' motion activity is not sufficient for their full-fledged development. Annual increase of special educational institutions students' quantity (SEI), due to their state of health, is observed.

Similar situation is typical not only for Russia but also for other countries. By the data of A. Drachuk (2005), M. Bulatova, O. Litvin (2004), G.P.Griban, T.B. Kutek (2004), L. Dolzhenko (2008), high mental loads, deficit of motion activity, unreasonable nutrition and pernicious habits, stresses and unsatisfactory organization of physical training influence negatively on the health status of Ukrainian higher educational institutions. The researches, which carried out at the same time in Byelorussia, also revealed the increase of SEI students. The scientists of this country observed the following negative dynamics: in 2001 the quantity of SEI students was 33%, in 2002 -37%, in 2003 – 46%, in 2004 – 48% [19]. Kazakhstan scientists also ascertain that educational process in a higher educational institution is connected with reduction of motion activity due to educational timetable. Deficit of motion activity naturally results in reduction of mental and physical efficiency [20, 21].

Theoretical analysis and generalizing of data from literature, devoted to the worsening of functional and psychological organisms of youth show that everyday students' motion activity is not sufficient for optimal development of organism's main physiological systems, does not create conditions for health improvement. The increase of annual quantity of students who, by their health state belong to special medical group (SMG) is observed. The quantity of students, who are completely disabled to do any physical activity, is growing [4, 12, 16].

The data of our analytical researches show an acute demand in scientific grounding of new approaches, which could permit to solve the tasks of students motion activity deficit compensation and thus, to support vital functioning of their organisms on the level, ensuring successful learning of educational programs of higher educational institutions.

This paper has been prepared in the frames of realization of Federal special purpose program "Scientific and scientific and pedagogical specialists of innovational Russia" for 2009- 2013 on subject " Systemic mechanisms of regulation of students' motion activity" (agreement No.14.A18.21.0281).

Purpose, tasks of the work, material and methods of research.

The purpose of the work is to scientifically ground the technology of students' provision by optimal motion modes in the process of educational and everyday activity.

The following *tasks* serve for achievement of the purpose:

1. Conduction of theoretical analysis and generalizing of the problem of students' motion activity increase.
2. Study of peculiarities of students' motion activity in conditions of educational and everyday activity.
3. To ground scientifically the approaches, promoting reduction of students' motion activity, increasing of their mental and physical efficiency using the technology of independent physical training.

Our researches were carried out for 11 years on the base of Belgorodskiy State National research university (BSNRU) and involved the pupils of Belgorod comprehensive schools, students of higher educational institutions of Belgorod and Belgorodskaya region. In total, more than 1 500 persons were examined. Since January 2009 the development of this subject was entered into plan of physical and health improving scientific-educational center of Belgorodskiy state national research university (PHISEC BSNRU) and have been executed in the frames of scientific grounding of technologies of students' motion activity increasing.

doi: 10.6084/m9.figshare.156351

The solution of the tasks, determined by the purpose of our research, conditioned the choice of research methods: theoretical analysis and generalization of literature sources, questioning, talks, testing of physical development, physical status and mental efficiency, natural, parallel, comparative experiment, statistical methods.

Results of researches.

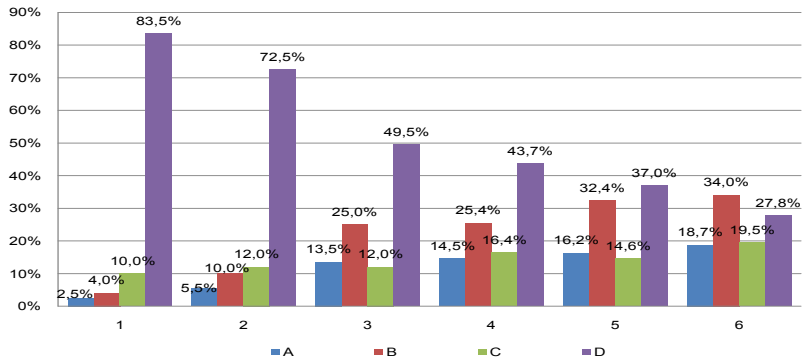
The results of the researches, which have been carried out last years [15, 24] show that the labor of students, especially first year students is of specific character. Working load in usual days is 12-14 hours per day, in the period of examinations - 16- 18 hours. With this, high intensity of educational process is accompanied by stresses, which are more often among the students, who live in hostels.

At present, in the system of higher education, the students' motion activity is ensured by two curriculum classes on physical culture per week. But the demand of young organism in motion corresponds to 14 -19 thousand steps, or 1.3 – 1.8 per day [25]. With this, typical higher educational curriculums on physical culture, no matter how efficient they are, can not solve the task of students' health improvement of ensuring their organisms with high level of efficiency which would promote successful mastering of their future specialty. The scope of load, declared by the mentioned curriculums, is quite insufficient. Due to this many specialists recommend to increase the scope of students' motion activity up to 8-10 hours per week by adding off-hour optional classes or home tasks. With this, in the opinion of the head of physical and health improving scientific-educational center of Belgorodskiy state national research university (PHISEC BSNRU) professor A.A. Gorelov, this measure is not very efficient and can be realized only by observance of a number of conditions which can hardly be fulfilled now. These conditions are: the level of students scholarship, promoting independent fulfillment of physical exercises, availability of sports base at the place of residence, individual physical and functional peculiarities, ability to independently dose loads and, finally, high level of motivation to independent physical training.

Our researches showed dynamics of percentage relationship of students by health groups in higher educational institutions and in schools (fig.1). Analysis of the obtained data showed that, starting from primary forms and up to the third year of higher educational institution, we can observe clear increase of percentage of students, related to special health groups (MPC, SHG, PG), and, consequently, reduction of percentage of persons, related to the main health group.

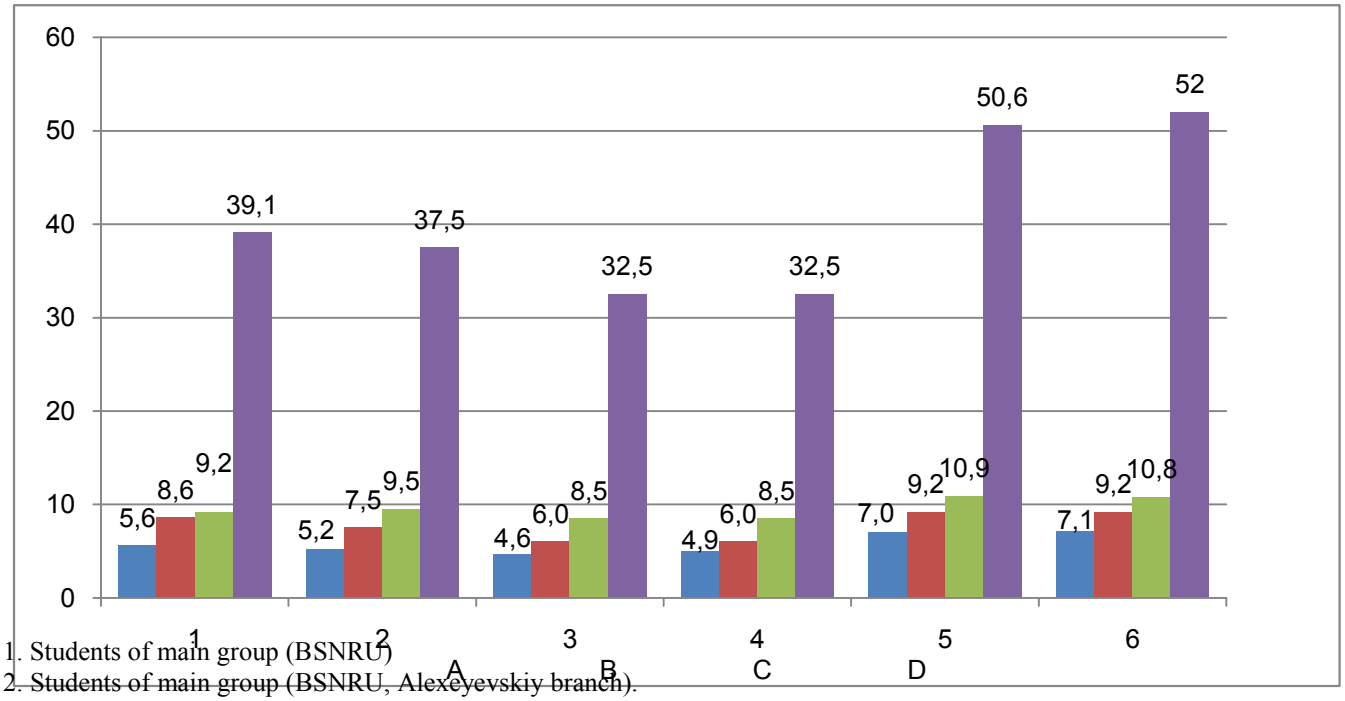
Observations, carried out by us in some Belgorod higher educational institutions, showed that intensity of students motion activity depends on a number of factors, whose influence was studied in everyday students' activity.

Researches of average–day and average-week dynamics value of students of different categories and groups of BNSRU, who live in urban environment, during their indoors and outdoors physical culture trainings (fig.2), showed that the most active are: firstly, students of sports department, secondly, students of the main health group. The least active are: firstly, students of special health group (SHG), who live and study in urban environment; secondly SHG students who study at Alexeyevskiy branch of BSNRU who live in country environment.



1 - primary forms, 2 - secondary forms, 3 - senior forms, 4 - I year, 5 - II year, 6 - III year
A - Release from physical training classes
B - Special health group
C- Preparatory group
D- Main group

Fig. 1. Distribution of students by health groups in school and higher educational institutions



1. Students of main group (BSNRU)
2. Students of main group (BSNRU, Alexeyevskiy branch).
3. SHG students (BSNRU).
4. SHG students (BSNRU, Alexeyevskiy branch).
5. Students of sports department (BSNRU).
6. Students of sports department (BSNRU, Alexeyevskiy branch).

A - Average-day motion activity (MA)
B - Average-day motion activity (MA) in days of indoor physical culture classes
C - Average-day motion activity (MA) in days of outdoor physical culture classes
D - Average-week MA.

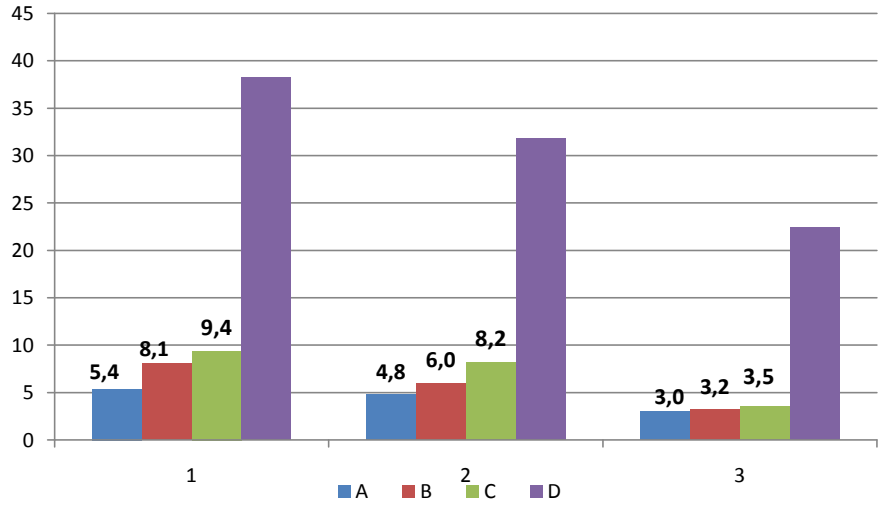
Fig.2 Motion activity (MA) of different groups students studying and living in urban environment (Belgorodskiy scientific research university) and in country environment (Belgorodskiy scientific research university, Alexeyevskiy branch).

Parallel to the study of students' motion activity status, both: those who live in urban environment and in the country, we analyzed the level of motion activity of students who were related to different health groups. The pedometering data of main health group, SHG group and students, released from physical culture classes were also studied. The data are shown in fig.3.

Information, illustrated by the figures above, shows that transfer to special health group and, more over, releasing from physical culture classes inevitably result in reduction of motion activity level and the motion activity of the students released from physical culture classes is nearly 2 times lower than the same of the main group students.

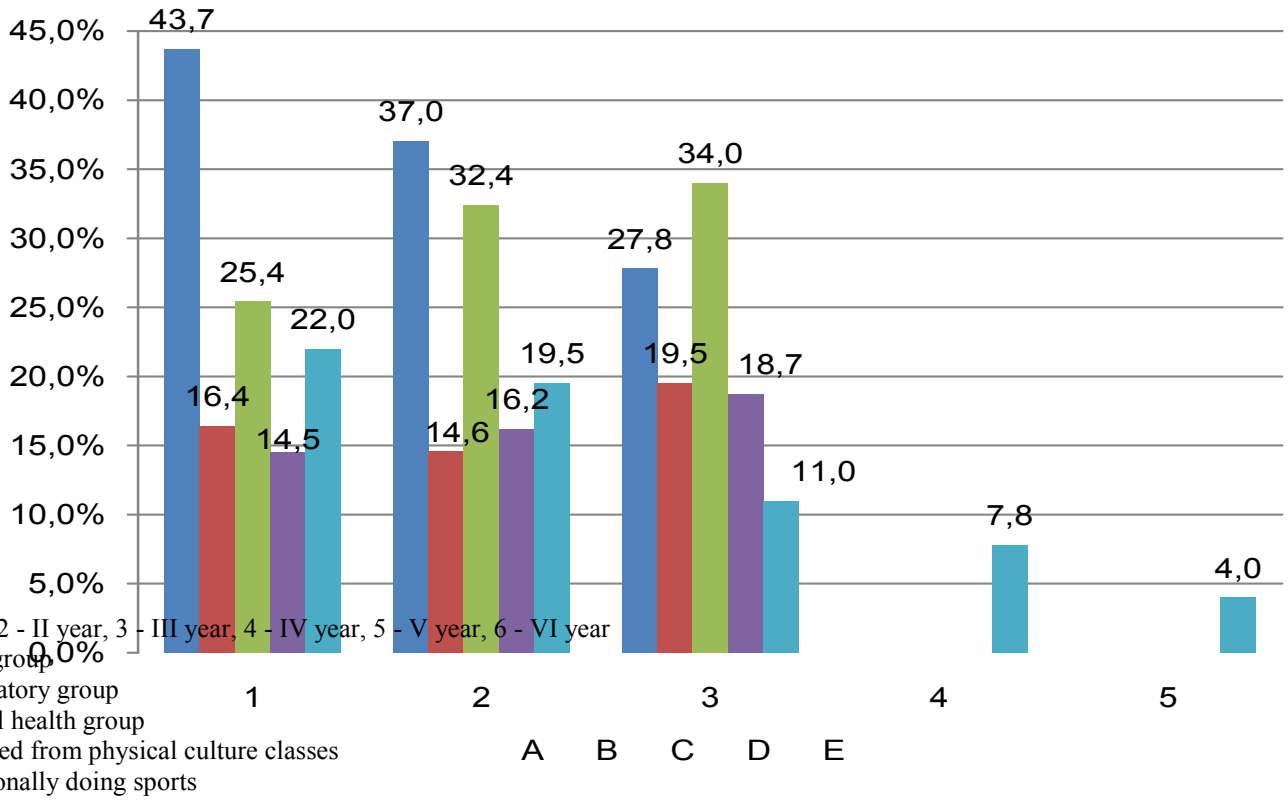
A peculiar contradiction appears: on the one hand motion activity is one of indispensable components of healthy life style, method of health improvement and on the other hand motion activity indicators of young men, having health aberrations are 2 times lower, while they especially need to improve their health.

The contradiction lies also in the fact that reduction of motion activity is at the same time the result and the reason of health level reduction. This is confirmed by the results of researches, conducted by most specialists and by our own researches, which were carried out in Belgorod higher educational institutions. So, for example, the number of Belgorod higher educational institutions students, who additionally do physical training (in sports groups or independently), is reduced in proportion to the growth the quantity of students, having health aberrations of different degrees. (Fig. 4).



1 - Students of main health group
2 - Students of special health group
3 - Students, who are released from physical culture classes
A - Day MA in average
B - Day MA in the days of indoor physical culture classes in average
C - Day MA in the days of outdoor physical culture classes in average
D - Week MA in average

Fig. 3. Motion activity (MA) of students of different health groups.

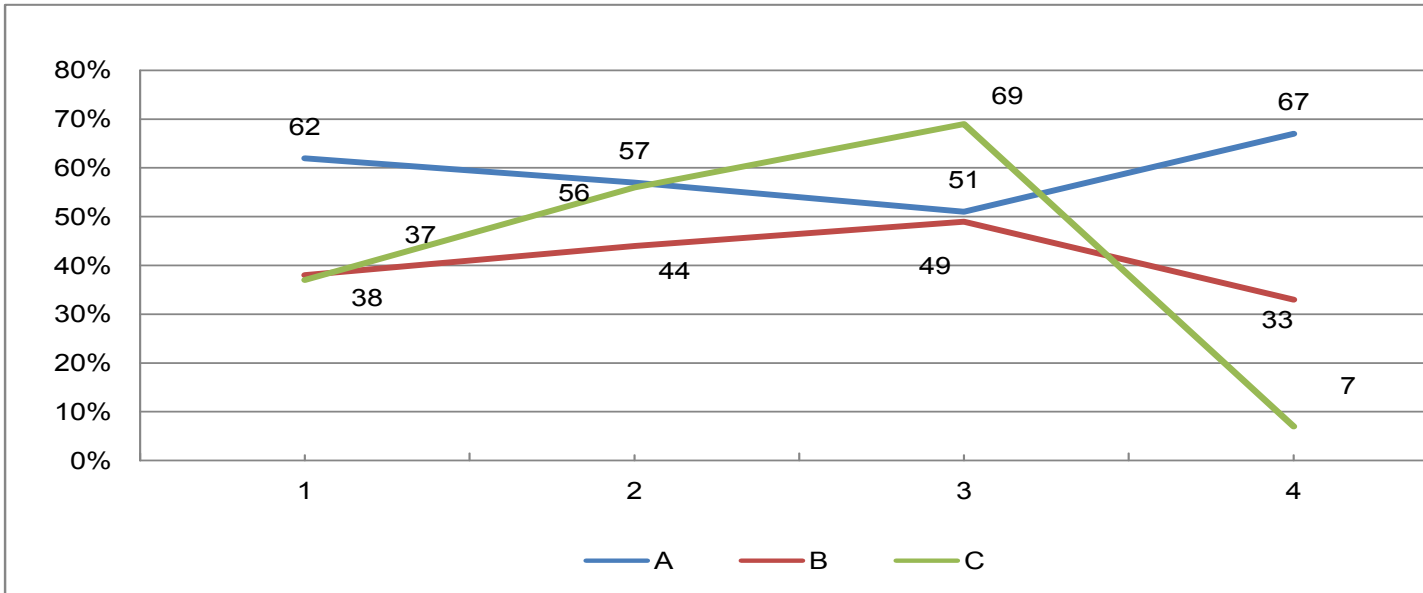


1 - I year, 2 - II year, 3 - III year, 4 - IV year, 5 - V year, 6 - VI year
A - Main group
B - Preparatory group
C - Special health group
D - Released from physical culture classes
E - Additionally doing sports

Fig. 4. Dynamics of students' distribution among health groups and the students, who additionally do sports.

Thus, research of students' motion activity of different groups and categories revealed strong problems and it requires to take certain measures on finding the ways for their solution.

In order to state the influence of motion activity on students' progress and morbidity the analysis of examination lists and students' health cards has been carried out. For every group we calculated the percentage of students who received "excellent", "good" and "satisfactory" at exams and the percentage of students, who missed classes because of catarrhal diseases. The results are given in Fig. 5.



1 - Main health group physical classes (average week MA – 38.3 km)
2 - Special health group (SHG) (average week MA 31.8 km)
3 - Released from physical classes (group of medicine physical culture) (average week MA 22.4 km)
4. Students, doing sports (average week MA 59.7 km)
ДА – motion activity
A - "excellent" and "good" progress
B - "good" and "satisfactory" progress
C - suffer from catarrhal diseases not less than 1-2 times a year

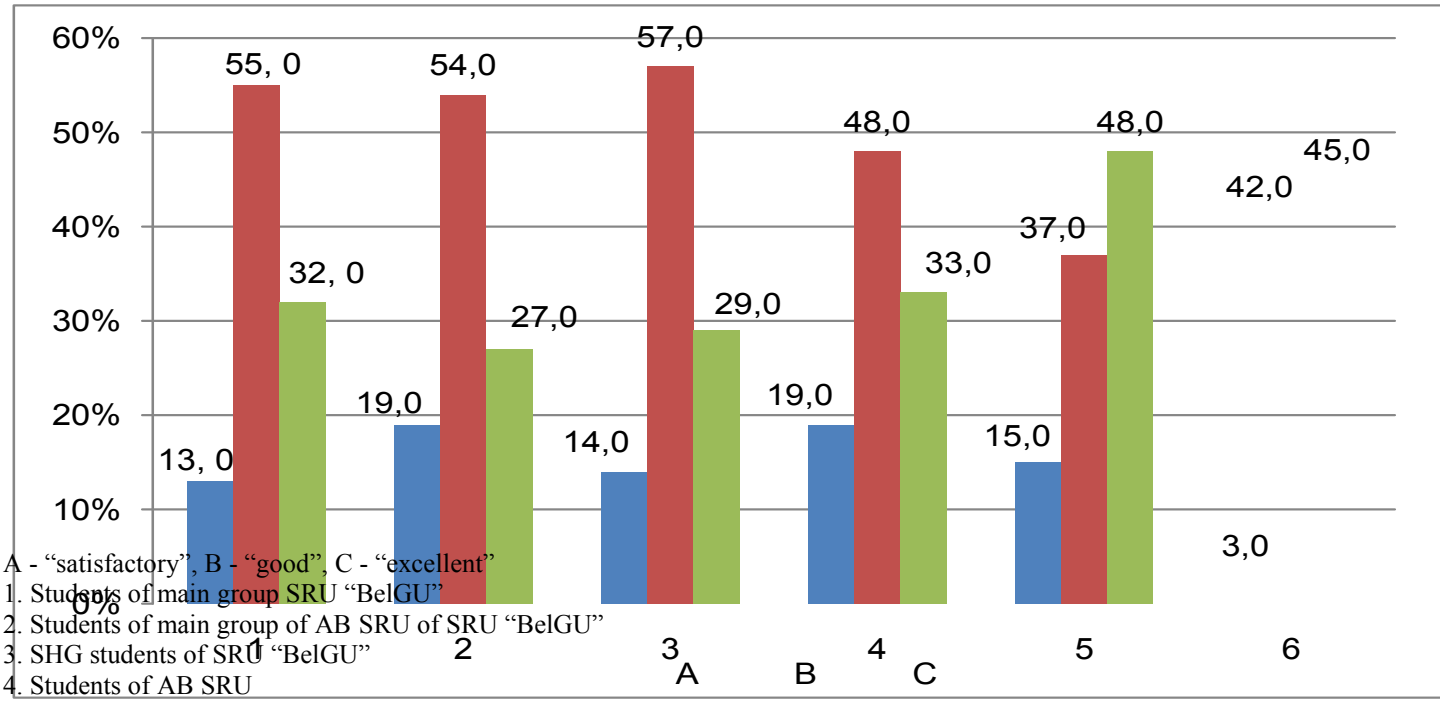
Fig. 5. The levels of progress and morbidity of students with different motion activity

The obtained information attests that students of main health group, who additionally do sports training, have the least percentage of morbidity (7%). The highest percentage of students who passed exams with "good" and "excellent" marks belongs also to this group. The second place is engaged by the students of main health group who attend only curriculum physical training classes. At the same time, in spite of good educational progress indicators of this group, rather high percentage of missed classes due to catarrhal diseases (37%) is characteristic for this group. This, in the first turn, attests that health is a key factor of more successful learning of curriculum, because, in spite of classes' missing, the students of this group has a certain reserve of organism, permitting to prepare more efficiently to resultant assessment.

Experimental data, obtained at SHG and MPC groups show direct dependence of morbidity percentage relationship and quality of progress in curriculum subjects. The quantity of students, having good" and "excellent" marks, varies within 57 -51% and morbidity percentage, especially in MPC reaches 69%. It says that students with weakened health are getting tired quicker in the period of preparation to exams, it is more difficult for them to concentrate attention on the studied subject, they lack of diligence in independent learning of a teaching material.

The given conclusion is confirmed by the research of progress level of students, who live and study in urban environment (BSNRU), and in the country (Alexeyevskiy branch of BSNRU, which is illustrated by fig.6).

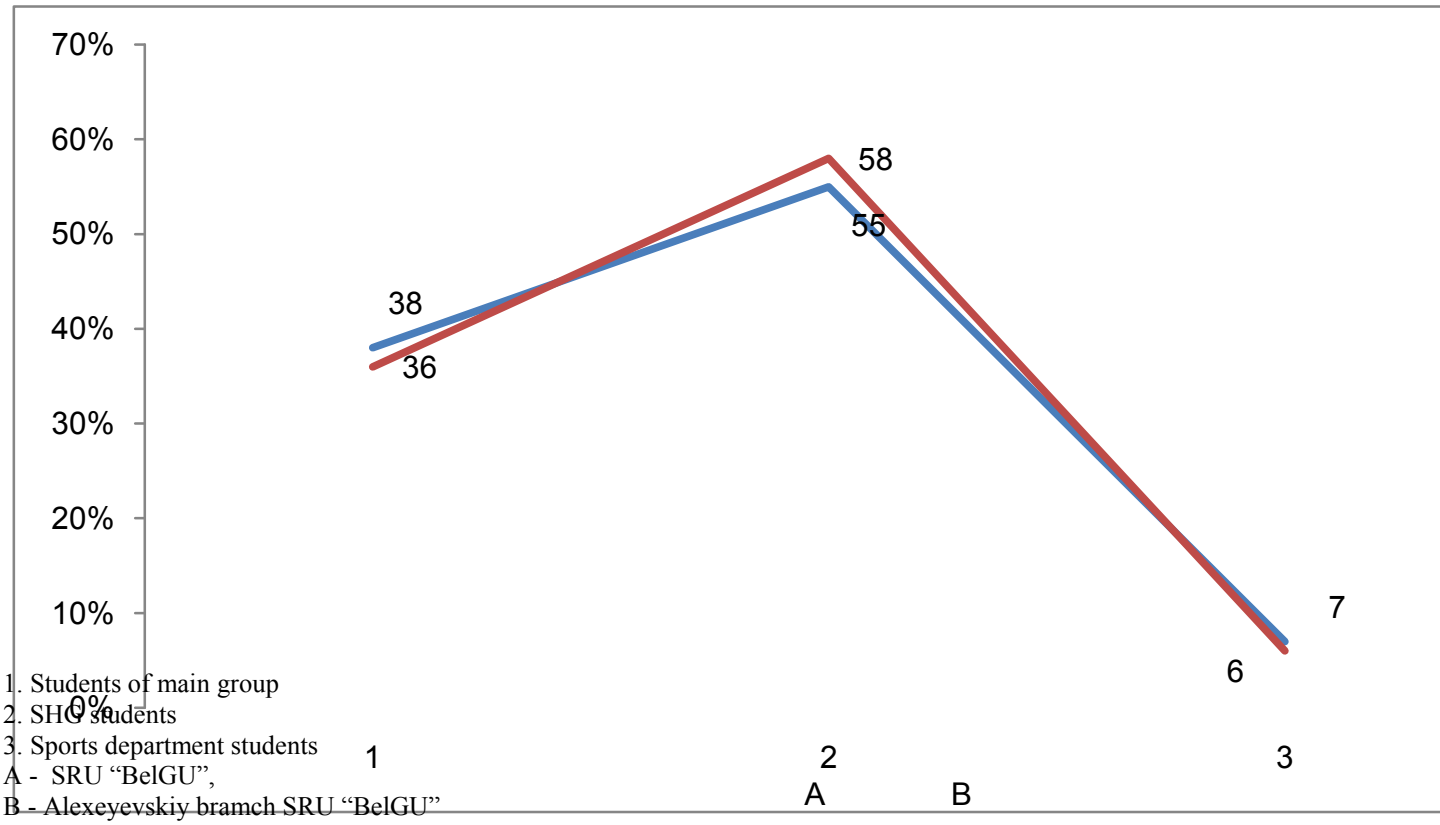
Thus, the most successful in learning the curriculum subjects are the students of sports department: the most often mark for this contingent of tested is "excellent" the rarest mark – "satisfactory". Practically equal level of progress has been noted among the students of main health group and SHG. The same trend is characteristic for the countryside as well.



A - "satisfactory", B - "good", C - "excellent"
1. Students of main group SRU "BelGU"
2. Students of main group of AB SRU of SRU "BelGU"
3. SHG students of SRU "BelGU"
4. Students of AB SRU
5. Students of sports department of SRU "BelGU"
6. Students of sports department of AB SRU "BelGU"

Fig.6. Students progress of different groups, living and studying in urban environment (BSNRU,) and in the country of (AB BSNRU,)

The data, given in fig. 7 show that SHG students are ailing the most often: 55-58% of this students' category are ailing not less than 1-2 times a year. Sports department students are ailing the most infrequently: 6-7% of the tested. The morbidity dynamics of urban and country students is identical.



1. Students of main group
2. SHG students
3. Sports department students
A - SRU "BelGU",
B - Alexeyevskiy bramch SRU "BelGU"

Fig.7. Morbidity level of different students' group, studying and living in urban environment (BSNRU), and in the country (AB BSNRU).

Thus, the conducted research permits to come to conclusion that students with higher level of motion activity and having good health are more successful in learning curriculum subjects. The results of researches attest that it is necessary to search efficient ways to increase motion activity of students of Russian higher educational institutions.

The higher educational program in discipline "Physical culture" stipulates plan physical training classes 2 times a week (every class – 2 hours) for 1-3 years students. These classes are compulsory for all students, having no contra-indications, irrespective of their attending any sports group or doing sports independently or not. However, the analysis of physical culture registers showed that one third of students does not attend the classes on different pretexts.

It is obvious that two 2 academic hours (90 minutes) a week can not solve the problem motion activity deficit compensation, more over in real conditions of educational activity the duration of these classes shortens. This shortening is occurred due to many objective reasons (movement to the places of classes, change of clothes, fulfillment of hygiene and sanitary requirements after classes and etc.) and subjective ones (unfavorable environment conditions, students' delays due to returning of manuals, time losses in cloakroom, visiting WC and etc.).

Generalization of the researches, conducted in Belgorod higher educational institutions (in total 1 500 persons have been examined) leads to conclusion that motion activity is an indispensable condition of students' good health and successful study. With this, in the process of studying students' motion activity reduces that, in its turn, leads to reduction of their health and progress levels. The value of motion activity depends on the first: presence or absence of additional physical training in the life of a student, the second: to which group he relates for physical culture training. One of the reasons of students' insufficient motion activity is the fact that physical training is of no interest for them and this result in missing these classes by nearly on third of students. Most of the students have not lost interest to motion activity, but they would prefer to train those exercises, which they like. The most interesting for them are classes in aerobics, outdoor games, swimming. About 40% of students are ready to do physical trainings, which are interesting for them, additionally.

The researches, conducted by V.G. Streltsov in co-authorship (1998), A.A. Gorevov in co-authorship (2003), A.A. Gorelov and I.V. Rusakova (2003, 2004) pointed to searching of efficiency measures for elimination of motion activity deficit of military distant aviation pilots and women – cadets of military educational institution have served as the bases for theoretical foundation of students motion activity monitoring in the process of their everyday and educational activity. The main idea of the a.m. authors was entering of the combat physical training "home tasks" into everyday and educational activity.

Functioning of the given physical training form was achieved by fulfillment of "home task", that permitted to plan independent physical training (IPT), monitor it, carry out pedagogical control over it and medical control of the health of trainees.

For this purpose we developed the BSNRU students' motion activity monitoring technology. The following conditions lied in the foundation of BSNRU students' motion activity monitoring technology:

- ✓ Organization of independent physical training of "home task" type, offered by A.A. Gorelov in co-authorship (2003). The distinctive feature of our approach lies in the fact that IPT content of every student considered individual choice of exercises form the list enclosed;
- ✓ duration of IPT must be not less than 15 minutes and shall not exceed 30
- ✓ before the beginning of independent training, students shall learn certain scope of theoretical knowledge and practical skills of doing physical exercises, dosing physical loads, practice in self control over own physical state;
- ✓ compulsory self control diarizing of health state;
- ✓ estimation of physical abilities' development, as well as health state, activity and mood;
- ✓ monitoring of IPT process in the course of curriculum physical culture classes;
- ✓ organization and conducting of mini complexes like "physical minute", "physical pauses" in the course of other curriculum classes. The methodology of such mini complexes' conducting should be given to physical organizers of students groups.
- ✓ compulsory timing of mini complexes' duration;
- ✓ determination of main group students' physical efficiency with the help of 3-minutes step-test, in SHG – 30 seconds step-test;
- ✓ individual regulating of students' physical loads, considering the general level of physical efficiency;
- ✓ considering of the students place of residence, food intake time, possibility to observe hygiene sanitation requirements;
- ✓ regular conduction of mass sports actions on Sundays, which should include competitions in different exercises, having high emotional tint and promoting to relieve emotional stresses;
- ✓ monitoring of day-off competitions by creating motivations to students' desire to participate in the competitions;
- ✓ the duration of day-off physical and health improving measures shall not exceed 2 hours.

This is overall idea of the offered by us technology of BSNRU students' motion activity monitoring.

The given above conditions lied in the foundation of basic experimental program which was planned to be conducted during one semester.

For estimation of the offered technology's efficiency pedagogical experiment was carried out with involving of first year students of computer sciences and telecommunications faculty, law and economical faculties, Four experimental groups (EG), one pilot group (PG) and one control group (CG) were formed of students (male) and the

same groups of the students (female). As a result 12 relatively uniform, each consisting of 20 persons, were formed by average values and by the dispersion of the examined indicators, which authentically are not different.

Organization of off-schedule physical and health improving measures in PG was fulfilled according to general plan of mass sports activity of BSNRU. The students of this group were ordered to compulsory take part in this activity. With this, concerning CG there was no strict control either of classes attendance or of the participation in main mass sports actions of BSNRU.

In general, the interpretation of physical state results of all tested groups permitted to make the following summarizing conclusions. Firstly: even very insignificant by scope and intensity, but everyday motion loads promote general increase of physical status and efficiency, secondly: deficit of motion activity affect rather negatively both the dynamics of basic physical abilities development and the level of general physical efficiency of students.

The efficiency of the offered by us technology of independent physical training was studied also in the aspect of its impact on mental efficiency indicators of the tested. The data, obtained in the course of the research, illustrate, that insufficient motion activity or its absence leads to (though not authentic $P>0.05$) but nevertheless the reduction of practically all studied parameters. In EG we observed their total improvement and in majority of cases by 95% value level ($P<0.05$). This fact also attests the reasonability of everyday execution of any physical exercises in comfortable load mode with consequent increasing of separate loco motions in every movement. In our opinion, improvement of EG students' mental efficiency occurred due to the fact that everyday independent physical trainings relieved tension, accumulated in durable intellectual activity and thus, permitted to restore effective functioning of central nervous system.

We judged about influence of independent physical training on functional state of CG, PG and EG students, basing on the dynamics of indicators, characterizing organism's reserve capabilities. The results of our researches attest that regularities, observed by us during analyzing of physical state and mental efficiency, manifest also on the level of organisms' functional capabilities of the tested students. Practically in all EG positive changes in cardiac vascular and respiratory systems occurred, authentically functional efficiency of male and female students increased. With this, by the majority of the studied parameters the differences between initial data and final results were authentic ($P < 0.05$). As we suggested the studied parameters of the tested students significantly reduced and in spite of the absence of authentic changes, they reached key point.

Thus, pedagogical experiment, which was carried out by us, completely confirmed the put by us hypothesis and permitted to make conclusions, corresponding to the tasks which were set in the research.

Summary.

1. Analytical study of special literature, regulatory and other documents show that they postulate catastrophic situation: nearly 50% of Russian higher educational institutions students have health aberrations. Actual scope of students' motion activity does not ensure their full-fledged development. Strengthening of this problem's negative side manifests in annual growth of students, relating to special health groups. The number of students for whom, by their state of health, physical training is prohibited at all is increasing constantly. The main reason of their health worsening is insufficient motion activity.

2. Theoretical analysis and generalization of literature sources in the frames of the studied problem represent students as special social group, characterized by deficit of motion activity owing to gross time losses connected with educational activity.

3. The study of BSNRU students' motion activity showed that on the one hand it is indispensable component of healthy life style, mean of health improvement, and on the other hand motion activity of students having health aberrations were reduced two times. This contradiction is strengthened also by the fact that reduction of motion activity is simultaneously the reason and the result of bad health. This conclusion is confirmed by the researches, conducted by us, which state that the least morbidity percentage belongs to the students of the main health group, who practice additional physical training. The second place of progress in study is engaged by the students of the second group, who attend only schedule physical culture classes. However, in spite of good indicators in their studies, they have rather large percentage of classes missing owing to catarrhal diseases. This also attests the prevailing significance of health state in learning curriculum subjects of higher educational institutions.

4. The main reasons, which condition the restriction of schedule physical training time, are time losses, connected with traveling to sports base; change of clothes and receiving of sports equipment; fulfillment of hygiene requirements and etc. This, in its turn, causes: creation of students', students parents', teachers' negative attitude to physical culture in general and schedule physical training classes particularly; appearance of different skin diseases owing to non observance of hygienic requirements; non observance of optimal relationship of physical loads' scope and intensity in week and, consequently, in semester cycles of educational activity; discrimination of physical culture moral and spiritual values; leveling of positive effect of physical training due to the absence of conditions for "trace" mechanisms' formation.

5. The most purposeful and perspective form of students' motion activity raising in the process of their education is independent physical training, of at least 15 minutes a day, in the morning, day or evening time, not less than 3-4 times a week, which should consider the students' interests and their individual peculiarities.

References:

1 Batishcheva I.V. *Konceptual'nye podkhody k uchebnoj innovacionnoj deiatel'nosti* [Conceptual approach to educational innovative activity], Cand. Diss., Kaliningrad, 2004, 23 p.

2 Belanov A.E. *Razvitie eksplicitnoj obuchaemosti prepodavatelej vuzov kak sredstvo sovershenstvovaniia ikh nauchno-pedagogicheskoj deiatel'nosti* [Development of explicit learnability of teachers of higher institutes as mean of perfection them to scientifically-pedagogical activity], Cand. Diss., Voronezh, 2002, 17 p.

3 Bulatova M.M., Litvin O.T. *Teoriia i metodika fizichnogo vikhovannia i sportu* [Theory and methods of physical education and sport], 2004, vol.1, pp. 3-9.

4 Volkov V.Iu., Volkova L.M., Davidenko D.N., Shchegolev V.A., Shcherbakov V.G. *Organizaciia i metodika uchebnogo processa, fizkul'turno-ozdorovitel'noj i sportivnoj raboty* [Organization and method of educational process, athletic-health-improvement and sporting work], 2000, vol.1, pp. 3-4.

5 Gorelov A.A., Rusakova I.V. O samostoiatel'noj fizicheskoj trenirovke studentok [About independent physical training of students]. *Fizicheskaia kul'tura i zdorov'e studentov Vuzov* [Physical culture and health of students of higher institutes], Sankt Petersburg, 2004, pp. 50 – 52.

6 Gorelov A.A., Rumba O.G., Kopejkina E.N. *Nauchnye problemy gumanitarnykh issledovanij* [Scientific problems of humanitarian researches], 2009, vol.12(1), pp. 27-35.

7 Gorelov A.A., Rumba O.G., Kondakov V.L. *Nauchnye problemy gumanitarnykh issledovanij* [Scientific problems of humanitarian researches],2008, vol.6, pp. 28-33.

8 Gorelov A.A., Kondakov V.L., A. N. Usatov. *Psikhologo-pedagogicheskie tekhnologii povysheniia umstvennoj i fizicheskoj rabotosposobnosti, snizheniia nervno-emocional'nogo napriazheniia u studentov v processe obrazovatel'noj deiatel'nosti* [Psychological pedagogical technologies of increase of mental and physical capacity, declines nervously-emotional tensions for students in the process of educational activity], 2011, vol.1, pp. 26-31.

9 Gorelov A.A., Kondakov V.L., A. N. Usatov. *Intellektual'naia deiatel'nost', fizicheskaia rabotosposobnost', dvigatel'naia aktivnost' i zdorov'e studencheskoj molodezhi* [Intellectual activity, physical capacity, motive activity and health of student young people], Belgorod, POLITERRA, 2011, 101 p.

10 Gorelov A.A., Rumba O.G., Kondakov V.L. *Nauchnye vedomosti Belgorodskogo gosudarstvennogo universiteta* [Scientific lists of the Belgorod state university], 2010, vol.6(77, 5), pp. 185-192.

11 Griban G. P., Kutek T. B. *Sportivnij visnik Pridniprov'ia* [Dnipro Sports Bulletin], 2004, vol.7, pp. 130-132.

12 Davidenko D.N., Polovnikov P.V., Shchegolev V.A. O fizkul'turnom obrazovanii studentov [About athletic education of students]. *Problemy fizicheskoj kul'tury, sporta i turizma* [Problems of physical culture, sport and tourism], Petrozavodsk, PSU, 2000, pp. 22-23.

13 Dolzhenko L. *Fizichna pidgotovlenist' i funkcional'ni osoblivosti studentiv iz riznim rivnem fizichnogo zdorov'ia* [Physical preparedness and functional features of students with different physical health level], Cand. Diss., Kiev, 2007, 21 p.

14 Drachuk A. *Teoriia i metodika fizichnogo vikhovannia i sportu* [Theory and methods of physical education and sport], 2005, vol.4, pp. 84-86.

15 Drobysheva S.A. *Povyshenie dvigatel'nykh vozmozhnostej studentov s zabolevaniem vegeto-sosudistoj distoniej sredstvami fizicheskogo vospitaniia* [Increase of motive possibilities of students with a disease vascular dystonia by facilities of physical education], Cand. Diss., Volgograd, 2004, 139 p.

16 Kalennikova N.G., Klebanova L.N. Sravnitel'nyj analiz sostoianiia zdorov'ia razlichnykh grupp naseleniia, prozhivaiushchikh na territorii Brianskoj oblasti [Comparative analysis of the state of health of different groups of population, resident on territory of the Bryansk area]. *Mediko-biologicheskie problemy fizicheskoj kul'tury i sporta v sovremennykh usloviiakh* [Medical and biological problems of physical culture and sport in modern terms], Belgorod, BSU Publ., 2003, pp. 114-118.

17 Lotonenko A.V., Gostev G.R., Gosteva S.R., Grigor'ev O.A. *Fizicheskaia kul'tura i zdorov'e* [Physical culture and health], Moscow, Euroschool, 2008, 450 p.

18 Marchuk S.A. *Teoriia i praktika fizicheskoj kul'tury* [Theory and practice of physical culture], 2004, vol.4, pp. 13-15.

19 Medvedev V.A., Makarevich O.P. Fizkul'turno-ozdorovitel'nye tekhnologii v fizicheskom vospitanii studencheskoj molodezhi respubliki Belarus' [Athletic-health-improvement technologies in physical education of student young people of republic Byelorussia]. *Olimpijskij sport i sport dlia vsikh* [Olympic sport and sport for all], Kiev, Olympic Literature, 2005, p. 597.

20 Mikhajlova S.N., Nikulina T.V. Osobennosti provedeniia zaniatij po fizicheskoj kul'ture so studentami, imeiushchimi otkloneniia v sostoianii zdorov'ia [Features of leadthrough of employments on a physical culture with students, having rejections in a state of health]. *Sovremennyj olimpijskij sport i sport dlia vsekh* [Modern olympic sport and sport for all], Almaty, KAZAST, 2009, pp. 61-64.

21 Moldagalieva Sh.B. *Metodika zaniatij ozdorovitel'noj aerobikoj so studentami vuzov Kazakhstana* [Method of employments health aerobics with the students of higher institutes of Kazakhstan]. . *Sovremennyj olimpijskij sport i sport dlia vsekh* [Modern olympic sport and sport for all], Almaty, KAZAST, 2009, pp. 64-67.

22 Rusakova I.V. *Soderzhanie i napravlennost' fizicheskoj podgotovki voennosluzhashchikh zhenshchin s gipodinamicheskim kharakterom professional'noj deiatel'nosti* [Table of contents and orientation of physical preparation of servicemen of women with hypodynamic character of professional activity], Cand. Diss., Sankt Petersburg, 1998, 24 p.

23 Savel'eva L.A., Zorchenko E.V. O znachenii pauz aktivnogo otdykha v zhizni studentov [About the value of pauses of active rest in life of students]. *Sovremennye didakticheskie problemy fizicheskoj kul'tury i*

ozdorovitel'nye programmy v obrazovatel'nom prostranstve vuza [Modern didactic problems of physical culture and health programs are in educational space of higher institute], Belgorod, 2008, pp. 74-76.

24 Skuratovich M.N. *Metodika zaniatij po fizicheskomu vospitaniiu v vuze so studentami special'noj medicinskoj gruppy s razlichnymi variantami vegetativnoj disfunkcii* [Method of employments on physical education in the higher institute with the students of task medical force with the different variants of vegetative disfunction], Cand. Diss., Omsk, 2006, 14 p.

25 Sal'kova E.V., Volodin A.V., Kniazeva N.A Fizicheskaia podgotovlennost' studentov kak vazhnyj komponent v obrazovatel'nom processe [Physical preparedness of students as an important component in educational process]. *Strategiia razvitiia sporta dlia vsekh i zakonodatel'nykh osnov fizicheskoj kul'tury i sporta v stranakh SNG* [Strategy of development of sport for all and legislative bases of physical culture and sport in the countries of the CIS], Kishinev, SUPC, 2008, pp. 192-194.

26 Strelec V.G., Gorelov A.A., Rusakova I.V., Gordeeva G.A. *Soderzhanie i napravlennost' fizicheskoj podgotovki voennosluzhashchikh zhenshchin s gipodinamicheskim rezhimom professional'noj deiatel'nosti* [Table of contents and orientation of physical preparation of servicemen of women with the hypodynamic mode of professional activity], Sankt Petersburg, IPC, 1998, pp. 76-81.

27 Uvarov V.A., Kovalev N.K., Bulavina T.A. *Organizaciia i metodika uchebnogo processa, fizkul'turno-ozdorovitel'noj i sportivnoj raboty* [Organization and method of educational process, athletic-health-improvement and sporting work], 2000, vol.1, pp. 45-50.

28 Shchegolev V.A., Vasilik M.A., Volkov V.IU., Volkova L.M., Davidenko D.N., Lutchenko N.G., Trunin V.V. *Vestnik Baltijskoj Akademii* [Announcer of Baltic Academy], 1998, vol.20, pp. 31-38.

Information about the authors:

Gorelov A.A.: gorelov@bsu.edu.ru; National Research University Belgorod State University; Pobeda 85, Belgorod, 308015, Russia

Kondakov V.L.: kondakov@bsu.edu.ru; National Research University Belgorod State University; Pobeda 85, Belgorod, 308015, Russia

Cite this article as: Gorelov A.A., Kondakov V.L., Usatov A.N. To the question about the use of independent physical training in educational space of modern higher institute. *Physical Education of Students,* 2013, vol.1, pp. 17-26. doi:10.6084/m9.figshare.156351

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 31.01.2013
Published: 09.02.2013

FEATURES OF ORGANIZATION AND EXTRA-CURRICULAR CLASSES ON THE SUBJECT "SPECIAL PHYSICAL TRAINING" WITH THE CADETS OF INSTITUTIONS OF HIGHER EDUCATION OF MINISTRY OF HOME AFFAIRS OF UKRAINE

Evtushov F.M.
National Academy of Home Affairs

Abstract. Concepts "Off-hour employments" are considered in the system of physical training of students of higher educational establishments of Ministry of Internal Affairs of Ukraine. The ways of perfection of method of their organization and leadthrough are shown taking into account modern requirements to physical training of officers. It is suggested to unite in a single process preparations educational, sporting mass and athletic-health-improvement work by bringing of proper коррективв in curricula and programs of preparation. It is recommended to examine off-hour employments as component part of educational training process. The necessity of account of results of participation of students is marked for competition activity to on professionally-applied to the types of sport. Preparations which conform to the modern requirements and standards are resulted recommendation on the correction of curricula and programs.
Keywords: professional, physical, training, students, off-hour, employments.

Introduction.

The problems of Physical training of the cadets of Ukrainian home affairs institutions of higher education are rather elucidated in scientific and in law regulatory literature [3, 5-11]. Governmental, military and policing authorities pay great attention to theoretical questions of this subject. However, due to some objective and subjective reasons, the quality of future officers' professional physical training leaves much to be desired. These reasons are as follows:

- Low level of entrants' and candidates' to service at home affairs bodies physical condition;
- Unreasonable planning and organization of cadets' training courses;
- Absence of clear interconnection between all kinds of special physical training.

Well-adjusted system of home affairs officers' physical training, corresponding to basic principles of physical education and the system of sports training [6] exists in theory. It is regulated by the current instructions on organization of Ukrainian home affairs rank and file and command staff physical training , which, by many items, is identical to the same instructions of Russian Federation and Republic of Belarus and imitates the training program of the lapsed USSR [1,2,8].

In practice, as a rule, physical training classes are planned as per "leftover" principle, without any regularity, evenness in class hours' distribution [4]. In the course of educational training process there is no clear interconnection between the subjects of classes, parts of "special physical training", their natural sense.

The present researches have been carried out within the frames of professional advanced physical training of Home Affairs ministry of Ukraine higher educational institutions' graduate cadets.

Last time the prospect of militia reorganization to police is one of the most discussed questions. Such reformation will naturally increase the requirements to professional qualification of personnel, physical training inclusive.

The practical task of the present paper is to determine and introduce into educational training process some essential corrections which would permit to match the professional qualification of militia-police officer with modern demands in the context of departmental educational system reformation and the reformation of home affairs authorities in general.

Purpose, tasks of the paper, material and methods.

The purpose of the paper is definition of conception "extracurricular classes" in the system of physical training of the cadets of Home Affairs ministry higher educational institutions of Ukraine, optimization of their organizational methods and their conducting considering modern demands to physical training of home affairs officers.

The tasks of the paper

1. Analysis of the existing forms of extra curricular classes in "special physical training".
2. Determination of the correspondence of educational course content to the tasks of highly qualified law enforcement specialists' preparation at present stage.
3. Determination of improvement ways of cadets' physical training by optimization of educational-training process, combination of all types and kinds of classes into integral system of preparation.

The materials of this paper are the results of researches and observations of the cadets educational process during the whole study period at higher educational institution, analysis of the cadets' physical condition dynamics and the indicators of their future activity as home affairs officers.

The methods of research are: analysis of literature and regulatory documents, pedagogical experiment, tests and comparative analysis of their results, mathematical statistics methods.

Results of the researches.

doi: 10.6084/m9.figshare.156352

In our opinion, the conception, considering cadets' physical training process as a form of professional applied complex sports [I.P. Zakorko, 2000, 2001, 2010], is the most reasonable. With this, the training process covers not only the period of education at higher educational institution, but, as a rule, the preceding period of study at school and, as mandatory component, future period of service as home affairs officer.

The main task of training is, of course, preparation of an officer to possible power conflict with a law breaker independently on the cadet's sex and specialty. However, successful mastering of martial arts is possible only if a cadet has sufficiently trained main motion skills, while his further service as a home affairs officer will require permanent maintaining of these skills considering natural age-related changes. The compliance with the a.m. conditions is possible only with the help of regular physical training.

The comparison of the existing time indicators of educational process and modern physical training methodologies permits to assert that high leveled physical training of cadets demands much more class time than it is usually given.

Besides, the organizers of educational process pay insufficient attention to extra-curriculum physical training. On the one hand quite a lot of mass sports and fitness actions are conducted. These actions are not the part of educational process and rather limited quantity of cadets and employees participate in them.

We offer to consider extra curriculum classes not only as a form of passing leisure time away and a method of sports team members' improvement, but as a component of educational process for all cadets and employees without exceptions. All kinds of extra curriculum classes shall be planned in compliance with general orientation of integral system of education and training process.

General planning will permit to use competition forms of professional skills, physical and psychological abilities improvement in educational process. In this case the range of class hours, covering the hours of culture education, physical training and sports actions and self preparation significantly widens.

It is worthy to remember about individual classes which assist to significantly widen the performance range of the cadets' motion skills, and it is especially important for mastering of self-defense techniques and professional-applied martial arts.

Summary.

Using of extra curriculum classes is an effective reserve of efficiency improvement of educational process (discipline "special physical training") of higher educational institutions of Home Affairs ministry of Ukraine cadets.

In order to improve methodology, organization and conducting of classes in the system of professional-applied preparation, improvement of physical level of home affairs cadets and officers it is offered:

1. To combine educational, physical training, sports and fitness work into integral process by corresponding corrections of curriculums and training programs.

2. To consider extra curriculum classes as a component of educational training process with main task: preparation of highly qualified home affairs officer.

3. To estimate the results of a cadet's participation in competitions in professional-applied kinds of sports as one of the criteria of his physical level.

To consider the creation of universal, common for all departmental educational institutions of Home Affairs ministry of Ukraine, model of educational process (discipline "special physical training") as a prospective direction. Such model shall cover both the period of study at higher educational institution and the whole period of service at home affairs bodies. It must be created considering the specificity of the cadet's future service as an officer.

The creation of such model will permit to significantly improve educational process and approximate it as much as possible to practical conditions of service.

References:

1 Barchukov I. S. *Fizicheskaia podgotovka lichnogo sostava specpodrazdelenij* [Physical preparation of personnel of the special divisions], Moscow, SportAkademPress, 2001, 252 p.

2 Grigor'ev I. S. *Boevaia podgotovka professional'nykh telokhranitelej* [Combat training of professional body-guards], Rostov on Don, Phoenix, 2004, 384 p.

3 Zakorko I.P. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, vol.1, pp. 49-51.

4 Zakorko I.P. Osoblivosti planuvannia i organizaciyi navchal'nogo procesu z disciplini "special'na fizichna pidgotovka" u vishchikh navchal'nikh zakladakh [Features of planning and organization of educational process from discipline the "Special physical preparation" in higher educational establishments]. *Aktual'ni problemi fizichnogo vikhovannia studentiv v umovakh kreditno-modul'noyi sistemi navchannia* [Actual problems of physical education of students in credit-module system], Dnipropetrovsk, 2010, pp. 74 – 77.

5 Zuikov G.G., Chernenko G. I, Ias'kov E.F. *Nauchnaia organizaciia upravleniia organami vnutrennikh del* [Scientific organization of management the organs of internal affairs], Moscow, 1984, p. 191.

6 Platonov V.N. *Sistema podgotovki sportsmenov v olimpijskom sporte* [The system of preparation of sportsmen in Olympic sport], Kiev, Olympic Literature, 2004, 808 p.

7 Popovich A.I. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports],2010, vol.5, pp. 109-112.

8 Karagodin A.V., Kaniber Iu.N. *Primenenie special'nykh sredstv sotrudnikami OVD* [Application of the special facilities the employees of Ministry of Internal Affairs], Belgorod, BLI, 2012, 120 p.

9 Zakorko I.P., Zhuravel' O.V., Logvinenko Iu.V., Sverdil Ie.V., Kalins'kij A.M. *Special'na fizichna pidgotovka* [Special physical preparation], Kiev, Knowledge Ukraine, 2010, 51 p.
10 Geller William A., Guy Swanger. *Managing Innovation in Policing: The Untapped Potential of the Middle Manager*. Washington, D.C.: Police Executive Research Forum. 1995. 240 p.
11 Norm Gledhill, Claire Shaw, Carroll Robinson. *PREP Appraisers from the Toronto Police Service*. Queen's Printer for Ontario, 2002, 28 p.

Information about the author:

Evtushov F.M.: zakorko@ukr.net; National Academy of Internal Affairs; Solomenskaya 1, Kiev, 03035, Ukraine

Cite this article as: Evtushov F.M. Features of organization and extra-curricular classes on the subject "Special physical education" with the cadets of higher educational establishments of Ministry of Internal Affairs of Ukraine. *Physical Education of Students,* 2013, vol.1, pp. 27-29. doi:10.6084/m9.figshare.156352

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 31.01.2013
Published: 09.02.2013

USE OF SWIMMING IN INVOLVING AND RESTORATION MICROCYCLES IN THE TRAINING PROCESS OF HIGHLY SKILLED HEAVY WEIGHT SAMBO WRESTLERS

Zakorko I.P.
National Academy of Internal Affairs

Abstract. Expedience of the use of the sporting and health swimming is grounded in precontest preparation of the highly skilled sportsmen unarmed self-defence. 10 sportsmen took part in research (weight over 90 kg). Offered to recommendation on the use of swimming in renewal of sportsmen after the competition and trainings loadings. On employments, swimming was utillized a method crawl on a breast and by a method breast-stroke. Length of path of pool is 25 meters. The level of influence of trainings is set on swimming of different orientation on the general consisting of the sportsman unarmed self-defence of context of preparation and renewal during the specialized competition activity. It is recommended in training on swimming to utillize overcoming at full pelt of cutting-off 250 meters in the mode to 5 minutes (time of competition fight is in the fight of sambo-5 of minutes).
Keywords: swimming, sambo wrestlers, mode, intensity, interval, rest, unarmed self-defence.

Introduction.

Sambo wrestling is one of popular kinds of sports martial arts. At the present stage of this wrestling's development the main task is to include sambo in the program of Olympic Games. For this purpose sports functionaries, coaches and sportsmen conduct large scope of work on popularization of sambo throughout the world.

Indeed, sambo has certain advantages in comparison with other sports martial arts and kinds of wrestling which are Olympic kinds of sports. On the base of comparative analyses sambo can be characterized as a martial art, which includes some elements of already established Olympic kinds. Thus, in sambo it is permitted to use throws, holds, painful holds like in judo (in combat part – suffocation techniques); throws with grasping of legs, like in freestyle wrestling; techniques of Graeco Roman wrestling; in combat part box punches and tae kwon do kicks are permitted and appraised.

Besides sports direction of sambo, it is a basic kind for training of sportsmen in "mixed" martial arts and is a professional-applied kind of sports, the component of training of military and police officers of many states.

In spite of large amount of scientific and methodological literature on sambo [2, 3, 8], some peculiar aspects of highly qualified sambo wrestlers training, using of elements of other kinds of sports on different stages of training process are not sufficiently elucidated [4, 6].

The researches have been carried out in the frames of "Program on development of sambo wrestling in Ukraine for 2012-2016" [http://nfsu.ho.ua/, http://www.sambo-fias.org/fias], as per Cl. 3 "Preparation of highly qualified sportsmen in professional-applied kinds of sports" of the plan of scientific research works of fire and special physical training department of public security and psychological personnel preparation educational-scientific institution (National Home Affairs academy) [http://fizo.org.ua/].

The practical task of the present paper is to include into academic training process of highly qualified heavyweight sambo wrestlers some corrections which would permit to improve and diversify preparation to competitions and, finally, would positively influence on competitions' results.

Purpose, tasks of the work, material and methods.

The purpose of the work is to ground the reasonability of sport and health improving swimming as the component of pre-competition preparation of highly qualified heavyweight sambo wrestlers on its different stages.

The tasks of the work:

1. To define the content of swimming training trainings for highly qualified heavyweight sambo wrestlers on different stages of pre-competition preparation and as the method of "intensive" restoration after competition loads.

2. To study the influence of different kinds of swimming training on general status of a sambo wrestler in the context of his preparation and restorations in the course of specialized competition activity.

3. To ground reasonability of swimming as a component of pre-competition preparation and restoration measures..

The material of the researches is the content of heavyweight highly qualified sambo wrestlers training process in involving and restoration micro cycles during the period of competition.

The methods of research are analysis of literature, pedagogical experiment, tests and comparative analysis of their results, methods of mathematical statistics.

The researches have been conducted in the period of 2010-2012 with group of highly qualified sambo wrestlers (n=10; weight over 90 kg., sport qualification not less than MS) on the base of combined team of Home Affairs National academy of

Results of researches.

The process of highly qualified sambo wrestlers training has a lot of common features with training of sportsmen of other kinds of wrestling and is rather monotonous by its general content.

doi: 10.6084/m9.figshare.156353

At different stages of preparation for competition for improvement of general endurance and speed abilities running and cross exercises are used; for development of dexterity and again endurance and speed outdoor games (with martial arts elements) are used. During such classes no special attention is paid to directly running and outdoor games techniques.

A qualified sportsman, knowing the foundations of different sports techniques can be compared with qualified engineer or lawyer who, besides his profession, knows several foreign languages.

The idea of application of swimming in training of sambo and judo wrestlers is not a new one. It was successfully applied by well known specialists: Ya.I. Voloschuk, judo Honoured Coach of the USSR , and his disciple, judo Honoured Master of Sports of the USSR V.V. Dvoynikov, who now successfully works in Belgium, in their coaching activity.

The analysis of literature [4-7, 9, 10], practical material, obtained as a result of different swimming trainings of the tested sportsmen, permitted to determine approximate content of classes depending on their tasks.

At trainings we used crawl on breast (inhale – exhale per every two strokes) and breaststroke styles. The length of water pool track – 25 meters. (See table 1).

Table 1.

Training 1 (aimed to development of special endurance and quickness), style of swimming – crawl on breast:

Distance length	Time mode (rest interval is not more than 30 sec. between series of distances)
250 m	5 min.-5 min.30 sec.
5x100 m	2 min.10sec-2 min.30 sec. Total time: 10 min.50 sec.-12 min. 30 sec.
250 m	5 min.-5 min.30 sec.
5x50 m	1 min.5 sec.-1 min.30 sec Total time: 5 min.25 sec.-7 min. 30 sec.
250 m	5 min.-5 min.30 sec.
10x25m	35-45 sec. Total time: 5 min.50 sec.-7 min. 30 sec.
250 m	5 min.-5 min.30 sec.
Total distance 2000 m	Total time (considering rest intervals): 44-50 min.

Table 2

Training 2 (aimed to development of general and special endurance), style of swimming – crawl on breast:

Distance length	Time mode (rest interval is not more than 1 min. between series of distances)
250 m	5 min.-5 min.30 sec.
500 m	10-11 min.
750 m	15-16 min.
1000 m	20-22 min.
Total distance 2500 m	Total time (considering rest intervals): 54-59 min.

Training 3 (aimed to development of general endurance), style of swimming – crawl on breast:

Total distance 3000 m; Total time: 1 hour-1 hour 10 min.

Table 3

Training 4 (aimed to restoration after load), style of swimming – crawl on breast, breaststroke:

Distance length	Time mode (without rest intervals)
250 m, crawl	5 min.30 sec.-6 min.
250 m, breaststroke	7 min.-7 min. 30 sec.
500 m, crawl	10 min.30 sec.-12 min.
500 m, breaststroke	14-15 min.
250 m, combination (25 m -crawl, 25 m-breaststroke)	6 min.30 sec.-7 min.
Total distance 1750 m	Total time: 44-48 min.

Training (aimed to restoration after load), style of swimming – crawl on breast, breaststroke (freestyle combination):. Total distance 2000 m; Total time: 50-55 min.

Summary.

1. Application of swimming training in involving micro cycles permitted to improve further sportsmen's adaptation to special training loads. For example, swimming at distance of 250 m with maximum speed in the mode up to 5 minutes (the time of sambo competition fight equals to 5 minutes).

2. Mastering and improvement of swimming technique by all tested sportsmen positively influenced on flexibility of superior limbs' joints, and consequently made some positive corrections in general technical picture of fight.

3. All tested noted restoration effect of swimming training after significant competition and special loads; their positive influence on general status of organism and mood.

Widening of special specialization range due to application of elements and even the whole training components from other kinds of sports in training process is, in our opinion, one of substantial and insufficiently studied reserves of sports skill improvement in the given kind of sports.

The further profound researches in this direction will permit to substantially enrich the arsenal of individual preparation of highly qualified sportsmen, to improve and diversify the current stereotypic models of training process.

References:

1 Zakorko I.P. Biomekhanicheskie osobennosti tekhnicheskoj podgotovki borcov tiazheloj vesovoj kategorii [Biomechanics features of technical preparation of fighters of heavy gravimetric category]. *International scientific congress «The modern Olympic sport»,* Kyiv, 1997, p. 280.

2 Zakorko I.P. *Moloda sportivna nauka Ukrayini* [Young sport science of Ukraine], 2000, vol.4, pp. 241-242.

3 Zakorko I.P., Shapovalov B.B., Zhuravel' O.V. *Sportivnij rozdil sambo i dziudo* [Sport section of sambo and judo], Kiev, KLI, 2005, 20 p.

4 Laputin A.M., Bobrovnik V.I. *Olimpijs'komu sportu – visoki tekhnologiyi* [To olympic sport – high technologies], Kiev, Knowledge, 1999, 164 p.

5 Bulgakova N.Zh. *Plavanie* [Swimming], Moscow, Physical Culture and Sport, 1984, 228 p.

6 Platonov V.N. *Sistema podgotovki sportsmenov v olimpijskom sporte* [The system of preparation of sportsmen in Olympic sport], Kiev, Olympic Literature, 2004, 808 p.

7 Platonov V.N. *Fizicheskaia podgotovka plovcov vysokogo klassa* [Physical preparation of swimmers of high class], Kiev, Health, 1983, 168 p.

8 Stankov A.G., Klimin V.N., Pis'menskij I.A. *Individualizaciia podgotovki borcov* [Individualization of preparation of fighters], Moscow, Physical Culture and Sport, 1984, 240 p.

9 Kylie A. Steel, Roger D. Adams & Colleen G. Canning. Identifying swimmers as water-polo or swim team-mates from visual displays of less than one second. *Journal of Sports Sciences,* 2007, vol.25(11) pp. 1251-1258.

10 Thomas Nikodelis, Iraklis Kollias & Vassilia Hatzitaki. Bilateral inter-arm coordination in freestyle swimming: Effect of skill level and swimming speed. *Journal of Sports Sciences.* 2005, vol.23(7), pp. 737-745.

Information about the author:

Zakorko I.P.: zakorko@ukr.net; National Academy of Internal Affairs; Solomenskaya 1, Kiev, 03035, Ukraine

Cite this article as: Zakorko I.P. Use of employments on swimming in pulling in and restoration microcycles in the training process of the highly skilled sportsmen of the highly skilled heavy weight sambo wrestlers. *Physical Education of Students,* 2013, vol.1, pp. 30-32. doi:10.6084/m9.figshare.156353

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 18.01.2013
Published: 09.02.2013

COMPATIBILITY OF SPORTSWOMEN AT SELECTION IN TEAMS OF CALISTHENICS GROUP EXERCISES CONDIDERING THEIR FUNCTIONAL STATE

Kozhanova O.S.
Borys Grinchenko Kiev University

Abstract. The degree of trained and predisposition of work is certain from data of mechanisms of energy-supply of sportswomen. 40 students took part in research. The degree of trained sportswomen was determined on results a vectorcardiography. On the level of functional possibilities of heart of sportswomen were up-diffused on three groups. It was set that most corresponds the specific of group exercises the first group of gymnasts the heart of which is in a greater degree predispositioned to implementation of loadings of anaerobic and mixed orientation. The first group of sportswomen is characterized optimum accordance of processes depolarization and repolarization of ventricles and normal functioning of auricles. For the sportswomen of this group a heart works in the economical mode without tension. It is set that the account of compatible functionality at a selection in commands on group exercises comes forward the factor of increase of efficiency of competition activity of sportswomen.
Keywords: group, exercises, artistic, gymnastics, selection, compatibility, energy-supply.

Introduction.

The quality of execution of highly difficult exercises, requiring skilled coordination, which are included in competition compositions, is one of the factors, determining sports results in calisthenics [2, 10]. To achieve high sports workmanship, speed of response, static equilibrium, speed-strength level, general endurance and force momentum are of great importance. The parameters of technical preparedness, such as difficulty and originality of exercises, technical equipping of compositions, skillfulness and the level of gymnasts' subjective preparedness characterize the specificity of trainings and competitions, both individual and group ones. Technical preparedness efficiency is determined by indicators of scope and intensity of intended training loads and by the development of physical abilities, gymnasts' special endurance in particular, connected with them [6, 11, 13]. That is why when selecting gymnasts for group exercises in calisthenics it is necessary to consider their functional potential. Criteria of functional compatibility are regarded as pre-conditions of team members' high efficiency and are of prior significance in achieving of competition results [3, 5].

The analysis of the problem showed that the problem of effective gymnasts' combined activity in teams has not been studied sufficiently yet. In connection with this, we consider urgent to ground the consideration of gymnasts' functional compatibility as a pre-condition of efficiency of gymnasts' competition activity when composing teams by calisthenics group exercises.

The work has been fulfilled as per subject 2.1.6 "Reasonable construction of training process in sports gymnastics at the stages of multi-years training" of aggregate plan of scientific and research works for 2006-2010, developed by Ministry of family, youth and sports of Ukraine; as per subject 2.12. "Creation of system of sportsmen's multi-year selection and orienting", of aggregate plan of scientific and research works for 2006-2010, developed by Ministry of family, youth and sports of Ukraine.

Purpose, tasks of the works, materials and methods.

The purpose of the research – foundation of gymnasts' functional compatibility as a criterion for selection in teams by calisthenics group exercises.

To achieve the set aim we used the following research methods: analysis of scientific-methodological literature, vector cardiography (VCG), methods of mathematical statistics.

In research, 40 girl-students of National University of physical education and sports of Ukraine (NUPESU) took part. There were involved for selecting into teams by group exercises. Among them there were 4 international level masters of sports of Ukraine, 28 masters of sports of Ukraine and 8 candidates to master of sports of Ukraine.

Results of research.

Inner processes of sportsman organism's adaptation to different physical loads in the course of training are the base of sports efficiency improvement [9]. Specificity of gymnasts organisms' adaptation responses, while fulfilling competition compositions, duration of which, as per competition rules, does not exceed 90 seconds for individual program and 150 seconds for group exercises, is characterized by great and maximum power (intensity).Heart rate quickly rises and nearly reaches its utmost and sometimes, reaches indeed. That is why, composition exercises of high coordination are carried out on the background of intensive bio energetic and psycho physiological processes and on high level threshold of anaerobic exchange and heart rate, which are connected with them [5, 6].

In calisthenics such parameters of technical preparedness as difficulty and originality of exercises, technical equipping of compositions, mastery and the level of gymnasts' subjective preparedness characterize specificity of training and competition activity both in individual and in group exercises [2]. Efficiency of technical preparedness is determined by indicators of scope and intensity of training loads, which make high demands to gymnasts' state of health, their organisms' functional capabilities and, first of all, to the state of cardiac vascular system. Adaptation re-

doi: 10.6084/m9.figshare.156354

constructions of heart functioning depend on the character of loads. Due to the fact that calisthenics is characterized by relatively low energy intensity of training and competition work, the prevailing energy supply source of physical exercises is anaerobic glycolysis, and, in some cases, creatine phosphor kinase mechanism [7].

In order to determine the training level of gymnasts by the given mechanisms of energy supply we used vector cardiography method. VCG method is more informative for determination of myocardium hypertrophy in comparison with other electro physiological methods. With the help of VCG ansate curves (P, QRS and T) are registered, which characterize the dynamics of electric field of different heart parts. All VCG loops have common zero point, from which the loop starts and in which it ends. Big outside loop QRS corresponds to the ventricles' depolarization process. Inside it small loop T is located, which reflects the process of re-polarization. The least loop P represents the process of atriums' excitement [1].

In total 40 gymnasts were examined in the state of relative relaxation. By the level of hearts' functional capabilities the gymnasts were divided into three groups. As per the data of qualitative and quantitative VCG evaluation (see table 1) the first group consisted of 13 gymnasts: 4 ones with hearts predisposed to anaerobic loads and 9 gymnasts with hearts predisposed to anaerobic and aerobic loads. Qualitative evaluation of gymnasts of this group was plotted as even combined myocardium hypertrophy with electric potential's prevailing both in the left and in the right sections of hearts. (fig. 1).

Fig. 1. Typical VCG graphs of gymnasts' ventricles, whose hearts were predisposed to anaerobic-aerobic loads. (n = 13)

This attests about myocardium predisposition to anaerobic-aerobic loads. These gymnasts had high anaerobic abilities and it permitted them to carry out short term work (up to 90 sec. and more) with high intensity. This characteristic in the most acceptable for group exercises, the program of which includes five exercises with skipping rope. Skipping rope exercises are characterized by prevailing of jumps, quick race and rhythm of work and it gives ground to suggest that here success will mainly depend on speed parameters.

Table 1

Quantitative VCG indicators of gymnasts of the first group
n = 13

Initials of gymnasts	Indicators					
	Vector H (initial) mm	Vector Г (main) mm	Vector K (final) mm	Loop area P, mm/sec	Loop area QRS, mm/sec	Loop area T, mm/sec
V.D	4,316	18,608	4,506	243,22	648,69	42,27
P.N.	9,615	22,248	13,963	382,72	1155,54	41,77
B.M.	13,797	22,671	18,509	367,37	1079,42	23,64
P.V.	14,652	26,289	9,567	286,63	1794,18	71,75
K.Ya.	14,357	29,829	12,960	339,81	1569,01	44,41
B.I.	10,701	25,618	18,301	507,98	1094,81	75,65
Ch.K.	10,194	22,048	10,085	311,46	640,74	25,68
R.Yu.	11,429	25,399	13,590	385,59	1114,96	51,43
S.Al.	7,992	32,982	11,728	610,77	1997,01	38,18
O.Al.	6,524	18,160	13,362	757,24	685,07	31,33
T.A.	7,853	34,121	24,883	394,73	1144,13	67,76
$\bar{x}$	24,6	24,7	12,9	450	1094	49,2
$\pm S$	4,7	5,5	1,4	66	456	18,3

±m	1,3	1,7	5,3	238	127	5,06
V, %	19,1	22,3	10,8	14,6	41,6	37,2

The second group consisted of 27 gymnasts: 19 of them were predisposed to anaerobic and aerobic loads and 8 gymnasts – predisposed to aerobic loads on the base of quantitative and qualitative VCG evaluations. Aerobic energy supply mechanism is less by its efficiency than energy supply by lactate and alactate speed of switching in supply of muscular activity, but exceeds manifold by capacity and efficiency. It should be noted that gymnasts with sufficiently expressed aerobic component of energy supply are able to carry out loads of medium intensity for long time (up to several hours) and this is also a positive indicators for group exercises. In this group the increase of electric potentials of the right ventricular septum, front right ventricle wall and posterobasal sectors of right ventricle were noticed to a lesser degree than in the first group and it also attests the heart's disposition to anaerobic loads.

The third group consisted of 14 gymnasts, who had changes, which indicated inefficient functioning of heart in tensed mode (significant non restoration). Ten gymnasts were in the aerobic and anaerobic mode and 4 – in anaerobic and aerobic. For this group of gymnasts, the fluctuations of myocardium functioning can be a limiting factor in achieving of high sports results. The functional reserves of gymnasts' hearts are reduced and execution of training and competition loads will require more energy expenses. This fact permits to regard the third group the least preferable for competitions of groups in calisthenics.

Thus, by the results of quantitative and qualitative VCG evaluations the most favorable indicators were noted (n=40) on the base of which gymnasts were divided into three groups – sports teams by the level of their functional adequacy. The first group of gymnasts, composed by the VCG data of myocardium bio electrical potentials, turned out to be the most preferable for group calisthenics exercises of combined team of NUPESU. It was characterized by optimal coincidence of depolarization and re polarization processes of ventricles and by normal atriums' functioning. The hearts of first group gymnasts worked in economic mode without tension. That is why, energy expenses connected with the fulfilled loads, will be minimal.

Summary.

Thus, high level of calisthenics gymnasts' preparedness mediates competition results, both individual and group ones. With selecting of gymnasts into teams for group exercises it is necessary to consider similarity of gymnasts' functional readiness levels because these parameters significantly influence on the efficiency of their training and competition activity.

Analysis of gymnasts compatibility (n = 40), considering their functional preparedness on the base of VCG registration of bio electrical myocardium potentials showed that gymnasts can be divided into three groups by the level of functional adequacy. By VCG results, the most preferable for group exercises was the first group of gymnasts who were inclined to anaerobic-aerobic loads; less preferable – second group gymnasts, who were inclined to aerobic-anaerobic loads; the third group consisted of gymnasts with non efficient and tensed mode of heart functioning.

Besides, it should be noted that in order to improve gymnasts' selection to calisthenics group exercises teams it is necessary to carry out complex evaluation of gymnasts' different compatibility kinds.

The prospects of further researches in the given direction lie in foundation of efficiency of gymnasts' selection to calisthenics group exercises teams on the base of complex evaluation of gymnasts' compatibility.

References:

1 Aulik I.V. *Opredelenie fizicheskoj rabotosposobnosti v klinike i sporte* [Determination of physical capacity in a clinic and sport], Moscow, Medicine, 1990, pp. 132 – 141.

2 Belokopytova Zh.A. *Teoretiko-metodicheskie osnovy sportivnogo otbora v sportivnykh vidakh gimnastiki* [Theoretical methodical bases of sporting selection in the sporting types of gymnastics], Moscow, Scientific world, 2004, 90 p.

3 Vishniakova S.V. Sovershenstvovanie funkcional'nykh vozmozhnostej sportsmenok na nachal'nykh etapakh podgotovki v khudozhestvennoj gimnastike [Perfection of functional possibilities of sportswomen on the initial stages of preparation in a calisthenics]. *Aktual'nye problemy podgotovki menedzherov k upravlencheskoj deiatel'nosti* [Issues of the day of preparation of managers to administrative activity], Volgograd, 2002, vol.2, pp. 35-38.

4 Zemskov E.A., Koledina I.V. *Teoriia i praktika fizicheskoj kul'tury* [Theory and practice of physical culture], 1999, vol.9, pp. 14 - 17.

5 Lapina L.N. *Zavisimosti mezhdu pokazateliami funkcional'nogo sostoianiia gimnastok i ikh sorevnovatel'nymi dostizheniiami* [Dependences between the indexes of the functional state of gymnasts and their competition achievements], Kiev, 1987, pp. 22 - 24.

6 Mekancishvili S.A. *Programmirovanie i normirovanie trenirovochnykh nagruzok pri podgotovke gruppovykh uprazhnenij khudozhestvennoj gimnastiki* [Programming and setting of norms of the trainings loadings at preparation of group exercises of calisthenics], Cand. Diss., Tbilisi, 1991, 24 p.

7 Nesterova T.V., Iashchenko A.G., Tajbolina L.A. *Analiz itogov uchastiia sbornoj komandy Ukrainy po khudozhestvennoj gimnastike v Igrakh XXVII Olimpiady* [Analysis of results of participation of collapsible command of Ukraine on a calisthenics in Games of XXVII Olympiad], Kiev, SERIPC, 2000, pp. 40 - 45.

8 Nesterova T.V., Kozhanova O.S. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2009,

vol.1, pp. 32 - 34.

9 Petrovskij V.V. *Modelirovanie funkcional'nogo sostoianiia sportsmenov razlichnoj podgotovlennosti* [Modelling of the functional state of sportsmen of different preparedness], Kiev, 1991, pp. 26 - 31.

10 Slavik N.I. *Upravlenie trenirovochnymi nagruzkami v sorevnovatel'nom periode s uchetom funkcional'nogo sostoianiia гимнастов* [Management the trainings loadings in a competition period taking into account the functional state of gymnasts], Cand. Diss., Kiev, 1989, 24 p.

11 Daly R.M., Caine D., Bass S. L., Pieter W., Broekhoff J. Growth of Highly versus Moderately Trained Competitive Female Artistic Gymnasts. *Medicine and Science in Sports* and *Exercise's*, 2005, vol.37(6), pp. 1053–1060. doi:10.1249/01.mss.0000167576.23413.ae

12 Paoli. Ketogenic diet does not affect strength performance in elite artistic gymnasts. *Journal of the International Society of Sports Nutrition*, 2012, vol.9, pp. 34-39. doi:10.1186/1550-2783-9-34

13 Zivcic Markovic K., Omrcen D. The analysis of the influence of teaching methods on the acquisition of the landing phase in forward handspring. *Science of Gymnastics Journal.* 2009, vol.1(1), pp. 21-30.

Information about the author:

Kozhanova O.S.: kozhan_olya@mail.ru; Borys Grinchenko Kiev University; Marshal Timoshenko str. 13-B, Kiev, 04205, Ukraine

Cite this article as: Kozhanova O.S. Compatibility of sportswomen at selection in commands on group exercises of artistic gymnastics accounting their functional condition. *Physical Education of Students,* 2013, vol.1, pp. 33-36. doi:10.6084/m9.figshare.156354

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 09.01.2013
Published: 09.02.2013

FITNESS – PROGRAMS AS MEAN OF FORMING OF PERSONALITY PHYSICAL CULTURE OF STUDENTS

Kurmaeva E.V.
Motor-Car-Road Institute

Abstract. Basic directions of perfection of process of physical education of students of higher institutes are examined. Attention is accented on the necessity of search of new effective ways of making healthy of students, increases of level of their physical development and preparedness. A questionnaire inspection is conducted 150 students. It is set that 62% boys would prefer engaged in the power types of fitness (athletic gymnastics, power lifting) and 38% wished to be engaged in the traditional types of sport. 75% girls preferred a fitness (70% to the aerobic orientation, 5% - power), 25% girls were chosen by the traditional types of physical activity. It is shown classifications of fitness programs. It is suggested to adapt existent fitness is programs for employments in the institutes of higher. The possible ways of making healthy of students, increase of level of their physical development and preparedness, attaching to the active way of life are shown.

Keywords: fitness, program, student, aerobic, physical, education.

Introduction

Active reformations, which are conducted in Ukraine, higher school entering the international educational space and connected with this dynamics of educational system changes, set to higher school quite new problems in the field of physical training, especially in educational process. However, dissatisfaction of physical training content is observed at present among students and it negatively influences on their physical level and health. That is why, discovering of new, effective ways of the students' health improvement, rising of their physical level, imparting active way of life to them is an urgent task. One of the most acceptable ways to solve this task is an integration of different fitness aspects into physical training of students, which are now being realized at Motor-car-road institute of State higher institution "Donetskiy national technical university".

The analysis of academic and scientific literature [3, 6, 7, 9-13] on the subject of the research shows that fitness training results in increasing of students' capacity for work and in improvement of their resistibility to harmful factors. In spite of big scope of research works on fitness subject, to day a lot of problems still require additional researches due to changes of students' studies and life conditions, environment, due to appearing of new kinds of fitness.

The present work has been fulfilled as per the plan of scientific research works of Motor-car- road institute ГВУЗ «ДонНТУ», physical training department.

Purpose, subject, materials and methos of the work

The purpose of the work – analysis of Motor-car –road institute students' preferences in choosing of physical training kinds, means and methods.

Results of research

The study of Motor-car –road institute students' preferences in choosing of physical training kinds, means and methods was conducted in February 2011 during one month, in leisure time. 150 of I – III years students (100 girls and 50 boys) of four faculties: "Transport technologies", "Motor transport" , "Motor roads", "Economics and management" were questioned.

The questioning resulted in compiling the list of physical training kinds, wanted by Motor-car –road institute students or in which they are trained now in leisure time, (see table 1). Boys (62%) preferred weightlifting fitness (athletic gymnastics, power lifting) and 38% chose traditional kinds of sports. Girls (75%) preferred fitness: 70% - fitness of aerobics type, 5% - weightlifting one and only 25% of girls chose traditional kinds of physical activity.

The complex of tasks, which are solved by fitness means include:

- Harmonious physical, intellectual, and spiritual development of students by motor function, respiratory and nerve system complex impact;
- Assistance to self-knowledge and self-realization by means of physical training;
- Free choice of kind and organization of training according to personal preferences;
- Improvement of essential motor skill and habits;
- Rising of students' interest to systematic physical training;
- Forming of knowledge about healthy life-style;;
- Development of aesthetic abilities and creativity by realization of interconnection of different fitness branches with such arts as music and dance.
- Forming of positive psychological and emotional mood with the help of musical accompaniment, which creates dance and play orientation of training [4.5].

doi: 10.6084/m9.figshare.156355

Table 1.

Results of students' questioning

Kinds of physical activity	Girls	Boys
Traditional kinds		
Sports games	10	18
Outdoor games	10	10
Track and field sports	5	10
Fitness		
Step aerobics	20	-
Fitball	16	-
Shaping	34	-
Athletics gymnastics	5	42
Power lifting	-	20

The implementation of fitness in educational program is carried out on the base of fitness programs.

At present time there is no clear and definite definition of the term "fitness program" in normative, educational and scientific literature. In general, term "fitness programs" is used in the meaning of synthesis of different fitness kinds and a system of health improving physical training including healthy life-style (rational nutrition, absence of pernicious habits, psychological training and etc.).

The kinds of fitness programs are: aerobics, weight lifting fitness, mixed kinds,

Body & Mind» (clever body), dancing, fitness, based on oriental martial arts.

Main orientations of fitness programs:

1. health improving – conditional (decrease of disease risk, achieving and maintaining of appropriate physical state.
2. development of the abilities to realize motor and sports tasks on rather high level.

In the first case fitness programs are oriented to the aims of health improving fitness, in the second – to the aims of sports or motor fitness [4, 10].

Classification of fitness programs [4, 5]:

1. Depending on the kind of motor activity:

1.1 one kind of motor activity (e.g. aerobics, health improving running, swimming, gymnastics);

1.2 combination of several motor activities (e.g. aerobics and body building, aerobics and stretching; health improving swimming and running);

1.3 combination of one or several motor activities and different factors of healthy life-style;

2. Depending on the contingent of fitness students:

2.1 individual training;

2.2 group training;

2.2 training of special groups;

Groups are arranged of the persons on the base of medical examinations which direct them to the main group or preparatory, medicinal group.

Such variety of fitness programs is conditioned by the tendency to satisfy different sports and health improving interests of students.

The variety of fitness programs does not mean arbitrariness of their creation; the using of different motor activity kinds shall correspond to basic principles of physical training. No matter how original any fitness program could be, it must include the following components:

- warming-up;
- aerobic part ;
- power part;
- stretching component;
- final (restorative) part [8, 10].

The above given generalized structure of the program can be changed depending on the aim of training, the physical state of the students and other factors. For example, the health improving fitness programs consists of 8 special-purpose components or blocks:

- preparatory (preparation of the student's organism to training);
- aerobic (development of cardiac vascular and respiratory systems);
- dancing- choreographic (realization of aesthetic settings, development of coordination abilities);
- corrective (correction of body, power exercises);
- prophylaxis (prevention of different diseases);
- additional (training of dexterity, flexibility, vestibular stability);
- arbitrary (training of musical –and-rhythmic abilities);
- relaxation (restoration after training, stress relieving, relaxing) [4, 5].

With composing of fitness programs it is important to consider the peculiarities of students' health state and the programs' adaptability to academic courses.

Summary

In the course of experiments, which were conducted with the students of Motor-Car-Road Institute ГВУЗ «ДонНТУ», it was stated that 62% of boys and 75% of girls would prefer different kinds of fitness. For this purpose, the existing fitness programs shall be adapted to higher educational institution academic courses. The efficiency of fitness programs' implementation in physical training of students requires their further study and further relevant researches.

References:

1 Ashkinazi S.M., Bobrov M.M., Voronov I.A. *Fizicheskaia kul'tura, obuchenie i zdorov'e* [Physical culture, teaching and health], Sankt Petersburg, SSUP, 2008, 143 p.
2 Berdnikov I.G., Maglevanyj A.V. *Massovaia fizicheskaia kul'tura v vuze* [A mass physical culture in the higher institute], Moscow, High school, 1991, 240 p.
3 Bulgakova O.V. *Organizacionno – metodicheskie usloviia optimizacii trenirovochnykh nagruzok u studentok, zanimaiushchikhsia ozdorovitel'noj aerobikoj* [Organizationally and methodical terms of optimization of the trainings loadings for students, engaged in health aerobics], Cand. Diss., Malakhovka, 2007, 27 p.
4 Davydov V.Iu., Shamardin A.I., Krasnova G.O. *Novye fitness – programmy* [New fitness programs], Volgograd, 2005, 284 p.
5 Davydov V.Iu., Shamardin A.I. *Ozdorovitel'nyj fitness dlia detej i vzroslykh* [Health fitness for children and adults], Volgograd, 2004, 135 p.
6 Dubogryzova I.A. *Metodika differencirovannykh zaniatij ozdorovitel'noj aerobikoj so studentkami tekhnicheskogo vuza* [Method of the differentiated employments health aerobics with the students of technical higher institute], Cand. Diss., Smolensk, 2005, 22 p.
7 Nikiforova S.A. *Integrativnye zaniatiia aerobikoj kak sredstvo formirovaniia zdorovogo stilia zhizni studencheskoj molodezhi* [Integrative employments aerobics as a mean of forming healthy lifestyle of student youth], Cand. Diss., Tyumen', 2008, 22 p.
8 Seluianov V.I. *Metodika silovoj podgotovki v ozdorovitel'noj fizicheskoj podgotovki* [Method of power preparation in health physical preparation], Aerobics, 2000, 103 p.
9 Streleckaia Iu.V. *Kommunikativnaia podgotovka na zaniatiiakh fitnes – aerobikoj s uchetom specifiki deiatel'nosti i individual'no – lichnostnykh razlichij studentov* [Communicative preparation on employments of fitness - aerobics taking into account the specific of activity and individually - personality distinctions of students], Cand. Diss., Sankt Petersburg, 2007, 22 p.
10 Lisickaia T.S. *Aerobika na vse vkusy* [Aerobics on all of tastes], Moscow, Education Vlados, 1994, 96 p.
11 Fediakina L.K. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, vol.2, pp. 119 – 123.
12 Loren R. Dyck, Kathi J. Lovelace. Finding a Fit With Fitness: Applying Intentional Change Theory in Worksite Health Promotion Programming. *Journal of Workplace Behavioral Health*. 2012, vol.27(1), pp. 12-31.
13 Simonete Pereira Da Silva, Gaston Beunen, Antonio Prista & Jose Maia. Short-term tracking of performance and health-related physical fitness in girls: The Healthy Growth in Cariri Study. *Journal of Sports Sciences*. 2013, vol.31(1), pp. 104-113.

Information about the author:

Kurmaeva E. V.: kurmaeva.e@mail.ru; Motor-Car-Road institute; Kirova str. 51, Gorlovka, Donetsk area, 84600, Ukraine

Cite this article as: Kurmaeva E.V. Fitness – programs as mean of forming of personality physical culture of students. *Physical Education of Students,* 2013, vol.1, pp. 37-39. doi:10.6084/m9.figshare.156355

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 15.01.2013
Published: 09.02.2013

FEATURES OF FINANCING OF MASS SPORTS IN EUROPE AT THE BEGINNING OF XXI CENTURY

Michuda Y.P., Zhuliaiev V.N.
National University of Physical Education and Sport of Ukraine

Abstract. Research purpose – to define and characterize tendencies and the main models of financing of development of mass sports in the countries of the European Union at the beginning of XXI century. As a material for researches information which contains in official publications of the European Union, and also monographic and periodicals on problems of development of mass sports is attracted. The main tendencies of financing of mass sports are defined, the structure of sources of financing mass in the countries of Europe at the beginning of XXI century is characterized. The comparative analysis of models of financing of mass sports in the different countries of Europe on the basis of application of criteria is carried out: 1) level of involvement of the population to sports activities (taking into account membership dues); 2) level of public financing counting on one person; 3) contribution of direct family costs; 4) contribution of volunteer sector.

Key words: mass sports, financing, sources, models.

Introducton.

To day development of mass sports is one of the main priorities of many states' policy in the sphere of physical culture and sports. It is not a casual factor because mass sports have a lot of social functions. Mass sports are considered an important component of a person's full fledged development and education, efficient preventive mean of diseases. Sports promote preparation to highly efficient work, defense of Motherland, ensuring creative longevity, substantial leisure, prevention from antisocial actions [4].

Financial provision of sports is an urgent problem and the necessary condition of sports development. Both, different social institutions and sports sciences representatives pay great attention to this problem for long time. In Europe, for example, intensive financing of mass sports took place in nineties. In European sport charter, which was adopted in 1992 at the conference of European states ministers of sports, it was noted that for solution of sports development problems it was necessary to issue funds from state budgets, (clause 12) [10].

One more document of European Community – Declaration of European conference "Sports and local administration" (1996) delegates declared new steps in improvement of sports (mass sports inclusive) development. The charter's authors formulated main approaches to sports financing and administration of it.. Particularly, they underline that it is necessary to develop different sources of sports financing on the base of private funds and contributions of Public Sector combination. With this it was stressed that local authorities shall be the main partner in financing local sports. Local authorities shall ensure the development of local sports in general and the sport for everybody and create necessary conditions for their current expenses and investments financing.. A balance shall be maintained between governmental and private sources of financing. Sports sector may be also considered a private source of financing. Enterprises' sponsorship and sports marketing are considered additional sources of financing. Local authority shall distribute finances so that to create the conditions of healthy life-style for low-income groups [13].

The practice of the a.m. ideas at the turn of the century was intensively reported in numerous works of specialists from different countries [1-6, 7-9]. Quantitative and qualitative characteristics of mass sports development in Europe were analyzed, dynamics of different countries population involving in sports were determined, approaches to administrating of mass sports were reflected, attention to governmental and local resort provision of mass sports development was accented [7].

The end of the first decade of new age was marked by new phenomena in economical life of European countries, which were caused by world depression. One of them was an aggravation of problem of mass sports subject financing. Now, new approaches for solution of this problem shall be searched, and this necessity strengthens the urgency of the present paper.

The present research work has been executed in the frames of scientific subject 1.7. "Theoretical, methodological and applied aspects of innovative technologies application in sports management" as per "Plan of scientific and research works in the sphere of physical culture and sports for 2011-2015" of Family, Youth and Sports Ministry of Ukraine, number of state registration 0111Uoo1719.

Purpose, tasks of the work, material and meethods.

The purpose of the research is to determine and characterize the trends and main models of mass sports development financing in the countries of European Community at the beginning of XXI century. As material for research, information from European Community's official publications, monographs and periodicals on the problems of mass sports development was used. In the course of research the following methods were applied: system analyses; history logical method; analyses of scientific literature; method of comparing.

Results of researches

In Europe, during the first decade of the new age mass sports have been acquiring the features of a real national economics' sector. Considering this fact, the present functioning of mass sports and their perspective development to a

doi: 10.6084/m9.figshare.156356

large extent are conditioned by the factors which influence on economic process in the whole world. To day, organization of sports feels increasing pressure form market, which, first of all, manifests as increasing of customers' requirements to the range and the quality of sports and fitness services. The adequate response to this challenge demands additional call for funds that is a difficult task in condition of economical regression. More over, in complicated economical conditions governmental resources for financial supporting of mass sports sphere significantly restrict.

The given above trends are confirmed by the results of sociological researches, which were conducted in the past years by the specialists of European Community. . The experts, questioned by them, attracted attention to the factors which oppress the financial provision of mass sports in the countries of Europe. In the first turn, this is reduction of mass sports governmental financing in favor of "high level" sports. This results in increasing of mass sports dependence on local authorities, which now themselves are suffering from deficit of local budgets and can not satisfy mass sports demands in financial resources.

In such conditions sports clubs and other sports units have to shift their financial problems onto the services customers, by increasing membership fees and prices of membership cards. This can lead to reduction of population participation in sports activity. One more factor, which experts noted as negatively influencing on mass sports financing, was, in their opinion, the risk of reduction of volunteers, who support sports organizations by their work. The logical conclusion from the said above is the necessity to mobilize other sources of financing in order to diversify mass sports financing and to reduce its dependence on governmental sector [11].

The official statistics data indicate that the trend of mass sports financing diversification in Europe has become noticeable in the first decade. Thus, as on 2008, the amount of funds flows directed to development of mass sports in 27 countries – members of European Community, was of 71.7 billion EUR, that made up 46.6% of all finances, invested in European sports system in the whole. Considering the contribution of volunteers' activity, total budget of mass sports is equivalent to 97.2 billion EUR. With this, funds were received by the sphere of mass sports from six different sources:

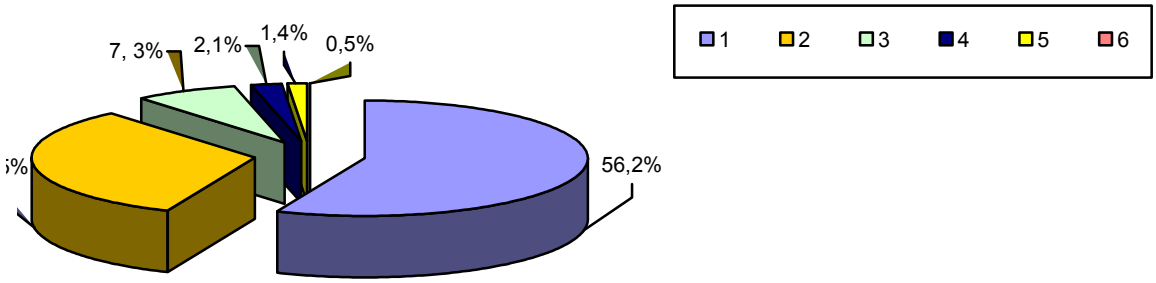
- own funds of persons, who go in for sports – 40.3 billion EUR;
- Investments from local budgets –– 23.3 billion EUR;
- Investments from governmental budget– 5,2 billion EUR;
- Sponsorship, patronage, donations – 1,5 billion EUR;
- Part of income from state lotteries, gaming and sports totalizator, which is issued to sports organizations through governmental and local budgets- 1.0 billion EUR;
- income from the sale of media rights to the organizers of sports actions; part of this income is directed to mass sports clubs – 0.4 billion EUR [12].

The leading part in financing of mass sports belongs to the doing mass sports population of European countries (the specific figure of its funds in the total of financing is 56.3%) and to local authorities (32.5%). At once, extremely low interest of business representatives to the development of mass sports should be noted. (See fig.1).

The present research has leaded to conclusion concerning the application of different models of mass sports financing. The classification of the models has been fulfilled on the base of four key factors, among which:

1) level of attraction of population to doing sports (considering membership fees);
2) the level of governmental financing per one person;
3) contribution from direct family expenses;
4) contribution of volunteers' sector. Each model reflects different historical, institutional and cultural factors as well as different levels of economic development and regulatory mechanisms in every country [12].

The first model is specific for the northern and western countries of Europe. These countries have high level of population's participation in sports activity (about 205 of population) and relatively high level of both: private and governmental sports financing. This model covers such countries as Austria, Belgium, Denmark, Finland, Germany, Ireland, Luxemburg, the Netherlands, Sweden and Cyprus. In this group of countries the average level of family expenses is low due to high level of governmental support, substantial financing from other sources and high level of gross domestic product per one person. The contribution of volunteers' labor also influences on decreasing of expenses for rendering of high quality sports services to population. The key problems for the countries of this groups are future trends of governmental mass sports financing, especially due to aging of nation, prospects of development of volunteers' activity, which is an important source of mass sports clubs development and active attracting of private sector to financing by means of sponsorship, donations and etc.



1. Own funds of persons, doing sports.
2. Local budget's financing.
3. Governmental financing.
4. Sponsorship, patronage, donations.
5. Income from lotteries, gaming, totalizators.
6. Income from sale of media rights.

Fig.1. Structure of mass sports financing in 27 countries of Europe:

The second model is spread in the countries of Mediterranean region. For these countries lower level of mass sports governmental support is intrinsic. In these countries, social demands in sports and fitness services rest on weaker governmental assistance than in the countries of the first group. However, the population manifests the readiness to spend own funds for health improving services of sport clubs, considering that the level of family expenses is higher than the level of governmental expenses. This group includes Greece, Italy, Malta and Spain. In this group family expenses for mass sports are higher than in countries of the first group. Governmental sector spends approximately half of the population's expenses (considering one person) for the development of mass sports. The volunteers' sector contribution is also less than in the previous group and the level of participation in mass sports (membership in sports clubs) is 5-10%.

For the countries of the second group the experts determined: creation of solidarity mechanism in sports sector in order to rise the level of financial assistance to mass sports; popularization of sports activity advantages by media means in order to attract attention to and form interest in rising the mass sports financing level of all social institutions (especially of local authorities); forming of the culture of volunteers activity in mass sports; development of governmental-private partnership or other mechanisms of collaboration for attracting of private sector to the development of mass sports.

The third model covers several countries with actually destroyed sports infrastructure after 1990. In these countries, mainly the countries of Central Europe, the demands of sports and fitness services are very low. Besides, due to limited governmental budgets state policy in the sphere of sports is of no priority and cannot promote the increase of demands for sports and fitness services. This group includes: Estonia, Hungary, Lithuania, Portugal, Rumania, Slovakia and Slovenia. The level of family expenses for sports doing is very low as well as the contribution of volunteers' activity. Governmental financing is also low, and is only one third of total sports sphere financing.. The level of participation in mass sports (membership in sports clubs) is 5-12%. The main problems for countries of this group are: Achieving of balance between the sources of financing, increasing of family expenses amount and the role of private sector; popularization of sports doing, first of all through media means; implementation of new forms of population's participation in mass sports by sports clubs; creation of conditions for development of volunteers' activity.

The fourth model (Bulgaria, Czech Republic and Poland) is nearly identical to the previous one. An important distinctive feature of this model is relatively high part of financing from governmental lotteries, totalizators, gaming etc. Czech Republic is a little bit detached from two other countries due to high level of volunteers' activity contribution in the development of sports organization and it compensates, to some extent, negligible financing from other sectors. In this group low family expenses is compensated both: by high level of governmental support and by financing from other sources. For example, in Poland and Bulgaria governmental contribution in financing of sports is much higher than average expenses from family budget per one person.

Key problems of this group are: popularization of sports activity advantages by media means in order to attract the population's attention and forming of its readiness to pay for sports and fitness services; diversification of sources of mass sports financing, e.g. by measures directed to the increase of specific figure of sponsors and donators for reduction of load on governmental budget; development of mass sports clubs network and diversification of sports and

fitness services for attraction new customers.

In addition to the mentioned above four models, specialists offer two more models, intrinsic separately for France and Great Britain. In France the level of social demand for sports and fitness services and the level of total sports expenses per one person are comparatively equal to the indicators of the countries, covered by the first model. The level of population's attraction to sports doing is as high as in the countries of the first group. At the same time, in France the contribution of governmental sector into financing of mass sports is higher than in the countries of the first group. On the contrary, family expenses are lower. Per every 1 EUR, spent by a separate sports club member in France, government spends additionally 80 cents on central and local levels (in comparison with 30-50 cents in the countries of the first group).

Key problems for mass sports financing in France are: increase of sports clubs membership and rise of pay for services; search of balance between different sources of financing, decreasing of dependence on one source; adapting of services to the demands of population in order to increase the level of sports clubs membership; increase of financing from other (private) sources; arranging of financing from lotteries, gaming, sports totalizators; optimization of funds distribution among "high level" sport and mass sports.

In Great Britain, in comparison with other countries, the model of restricted governmental support is acting.. Family budgets' expenses are relatively large source of mass sports financing that reflects high level of population's readiness to pay for services and high level of individual understanding of the importance of physical activity. But relatively low level of governmental support can lead to the reduction of the population's participation in sports activity, comparing with the countries of the first group. Key problems for Great Britain are: expansion of market of sports and fitness services; achieving of high level of population's participation in sports activity; increase of financing from lotteries and other private sources (commercial companies).

Summary.

The executed research confirmed the existence of problems in mass sports financing in Europe. Their solution is carried out in the frames of different financing models, the choice of which is conditioned by the distinctions in relation of society and government to the development of mass sports in different countries. Each of the models has its strong and weak sides.

The prospects of future researches.

In new age evolution of mass sports European financing models conditions the need in researches which shall give answers to a number of questions, connected with the influence of state regulatory policy on mass sports financing, stabilization of different financing sources, the prospects of market mechanisms of mass sports financing application.

References:

1 Vapniarskaia O.I., Zolotov M.I. *Menedzhment v Rossii i za rubezhom* [Management in Russia and abroad], 2003, vol.3, pp. 30-35.

2 Dutchak M. V. *Teoriia i metodika fizichnogo vikhovannia i sportu* [Theory and methods of physical education and sport], 2007, vol.3, pp. 47–58.

3 Kutepov M. E. *Sport dlia vsekh* [Sports for all], 1999, vol.4, pp. 21–23.

4 Operajlo S. I., Il'chenko A. I., Iermolova V. M., Ivanova L. I. Kniga vchitelia fizichnoyi kul'turi [Book of teacher of physical culture], Kharkiv, TORSING PLUS, 2005, p. 71.

5 Sokolov A. S. *Teoriia i praktika fizicheskoj kul'tury* [Theory and practice of physical culture], 1999, vol.4, pp. 45–49.

6 Zolotov M.I., Platonova N.A. *Ekonomika massovogo sporta* [Economy of mass sport], Moscow, Physical culture, 2005, 300 p.

7 Andreff W., Staudohar P. The Evolving European Model of Professional Sports Finance. *Journal of Sports Economics,* 2000, vol.1(3), pp. 257-276.

8 Arnaut J. L. *Independent European Sport Review*. 2006. Brussels: EU, 2006, 175 p.

9 Expert Group "*Sustainable Financing of Sport*". Report from the 2nd meeting (16 November 2011). EU Work Plan for Sport. 2011-2014. EU, 2011, 5 p.

10 Expert Group "*Sustainable Financing of Sport*". Report from the 2nd meeting (22 May 2012). EU Work Plan for Sport. 2011-2014. EU, 2012, 9 p.

11 Fort R. European and North American Differences. *Scottish Journal of Political Economy*, 2000, vol.47(4), pp. 431-455.

12 Giulianotti R. Sport Spectators and the Social Consequences of Commodification. *Journal of Sport & Social*. 2005, vol.29(4), pp. 386-410.

13 McEvoy C., Morse A. An investigation of the relationship between television broadcasting and game attendance. *International Journal of Sports Management and Marketing,* 2007, vol.2(3), pp. 222-235.

14 Mondello M., Pedersen P. A Content Analysis of the Journal of Sports Economics. *Journal of Sports Economics,* 2003, vol.4(1), pp. 64-73.

Information about the authors:

Michuda Y.P.: ypmichuda@mail.ru; National University of Physical Education and Sport of Ukraine; Fizkultury str. 1, Kiev, 03680, Ukraine.

Zhuliaiev V.N.: v.zhuliaiev@ffu.org.ua; National University of Physical Education and Sport of Ukraine; Fizkultury str. 1, Kiev, 03680, Ukraine.

Cite this article as: Michuda Y.P., Zhuliaiev V.N. Features of financing of mass sports in Europe at the beginning of XXI century. *Physical Education of Students,* 2013, vol.1, pp. 40-44. doi:10.6084/m9.figshare.156356

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 14.01.2013
Published: 09.02.2013

GONIOMETRIC RESEARCHES OF ARMWRESTLING SPORTSMEN

Podrigalo L.V., Galashko M.N., Galashko N.I.
Kharkov National Pedagogical University

Abstract. It is analysed results of goniometry of sportsmen of armwrestling and persons that go in for sport on amateur level. Amplitude of motions is studied in radiocarpal, elbow and humeral joints. It was used results of inspection of 27 persons in age 19-21 year. Large amplitude of motions of sportsmen is confirmed, especially in a radiocarpal joint. Information is interpreted as proof of importance of development of brush for effectiveness in armwrestling. Application of method of cross-correlation matrices was set by more optimum state of sportsmen. The biomechanics features of armwrestling are marked importance of optimum corners of adduction in joints in a frontal plane. Plugging is recommended in the training process of exercises on adduction, bending and unbending of radiocarpal joint. The indicated motions are important with technical tactical positions, their implementation allows to provide the most advantageous position of fighter raceme and provides terms for winning in a fight.
Keywords: goniometry, armwrestling, amplitude, joint, biomechanics.

Introduction.

Rising of sportsmen effectiveness is ensured by studying of peculiarities of special properties and by optimization of their levels. The results of arm wrestlers' of different skills complex examination permitted to specify a number of factors, influencing of their successfulness [1]. Research of bio mechanical and ergonomic aspects of this kind of sports proved the appropriateness of specialized limbs muscles' development, mainly of forearm muscles and biceps, rising of joints functional reliability [2, 3, 8-10]. In connection with this it can be suggested that amplitude of movements in joints around possible axes should also be considered as an important for this kind of sports property. The main method of its studying is goniometry [4, 5]. The given method gives objective information about peculiarities of supporting motion system to a researcher; the obtained results are widely used as criteria for evaluation of physical preparedness, efficiency of the conducted rehabilitation [4, 5]. But, till present time goniometric researches have not been carried out in arm wrestling and this fact conditioned the urgency of the given work.

The work has been executed as per plan of scientific and research works of Kharkov national pedagogical university, named after G.S. Skovoroda.

Purpose, tasks of the work, material and methods.

The purpose of the work is goniometric research of movement amplitude in arm wrestlers' (professionals and amateurs) arms' joints.

As materials we used the results of examination of 27 (20, 22 ± 0.55 years old) persons. The examined were divided into two groups: experimental group (EG) – 12 arm wrestlers of 19.83 ±0.67 years old with skill level from 3rd grade to master of sports and control group (CG) – 15 persons of 20.53±0.84 years old – arm wrestlers- amateurs.

For achieving of the set purpose such methods as goniometric examination and statistical analysis of the obtained data were applied. With the help of standard goniometer we determined movement amplitudes in radiocarpal, elbow and shoulder joints; 2-3 measurements of each movement were carried out, maximal indicators were registered [4]. In radiocarpal and shoulder joints bending, unbending, abductions, adduction were evaluated; in elbow joints – bending and unbending. The obtained results were processed with the help of licensed batch of electronic Excel tables with determination of parametric (Student's criterion) and non parametric criteria (by Wilkokson-Mann-Wittny) and indices of non parametric correlation of Pirson [6]. For analysis of correlation matrixes the indicators, offered in work [7], were used.

Results of researches.

The results, given in table 1, proved that comparison of mean values in groups with the help of Student's criterion, has not determined significant differences.

Table 1

Results of movement amplitude in arm joints study

Joint, movement (degrees)		The examined groups	
		EG	CG
Radiocarpal, right	Bending	68,92±2,68	68,40±1,80[1]
	Unbending	51,92±2,37[1]	55,27±2,32
	Abduction	42,50±2,52	43,07±2,34
	Adduction	31,17±1,64	28,27±1,56
Radiocarpal, left	Bending	66,50±2,75	62,87±2,02
	Unbending	59,17±1,58	55,13±2,58
	Abduction	43,67±2,93	42,33±2,38

doi: 10.6084/m9.figshare.156357

	Adduction	33,25±1,34	29,73±1,82
Elbow right joint	Bending	127,50±3,10	126,93±2,35
	Unbending	21,58±1,53	18,27±1,08
Elbow left joint	Bending	129,42±2,90	129,73±2,06
	Unbending	21,17±1,38	21,07±1,32
Right shoulder joint	Bending	159,50±2,80	164,13±2,99
	Unbending	52,17±3,09	51,13±3,24
	Abduction	149,33±4,28	148,47±3,79
	Adduction	23,75±3,25	18,67±0,94
Left shoulder joint	Bending	160,33±2,96	163,27±3,61
	Unbending	51,92±2,99	48,80±3,43
	Abduction	148,00±4,18	146,20±3,39
	Adduction	25,83±2,95	21,67±1,73

Note. 1 – the difference from the left joint is authentic ($p<0,05$).

Unbending amplitude values of right radiocarpal in EG and bending amplitudes in the same joint of CG are the exclusions. In these cases authentic ($p<0,05$) difference from the left radiocarpal is confirmed that can be interpreted as an illustration of some skewness of muscular developments of the examined persons.

In this situation it is acceptable to use non parametric criteria of statistical processing, which permit to analyze the difference between samples independently on the character of data distribution [5]. For analyzing we used criterion of Wilkinson-Mann-Wittny (U), as the most powerful in the given group. By a number of indices its calculation confirmed big amplitude of EG sportsmen's movements comparing with CG.

The differences in movements' amplitude of radiocarpals were the most evident. In them exceeding by adduction in the right ($U=19,46$, $p<0,01$), bending ($U=41,01$, $p<0,01$), unbending ($U=17,48$, $p<0,01$) and adduction ($U=32,32$, $p<0,01$) was found. In shoulder joints the same dependence is confirmed by adduction both in the right ($U=31,45$, $p<0,01$), and in the left ($U=31,82$, $p<0,01$) joints. The obtained results give ground to regard movements' amplitude in arm joints as an important for effectiveness in arm wrestling property, and its increasing proves greater flexibility of the examined sportsmen in comparison with amateurs. In its turn it permits to broaden the arsenal of arm wrestling techniques and thus, to improve successfulness of competitions.

It is also interesting that the expressiveness of difference between groups reduces in line: radiocarpal – elbow joint- shoulder joint. The analysis of radiocarpal mobility, fulfilled by Ye.V. Safonenkova [4], permitted to make conclusion about significance of this indicator in many kinds of sports. Considering peculiarities of arm wrestling, the development of radiocarpal and hand shall be regarded as a significant factor, because just they take maximum load in the process of wrestling [2]. The data, obtained by us, give ground to recommend including of adduction, bending and unbending of radiocarpal exercise into training course for arm wrestlers. The mentioned movements are very important are important from the point of technique and tactic position, because their execution promotes the most favorable position of arm wrestler's hand, i.e., provides conditions for victory.

Less expressed differences between indices of elbow and shoulder joints reflects their function in arm wrestling – formation and holding of all kinetostatics line, as the main ergonomic conception of this kind of sports [2]. For these joints the developed force is more important than amplitude of movements. Kinetostatics line, which is formed limb is characterized by decrease of maximum force in direction fro shoulder joint to hand, i.e. opposite to increasing of flexibility and its goniometric indicators.

The determined differences of movements' amplitude in elbow and shoulder joints can be explained with the help of a number of assumptions. First of all prevailing of elbow joints unbending amplitude in EG can reflect sportsmen's orientation to development mainly bending muscles in comparison with amateurs whose muscles-antagonists take more even load. One more factor, increasing unbending amplitude, is wide application in arm wrestling such exercise as weight lifting by biceps of arm, resting on desk. In this position triceps tendons stretch and it, consequently, increases unbending amplitude.. Besides, such tactic technique as wrestling with maximally adducted shoulder promotes increasing load on triceps and stretching. For final analysis of the determined peculiarities goniometric data are insufficient, that is why these results will be supplemented by anthropometric and functional researches.

At the same time differences of shoulder joints goniometry are interpreted from the point of view of bio mechanical arm sports peculiarities in rather interesting way. Adduction is fulfilled in front surface, in which the fight itself takes place, i.e. amplitude's increasing in this position can prove both: specialized training of arm wrestlers and better successfulness of EG in comparison with CG.

For evaluation of sportsmen's state from position of systemic analysis, the method of correlation matrixes was applied. This method permits to provide quantitative characteristics of functional system, which depend on relationship of steady and unsteady links in it [6]. The obtained results are given in table 2.

Table 2

Data of correlation matrixes of goniometric indices

Group	Specific weight of authentic links (%)	Specific weight of important links (%)	Index of labialization/synchronization (%)	Average factor of corellation
ОГ	10,53	45,79	40,30	0,75
КГ	13,16	43,16	36,74	0,66

The analysis shows prevailing of specific weight both authentic and important links in CG that, in our opinion, must be interpreted as illustration of tension of adaptation-compensatory capabilities in this group in comparison with steady state in EG. Functional system in the given state tries to preserve the current steadiness, creating new links. Considering the fact that correlation matrixes were formed by goniometric indices, this can be one more proof of less flexibility of arm wrestling amateurs.

One more proof of greater state steadiness in EG is exceeding of synchronization/labialization index, which illustrates reduction of functional tension. Significantly high values of correlation average factor in both groups prove again that system state shall be estimated as tension, but the tension, which does not go out the limits of functional capabilities. At the same time for EG this index attests about high degree of link and for CG – about dependence of average value. In our opinion, it must be estimated as the reflection of better balance and harmonicity of just sportsmen indicators' development. Thus, analysis of correlation matrixes proves that the sportsmen's state is more steady, and the level of their functional tension is lower than in control group.

Summary.

Goniometric research proved increment of amplitude of professional arm wrestlers arms joints' movement versus arm wrestlers-amateurs. This permits to regard this property as an important one for successfulness in this kind of sports. The differences in radiocarpals were the most expressed that illustrate the importance of their training for arm wrestling. The method of correlation matrixes proved that the sportsmen's state is more steady and functional tension lower than in control group.

The prospects of future researches in this direction shall be pointed at study of goniometric peculiarities of sportsmen of the highest qualification, at determination of interconnections between morphological-functional peculiarities and goniometric indicators.

References:

1 Podrigalo L.V., Istomin A.G., Galashko N.I. *Monitoring funkcional'nogo sostoianiia sportsmenov v armsporte* [Monitoring of the functional state of sportsmen in armwrestling], Kharkov, KNMU Publ., 2010, 120 p.

2 Podrigalo L.V., Galashko O.I., Galashko M.I. *Visnik Chernigivs'kogo derzhavnogo pedagogichnogo universitetu* [Bulletin of the Chernihiv State Pedagogical University], 2011, T.1, vol.91, pp. 363 - 365.

3 Podrigalo L.V., Galashko N.I., Galashko M.N. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2012, vol.1, pp. 87-90.

4 Safonenkova E. V. *Matematicheskaia morfologiia* [Mathematical morphology], 2010, T.9, vol.4, pp. 100-105.

5 Gulbani R.SH., Kuz'menko E.A. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, vol.2, pp. 40-42.

6 Antomonov M.Iu. *Matematicheskaia obrabotka i analiz mediko-biologicheskikh dannyk* [Mathematical treatment and analysis of medical biological data], Kiev, 2006, 560 p.

7 Zosimov A.N. *Sistemnyj analiz v medicine* [Analysis of the systems in medicine], Kharkov, Tornado, 2000, 82 p.

8 Pedrazzini A., Pedrazzoni M., De Filippo M. Humeral fractures by arm wrestling in adult: a biomechanical study. *Acta Bio Medica*, 2012, vol.83(2), pp. 122-126.

9 Raif Zileli. The Correlation between Strength and Anthropometric Charecteristics in Arm Wrestling Athletes with Performance. *The Online Journal of Recreation and Sport*. 2012, vol.1(4), pp. 18-20.

10 Silva Z. Electromyographic evaluation of upper limb muscles involved in armwrestling sport simulation during dynamic and static conditions. *Journal of Electromyography and Kinesiology.* 2009, vol.19, pp. 448–457.

Information about the authors:

Podrigalo L.V.: l.podrigalo@mail.ru; Kharkov National Pedagogical University; Artema str. 29, Kharkov, 61002, Ukraine.

Galashko M.N.: l.podrigalo@mail.ru; Kharkov National Pedagogical University; Artema str. 29, Kharkov, 61002, Ukraine.

Galashko N.I.: l.podrigalo@mail.ru; Kharkov National Pedagogical University; Artema str. 29, Kharkov, 61002, Ukraine.

Cite this article as: Podrigalo L.V., Galashko M.N., Galashko N.I. Goniometric researches of armwrestling sportsmen. *Physical Education of Students,* 2013, vol.1, pp. 45-48. doi:10.6084/m9.figshare.156357

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 09.01.2013
Published: 09.02.2013

ANALYSIS OF THE UKRAINIAN WOMEN TEAM' S GAMES AT EUROPEAN BASKETBALL CHAMPIONSHIP 2012

Pomeschskova I.P., Kycherenko A.S., Yevtushenko I.M.
Kharkov State Academy of Physical Culture
Kharkov National Medical University
National University of Life and Environmental Sciences of Ukraine

Abstract. The indexes of efficiency of playing activity of basketball-players of youth collapsible command of Ukraine were studied in the games of championship of European of 2012. Playing indexes are analysed 16 commands of division A in 70 games of championship, the individual indexes of leading basketball-players are considered. It is set that basketball-players on all of the tools of indexes technical tactical actions in an attack had a result above average, in defence their indexes were below middle. It is marked that on the average commands for meeting executed 60,5 attacks on a ring from a game with the percent of hit 36,8 % (for 61,3 point). The greatest percent of hits 41,5 % it was exposed at the command of Spain. The collapsible command of Ukraine on the average for a game collected 70,4 point. A percent of hit from the game of the Ukrainian basketball-players was 37,8 %. On championship on the average for the game of command 18,1 got a foul.
Keywords: basketball players, team, throws, hitting, rebounds, steals, fouls, losses, block-shots, passes.

Introduction.

European Under – 20 Championship of youth teams (FIBA-Europe Under-20 Championship), earlier known as European Championship "Under 22 and "Under" started to be carried out from 1992 and conducted once every two years. Since 20044 it has been being carried out annually.

Unlike individual kinds of sports, in basketball game activity is formed from large quantity of attack and defense parameters, that is why in control of team‟s game efficiency in general and individual members the efficiency of their tactic and technique actions and their activity is considered.

The problems of efficiency analysis of basketball players‟ activity in game were dealt with by Zh. Kozina, S. Zaschuk [2], R. Sushko [3, 6], O.P. Kovalenko and Ye.A. Zaharina [1], I.G. Maximenko [3], R. Tymanski, V. Smulski, T. Hutsynski [7], Chad Carlson [8], John Taylor [9], Yves C. Vanlandewijck [10] and other. But these researches touched, mainly, high qualified sportsmen of combined or club teams and other problems of teams‟ training and their participation in different competitions. Meanwhile, competition activity of every team has its specific features and it requires tocarry out special researches and pedagogical observations. Game activity of Ukrainian youth teams has not been sufficiently studied yet and it served as a cause of our researches.

The research was conducted as per the subject 2.8 "Improvement of academic training process of outdoor games" (state registration No. 0111U003126) of scientific and research work plan of Kharkov State Academy of Physical Culture

Purpose, tasks of the work, material and methods.

The purpose of the research – determination of game indicators of Ukrainian women‟s combined basketball team at European Championship 2012.

To achieve this purpose the following tasks were set:

1. To carry out analysis of Ukrainian combined women team‟s game indicators at European Championship, 2012.

2. To determine the best basketball players of Ukrainian combined team by game indicators.

The methods of the research: theoretical analysis of scientific and methodological literature, pedagogical observations, methods of mathematic statistics.

Results of research.

In division A 16 European teams of women under 20 took part in European Championship. Combined team of Ukraine has been participating in this Championship in the highest division since 2004; it took the following places: in 2004 – 5th place; in 2005- 7th place; in 2006 -13th place, in 2007 -13th place; in 2008 – 5th place; in 2009 – 13th place; in 2010 – 5th place; in 2011 – 6th place and in 2012 – 7th place [http://www.fibaeurope.com/]. Thus, Ukrainian women-sportsmen did not take prize places, and 5th place was their highest achievement.

The annual prize winners of European Championship among women‟s teams under 20 are shown in table 1. From this table we see, that combined team of Russia became prize winner the most often.

In 2012, Ukrainian youth combined team consisted of 12 basketball players: Natalia Pokrovenko, Kseniya Afanasyeva, Olga Krayevskaya, Yekaterina Demchenko, Mariya Tkach, Alina Yagupova, Larisa Stadnik, Viktoria Kariyeva, Alexandra Chek, Anna Kiriyenko, Lyudmila Naumenko, Mariam Uro-Nile and team coaches Larisa Yeschenko and Irina Nagornaya. It should be noted that. Three of the members are the students of Kharkov State Academy of Physical Culture and two of them Natalia Pokrovenko and Alexandra Chek are the disciples of coach Ella Chek,of Children & Youth Sports School No.13.

doi: 10.6084/m9.figshare.156358

Table 1

Prize winners of European Championship in basketball among women's teams under 20.

year	***Place of games***	***1st place***	***2nd place***	***3rd place***
2012	Debretsen (Hungary)	Spain	Russia	Turkey
2011	Novi-Sad (Serbia)	Spain	Russia	Poland
2010	Liyepaya (Latvia)	Russia	Spain	Latvia
2009	Gdynya (Poland)	France	Spain	Latvia
2008	Chiety, Sulmona, Peskara (Italy)	Russia	France	Serbia
2007	Sofia (Bulgaria)	Spain	Serbia	France
2006	Shopron (Hungary)	Russia	Hungary	France
2005	Brno (Czech Republic)	France	Poland	Latvia
2004	Saint Briyet, Camper (France)	Russia	France	Czech Republic
2002	Zagreb	Czech Republic	Russia	France
2000	Bardieyev, Luchinets, Ruzhomberoke (Slovenia)	Russia	Czech Republic	Rumania

Average height of Ukrainian team members is 181.1 cm, the average height of other teams: Poland team – 181.1 cm, Sweden team – 182.4 cm, the Netherlands team – 184.3 cm, Italy team -176.9 cm, Turkey team – 182.5 cm, France team – 180.2 cm, Portugal team – 175.3 cm, Russian team – 181 cm, Slovakia team – 182.8 cm, Serbia team – 179.5 cm, Great Britain team – 178.5 cm, Byelorussia team – 179.1 cm, Spain team 180.2 cm, Latvia team – 179 cm, Lithuanian team – 180.9 cm. Thus, the members of the Netherlands team were the tallest and the most undersized was Portugal team. Central player from Slovakia team Beata Yanoschikova, whose height was 196 cm, was the tallest player at the Championship. The central player of Ukrainian team was Alexandra Chek, of 190 cm height.

Analyzing the indicators of teams" effectiveness at Championship, shown in table 2, we see, that in average, during one game, teams attacked ring 60.5 times with hit percentage of 36.8%, winning 61.3 points.

Table 2

Effectiveness indicators of women's teams under 20 at European Championship

Team	P	Total of game			2-points throws			3-points throws			Penalty throws		
		H	Th	%	H	Th	%	H	Th	%	H	Th	%
Byelorussia	57,4	22	68,6	32	18	50,3	35,8	4	18,3	21,8	9,4	12,5	72,2
France	62,4	24,4	62,6	39	21,3	52,5	40,6	3,1	10,1	30,8	10,4	15	69,6
Great Britain	53,7	18,6	49,9	37,4	17,1	42,7	40	1,5	7,1	21,9	14,8	21,2	70,2
Italy	63	24	62,3	38,5	18,7	43,2	43,4	5,2	19,1	27,3	9,7	14,2	68,8
Latvia	61,3	22	64,1	34,3	15,1	41,1	36,8	6,8	23	30	10,4	16	65,3
Lithuania	60,1	20	59,7	33,5	15,6	45,5	34,3	4,4	14,2	30,7	15,7	22,7	69,2
The Netherlands	62,7	22,5	61,2	36,8	17,7	43,5	40,6	4,8	17,6	27,7	12,7	19,3	66,1
Poland	61,7	23,8	55,2	38,2	18,7	45	41,7	5	17,1	29,2	9,2	13,4	69,2
Portugal	52,3	19,7	58,7	33,6	15,8	43,3	36,7	3,8	15,4	25,2	8,9	12,8	69,9
Russia	61,4	22	59,7	36,8	16,1	39,8	40,4	5,8	19,8	29,6	11,5	17,3	66,7
Serbia	60,1	22,2	59,2	37,6	17,6	42,1	41,8	4,6	17,1	27	11	16,9	65,2
Slovakia	62,3	22	61	36,1	16,5	43,9	37,6	5,5	17,1	32,1	12,7	17,6	72,3
Spain	66,6	26,6	64,3	41,5	22,9	48,6	47,1	3,8	15,7	23,9	9,6	14,7	64,7
Sweden	63,6	21,8	60,6	36,1	16,5	39,9	41,5	5,3	20,7	25,7	14,6	20,1	72,4
Turkey	61,8	21,8	55	39,8	16,8	40,2	42	5	14,7	33,8	13,1	17,4	75,2
Ukraine	70,4	25,2	66,7	37,8	18,3	44,1	41,6	6,8	33,6	30,4	13,1	17,8	73,3
Average	**61,3**	**22,4**	**60,5**	**36,8**	**17,7**	**44,1**	**40,1**	**4,7**	**17,5**	**27,9**	**11,6**	**16,8**	**69,4**

P –points, H - hits, Th - throws

The highest percentage of hits 41.5% belonged to Spain team, the winner of Championship. Ukrainian combined team gained in average 70.4 points during a game and it was the best indicator among all teams. Hits percentage of Ukrainian basketball players was 37.8%.

Analyzing the effectiveness indicators of Ukrainian players we can note that hit percentage of 2-points throws was 41.6%; it is higher than the average result and is the fifth indicator among all the teams. The same picture we have, when analyzing the accuracy of 3-points throws, where the effectiveness of Ukrainian basketball players exceeds

average result by 2.5% and this is also the fifth indicator at the Championship. The efficiency of penalty throws fulfillment yielded only to the penalty throws accuracy of Turkish players.

The study of individual efficiency revealed that the largest number of points per one game was gained by Alina Yagupova, who was the leader of Championship by this indicator. In average, per one game she brought to her team 27.6 points. Besides her, 19 basketball players from different European teams gained more than 10 points per one game, but no one of them gained more than 20 points. Among Ukrainian players the best result in 2-points throws accuracy was shown by Lyudmila Naumenko, whose hit percentage was 46.2%. This is the fourth throws accuracy result at close and medium distance. But the central player of Serbian team Ivanna Braykovick became the leader by this indicator with her indicator of 54.15%. Analysis of 3-points throws showed that the highest result – 55.0%- belonged to Russian basketball player Darya Namok while Ukrainian player Alina Yagupova took the 12th place, having 37.2%. In penalty throes accuracy A. Yagupova was the best among Ukrainian players (effectiveness – 80.0%). This if the fourth result among penalty throws snipers, the leader of whose is Serbian basketball player Snezhana Kolik, whose effectiveness is 89.3%.

In average, combined team of Ukraine carried 13.2 effective passes, it is the biggest quantity among all teams and exceeds their average result by 3 passes. With this, 5.3 passes per one game were carried out by A. Yagupova who has the best result by this indicator.

Analysis of rebound effectiveness showed that Ukrainian team had the best results among all teams of the Championship both at own and at adversary"s backboard.\ (see table 3).

Table 3.

Game effectiveness indicators of women teams at European Championship

Team	EP	Rebound			CH	BSh	L	fouls	
		total	OB	AB				Of players	On players
Byelorussia	9,6	40,7	27,1	11,3	8,2	3,7	16,0	17,7	16,1
France	8,8	44,2	29,8	14,4	8,0	2,1	14,9	19,6	16,3
Great Britain	7,4	40,6	28,1	12,4	4,6	0,7	21,8	16,3	18,4
Italy	12,3	35,2	23,1	12,1	11,2	1,2	13,8	18,1	16,2
Latvia	10,8	39,8	28,4	11,3	8,8	1,4	15,9	18,6	16,8
Lithuania	8,6	44,5	28,6	15,9	8,9	1,4	19,8	15,5	22,1
The Netherlands	11,3	41,4	26,3	14,8	11,3	1,0	18,7	18,2	18,1
Poland	12,1	42,1	28,3	13,9	10,1	4,3	19,9	19,3	17,0
Portugal	6,8	33,3	22,2	11,1	10,1	0,4	12,6	14,3	16,4
Russia	8,9	38,4	27,1	11,3	6,7	3,8	14,3	19,1	19,6
Serbia	10,0	37,8	25,8	12,0	8,0	1,3	16,5	17,8	19,3
Slovakia	11,1	34,5	23,4	11,1	7,4	1,3	14,5	24,9	19,6
Spain	11,6	42,4	28,7	13,8	14,0	2,7	16,7	17,9	15,8
Sweden	10,3	39,4	26,0	13,4	9,7	2,7	19,8	16,7	19,2
Turkey	10,0	38,4	28,6	9,8	8,1	2,4	17,7	16,9	19,4
Ukraine	13,2	44,7	30,0	14,7	6,7	2,0	16,4	18,8	18,0
Average	**10,2**	**39,8**	**26,9**	**12,7**	**9,0**	**2,0**	**16,8**	**18,1**	**18,0**

EP- efficient pass, OB- own backboard, AB- adversary's backboard,CH – change of hold , B Sh- block short, L – losses.

So, if at Championship, in average teams carried out rebounds at own and adversary"s backboards 39.8 times, Ukraine players won backboard 44.7 times. With this they carried out by 3.1 rebounds more than other teams in average at own backboard and by 2 rebound more than at the adversary"s backboard. Analysis of individual rebound indicators of Ukrainian basketball players showed that A. Yagupova was the best by this parameter, because she had 10.1 rebounds. By this parameter she took the third place among all participants. Kseniya Tihonenko, central player of Russian combined team was the most active in struggle at backboard: she fulfilled rebounds for 11 times.

However, A. Yagupova headed the list of the most active basketball players in struggle at own backboard; in average, per one game she fulfilled 2.9 rebounds. With this result she took the 10th place in the list of the best players in struggle at adversary"s backboard. This list was headed by central player from Lithuania Monika Grigolauskayte, who fulfilled 4.3 rebounds per a game.

At the Championship teams received in average 18.1 fouls per one game, with this some of them received foul for 18.0 times.

Analyzing the losses of Ukrainian combined team, we see that basketball players lost ball in average 16.4 times and it is an average indicator for all teams of the tournament.

The analysis of Ukrainian team"s game actions showed that its parameters are worse than average statistical of the Championship. Thus, Ukrainian basketball players fulfilled 6.7 changes of hold per one game and it is one of the worst indicators among teams-participants. The quantity of block-shorts of Ukrainian team per one game corresponded to average statistical figure of the Championship, in average 2- per one game. Ukrainian team misses about 67.7 points and it is worse than average indicator. In our opinion, insufficient defense turned out to be one of the factors which hindered Ukrainian team to raise higher the 7th place, though our team defeated France team, which took the 5th place and Russian team, silver prize winner of championship.

The efficiency of Ukrainian basketball players" attacks, which was calculated by formula, offered by L.Yu. Poplavskiy [4], was 0.82 points per every ball holding by the team versus 0.70 points per every ball holding by adversary, that points at rather high indicator of efficiency of Ukrainian team. But unsuccessful game of Ukrainian combined team against the Netherland team in quarter-final and the game against Sweden team for 5th-8th places gave no chance for Ukrainian basketball players to raise higher than the 7th place. Probably, two fails in succession were caused by insufficiently steady staff of the team, i.e. in all 9 games only 7 players took part.

Detail analysis of game with the Netherland team, which was failed by Ukrainian team with the score 63:71, that prevented it from further struggle for medals, showed that in this game Ukrainian basketball players conducted by 6 attacks more, but the effectiveness of their throws was by 1.4% lower. In 3-points throws the accuracy of Ukrainian players was by 9.4% worse. However, 2-points throws were fulfilled by 8.5% more effectively. With this Ukrainian players received fouls 16 times, executed penalty throws 10 times with hit percentage of 60%. Basketball players from the Netherland carried out 27 penalty throws with effectiveness 63%. Ukrainian players got betters results than adversary both at own and adversary"s backboards and executed by 9 efficient passes more. But the lost the ball by two times more. Study of defense revealed that the Netherland team was more active in defense and changed hold 6 times versus 3 hold changes made by Ukrainian players. Thus attacking efficiency of Ukrainian basketball players was approximately of 0.67 points versus 0.75 points by every ball hold by adversary. This points at low effectiveness indicator of Ukrainian team in the given game and it conditioned the fail.

Summary.

1. At European Championship, 2012, Ukrainian women"s team had indicators of attacking tactic and technique actions higher than average bu all components; in defense its indicators were lower than average. Effectiveness of attacks was 0.82 points, effectiveness of defense – 0.7 points.
2. Attacking player A. Yagupova was the leader of Ukrainian team at this Championship. By many parameters she was the best among all players and entered in symbolic combined top of five best players of the tournament.

The prospects of further researches in this direction are connected with study of effectiveness of Ukrainian national women"s combined team indicators at European Championship 2013 and comparison of them with the obtained results of youth combined team.

References:

1 Kovalenko O. P., Zakharina Ie. A. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2011, vol.2, pp. 53-56.

2 Kozina Zh.L., Zashchuk S. G *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, pp. 52–56.

3 Maksimenko I.G. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2010, vol.4, pp. 84-86.

4 Poplavskij L.Iu. *Basketbol* [Basketball], Kiev, Olympic Literature, 2004, pp. 397–401.

5 Sushko R.O. *Visnik Chernigivs'kogo derzhavnogo pedagogichnogo universitetu* [Bulletin of the Chernihiv State Pedagogical University], 2010, vol.81, pp. 666–672.

6 Sushko R.O. *Slobozhans'kij naukovo-sportivnij visnik* [Slobozhansky scientific and sport bulletin], 2011, vol.1, pp. 45–52.

7 Tyman'ski R., Smul'skij V., Khucin'ski T. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2010, vol.3, pp. 117-120.

8 Chad Carlson. Basketball's Forgotten Experiment: Don Barksdale and the Legacy of the United States Olympic Basketball Team. *The International Journal of the History of Sport*. 2010, vol.27(8), pp. 1330-1359.

9 John Taylor, Adrienne Hughes & Pelagia Koufaki. The impact of community-based physical activity projects on girls' and young women's engagement in physical activity: findings from an evaluation of the „Girls on the Move" programme. *Managing Leisure*. 2013, vol.18(1), pp. 46-60.

10 Yves C. Vanlandewijck, Christina Evaggelinou, Daniel J. Daly, Joeri Verellen, Siska Van Houtte, Vanessa Aspeslagh, Robby Hendrickx, Tine Piessens & Bjorn Zwakhoven. The relationship between functional potential and field performance in elite female wheelchair basketball players. *Journal of Sports Sciences.* 2004, vol.22(7), pp. 668-675.

Information about the authors:

Pomeschskova I.P.: pomeshikovaip@mail.ru; Kharkov State Academy of Physical Culture; Klochkovskaya str. 99, Kharkov, 61022, Ukraine.

Kycherenko A.S.: meduniver@knmu.kharkov.ua**;** Kharkov National Medical University; Lenina boulevard 4, Kharkov, 61022, Ukraine.

Yevtushenko I.M.: rectorat@nauu.kiev.ua; National University of Life and Environmental Sciences of Ukraine; Heroyiv Oborony st., 15, Kyiv, 03041, Ukraine

Cite this article as: Pomeschskova I.P., Kycherenko A.S., Yevtushenko I.M. Analysis of the performance of the Ukrainian women″s team at the European Basketball Championship 2012. *Physical Education of Students,* 2013, vol.1, pp. 49-53. doi:10.6084/m9.figshare.156358

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 15.01.2013
Published: 09.02.2013

FEATURES OF PHYSICAL DEVELOPMENT, PHYSICAL PREPAREDNESS AND FUNCTIONAL STATE OF BOYS AND GIRLS – STUDENTS OF POLISH HIGHER EDUCATIONAL ESTABLISHMENTS

Prusik Krzysztof[1], Prusik Katarzyna[1], Kozina Zh.L.[2], Iermakov S.S.[2]
Academy of physical education and sports[2], Gdansk[1], Poland
G.S. Skovsroda Kharkov national pedagogical university[2]

Abstract. The features of level and structure of indexes of physical development, physical preparedness and functional state of students are considered. In research 50 took part students of Higher School of Sciences about health from Bydgoshch (14 boys and 36 girls, age 18-29 years). Reliable distinctions are exposed in physical preparedness and functional state of boys and girls on the indexes of force. Indexes of psychophysiological possibilities, frequencies of heart-throbs in a state of rest, the index of Ruf'e have no reliable distinctions at boys and girls. It is shown that power capabilities have the most value in complex preparedness of boys. Functional and psychophysiological possibilities have the most value in complex preparedness of girls. The factor structure of preparedness of girls is differ by greater complication as compared to boys. On the level of physical preparedness and functional state of girls in a greater degree of anthropometric information have influence as compared to boys. Power capabilities for girls occupy middle position in the general structure of preparedness, while for boys' power capabilities occupy leading position. It is shown that on employments on physical education of boys it is necessary to do an accent on development of force, while for girls - on development of endurance (functional possibilities) and in a greater degree as compared to boys it is necessary to take into account psychophysiological possibilities.

Keywords: students, functional, psychophysiological, physical, preparedness, boys, girls, speed of reaction, force.

Introduction.

At present an objective study of gender differences in various aspects of functional status, physical preparation and psychophysiological features has particular relevance [7, 8]. This problem has its roots in the distant past, because people are always worried about the problem of the features of male and female body, connected with various biological and social roles of men and women [8]. At the present stage, when there is an obliteration of differences in the social sphere of men and women, this issue is of particular relevance. The greatest expression of the necessity to conduct such research is in the field of physical education, particularly in the physical education of students, because physical education is most closely associated with the biological preconditions of psychomotor development, and adolescence is the final phenotypic consolidation of genotypic sex differences [5, 6, 8, 9, 10-20].

There are many different points of view according to gender differences in the modern literature.

As noted E.P. Ilyin [8], in time of A.S. Pushkin and M.Yu. Lermontov a strong man and a woman (or girl) "poor health" were standards in high society. Some of the girls to correspond to such standard even drank vinegar causing both pallor and stomach illness. K. Marx, in response to daughters' questionnaire, also did not escape the effects of these stereotypes, saying that the main sign of the dignity of a man is the power, and woman – weakness.

However, as the author notes [8], now women sporting type with a slim figure and developed psychomotor qualities are in vogue. To contribute such ideal promotes physical exercise.

However, the E.P. Ilyin critically illuminates feminist points of view according to men and women equal opportunities in various fields on the basis of factual scientific researches.

In a review of studies [8] devoted to this problem, E.P. Ilyin points out that scientists of our country are strongly disagree with those representatives of Western science who seek to prove the equal opportunities of men and women in society. I.S. Kon (1981) emphasizes the importance of taking into account gender differences in the study of identity formation. Theoretical underestimation of sex, says I.S. Kon, almost turns that traditionally masculine characteristics and patterns of behavior unwittingly accepted and paid for the universal, which distorts the real picture of the gender-specific.

The same notes E.P. Korablina (1998), V.D. Yeremeeva and T.P. Hrizman (2001), who emphasize the importance of sex differences in child rearing.

R. Davis and A. Buchwald (R. Davis, A. Buchwald, 1957) point out that the same stimulus can cause men and women of different physiological changes.

E.P. Ilyin notes that the most clearly differences between men and women are found on psychomotor abilities in spatial imagination and mathematical abilities (in favor of men), on verbal abilities (in favor of women). One notes that the existing differences in the intellectual sphere are very insignificant and often do not exceed 5-10 %, and in 90% distribution of male and female samples coincide (E. Maccoby, C. Jacklin, 1974; Pleck, 1978; D. Halpern, 1986; D. Ruble, 1988; J. Hyde, 1991).

A number of researchers [6, 7, 8, 10] indicate that the overemphasis of sex differences, harsh contrasting of masculine and feminine, traditionally carried out for a long time, has its drawbacks. According to I.S. Kon (1981), there was long dispute as to whether a more desirable polarization of masculine and feminine with a maximum matching of individual characteristics with the appropriate cultural stereotype (strong, tough, energetic man, weak, soft, passive,

doi: 10.6084/m9.figshare.96415

female) or, alternatively, their overcome and combination in one person (strong, but also soft and gentle man, but at the same time an independent woman). And at higher levels of culture and philosophical reflection preference is usually given to the second model that promises greater understanding of sex, while in the first case their relationships are thought to be hierarchical based on domination and subordination [8].

Thus, the issue of gender differences remains relevant, as related to changing social conditions combined with relatively constant biological assumptions.

The work was performed in accordance with the Consolidated Plan of Research of the Ministry of Education and Science, Youth and Sports of Ukraine on theme 2.4 "Theoretical and methodological foundations of personalization of educational-training process of athletes in team sports" and on theme 91 "Theoretical and methodological basis of personalization in physical education and sports" (number of state registration 0112U002001).

Purpose, tasks of the paper, material and methods.

The purpose of a study – to determine the features of the level and structure of indexes of physical development, physical training and functional status of boys and girls – students of higher educational establishment.

Methods of research. In the paper is used anthropometric methods of research from which to analyze Ketle Index was selected as the most informative indicator of the ratio of length and weight, and the length of the forearm for subsequent determination of the torque value in flexion forearm; from the indexes of physical training was determined the hand and forearm flexor force with a dynamometer, indexes of flexibility of the spine; from the indexes of functional status determined Ruf'e index and indicators of ortho tests and physiological indicators: simple reaction time on light, simple reaction time on sound, choice reaction time, an estimation of precision and speed of producing the desired motor movements [1-4], and indexes of Romberg test and orthostatic test.

The study involved 50 students of Higher School of Health Science from Bydgoshch, including 14 boys and 36 girls, middle age 24,00±5,39 (girls) and 26,64 ± 6,16 (boys). The studies were conducted in May 2012 in kinesiology exercises. The choice of research is grounded on the fact that Poland has a central position not only from the point of view of geography, but also from the point of view of standard of living, life expectancy, health status among European countries. Suppose that the analysis of parameters of physical development, physical training and functional status of the Polish students reflects average physical development, physical training and functional status of students in Europe.

Results of the research.

According to the study, significant differences in the level of physical training and functional status between boys and girls identified in terms of power capacity (p<0, 001, p<0, 05) (Table 1). For other studied parameters revealed a tendency for differences without statistical difference.

Spine flexibility is 4,25±0,87 cm at girls and 4,00±1,41 cm at boys (p>0, 05); Ketle Index is 21,56 y.e. at girls and 21,92 y.e. at boys (p>0, 05); heart rate in a state of rest is 72,00±6,16 rate per min $^{-1}$ at girls and 74, 29±7, 27 rate per min $^{-1}$ at boys (p>0, 05) (Table 1).

There were no significant differences between the indices of heart rate (HR) of boys and girls immediately after physical load. This index is equal to 126,44 rate per min $^{-1}$ at girls and 132, 71 rates per min $^{-1}$ at boys (p>0, 05) (Table 1), though in such case one can consider an existence of tendency to differences. Also there are no significant differences between boys and girls in terms of heart rate in the first minute recovery (81, 67±12, 69 rates per min $^{-1}$ at girls and 86, 57±15, 58 rates per min $^{-1}$ at boys) (p>0, 05); according to Ruf'e index (8, 01±3, 39 y.e. at girls and 9, 36±4, 5 y.e. at boys) (p>0, 05); according to indicators of ortho tests: HR lying is 69, 25±13, 63 69 rates per min $^{-1}$ at girls and 71, 86±10, 95 rates per min $^{-1}$ at boys (p>0, 05); HR standing is 71, 5±15, 56 rates per min $^{-1}$ at girls and 72, 86±16, 88 rates per min $^{-1}$ at boys (p>0, 05); change of HR crossing from the state of lying into the state of standing is not exceeding 5 rates per min $^{-1}$ both at girls and boys that may explain the increased emotional response of testee during the test; the differences in the change in heart rate in orthostatic between boys and girls as not significant (p>0, 05) (Table 1).

In indexes of psycho-physiological capabilities also found no significant differences between boys and girls: accuracy rate of motion along a given path was 0, 22±0, 02 y.e. at girls and 0, 26±0, 023 y.e. at boys (p>0, 05); the speed of the brush to the desired path was like the boys and girls 0, 08 m sec^{-1} (p>0, 05); simple reaction time on the sound was found to be 0, 36±0, 06 sec at girls and 0, 35±0, 06 sec at boys (p>0, 05) (Table 1). It should be noted a trend to a higher rate of reaction of choice for girls compared with boys: 0, 91±1, 3sec at girls and 1, 27±2, 28 sec at boys (p>0, 05) (Table 1).

Significant differences among the measured parameters in this study were found in the right hand dynamometry, dynamometry of left hand, forearm flexor force, moment of force, as well as the length of the forearm, ie in indicators related to the manifestation of strength and anthropometric data. Dynamometry of left hand is 32, 81±9, 27 kg at girls and 44, 49±12, 77 kg at boys (p<0, 05); right hand dynamometry is 31, 22±7, 97 kg at girls and 43, 69±12, 43 kg at boys (p<0, 05) (Table 1). Forearm flexor strength at girls is equal to 8, 63±3, 26 kg, at boys – 10, 79±4, 08 kg (p<0, 05), moment of force during arm flexion was 2, 21±0, 89 kg·m^2·sec^{-2} at girls and 2, 91±1, 21 kg·m^2·sec^{-2} at boys (p<0, 05) (Table 1).

Table 1

Indexes of physical development, physical preparation and functional status of boys and girls

Indexes	Groups	$\bar{x}$	S	t	p
Flexibility of the spine, cm	girls	4.25	0.87	0.76	0.45
	boys	4.00	1.41		
Ketle index, y.e	girls	21.56	2.25	-0.55	0.58
	boys	21.92	1.32		
Age	girls	24.00	5.39	-1.43	0.16
	boys	26.64	7.04		
Heart rate at rest, rates per min^{-1}	girls	72.00	6.16	-1.12	0.27
	boys	74.29	7.27		
Heart rate directly after physical loading, rates per min^{-1}	girls	126.44	21.23	-0.86	0.39
	boys	132.71	27.57		
Heart rate in a first minute of renewal, per min^{-1}	girls	81.67	12.69	-1.15	0.26
	boys	86.57	15.58		
Ruf'e index, y.e.	girls	8.01	3.39	-1.15	0.26
	boys	9.36	4.50		
Romberg test, c	girls	14.81	9.11	0.06	0.95
	boys	14.64	3.67		
The accuracy of the arm to the desired path, y.e	girls	0.22	0.02	-0.61	0.55
	boys	0.26	0.023		
The speed of the arm to the desired path, $m \cdot sec^{-1}$	girls	0.08	0.03	0.03	0.98
	boys	0.08	0.04		
Left wrist dynamometry, kg	girls	32.81	9.27	-3.59	0.00
	boys	44.49	12.77		
Right wrist dynamometry, kg	girls	31.22	7.97	-4.22	0.00
	boys	43.69	12.43		
Forearm length, m	girls	0.26	0.01	-2.28	0.03
	boys	0.27	0.02		
The strength of the forearm flexor, kg	girls	8.63	3.26	-1.96	0.06
	boys	10.79	4.08		
Moment of force of arm flexion, $kg \cdot m^2 \cdot sec^{-2}$	girls	2.21	0.89	-2.24	0.03
	boys	2.91	1.21		
Simple reaction time on a sound, sec	girls	0.36	0.06	0.50	0.62
	boys	0.35	0.06		
Choice reaction time, sec	girls	0.91	1.30	-1.97	0.06
	boys	1.27	2.28		
Simple reaction time on light, sec	girls	1.24	1.28	-0.11	0.92
	boys	1.28	1.36		
Heart rate lying, rates per min^{-1}	girls	69.25	13.63	-0.64	0.53
	boys	71.86	10.95		
Heart rate standing, rates per min^{-1}	girls	71.50	15.56	-0.27	0.79
	boys	72.86	16.88		
Heart rate standing - Heart rate lying, rates per min^{-1}	girls	2.25	10.48	0.38	0.71
	boys	1.00	10.40		

Thus, significant differences in the physical preparation and functional status of men and women were found only according to the indexes of power. Psychophysiological indicators of opportunities for boys and girls do not have significant differences, as well as indicators of heart rate at rest, immediately after the physical loading, the first minute of recovery and index of Ruf'e index, that partly confirms the findings of other authors [8] on minor sex differences in psychophysiological features and significant gender differences in the power development.

To analyze the structure of physical preparation, functional status and psychophysiological features of students was conducted a factor analysis method of principal components. In this study, factor analysis was used to determine the relationships between variables, classification of variables and reduce the number of variables to describe the data. It was determined factor structure of comprehensive training of boys, girls and all students surveyed in general. Factor analysis revealed additional features of the integrated training of boys and girls.

In the structure of boys preparation were allocated four factors.

The first factor consisted of the following test scores: the length of the forearm (r=0, 82), simple reaction time on sound (r= -0, 81), moment of force during arm flexion (r=0, 78), Ketle index (r= -0, 77), forearm flexor strength (r=0, 70), right wrist dynamometry (r=0, 66), left wrist dynamometry (r=0, 64) (Table 2).

Based on analysis of test scores included in the first factor, it was defined as "Power abilities".

The second factor consisted the following indexes as Ruf'e index (r=0, 82), heart rate on a first minute of renewal (r=0, 90), heart rate directly after physical loading (r=0, 84), heart rate in state of rest (r=0, 79) (Table 2). Based on analysis of test scores included in the first factor, it was defined as "Functionality".

Table 2

Factor structure of complex preparation of boys

Indexes	Factors			
	1	2	3	4
	27.73%	21.28%	17.55%	9.23%
	Power abilities	Functional opportunities	Psychophysiological opportunities	Coordinational abilities
Forearm length, m	0.82			
Time of simple reaction on a sound, sec	-0.81			
Moment of force during the forearm flexor, kg·m^2·sec^{-2}	0.78	-0.515		
Ketle index, y.e	-0.77			
The strength of the forearm flexor, kg	0.70	-0.54		
Right wrist dynamometry, kg	0.66	-0.42		
Left wrist dynamometry, kg	0.64			
Ruf'e index, y.e.		0.95		
Heart rate after physical loading, rates per min^{-1}		0.90		
Heart rate directly after physical loading, rates per min^{-1}		0.84		
Heart rate in a state of rest, rates per min^{-1}		0.79	-0.42	
Heart rate standing, rates per min^{-1}			0.96	
Heart rate standing - Heart rate lying, rates per min^{-1}			0.86	
Choice reaction time, sec	0.48		0.80	
Simple reaction time on light, sec			-0.75	
Heart rate lying, rates per min^{-1}	0.42		0.65	
The speed of the arm to the desired path, m·sec^{-1}				-0.80
The accuracy of the arm to the desired path, y.e				0.77
Flexibility of the spine, cm		-0.41		0.74

The third factor consisted the following indexes as heart rate standing (r=0, 96), difference between heart rate in state of standing and state of lying (r=0, 86), choice reaction time (r=0, 80), simple reaction time on light (r= -0, 75), heart rate in state of lying (r=0, 65). As far as the third factor consist indexes of speed reaction and indexes of ortho tests that reflex vegeto vascular regulation, third factor was determined as "Psychophysical opportunities" (Table 2).

The fourth factor include speed indexes and accuracy of speed of arm to the desired path (r= -0, 80; 0, 77) and flexibility of the spine (r=0, 74). On the basis of the indicators included in the fourth factor, he was named a "Coordinating capacity" (Table 2).

Thus, in the complex training of youths the most importance have power capacities, than followed functionality, physiological capacities and coordination abilities.

Table 3 shows the characteristics of complex testing factors of girls.

The first factor includes the following indexes of testing: Ruf'e index (r=0, 98), heart rate on a first minute of renewal (r=0, 80), heart rate directly after physical loading (r=0, 91), heart rate in state of rest (r=0, 63), Ketle index (r=0, 61) (Table 3). Based on analysis of test scores included in the first factor, it was defined as "Functional opportunities".

The second factor includes the following indexes: heart rate in state of lying (r=0, 88), choice reaction time (r=0, 85), heart rate in state of standing (r=0, 84). Based on analysis of test scores included in the second factor, it was defined as "Psychophysiological opportunities".

The third factor includes such indexes as right wrist dynamometry (r=0, 86), the strength of the forearm flexor (r=0, 80), moment of force during the forearm flexor (r=0, 76), left wrist dynamometry (r=0, 73). In generalizing these indicators third factor was named "Power abilities" (Table 3).

The fourth factor include indexes of simple reaction time on light (r=0, 78) and girls' ages (r= -0, 44). These data suggest that older students have worse simple reaction time, so the fourth factor was named "Age features" (Table 3).

Table 3

Factor structure of complex preparation of girls

Indexes	Factors					
	1	2	3	4	5	6
	20.66%	15.78%	13.36%	7.69%	7.02%	6.07%
	Functional opportunities	Psychophysiological opportunities	Power abilities	Age abilities	Anthropometric data	Coordinational abilities
Ruf'e index, y.e.	0.98					
Heart rate directly after physical loading, rates per min^{-1}	0.91					
Heart rate in a first minute of renewal, per min^{-1}	0.80					
Heart rate in a state of rest, rates per min^{-1}	0.63			0.47		
Ketle index, y.e	0.61					
Heart rate lying, rates per min^{-1}		0.88				
Choice reaction time, sec		0.85				
Heart rate standing, rates per min^{-1}		0.84				
Right wrist dynamometry, kg			0.86			
The strength of the forearm flexor, kg			0.80			
Moment of force during the forearm flexor, $kg \cdot m^2 \cdot sec^{-2}$			0.76	0.44		
Left wrist dynamometry, kg			0.73			
Time of simple reaction on a light, c				0.78		
Age	0.43			-0.44		
Heart rate standing - Heart rate lying, rates per min^{-1}					0.89	
Forearm length, m				0.44	0.45	
Romberg test, sec						0.78
The speed of the arm to the desired path, $m \cdot sec^{-1}$						0.72

The fifth factor include indexes of ortho tests (differences between heart rate in state of standing and heart rate in lying) (r=0, 89) and forearm length of (r=0, 45). As length of forearm is connected to body length, increase of heart rate crossing from the state of lying to the state of standing is more expressed at people with more length of body, the forth factor was named "Anthropometric data" (Table 3).

The sixth factor include indexes of Romberg tests (r=0, 78) and velocity of bone motion to the desired path (r=0, 72), on the basis of which sixth factor was defined as "Coordinational abilities" (табл. 3).

Thus, in the complex training of girls the most importance have functional and physiological features, then – power abilities, age features, anthropometric data and coordination abilities. In general, the factor structure of

preparedness of girls is more complex than at boys. The level of physical preparation and functional status of women more influence age-specific anthropometric data and compared with boys. The power capacities of girls occupy a central position in the overall training, while at the young men power capacities occupy a leading position. The issues identified features in the structure of the complex preparedness of boys and girls in physical education of boys should be focuses on the development of strength, while the girls - the development of endurance (functionality) and to a greater extent than boys to consider psychophysiological opportunities.

Similarly, an analysis of the integrated training of all students, boys and girls was conducted. It was revealed that the overall structure of the preparedness of students is similar to the structure of youth preparation: the first factor (20, 82%) – "Power abilities", the second factor (16, 11%) – "Functional opportunities", the third factor (13, 87%) – "Psychophysiological opportunities", the fourth factor (8, 49%) – "Age abilities", the fifth factor (7, 00%) – "Coordinational abilities" (Table 4).

Table 4

Comparative characteristics of the factor structure of complex training of boys, girls and the group as a whole

№ factor	General factor structure of students' preparation	Factor structure of boys' preparation	Factor structure of girls' preparation
1	Power abilities, 20.82%	Power abilities, 27.73%	Functional opportunities, 20.66%
2	Functional opportunities, 16.11%	Functional opportunities, 21.28%	Psychophysiological opportunities, 15.78%
3	Psychophysiological opportunities, 13.87%,	Psychophysiological opportunities, 17.55%	Power abilities, 13.36%
4	Age abilities, 8.49%,	Coordinational abilities, 9.23%	Age abilities, 7.69%
5	Coordinational abilities, 7.00%		Anthropometric data, 7.02%
6			Coordinational abilities, 6.07%
Sum	66.29%	75.81%	70.59%

Obtained results show that the current process of training in high school involves a high level of physical training, which linked to the general level of health, the development of physical qualities. On physical education classes at high school should be considered sexual characteristics of the students. Physical education of girls and boys should be tailored to the main factors determining the complex structure of their training.

Summary.

1. There were significant differences in the physical training and functional status of men and women in terms of power. Psychophysiological indicators of capacity, heart rate at rest, immediately after the physical loading, on the first minute of recovery and rate index Ruf'e at boys and girls do not have significant differences.

2. It is shown that in the complex training of boys the most importance have power capacity, followed by functionality, physiological capacity and coordination abilities.

3. It is shown that in the complex training of the girls the most importance have functional and physiological features, then – power abilities, age characteristics, anthropometric data and coordination abilities. In general, the factor structure of preparedness of girls is more complex than at boys. The level of physical preparation and functional status of women more influence age-specific anthropometric data and compared with boys. The power capacity of girls occupy a central position in the overall preparation structure, while at boys power capacity can occupy a leading position.

4. It is shown that, in connection with the identified features in the structure of the complex preparedness of boys and girls in the classes of physical education of boys should focus on the development of strength, while at girls – development of endurance (functionality) and to a greater degree than boys should take into account physiological features.

In the future, further research is planned to study the individual typological features of the Polish students.

References:

1 Ashanin V.S., Filenko L.V. *Fiziceskoe vospitanie studentov tvorceskih special'nostej* [Physical Education of the Students of Creative Profession], 2008, vol.3, pp. 3-8.

2 Ashanin V.S., Golosov P.P., Gorbatenko Iu.I. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, vol.2, pp. 11-13.

3 Ashanin V.S., Nesterenko N.S. *Fiziceskoe vospitanie studentov tvorceskih special'nostej* [Physical Education of the Students of Creative Profession], 2008, vol.2, pp. 84-90.

4 Ashanin V.S. *Slobozhans'kij naukovo-sportivnij visnik* [Slobozhansky scientific and sport bulletin], 2004, vol.7, pp. 239-243.

5 Bondarev D.V., Gal'chinskij V.A. *Fiziceskoe vospitanie studentov tvorceskih special'nostej* [Physical Education of the Students of Creative Profession], 2008, vol.1, pp. 59-64.

6 Dubrovskij V**.** I. *Valeologiia. Zdorovyj obraz zhizni* [Valeology. Healthy lifestyle], Retorika-A, 2001, 560 p.

7 Zajcev V.P., Kramskoj S.I., Manucharian S.V., Poliakova M.A., Evsiutina V.B. *Fiziceskoe vospitanie studentov tvorceskih special'nostej* [Physical Education of the Students of Creative Profession], 2009, vol.3, pp. 77-82.

8 Il'in E.P. *Differencial'naia psikhofiziologiia muzhchiny i zhenshchiny* [Differential psychophysiology of man and woman], Sankt Petersburg, SSU Publ., 2003, 366 p.

9 Kozina Zh.L., Barybina L.N., Grin' L.V. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, vol.5, pp.30-35.

10 Platonov V.N. *Sistema podgotovki sportsmenov v olimpijskom sporte* [The system of preparation of sportsmen in Olympic sport], Kiev, Olympic Literature, 2004, T.4, 607 p.

11 Agnieszka Woronkowicz, Barbara Anna Cichocka, Malgorzata Kowal, Lukasz Kryst, Jan Sobiecki. Physical development of girls from Krakow in the aspect of socioeconomical changes in Poland (1938–2010). *American Journal of Human Biology*. 2012, vol.24, Issue 5, pp. 626–632. doi:10.1002/ajhb.22283

12 Fetro J.V. Health literate youth: evolving challenges for health educators. *American Journal of Health Education,* 2010, vol. 41, no. 5, pp. 258-264.

13 Marks R. Healthy schools and colleges: what works, what is needed, and why? *Health Education*, 2010, vol.110, no. 4, pp. 421-426.

14 Marta Anczewska, Katarzyna Charzynska. Educational assessment of pupils in Poland. *SA-eDUC JOURNAL,* 2012, vol.9(1), pp. 11-19.

15 Martin P., McCullagh J. Physical education and outdoor education: complementary but discrete disciplines. *Asia-Pacific Journal of Health, Sport and Physical Education,* 2011, vol. 2, no. 1, pp. 67-78.

16 McKenzie T., Lounsbury M. School Physical Education: The pill not taken. *American Journal of Lifestyle Medicine,* 2009, vol. 3, no. 3, pp. 219-225.

17 Nutbeam D. The evolving concept of health literacy. Social Science and Medicine, 2008, vol. 67, pp. 272-278.

18 Renson R. Messages from the future: significance of sport and exercise in the third millennium. *European Journal of Sport Science,* 2001, vol.1, no. 1, pp. 1-17.

19 Resiak Malgorzata, Niedzielska Aleksandra. The Level of Physical Development and Physical Fitness in 6-7-Year-Old Children from School and Pre-School Institutions in Gdansk. *Baltic Journal of Health and Physical Activity*. 2009, vol.3, Issue 4, pp. 286–292,

20 Tinning R. Aliens in the gym: Considering the learner in physical education, *Healthy Lifestyles Journal*, 2008, vol. 54, no. 2, pp. 13-19.

Information about the authors:

Prusik Krzysztof: prusik@hot.pl; Academy of Physical Education and Sports; ul. Wiejska 1, 80-336 Gdansk, Poland.

Prusik Katarzyna: prusik@hot.pl; Academy of Physical Education and Sports; ul. Wiejska 1, 80-336 Gdansk, Poland.

Kozina Zh.L.: zhanneta.kozina@gmail.com; Kharkov National Pedagogical University; Artema str. 29, Kharkov, 61002, Ukraine.

Iermakov S.S.: sportart@gmail.com; Kharkov National Pedagogical University; Artema str. 29, Kharkov, 61002, Ukraine.

Cite this article as: Prusik Krzysztof, Prusik Katarzyna, Kozina Zh.L., Iermakov S.S. Features of physical development, physical preparedness and functional state of boys and girls – students of Polish higher educational establishments. *Physical Education of Students,* 2013, vol.1, pp. 54-61. doi:10.6084/m9.figshare.156359

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 15.01.2013
Published: 09.02.2013

CONDITIONAL FIGHT, AS METHOD OF IMPROVEMENT OF TACTIC-TECHNIQUE PREPAREDNESS IN KICKBOXING, AND ITS CLASSIFICATION

Skyrta O.S.
Dnepropetrovsk State Institute of Physical Culture and Sport

Abstract. A place and role of conditional duels is certain in the system of training in kickboxing as a methodical reception of perfection to technical tactical preparedness of sportsmen. The analysis is conducted on 24 literary sources. The alternative variant of classification of conditional duels is offered, in which for basis of distributing limitation of volume is chosen battle technical tactical actions and them sets. It is suggested to group conditional duels for duels with one-sided a task and multilateral tasks. Also for duels with the narrowly limited actions of partners and duels with wide technical tactical by tasks. The use of alternative classification is given by possibility. It is recommended to utillize in training narrow limitation of actions of one of partners and considerable expansion technical tactical tasks other. Offered to recommendation on artificial limitation of battle facilities in conditional duels and forming of individual manner of embay.

Keywords: kickboxing, technique, tactic, preparedness, conditional, duel, classification.

Introduction

Improvement of technique level in impact martial arts is an important reserve of high sports results. This is stressed in many works [3, 4, 5, 7, 10, 12, 14, 23, 25-27]. But, by the data of B.B. Shapovalov, Ye.G. Dvoretskiy [22], A.A. Kupriyanov [11] and V.A. Yeganov [7] only 30% of training time is net time, considering conditional fights, freestyle and sparrings, of kickboxers' technique improvement. Meanwhile the authors think that the main way to improve the performance quality is a purposeful approach to training, with competition peculiarities being considered. This approach means purposeful formation and improvement of combat actions with the help of exercises, simulating main competition conditions and situations. Simulation of competition conditions in training is easier in sparring; conditional fight is one of its kinds [9].

For stimulation of sportsman's specific activity, in order to improve tactic-technique level special methods were developed in martial arts: trainings without partner, trainings with conditional partner, training with partner, trainings with adversary. Training with partner is the main method for mastering tactic –technique actions. In this case, partner is active assistant and promotes rational mastering of these actions. As training means the following is used: exercises in conditioned situations, in which sportsman -"adversary" acts within strictly definite by coach frames of tasks; fragments of different competition situations [15].

In most of impact martial arts the method of training with partner in conditioned situations is used as conditional fights in boxing, kickboxing and tae kwon do during training classes, devoted to improvement of tactic-technique level [1]. Conditional fight is a fight with certain restriction of tactic and technique means [9, 24]. By the opinion of V.A. Kiseliov [10], in boxing, conditional sparring is intended for boxers' special skills and technique development and improvement; it is conducted at a brisk race and is approached to natural conditions of boxing. Such sparring develops both: technical skills of boxers and his special abilities – endurance, quickness, dexterity, quick thinking, prognostication of situation and etc. [9, 10].

In French boxing "savate", which is a "relative" of modern kickboxing, two kinds of conditional fights are used for preparation to competitions: fight, in which partners exchange kicks and punches determined for them by coach, and semi-conditional fight, in which sportsmen use any blows , technically correctly, very accurately and quickly but with restricted strength [20].

A.V. Zhadan, in his work [8] described variants of karate conditional fights on the stage of specialized basic training: programmed sparring by one step (kihon-ippon-kumite), semi-freestyleby one step (ji-ippon-kumite), "pendulum" of one movement (okur-kumite), semi-freestyle by one step with attack by combination (yakusoku-kumite), "pendulum" on combination (kuyeshi-kumite).

By information of A.Ye. Taras [19], in Korean combat martial art "vietvodao-vovinam" conditional fight "fan don" is used: sparring in which counterattacking techniques are trained with partner; it resembles training "kumite" in karate (by three, two or one movement0 and is constructed by principle "block plus blow".

In Thailand boxing "muai thai", by the opinion of Sagat Noi Koklama, fixing of tactic technique actions is realized in conditional fights, which are conducted first at slow race and then with progressive quickness [17].

In the course of trainings on improvement of techniques and tactic of kickboxing conditional fights are used [1, 2, 16, 23] as a methodological method, directed to improvement of tactic-technique level, in which two partners, being relatively restricted by their tasks (using not all blows), have broad opportunity to apply different combinations and series of attacking and counterattacking blows and al kinds of blocks. Conditional fight is a transient stage to freestyle fight and is used, on the one hand to discipline the fighter (making him to control every movement) and on the other hand to simplify the fight in respect to possible combinations and thus, to make sportsmen's self orientation easier [2].

doi: 10.6084/m9.figshare.156359

In conditional fight coach can determine combat abilities of his disciple because it is the first and responsible sportsman's test "in practice", the test for combat thinking, combat excitement, blows, counterattacks and blocks techniques. Meanwhile, the first signs of combat individual manner manifest in conditional fight [9, 18, 22, 23].

Classification (from Latin "classis" - degree and "facere" – to do) in the opinion of I.T. Frolov, is a sensible order of things and phenomena, division of them into kinds according to their significant properties; special kind of logical operation of concepts scope concepts, which is a certain combination of divisions (division of a class into kinds and distribution of these kinds, etc.) [21].

V.M. Romanov, in his paper on kickboxing tactics [16], classifies conditional fights into: conditional fights with one-sided task and conditional fights with multi-sided (two-sided) tasks. Other boxing and kickboxing specialists [1, 9, 13] think that conditional fights shall be classified into:

a.) conditional fight with restricted task and partners' actions;

b.) conditional fight with wide range of tactic and technique tasks.

Thus, the above said permits to come to conclusion that improvement of martial arts sportsmen's tactic and technique level with the help of conditional fights is an important reserve for achievement of high sports results. But in our opinion in scientific and methodological literature insufficient attention is paid to conditional fights' classification and it prevents from understanding of the significance and effectiveness of this methodological method of kickboxers' tactic and technique level improvement.

The research has been carried out as per aggregate plan of scientific and research work in the sphere of physical culture and sports for 2011-2015 of Ukraine Ministry of education and science, youth and sports, subject 2.18 "Improvement of sportsmen motion activity mechanisms' controlling".

Purpose, tasks of the work, material and methods.

The purpose of the research is to determine the place and role of conditional fights in kickboxing training system, as a methodological method of kickboxers' tactic and technique level improvement, to complement the existing system and to develop alternative classification of conditional fights.

The tasks of the research.

1. To analyze scientific and methodological literature about conditional fights as a methodological method of kickboxers' tactic and technique level improvement.

2. To provide definition of conditional fight, improve the existing classification, develop new classification of conditional fights in kickboxing.,

In the period of work on this paper 27 sources of scientific and methodological literature have been analyzed.

Results of research.

According to the conducted analysis of scientific and methodological literature, kickboxing conditional fight is a variant of sparring (method of tactic and technique improvement) and its application implies using of exercises in conditioned situations. Besides, it is one of the most effective ways of kickboxer's tactic and technique level improvement, which reflects an arsenal of actions and their combinations (structures), promoting to achieve his target and to solve combat tasks arising in the course of competition fight. Technique consists of the trained up to automatic performance separate operations and their combinations, while tactic means capability to combine them in different actions, considering his own current state and the adversary's peculiarities.

But, concerning classification of conditional fights, which was finally formulated in the papers by M.I. Romanenko 91978) and I.P. Degtyariov (1979) for boxing (fg.1), in our opinion, in the future boxing and the kickboxing specialists based on it automatically, without paying any attention to this problem.

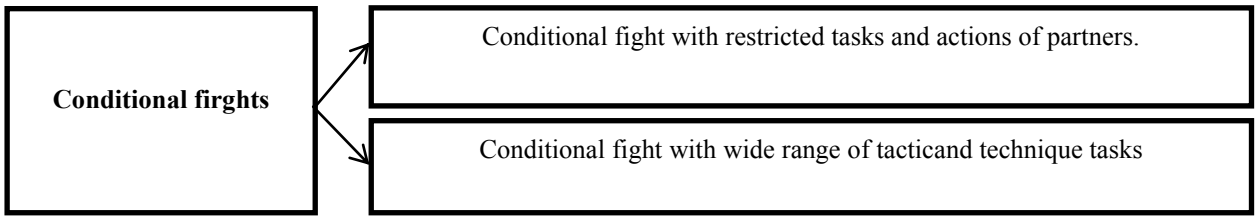


Fig.1. Classification of conditional fights in boxing. (As perI.P.Degtyariov 1979).

From our point of view, classifications, given in scientific and methodological literature, have rather conservative character and are reduced to division into conditional fights with one-sided task, in which one sportsman attacks by the coach's instruction and the other blocks or counterattacks, and two-sided conditional tasks, in which both partners attack and counterattack, restricted by the instructions of coach. Besides, there is division into conditional fights with strictly restricted actions of partners (one partner executes only one attacking blow and the other use any block or counterattack mean, combined with this block) and conditional fights with wide range of tactic and technique tasks (two-sided actions of partners when each of them has right to attack, counterattack and block the adversary).

After fulfilling the analysis of scientific and methodological materials and basing on our own experience, we have made an attempt to improve the current classification of conditional fights by means of widening of kinds (classes) range of the a.m. fights, by marking out certain kind of conditional fight, which, in our opinion, can not be covered by any item of classification. Thus, when using division of conditional fights into one-sided and multi-sided ones or into the fights with strictly restricted of wide-range tactic and technique tasks, there is, in our opinion, a transient variant, which cannot be related to either first class or the second one in both classifications. The example is a conditional fight, in which one of sportsman attacks (with one tactic and technique action or combination) strictly as per instruction of coach and the other blocks in freestyle (on his own) or uses determined by the coach block technique and counterattacks with a blow or blow combination on his own, considering the current situation. Thus, with classification into one-sided and multi-sided tasks there appears a transient stage, which could be called conditional fight with combined tasks (combined tasks mean one-sided task of one partner and multi-sided tasks of the other one).

Using division into conditional tasks with restricted tasks and fights with wide range of tactic and technique tasks, we can specify, as a transient stage, conditional fights with one-sided – widened actions of partners, in which "one-sided-widened" means restricted actions of one partner and wide range of actions of the other.

But even this, improved classification, in our opinion, reflects the essence of the given method only in boxing. I.e. in kind of martial arts, in which sportsmen are rather restricted in their tactic and technique attacking arsenal (as per existing rules only punches are permitted). In martial arts, in which punches and kicks are used (kickboxing, Thailand boxing - muai thai) the above mentioned classifications reduce the possibility of conditional fights' using in training of combat skills. That is why we have developed an alternative classification of conditional fights for kickboxing, which would permit for modern coach to understand deeper the essence of conditional fight, and a methodological form of kickboxers' tactic and technique level improvement; for martial art sportsmen to achieve better results in mastering skills with less efforts; which would permit not only to reveal first signs of individual combat manner but to develop the most efficient for every sportsman tactic and technique actions, which will lead to formation of his individual combat manner.

In the developed by us alternative classification of conditional fights, quantitative and qualitative restriction of combat tactic and technique actions and their combinations was taken as the distribution base.

Conditional fights in kickboxing are classified as follows (see Fig2):

1. Reduction of quantity of sportsmen, which are limited in their tactic and technique actions.
    1.1. Conditional fights, in which actions of both sportsmen are restricted.
    1.2. Conditional fights, in which actions of only one sportsman are restricted.
2. Reduced quantity of tactic and technique actions (blows) in attack (counterattack).
    2.1. Conditional fights, in which only one tactic and technique action is used.
    2.2. Conditional fights, in which two tactic and technique actions are used.
    2.3. Conditional fights, in which three or more tactic and technique actions are used.
3. Reduction of active and passive combat tactic and technique actions quantity.
    3.1. Conditional fights based on "attack-block" scheme.
    3.2. Conditional fights based on "attack-block-counterattack" scheme.
    3.3. Conditional fights based on "attack-block-counterattack-block-counterattack-block" scheme.
4. Reduction of attacking – counterattacking tactic and technique methods.
    4.1. Conditional fights, in which only punches are used (jabs, hooks, uppercuts).
    4.2. Conditional fights, in which only kicks are used (front-kick, round-kick, side-kick, back-kick, ankle trips, etc.).
    4.3. Conditional fights, in which only knee kicks are used (direct, side-kicks, with grasp of adversary, without grasp).
    4.4. Conditional fights, in which only blow combinations are used (hands-legs. hands-knees, legs-knees).
    4.5. Conditional fights, in which all permitted blows are used.
5. Reduction of blow impact direction level.
    5.1. Conditional fights, in which blows at upper level are used.
    5.2. Conditional fights, in which blows at middle level are used.
    5.3. Conditional fights, in which blows at lower level are used.
    5.4. Conditional fights, in which combinations of direction variants are used (upper-middle levels,upper-lower levels, middle-lower levels).
    5.5. Conditional fights, in which blows at all levels are used.
6. Restriction of blocking techniques.
    6.1. Conditional fights, in which blocks with hands and legs are used.
    6.2. Conditional fights, in which blocks with body are used.
    6.3. Conditional fights, in which defensive maneuvering is used.
    6.4. Conditional fights, in which defensive combinations are used (hand and legs blocks, body blocks, maneuvering, etc.).
    6.5. Conditional fights, in which complex defense is used combination of all defensive techniques, depending on definite situation of conditional fight).
7. Restriction of combat distance.

7.1. Conditional fights at far distance.
7.2. Conditional fights at medium distance.
7.3. Conditional fights at close distance.
7.4. Conditional fights in clinch.
7.5. Conditional fights at possible two or more distances (far-medium, medium-close, close-clinch).
8. Restriction of impact strength.
8.1. Conditional fights with light-touch blows.
8.2. Conditional fights with medium strength blows.
8.3. Conditional fights with full strength blows.

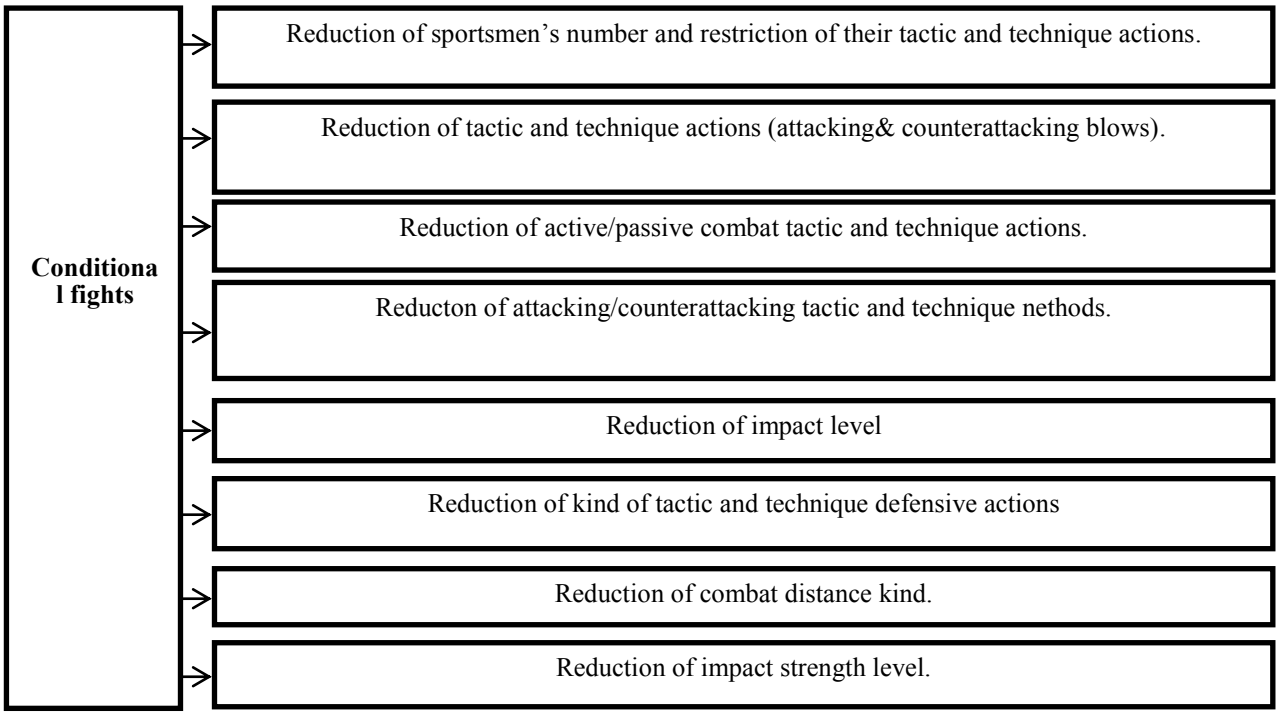


Fig.2. Alternative classification of conditional fights in kickboxing.

In training kickboxing programs for children & youth sports school such methodology as conditional fight practically is not reflected. The time for practicing of this method is given, but the selection of conditional fights kinds is entrusted to experience and skills of coach staff. That is why we implement in practice the developed program on improvement of kickboxers tactic and technique preparedness with the help of conditional fights on the stage of specialized basic training and the results of it will be presented in future works.

Thus, using alternative classification of conditional fights in kickboxing, coach can definitely determine the circle of tasks for every of sportsman, independing on the range of tasks to be solved in the given exercise.

Summary.

Artificial reduction of combat means n conditional fights permits not only to improve attacking or counterattacking actions, but also promotes kickboxer to find tactical ways for raising of these actions' efficiency; in other words promotes to improve tactic and technique attacking and blocking actions and to form individual manner of combat conduction.

Classification of conditional fights with quantitative and qualitative restriction of tactic and technique actions and their combinations as its base, permits to open all varieties of this method of kickboxers' tactic and technique preparedness improvement and completely reflects the essence of its name.

References:

1 Atilov A.A., Glebov E.I. *Kik-boksing Lou-kik* [Kickboxing of Lou-kik], Rostov on Don, Phoenix, 2002, 560 p.
2 Bakulev S.E., Mokeev G.I., Shestakov K.V., Chistiakov V.A. *Kikboksing* [Kickboxing], Sankt Petersburg, SSPU, 2010, 112 p.
3 Belykh S.I. *Slobozhans'kij naukovo-sportivnij visnik* [Slobozhansky scientific and sport bulletin], 2009, vol.3, pp. 332-335.
4 Belykh S.I., Eremenko V.V., Marabian A.V. *Slobozhans'kij naukovo-sportivnij visnik* [Slobozhansky scientific and sport bulletin], 2007, vol.11, pp. 119-122.
5 Gorbenko V.P., Skirta O.S. *Slobozhans'kij naukovo-sportivnij visnik* [Slobozhansky scientific and sport bulletin], 2012, vol.2, pp. 90-93.
6 Gorbenko V.P., Skirta O.S. *Sportivna nauka Ukrayini* [Sport science of Ukraine], 2012, vol.5(49), pp. 32-38.
7 Eganov V.A. *Metodika obucheniia zashchitnym tekhniko-takticheskim dejstviiam v kikboksinge* [Teaching method protective technical tactical to the actions in kickboxing], Cand. Diss., Chelyabinsk, 2005, 171 p.
8 Zhadan A.V. *Mezhvuzovskij sbornik nauchnykh trudov* [Intercollegiate collection of scientific labours], Smolensk, 2008, vol.7, pp. 55-60.
9 Kalmykov E.V. *Teoriia i metodika boksa* [Theory and method of boxing], Moscow, Physical Culture and Sport, 2009, 272 p.
10 Kiselev V.A. *Sovershenstvovanie sportivnoj podgotovki vysokokvalificirovannykh* bokserov [Perfection of sporting preparation of highly skilled boxers], Moscow, Physical Culture and Sport, 2006, 127 p.
11 Kupriianov A.A. *Kikboksing* [Kickboxing], Yakutsk, Rektaym, 2004, 56 p.
12 Luk'ianenko V.P., Volikov R.A. *Vestnik Stavropol'skogo gosudarstvennogo universiteta* [Announcer of the Stavropol State University], 2010, vol.66, pp. 82-85.
13 Ost'ianov V.N. *Obuchenie i trenirovka bokserov* [Teaching and training of boxers], Kiev, Olympic Literature, 2011, 272 p.
14 Pashkov I.M., Rovnyj A.S. *Slobozhans'kij naukovo-sportivnij visnik* [Slobozhansky scientific and sport bulletin], 2011, vol.4, pp. 60-63.
15 Platonov V.N. *Sistema podgotovki sportsmenov v olimpijskom sporte* [The system of preparation of sportsmen in Olympic sport], Kiev, Olympic Literature, 2004, 808 p.
16 Romanov Iu.N. *Takticheskaia podgotovka v kikboksinge* [Tactical training in kickboxing], Chelyabinsk, 2004, 92 p.
17 Sagat Noj Koklam. *Osnovy tajs'kogo boksa* [Bases of the thai boxing], Rostov on Don, Phoenix, 2003, 352 p.
18 Stepanov M.IU. *Individualizaciia predsorevnovatel'noj podgotovki kvalificirovannykh kikbokserov na osnove stilevykh razlichij* [Individualization of precontest training of skilled sportsmen in kickboxing on the basis of stylish distinctions], Cand. Diss., Naberezhnye Chelny, 2011, 24 p.
19 Taras A.E., Kurejchik V.S. *V'etvodao-Vovinam: ot nachinaiushchego k chernomu poiasu* [From a beginner to the black belt], Minsk, Krasiko, 1994, 115 p.
20 Taras A.E. *Francuzskij boks savat* [French boxing of savat], Minsk, Kharvest, 1997, 304 p.
21 Frolov I.T. *Filosofskij slovar'* [Philosophical dictionary], Moscow, Policy Publ., 1981, 445 p.
22 Shapovalov B.B., Dvoreckij E.G. *Kikboksing* [Kickboxing], Kiev, 2010, 110 p.
23 Shestakov K.V. *Postroenie trenirovki kikbokserov-iuniorov vysshikh razriadov na etape predsorevnovatel'noj podgotovki* [Construction of training of juniors in kickboxing of higher digits on the stage of precontest preparation], Cand. Diss., Sankt Petersburg, 2009, 163 з.
24 Kliuchnikov E.IU. *Tkhekvondo* [Taekwondo], Rostov on Don, Phoenix, 2007, 797 p.
25 Gartland S., Malik M.H.A., Lovell M.E. A prospective study of injuries sustained during competitive Muay Thai kickboxing. *Clinical Journal of Sport Medicine*. 2005, vol.15, pp. 34-36.
26 Terry P.C., Slade A. Discriminant effectiveness of psychological state measures in predicting performance outcome in karate competition. *Perceptual and Motor Skills.* 1995, vol.81, pp. 275-286.
27 Weinberg R.S., Seabourne T.G., Jackson A. Effects of visuo-motor behavior rehearsal, relaxation, and imagery on karate performance. *Journal of Sport Psychology.* 1981, vol.3, pp. 228-238.

Information about the author:

Skyrta O.S.: skgermes@rambler.ru; Dnepropetrovsk State Institute of Physical Culture and Sport; Victory Quay str. 10, Dnepropetrovsk, 49094, Ukraine.

Cite this article as: Skyrta O.S. Conditional duel, as methodical reception of perfection to technical tactical preparedness in kickboxing, and its classification. *Physical Education of Students,* 2013, vol.1, pp. 62-67. doi:10.6084/m9.figshare.156360

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 08.01.2013
Published: 09.02.2013

ON COMPETENCE AND WORKMANSHIP OF SPECIALISTS IN THE FIELD OF PHYSICAL CULTURE

Sobyanin F.I., Dudkina S.G.
National Research University Belgorod State University

Abstract. Correlation of concepts «competence» and «professional trade» is examined. More than 200 sources are studied. The necessity of account for training of athletic personnels of professional fitness and value of professional trade becomes firmly established as to the ultimate goal of forming of specialist in the field of physical culture. Negative tendencies are exposed in maintenance of preparation of specialists and higher professional athletic education in the higher institutes. Culturological and acmeological approach is offered for further strategy of perfection of professional pedagogical preparation of specialists. The stages of forming of specialist are presented on the basis of application of this approach. A necessity is marked at training of personnels oriented on the exposure of features of professional fitness of young people to the professions in the field of physical culture, its initial state and dynamics.
Keywords: physical culture, competence, professional, trade, pedagogical, shots.

Introduction

Modern paradigm which is developing now in higher professional sports education is based on competence approach. Last years in different countries the problem of sports education upgrading has become rather acute [4, 5, 7, 9 12, 16]. In connection with this a question appears: how efficient this approach can be in the system of higher sports education and what prospects it has. In order to answer this question it is worthwhile to regard the relationship of conceptions "competence" and "workmanship". The urgency of this lies in the fact that the solution of this problem is of importance for understanding of future physical culture specialists upgrading. This work has been executed as per plan of scientific research works of Belgorod state national research university.

Pupose, tasks of work, material and methods.

The purpose of the work is studying of relationship between conception "competence" and "workmanship" in the context of physical culture specialist preparation.

The methods and organization of studying. The studying of relationship of conceptions "competence" and "workmanship" has been conducted on the base of special literature, including documents, manuals, handbooks, scientific works, monographs, theses, materials of scientific conferences and congresses analysis. In total, more than 200 sources, published in Russia, Ukraine, Kazakhstan, Slovakia, Moldavia and Serbia, were studied.

Results of the researches.

The essence of the problem lies, apparently, in how "workmanship" is interpreted and how it is realized in the practice of specialists' preparation. Существо

Many dictionaries give explanation of "competence" as "possession of competence" or "having knowledge, permitting to judge about something". And "competent" man seems to be "having competence", "having knowledge in definite field" (In Latin "competence" - means "able, appropriate". Finally, word "competence" (in Latin "competentia" – "vested belonging") means either a "circle of a body's or person's powers" or a circle of questions, in which a person has experience or knowledge" [11, 13]. There are many other opinions about the essence of competence. (A.V. Khutorskiy, "Technology of key and subject competence designing" [Electronic source] http: // www. eidos.ru/yournal/2006/0505.htm) [7, 12]. Analysis of literature shows that theoretical readiness is more expressed by the essence of competence. For example, in one case it is said that competence consists of two components: content – "knowledge" and "process" – "practical skills", but finally, competence is characterized by efficient and mobile knowledge [14]. In other work it is said that competence means awareness [7]. Competence is widely elucidated in a number of documents, e.g. in "Conception of Russian education upgrading for the period upto 2010" [6].

Analysis of the a.m. definitions of competence leads to conclusions:

- there is no unambiguous interpretation of competence essence;
- competence is understood as a circle of questions (may be obligations, powers and etc.) for which the given person is responsible;
- competence is understood as highly specialized knowledge, theoretical preparedness, having knowledge in something;;
- competence is understood as both: having knowledge in something and having practical experience;
- competence has rather wide interpretation, including knowledge, skills, personal abilities and other components of personality. With such ambiguity of the regarded term's interpretation the main is not clear - which level of specialist's preparedness is meant: either he knows his duties theoretically, or he is ready to cope with his professional functions both theoretically and practically or he just knows the circle of his official duties. Alas, at present, in labor market conditions of severe competition employers are not interested in such specialist's competence; they unconditionally require professionalism. That is why, now, in different fields of human activity the expression "professional" is used.

doi: 10.6084/m9.figshare.156361

How is “competence” approach realized in the field of professional physical culture higher education in practice? As a rule, we think, that it is realized as a result of a specialist’s preparation. With this, mastering of particular competences in the content of education, a school leaver was not regarded if he initially fits for future profession or not. In practice there were cases when advanced student became poor teacher and inveterate mediocre student became good specialist with the lapse of time. This phenomenon is conditioned by the presence or absence of professional adequacy. Though in the given above list of competences not only knowledge requirements are expressed, it is necessary to state, that the approach, under consideration, is oriented mainly to paradigm of knowledge. We can receive evidences of this fact, if we regard peculiar competences in state educational physical culture bachelors’, masters’ and specialists’ standards and familiarize with other planning documents.

For example, in Russian realities, Federal state educational standards of higher professional education (branch 034300 – Physical culture qualification – master)) has lists of general cultural competences (GCC), professional competences (PC), which in many cases have no connection with practice. It is clear that students can obtain knowledge only by learning peculiar subjects, but how to prepare specialists for them “to take responsibility for their own decisions within the frames of professional competence” (GCC-7), “to take atypical decisions (GCC-8), “ to be initiative, in risky situations inclusive” (GCC-9), “to cope with problem situations” (GCC-10) and etc. [Federal state educational standards of higher professional education (branch 034300 – Physical culture qualification – master)) – M., 2010. – pg. 29]. What is done in higher educational institution for implementation of these competences? The mentioned competences are quite called-for, properly formulated, but they are overrated, theorized and cannot be practically realized.

Education becomes more and more distant from a student’s personality. The thesis of education humanization is being declared, but, in practice, unreasonable computerization, testing, remote teaching moves teacher more and more away from student. Not excluding the need in the mentioned trends, it should be remembered that nothing can replace direct teacher – student’s communication, no machine can improve humanization process without human factor, without direct communication, without interaction. The best manuals, the best softs, which have appeared to-day, to-morrow will go out of date. Teacher always can bring to student new trends, facts, explain comprehensively problem aspects.

The other urgent problem of competent specialist’s training is increasing of relative quota of students’ independent work. In wide practice of higher educational institutions this is an actual loss of academic hours, because sports students will more gladly spend their time for sports trainings, which are interesting for them, or for some other interesting activities, than for independent academic tasks. Students’ extra-curricular work and the control of it actually are not organized by teachers. At the same time, students are not sufficiently conscientious to pay required time to extra-curriculum work.

Introduction of testing also does not correspond to the idea of education humanization. In many subjects (e.g. in special courses) it is very difficult to prepare test tasks in the offered forms. Much useful information just cannot be “embedded” in these forms. Teacher has to take information from other fields of knowledge that misrepresents the content of testing and reflects the subject itself inadequately. Students come to understanding, that if to solve test tasks correctly and to “guess” some answers, they can receive positive mark. Teacher has little reasons for careful checking of student; if testing is successful, teacher and student mutually release each other from further control, but the quality of students theoretical ground is reduced. Because to answer the questions orally or in written form is more difficult than to answer test questions just choosing correct variant of answer, it is necessary to more efficiently prepare for this. Besides, testing does not require from students to be creative.

The other disadvantage of modern, competence approach to education is “mosaic” preparedness of students. The matter is, that earlier, academic budget assigned larger quantity of academic hours for every discipline to physical culture curriculum. That is why, students learnt subjects quite substantially. At present, the budget of academic hours has significantly increased but the number of disciplines having little quantity of academic hours has also increased and students have not sufficient time not only for mastering knowledge (to say nothing about skills), but even for obtaining of most general ideas about the essence of subject, or they know the subject’s essence but very superficially. For a long time the problem of de fragmentation of professional physical culture higher education has been ripe [2]. For this it is necessary to scientifically ground how and in which sequence peculiar disciplines, stages of teaching and etc. shall be distributed. Increasing of amount of scientific information demands appropriate conditions, application of more efficient means and methods of teaching.

One more contradiction to idea of education humanization is that neither teachers nor supervisors or departments have objective information of what is every peculiar student actually (except his exams successes or fails, attendance at classes, achievements in sports), have any idea of his abilities and bents to future profession; they do nothing for purposeful formation of professional motivation. In the best case it happens spontaneously.

The development of professional physical culture system goes per se, separately from the process of specialist’s formation. Innovations are introduced into the content of higher education, but, sometimes, they are not accepted by students and even are rejected. Students adapt to these innovations, trying to find way out by different means. For example, not long ago majority of students passed finals and only some of them, the most prepared, defended degree works. As per new requirements all students shall prepare degree works and this is seemingly useful innovation, meeting modern requirements. But majority of students does not execute these works on their own: they either search ready material in internet or ask third persons, even including their teachers.

Meeting the requirements of realization of competence approach, professors of higher educational institutions found themselves in conditions of severe time limit, and this time shall be spent on preparation of large scope of planning and testing documents and other activity, that could be done, for example, by ministries or educational methodological associations, and, actually, professors have no time for the main activity – direct work with students.

At the same time the problem of higher education quality is becoming more acute [3, 4, 7, 16], but here some confusion occurs as well: in practice, estimation of education quality is reduced to analysis of documentation which was made at departments and to estimation of students' knowledge by "leftover principle", but actual quality of education remains without attention to be paid to it. Because the main feature of professional higher education system is "new formations in personality"[5]. By right remark of prof. N.V. Kuzmina "creative readiness" to future professional activity shall be the criteria of higher professional physical culture institution's functioning quality [5]. To achieve this result it is required to re-orientate higher professional physical culture education to cultural achmeological approach. This will permit to represent achieving of education quality in new aspect and in compliance with the modern world. Consideration of all pedagogical categories in the light of new educational paradigm lies in the foundation of this approach. This is even more urgent for the given kind of education, which reflects the state of society culture, - "physical culture" [9]. In this case, the first position must be taken by conceptions "professionalism", "pedagogical qualification" and "culture". Here, "culture" should be understood as a specific, morally oriented method of human activity as well as evaluation and consciousness of its results. With this, "competence" shall not be excluded from the list of urgent categories, but its status and position in the succession of specialist's formation will change.

Not only in theory but also in practice of physical culture specialists' training, it is quite necessary to apply well known in labor and engineer psychology category "professional adequacy" as an initial. "Professional adequacy" shall be understood as dynamic, relatively steady, optimal level of combination of biologically and socially conditioned specialist's premises, which are necessary for successful professional activity in a certain field [8, 10]. Professional adequacy of physical culture specialist is a "relative" one by its type, i.e. it does not lodge absolutely strict requirements to future professional, because the most important positions in it are taken by compensatory mechanisms, but it requires the presence of some peculiar components on a certain level [10]. Professional adequacy of a physical culture specialist, by our data, must include: professional-pedagogical orientation of personality (interests, motives, ideals, value orientation, professional intentions and demands); mental and physical adequacy; individual and psychological peculiarities of personality (abilities, character and temperament) [8].

Professional adequacy is an initial category, which shall be considered as far back as on pre institutional stage of future specialist's formation - in the process of professional orientation, professional selection. It would promote to significantly improve the quality of future sports-pedagogical specialists. At present, unfortunately, intake of school leavers, without considering of their professional adequacy, is conducted instead of professional selection and it initially determines many problems of professional-pedagogical content at higher educational institutions. Meanwhile, knowing of student's professional adequacy would really prompt "individual way" of specialist's formation in the future period of study at higher educational institution. Some components of professional adequacy could be corrected by purposeful pedagogical impact.

Further, on the base of professional adequacy "professional readiness" shall be formed. It is understood as "professional competence" in broad sense (i.e. mainly theoretical readiness). In compliance with the reality graduate must be really competent, i.e. ready for professional activity, but mainly theoretically (this corresponds to the reality) because actually all graduates are imperfect by their skills, they just lacks of professional practice. As experience shows, adaptation to professional activity takes in average nearly 3-4 years. Even those, who starts working by his specialty, still being the students of higher educational institution, will pass this period, because they will meet the moment when they starts to compare theoretical knowledge obtained at higher educational institution with the demands of practice. And in general, this period does not contradict modern educational paradigm – preparation of competent specialist, but it brings into this process quite new sense meaning that competence is not a final target but only a transient stage of future specialist-professional's preparation.

On after-institutional stage of specialist's formation "professionalism" takes the first position by its meaning [3]. Unlike the opinion of N.V. Kuzmina [5], we understand "professionalism" as skillfulness in broad sense. We can hardly agree that "professionalism" is "steady state of specialist's personality and activity and is formed in the process of "professional training" [5], because its gaining requires certain time after graduation from higher educational institution. Graduate, as a rule, does not yet ready for his work as professional. His practical experience is insufficient as it has already been said above.

"Professionalism" is a skillfulness that starts to appear on the base of competence: knowledge in broad sense is refined into skillfulness in broad sense. Some authors replace this conception with close by sense one, e.g., "pedagogical skills", in which they regard the specialist personality's features, his abilities, which starts to compose a certain system. (ВишЊиЋ Д., ЈовановиЋ А., МилетиЋ К
"Theory and Methodology of Physical Education". Manual. Belgrade, 2004. pg.596; R. Chokorilo, "Pedagogy of Sports". Belgrade: Higher sports training school, 1998 (Novy Sad: Graph style). – pg.242). Gradually, specialist's theoretical readiness is updating in practice, all extra, alien everything that is needless disappear. On the other hand, the accumulated experience of practical activity constantly correlates with theoretical knowledge, finds links with theory and joins with it. In professionalism future professional ripens, who starts to have his own system of activity. It happens with higher educational institutions graduates after adaptation to professional-pedagogical activity which takes

several years. Meanwhile, at this period physical culture specialists are still reaching to the peaks of their profession, accumulate experience and start to create consciously or unconsciously their authors' system of activity.

Finally, after certain period of time, specialist reaches his next stage of professional development. His "workmanship" is formed. "Workmanship" is a systemic feature of personality, which, on the base of his professional adequacy, in the process of education and labor, is transformed into individual (author's) skillfulness, permitting to reach the peaks of pedagogical activity [10]. However, not all specialists can go the way from "professionalism" to "workmanship" of high level. It depends on many reasons.

One of the main signs and results of pedagogue –master who reached the peaks of his profession (acme) – is creation of author's system of activity. As per the classification by V.P.Branskiy & S.D. Pozharskiy [1], there are several models of appearance of professional activity peaks. One-peak model means reaching only one peak (acme). Multi-peaks model means reaching several peaks in the process of professional activity, which are approximately equal by their level, value at definite period of time. Macro-peak model is a kind of "ladder" type variant, when peaks gradually rise and reach their maximum; in the future they gradually go down. In the opinion of some authors there also exits "bottomless" (i.e. not going down) model, which can be depicted by continuous, ascending to maximum peak, line which is broken in its way upward [1]. However as per the data, obtained by academician N.V. Kuzmina, movement to professional peaks on example of school teachers does not occur absolutely upward. All tested manifested short wave-like recessions with sequential new ascents [5]. Probably, the mentioned regularity is connected with objective influence of different factors, including effect of natural biological rhythms.

Author's system, created by a pedagogue is a mature pedagogical system, having common features with his colleagues' activity but also having special, individual style and content which distinguish this master from others. This originality was earlier formulated by P.F. Lesgaft in his expression: "Method is me!" [5]. On previous stages of self-movement to professional peaks specialist creates only different ideas, intentions and fragments of his future author's system. Acquiring more perfect format, such system is practically and theoretically tested. When the author's system of professional activity is a recognized fact, specialist, as a rule, has certain insignia, status, awards, proving his high professional level.

Summary.

The study of relationship of conceptions "competence" and "workmanship" of physical culture specialist shows that:

- competence is mainly interpreted as theoretical preparedness of personality unlike workmanship, which is the final aim of specialist's formation;
- on the assumption of the said above, "competence" can be used in higher educational institutions, but must not be defined as the final result of physical culture specialists formation. It is necessary to regard competence as a regular stage of specialist's movement to his workmanship;
- when preparing sports-pedagogical specialists, it is necessary to orient not only to the current educational standards, but to revelation of students' professional adequacy peculiarities, its initial state and its dynamics;
- selection of school leavers in the higher educational institution admittance period should be carried out considering the revealed indicators of their professional adequacy to the activity in sports sphere;
- in the period of study at higher educational institutions it is necessary to orientate future specialist not only to gaining knowledge and competences but also to formation professionalism, workmanship, achievement of peaks in physical culture activity. Students shall learn the ways and methods of mastering the chosen profession and achieving professional peaks;
- preconditions of formation of future workmanship shall be created on the base of idea of actual educational humanization, discovering of abilities and potentials of students' personalities, formation of their personalities' culture.

References:

1. Branskij V.P., Pozharskij S.D. *Social'naia sinergetika i akmeologiia* [Social synergetics and acmeology], Sankt Petersburg, 2001, 200 p.
2. Gorelov A.A., Gorelov S.A., Rumba O.G., Sokorev V.V. O neobkhodimosti defragmentacii soderzhaniia sovremennogo fizkul'turnogo obrazovaniia [About the necessity of defragmentation of maintenance of modern athletic education]. *Strategiia razvitiia sporta dlia vsekh i zakonodatel'nykh osnov fizicheskoj kul'tury i sporta v stranakh SNG* [Strategy of development of sport for all and legislative bases of physical culture and sport in the countries of the CIS], Kishinev, USEFS, 2008, pp. 33-38.
3. Daupaev M.O., Kuvashev B.M. Pedagogicheskie aspekty podgotovki specialista po fizicheskoj kul'ture i sportu [Pedagogical aspects of preparation of specialist on a physical culture and sport]. *Sovremennye tendencii razvitiia fizkul'turnogo obrazovaniia* [Modern progress of athletic education trends], Ural'sk,WKSU Publ., 2010, pp. 58-61.
4. Zhampeisova K.K., Dosybaeva G.K. *Vestnik Zapadno-Kazakhstanskoj gumanitarnoj akademii* [Announcer of the A West Kazakhstan humanitarian academy], 2010, vol.1(12), pp. 7-13.
5. Kuz'mina N.V. (Golovko-Garshina). *Predmet akmeologii* [Subject of acmeology], Sankt Petersburg, Politekhnika, 2002, 189 p.
6. Mishin B.I. *Nastol'naia kniga uchitelia fizkul'tury* [Table book of teacher of physical education], Moscow, Astrel, 2003, 526 p.
7. Rusova N.Iu. *Sovremennye tekhnologii v nauke i obrazovanii* [Modern technologies in science and education], Lower Novgorod, LNSPU, 2002, 200 p.
8. Sobianin F.I. *Professional'no-pedagogicheskaia prigodnost' studentov k deiatel'nosti uchitelia fizicheskoj kul'tury* [Professionally-pedagogical fitness of students to activity of teacher of physical culture], Cand. Diss., Leningrad, 1991, 24 p.
9. Sobianin F.I. *Professional'naia podgotovka uchitelej fizicheskoj kul'tury na osnove kul'turologicheskogo podkhoda* [Professional preparation of teachers of physical culture on the basis of culturological approach], Dokt. Diss., Sankt Petersburg, 2002, 53 p.
10. Sobianin F.I. *Vvedenie v akmeologiiu uchitelia fizicheskoj kul'tury* [Introduction to the acmeology teacher of physical culture], Shuya, SSPU, 1998, 239 p.
11. *Slovar' inostrannykh slov* [Dictionary of foreign words], Moscow, Russian language, 1989, pp. 247.
12. Smolianinova O.G. *Informatika i obrazovanie* [Informatics and education], 2002, vol.9, pp. 45-50.
13. *Sovremennyj slovar' inostrannykh slov* [Modern dictionary of foreign words], Moscow, Russian language, 1993, p. 295.
14. Choshanov M.A. *Pedagogika* [Pedagogics], 1997, vol.2, pp. 34-37.
15. Shakhverdov G.G. *P.F. Lesgaft. Ocherk zhizni i nauchno-pedagogicheskoj deiatel'nosti* [P.F. Lesgaft. Essay of life and to scientifically-pedagogical to activity], Leningrad, 1950, 338 p.
16. Enric M. Sebastiani I. Obrador. *Competence Profile of Physical Education Teachers. Professionals and volunteers in physical education*. Monograph book of scientific and professional articles. editors Jana Vasickova, Branislav Antala, Bratislava, 2012, pp. 28-37.

Information about the authors:

Sobyanin F.I.: Sobyanin@bsu.edu.ru; National Research University Belgorod State University; Pobeda 85, Belgorod, 308015, Russia

Dudkina S.G.: Sobyanin@bsu.edu.ru; National Research University Belgorod State University; Pobeda 85, Belgorod, 308015, Russia

Cite this article as: Sobyanin F.I., Dudkina S.G. About a competence and professional trade of specialists in the field of physical culture. *Physical Education of Students,* 2013, vol.1, pp. 68-73. doi:10.6084/m9.figshare.156361

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 21.01.2013
Published: 09.02.2013

COMPARATIVE ANALYSIS OF MOVEMENTS ACTIVITY WITH AND WITHOUT BALL IN TRAINING OF 11-15 YEARS OLD YOUNG FOOTBALLERS OF DIFFERENT PLAYING LINES

Usakovsky Y.O., Bova N.I.
National Academy of Home Affairs of Ukraine

Abstract. Motive activity of young footballers of different playing lines of business is considered. For research is served the actions of players aged 11-15 years (n=93). The analysis of motive activity of footballers is presented with ball and without on the stage of base pre-treatment. The value of motive activity is appraised for competition activity of footballers. The necessity of development of specific capacity of footballers is certain. It is set that dimension of motive activity of 11 years footballers (20 persons) includes slow runs - from 23,9 to 25 minutes; accelerations on different distances - from 3 to 3,4 minute; jerks - from 2 to 3,4 minute; jumps and fight for a ball - from 0,9 to 1,1 minute. On the average for training (90 minutes) footballers running during 45 minutes (from them 4 minutes of contiguities with ball).

Keywords: football, players, training, ball, endurance.

Introduction

A present stage of development, football is characterized by a large scope of motion activity, high speed of movement and by participation of practically every player both in defense and in attack [3]. As a result, adversary instantly puts a player, who captured the ball, in strict conditions of time and space deficit.

The stage of initial training in football is a period of fundamental preparation and its efficiency and purposefulness will to a large extent determine the whole period of further players' improvement. It has already established that even at early stages of training young sportsman must clearly understand main tactic and technical techniques and the technology of their using [4]. Numerous observations of football players' of different qualification and age games revealed that tactics of any game inevitably strengthen the requirements to training "game without ball", to football players' technical skillfulness and to game with ball [10].

In this connection the problem of physical efficiency and accuracy of footballers' tactic and technique actions with ball and footballers' movements without ball has become ever more acute. The less footballers make mistakes, executing actions with ball, the more often and appropriately they take acute and favorable positions, moving on football field, the more they have opportunities for creation and realization of tactic intentions, leading to victory.

That is why the problem of young footballers' movement actions in its full scope, both in training and in competitions takes an important place in a number of actual sports research directions.

In connection with the above said, this problem has significant theoretical and practical meaning for preparation of full-fledged football reserve in Ukraine.

The research has been carried out as per plan of scientific and research works in the sphere of physical culture and sports for 2011-2015 on subject 2.3 "Scientific and methodological fundamentals of perfection of football sportsmen's training, considering the peculiarities of competition activity".

Purpose, tasks of the work, material and methods.

The purpose of the work is analysis of young, 11-15 years old, footballers' movement activity scope with and without ball in training.

The methods of research:

1. Analysis of scientific and research literature on the studied problem.
2. Pedagogical experiment.
3. Pedagogical observations.
4. Statistical processing of the obtained data.

Results of researches.

By the present time a lot of researches of footballers' movement activity in competitions have been fulfilled. As a result data about character and scope of players' action with and without ball have been obtained.

Football relates to kinds of sports in which greater part of players' activity is running load of different speeds. Running of footballer is composed of different forms of movement (traveling, accelerations, jerks to different directions). It often starts from different positions, with sharp changing of rhythm and race [8].

Actions with ball are very important forms of movement which are applied in game. Exactly they determine the specificity of this kind of sports and differentiate it from the other kinds. As it is known, the main forms of football movements are kicks, stops, dribbling, dodging, side throw-in, goal-keeper technique. Ball passes are the fundamentals of group and team playing. They determine the race of game, attacking and defensive combinations' speed [1, 3, 4, 11-13]. The character of passes influence on the style of team's playing. Goal kicks are the most essential element of game. They condition efficiency of game and the number of goals.

In the period of game a footballer has in average from 34 to 70 contacts with ball and summarized time of direct contact is about 135 – 165 seconds. It was established that centerline footballers hold ball the most frequently, and central fullbacks – the least frequently [7].

doi: 10.6084/m9.figshare.156362

At modern stage of football development a trend to universalizing of footballers is traced, there is an intention to level the boundaries between the duties of fullbacks, half-backs, and forwards. One of the main principles of universalism is interchangeability of different lines' footballers: fullbacks should be skilled in attacking and forwards – in defense. [9].].

For mastering of main tactic points one should clearly imagine which requirements are lodged to footballers depending on their role in game. As it is known all footballers are differentiated into goalkeepers, back line players, center line players and forwards by their functional duties [3].

In training of footballers of certain age coach shall consider morphological and functional capabilities of the trainers [1]. Main demand of juvenile age is connected with the process of puberty. It is characterized by intensive development of endocrine system, significant neurohormonal reconstructions and intensive development of all physiological systems of teenager's organism.

In this period significant psychological changes occur. High emotionality, unbalanced state of mood, unmotivated actions, hot temper, exaggeration of own abilities take place. The source of this is – intensive physical development, puberty, appearance of the so-called feeling of maturity [1, 9].

Methodologically correct sports trainings of teenagers influence positively on formation of trainees' organisms. It manifests in double way, both: as morphological changes like growth of anthropometric properties and as functional shifts like increased efficiency.

Teenagers' organisms are quickly adjusted for work. It is explained by better mobility of nervous processes, that is why warming-up shall take not more than 8-10 minutes [1, 8, 9, 10].

Thus, by 11-15 years age, boys' organisms have mainly formed.

General endurance of young footballers is growing with age. And this growth is uneven. With insufficient its growth at initial training stage (8-10 years old) it is changed by sharp growth in age groups from 11 to 15 (specialization stage). After 16 (stage of sports perfection), general endurance race reduces. Increase of aerobic component of endurance, connected with its natural growth and with influence of training and competition loads, ends, mainly by 20-21 years old age.

Essential dynamics of speed endurance is observed at 12-15 years age. Natural growth of speed endurance ends by 18 years age and equals to 90-95% of adult footballers' endurance [10].

Coming out from the above said, e conducted comparative analysis of motion activity scope with and without ball of different game roles (only field players) of young footballers of Road physical culture and sports club "Locomotive" (Kiyev). We conducted it on example of training class directed to development of special endurance. As means there were used: playing and tactic and technique exercises (footlball on small sites with shortened number of players; kicking goals after dribbling; dodging of stands; ball passes in movement in pairs; in groups of three; games in "square" – 4x2, 5x3, 4x2 on sites of different areas).

Table 1

Motion activity scope of 11 years old footballers

Game role	Motion activity scope (min.).										
	With ball						Without ball				
	passes	stops	dribbling	dodging	kicks	Other actions	Slow trveling	Accelerations at different distances	jerks	Jumps and fight for ball	Pauses between exercises
Fullback	0,2	0,15	0,51	1,12	0,21	1,1	25	3	2	1	10
Halfback	0,27	0,19	1,14	1,21	0,24	1,19	23,9	3,4	2,7	1,1	10
Forward	0,24	0,16	1,1	1,17	0,3	1,1	24	3,1	3,4	0,9	10
Total	Fullback: With ball– 3.29 min Without ball– 41 min			Halfback: With ball– 4.24 min. Without ball– 41.1 min				Forward: With ball– 4.07 min. Without ball– 41.4 min.			

The scope of motion activity of young (11 years old) footballers (20 persons), on example of training class, directed to development of general endurance showed that their motion activity without ball consists of slow traveling from 23.9 to 25 minutes; accelerations at different distances – from3 to 3.4 minutes; jerks – from 2 yo 3.4 minutes; jumps and fights for ball – from 0.9 to 1.1 min. See table 1.

In average, during training class (90 minutes) young footballers (11 years old) are running for 45 minutes, including 4 minutes of contacts with ball.

The scope of motion activity of 12 years old footballers (19) persons showed, on example of training class, directed to development of general endurance, that their motion activity is higher than of younger players: slow traveling– from 24.1 to 24.9 minutes; accelerations at different distances – from 3.2 to 3.4 minutes; jerks –from 2.05 to 3.8 minutes; jumps and fights for ball – from 0.9 to 1.1 minutes. See table 2.

Table 2

Motion activity scope of 12 years old footballers

Game role	Motion activity scope (min.)										
	With ball						Without ball				
	passes	stops	dribbling	dodging	kicks	Other actions	Slow traveling	Accelerations at different distances	jerks	Jumps and fight for ball	Pauses between exercises
Fullback	0,21	0,16	0,53	1,2	0,23	1,2	24,9	3,2	2,05	1,05	10
Halfback	0,29	0,21	1,2	1,29	0,29	1,21	24,1	3,4	2,7	1,1	10
Forward	0,24	0,19	1,1	1,3	0,32	1,17	24,3	3,3	3,8	0,9	10
Total	Fullback : With ball– 3.53 min Without ball– 41.2min.			Halfback: With ball – 4.49 min. Without ball– 41.3 min				Forward: With ball– 4.32 min. Without ball– 42.3 min.			

Slow traveling became more seldom because the time for accelerations and jerks increase. Total time of direct contact with ball is from 3.53 to 4.49 minutes.

The scope of motion activity of 13 years old young football players (18 persons) showed that their motion activity without ball a little bit higher than of 11-12 years old boys: slow traveling – from 24.1 to 24.7 minutes; accelerations at different distances – from 3.27 to 3.5 minutes; jerks – from 2.5 to 3.9 minutes; jumps and fights for ball – from0.86 to 1.17 minutes. Total time of direct contact with ball is from 3.57 to 4.61 minutes.

Motion activity of 14 years old young football players (18 persons) is, out of the questions, higher than of their younger colleagues: slow traveling – from 24.5 to 24.7 minutes; accelerations at different distances – from 3.41 to 3.55 minutes; jerks – from 2.25 to 3.95 minutes; jumps and fights for ball – from 0.9 to 1.17 minutes. Total time of direct contact with ball is also higher, i.e., from 4.2 to 4.92 minutes.

Table 3

Motion activity scope of 15 years old footballers

Game role	Motion activity scope (min).										
	With ball						Without ball				
	passes	stops	dribbling	dodging	kicks	Other actions	Slow traveling	Accelerations at different distances	jerks	Jumps and fight for ball	Pauses between exercises
Fullback	0,35	0,31	1,25	1,2	0,35	1,4	24,6	3,49	2,45	1,21	10
Halfback	0,41	0,38	1,41	1,48	0,46	1,41	24,2	3,57	3,09	1,27	10
Forward	0,39	0,34	1,32	1,7	0,42	1,47	24,1	3,57	4,15	1,05	10
Total	Fullback: With ball– 4.86 min. Without ball– 41.75 min.			Halfback: With ball– 5.55 min. Without ball– 42.13 min				Forward: With ball– 5.64 min Without ball– 42.87 min			

Total time of direct contact with ball of 15 years old footballers (18 persons) is 4.86 – 5.64 minutes. From 90 minutes of training time 45-49 minutes belongs to motion activity (table 3). In the base of the conducted observations, it has been determined that from total scope of actions, which a player carries out during training, 20% belongs to ball passes, 7% to dribbling, 4% to dodging, 2.5% to kicking goals, 5% to to other actions.

It has also been determined that centerline players hold ball the most frequently and central full and halfbacks – the least frequently.

Summary.

Analysis of literature and results of pedagogical observations show that it is necessary to study motion activity and reliability of execution of technique and tactic players' actions of different roles in youth teams. Motion activity of players both of 11 years old and 15 years old includes great scope of movements without ball. The character of young players' movements varies by speed and by direction. Regarding the reliability of execution of individual and group tactic and technique actions, it should be noted that young football players (11-12 and 12-13 years old) yield to their elder associates in reliability of ball passes.

In training process more attention should be paid to the development of specific efficiency of the players of all roles (except goalkeeper), which permit to maintain motion activity and reliability of attacking and defensive tactic and technique actions' fulfillment on high level.

References

1 Variushin V.V. *Trenirovka iunykh futbolistov* [Training of young footballers], Moscow, Physical Culture and Sport, 2007, 112 p.
2 Golomazov S.V., Chirva B.G. *Futbol* [Football], Moscow, Division, 2006, 112 p.
3 Iermolenko P.V. *Teoriia i metodika fizichnogo vikhovannia i sportu* [Theory and methods of physical education and sport], 2010, vol.3, pp. 27-32.
4 Iermolenko P., Zalojlo V. *Teoriia i metodika fizichnogo vikhovannia i sportu* [Theory and methods of physical education and sport], 2012, vol.1, pp. 16-22.
5 Tumanian G.S. *Strategiia podgotovki chempionov: nastol'naia kniga trenera* [Strategy of preparation of champions: table book of trainer], Moscow, Soviet sport, 2006, 496 p.
6 Monakov G.V. *Podgotovka futbolistov* [Training of footballers], Moscow, Soviet sport, 2007, 288 p.
7 Kuk M., Shoulder D. *Trenirovochnye programmy i uprazhneniia ot vedushchikh trenerov mira* [Trainings programs and exercise from the leading trainers of the world], Moscow, Astrel, 2009, 128 p.
8 Kuznecov A.A. *Futbol. II etap (11-12 let)* [Football. II stage (11-12 years)], Moscow, Olimpiya, Man, 2008, 208 p.
9 Kuznecov A.A. *Futbol. II etap (11-12 let)* [Football. III stage (13-15 years)], Moscow, Olimpiya, Man, 2008, 312 p.
10 Polishkis M.S., Vyzhgin V.A.*Futbol* [Football], Moscow, Physical education, education and science, 1999, 254 p.
11 Aboudrar S., Rkain H., Errguig L., Radjab Y., Oukerraj L., Azzaoui A., Ibrahimi A., Coghlan L., Cherti M., Benjelloun H., Dakka T. Young footballers, assessed by deep breathing test, have a higher vagal response. *Open Journal of Molecular and Integrative Physiology*. 2012, vol.2, pp. 61-64. doi:10.4236/ojmip.2012.23009
12 Andrew E. Kilding, Helen Tunstall, Dejan Kuzmic. Suitability of FIFA's "The 11" training programme for young football players - impact on physical performance. *Journal of Sports Science and Medicine*. 2008, vol.**7,** pp. 320-326.
13 Marijana Mladenovic, Aleksandar Marjanovic. Some differences in sports motivation of young football players from Russia, Serbia and Montenegro. *SportLogia*. 2011, vol.7(2), pp. 145–153. doi:10.5550/sgia.110702.en.145M

Information about the authors:

Usakovskiy Y. O.: humph@ukr.net National Academy of Internal Affairs of Ukraine; Kudryashova str. 8, Kiev-150, 03035, Ukraine.

Bova N.I.: humph@ukr.net; National Academy of Internal Affairs of Ukraine; Kudryashova str. 8, Kiev-150, 03035, Ukraine.

Cite this article as: Usakovsky Y.O., Bova N.I. Comparative analysis of motive activity with a ball and without in training of different playing lines of young footballers aged 11-15 years. *Physical Education of Students,* 2013, vol.1, pp. 74-77. doi:10.6084/m9.figshare.156362

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 12.12.2012
Published: 09.02.2013

THE PREVENTION PROGRAMS OF PHYSICAL REHABILITATION FOR CHERNOBYL DISASTER SURVIVORS

Korobeynikov G.V., Drojjin V.U.*
National University of Physical Education and Sport of Ukraine
* Luhansk Taras Shevchenko National University

Abstract. The purpose of the study: approbation of the prevention program of physical rehabilitation for Chernobyl disaster survivors in lifestyle aspects. Sixty persons who were disaster survivors and workers of Chernobyl Nuclear Power Plant aged 32-60 have rehabilitation during 21 days. The complex of training prevention programs of physical and psycho-emotional rehabilitation methods was elaborated. The study of efficacy of training prevention programs among Chernobyl disaster survivors. The results showed the improvement of psycho-emotional status and normalization of cardiovascular vegetative regulation after training prevention programs in Chernobyl disasters survivors. The studies show that the preventive programs for Chernobyl disaster survivors in lifestyle aspects had the high effect. This displays the decrease of tempo of aging and the improving of physical and psychological health status of Chernobyl disaster survivors during preventive course.
Key words: preventive programs, physical rehabilitation, Chernobyl disaster survivors, lifestyle, health.

Introduction

There are many medical consequences obtained twenty seven years before accident on Chernobyl Nuclear Power Plant. This is more important problem for Ukraine and people of the world. The studies of Ukrainian scientists showed the decrease of cardiovascular disease of people who live in Chernobyl region (more then 30 km around) after accident [1, 2, 3, 4]. Apart from, the long stay in ecological disaster region is resulted is evolution of the psycho-emotional disorders and psychosomatic pathologies [5, 6, 7, 8].

The use of pharmacological rehabilitation may accompany with "drug's disease". Still the lifestyle change intervention with diet, aerobic exercise and stress management as prevention rehabilitation methods was more effective.

Purpose, tasks of the paper, material and methods

The aim of the study: approbation of the prevention programs of physical rehabilitation for Chernobyl disaster survivors in lifestyle aspects.

Methods

Sixty persons, disaster survivors and workers of Chernobyl Nuclear Power Plant aged 32-60 have rehabilitation during 21 days.

The complex of physical rehabilitation programs as lifestyle change intervention included:

- low-fat diet with finishing of smoking and alcohol using: vegetable low-meet foods;
- physical aerobic exercises use complex of physical rehabilitation;
- stress management includes psychotherapy and training course of psycho-emotional rehabilitation.

The rules for complex of physical rehabilitation for Chernobyl disaster survivors:

1. The training lessons of physical rehabilitation must be held on the sporting hall or open ground.
2. The training lessons of physical rehabilitation must be held among patients of II or III Chernobyl disaster categories.
3. The training lessons of physical rehabilitation must include morning exercises and healthy exercises.
4. The morning exercises must be hold 10 minutes after awakening and 30 minutes before breakfast. Duration of morning exercises - 20-30 minutes.
5. The healthy exercises must be hold 1-2 an hour before and 2 an hour after meal, in the second part of the day. Duration of healthy exercises - 1 an hour.

The study of the effect of preventive program for Chernobyl disaster survivors. The functional age and tempo of aging as criterion of health status were studied.

The tempo of aging (TA) was determined [9]:

$$\mathbf{TA = (BPSr/BPSt + BPDr/BPDt + HRr/ HRt + HRw r/ HRw t + + VCt/VCr + HBIt/HBIr + HBEt/HBEr + SBt/SBr) / n,} \quad (1)$$

were: TA - tempo of aging (secret unit); BPS - blood pressure systolic (mm); BPD - blood pressure diastolic (mm); VC - vital capacity of the lungs (l); HBI - hold the breath in inhale (s); HBE - hold the breath in exhale (s); SB - static balance (s); HR - heart rate in rest (min-1); HRw - heart rate after 20 squats (min-1); r - real estimation of parameter; t - table estimation of parameter; n - number of parameters.

Functional age was determined:

$$\mathbf{FA = TA * KA,} \quad (2)$$

were: KA - calendar age (years).

Table 1

Average population parameters for women, which include the tempo of aging formula

Parameters	Age groups, years					
	20-29	30-39	40-49	50-59	60-69	70 and over

doi: 10.6084/m9.figshare.156363

Blood pressure systolic, mm	120	120	130	130	130	130
Blood pressure diastolic, mm	70	70	70	80	80	80
Heart rate in rest, min^{-1}	60	70	70	70	70	75
Heart rate after 20 squats, min^{-1}	120	130	140	150	150	150
Vital capacity of the lungs, l	3,0	2,8	2,8	2,0	1,8	1,8
Hold the breath in inhale, s	60	60	40	30	20	20
Hold the breath in exhale, s	40	40	20	20	18	18
Static balance, s	30	30	20	18	18	10

The average parameters, which include formula (1), are presented in the tab.1 (for women) and tab.2 (for men). These meanings were the results of the analysis of investigations in aging researches areas and our investigations.

Psycho-emotional status of patients was studied by subjective estimation of self-sense, activity and mood, before and after one rehabilitation course.

Table 2

Average population parameters for men, which include the tempo of aging formula

Parameters	Age groups, years					
	20-29	30-39	40-49	50-59	60-69	70 and over
Blood pressure systolic, mm	120	120	130	130	130	130
Blood pressure diastolic, mm	70	70	70	80	80	80
Heart rate in rest, min^{-1}	60	70	70	70	70	75
Heart rate after 20 squats, min^{-1}	120	130	140	150	150	150
Vital capacity of the lungs, l	3,5	3,4	3,0	2,9	2,6	2,0
Hold the breath in inhale, s	90	90	80	60	40	30
Hold the breath in exhale, s	60	60	40	30	20	20
Static balance, s	60	60	40	30	20	10

Results of the research.

The average parameters of functional age and tempo of aging in patients before and after preventive course are presented in tab.3.

Table 3

Average data of functional age and tempo of aging in Chernobyl disaster survivors before and after preventive course

State	Age, years	Functional age, years	Tempo of aging
Before preventive course	48,81±1,91	71,75±5,62	1,58±0,09
After preventive course	48,81±1,91	66,76±4,31	1,36±0,06

The results showed the increasing of the functional age (71,7±5,62) for comparative of calendar age (48,81±1,91) before the prevention course. This is associated with the acceleration type of aging and decline of health in Chernobyl disaster survivors.

The average parameters, which include formula of determination of tempo of aging before and after preventive course of Chernobyl disaster survivors, are presented in tab.4.

Table 4

Average parameters, which include the tempo of aging formula in Chernobyl disaster survivors before and after preventive course

Parameters	Before preventive course	After preventive course
Blood pressure systolic, mm	130,13±3,13	127,21±2,60*
Blood pressure diastolic, mm	82,37±2,22	79,08±1,58*
Vital capacity of the lungs, l	2,79±0,11	2,91±0,25

Hold the breath in inhale, s	40,31±3,14	41,82±3,09*
Hold the breath in exhale, s	21,62±1,43	24,17±1,61*
Static balance, s	8,03±1,98	9,52±1,93
Heart rate in rest, min^{-1}	77,28±2,06	75,11+1,33*
Heart rate after 20 squats, min^{-1}	117,66±4,06	115,17±4,10*

* - $p < 0,05$

The analysis of this data shows the increase of arterial blood pressure for concerning health norm. This fact demonstrates the significant role of heart health for people who Chernobyl disaster survivors.

At the same time, the decrease of static balance for concerning average population meanings may be related with internal brain vascular disturbance.

The decline of respiratory functions displays the decrease of hold the breath in inhales and exhales parameters.

The tempo of aging structure before preventive course was studied for multiple correlation between functional age and parameters, which include formula of determination of tempo of aging (tab. 5).

Table 5

Results of multiple correlation analysis between functional age and parameters, which include the tempo of aging formula before preventive course in Chernobyl disaster survivors

Parameters	t	R
Static balance	3,41	- 0,26
Vital capacity of the lungs	2,84	-0,48
Blood pressure diastolic	2,38	0,65
Heart rate after 20 squats	2,45	0,02
Heart rate in rest	2,20	0,39
Total correlation	3,53	0,71

According to correlation analysis the functional age in Chernobyl disaster survivors before preventive course was the determination of heart parameters and static balance parameters.

After preventive course program, the average parameters of functional age in Chernobyl disaster survivors decrease. This demonstrates the improving of general health status in Chernobyl disaster survivors (tab. 3). But, the tempo of aging after preventive course remains accelerating (tab. 3).

The decrease of arterial blood pressure, heart rate in rest and after physical load, increase of vital capacity of lungs and static balance showed the improvement of health promotion in Chernobyl disaster survivors during the preventive course (tab.4).

The results of multiple correlation analysis between functional age and parameters, which include formula of determination of tempo of aging in Chernobyl disaster survivors after preventive course, are presented in tab. 6.

Table 6

Results of multiple correlation analysis between functional age and parameters, which include the tempo of aging formula after preventive course in Chernobyl disaster survivors

Parameters	T	R
Blood pressure systolic	5,60	0,83
Blood pressure diastolic	2,01	0,56
Heart rate in rest	1,79	0,19
Static balance	1,36	-0,31
Heart rate after 20 squats	2,23	0,09
Total correlation	3,62	0,78

As it is seen on tab. 6, the general structure of aging in Chernobyl disaster survivors after preventive course does not change. But, there are changes of internal structure of aging among studied parameters.

According to this data the main factor, which determined of aging structure in Chernobyl disaster survivors after preventive course is arterial blood pressure.

Thus, one of the ways for possibility of the health improving in Chernobyl disaster survivors is related with the regulation of arterial blood pressure.

The average parameters of psycho-emotional status of patients before and after preventive course are presented in tab. 7.

Table 7

Average parameters of psycho-emotional status in Chernobyl disaster survivors before and after preventive course

Parameters	Before preventive course	After preventive course
Self-sense, secret unit	5,33±0,18*	6,18±0,17*
Activity, secret unit	5,41±0,17*	6,05±0,22*

Mood, secret unit	5,67±0,20*	6,49±0,22*

* - $p < 0,05$

According to data from tab. 7 the subjective estimation of self-sense, activity and mood in Chernobyl disaster survivors improve during preventive course. This fact indicated the promotion of psychological health of Chernobyl disaster survivors during lifestyle change intervention.

The relations between psychological and physical health were studied. The correlation analysis between psycho-emotional status parameters and arterial blood pressure as criterion of physical health are presented on tab. 8.

According to this analysis close correlation is showed between arterial blood pressure and mood. At the same time the correlation between arterial blood pressure and parameters of psycho-emotional status before preventive course is closer for concerning after preventive course. This demonstrates the decrease of psycho-physiological tension of regulatory systems of human organism during preventive course of Chernobyl disaster survivors [10].

Table 8

Results of correlation analysis between parameters of psycho-emotional status and BPS in patients before and after preventive course.

Parameters	Before preventive course	After preventive course
Self-sense	- 0,27	- 0,17
Activity	- 0,35	- 0,05
Mood	- 0,39	- 0,05

This corresponds with correlation analysis data between mood and functional age: before preventive course correlation coefficient makes up $r = - 0,33$ ($p < 0,06$).

Thus, the improving of physical health after preventive course influence the promotion of the psychological health of Chernobyl disaster survivors.

Summary.

The studies show that the preventive programs for Chernobyl disaster survivors in lifestyle aspects had the high effect.

This displays the decrease of tempo of aging and the improving of physical and psychological health status of Chernobyl disaster survivors during preventive course.

However, the solution of problem of health promotion must have Government and International support of lifestyle changes preventive programs, especially for people who survivors Chernobyl accident.

Reference:

1. Zotov V.N., Korkushko O.V. *Medico-biological aspects of healthy rehabilitation system's in people who Chernobyl disaster survivors.* Kiev, Medecol "Medicine-ecology", 1996, 196 p.
2. Bebeshko V.G. Bazika D.A., Romanenko U.A., Loganovskiy K.M. Radiological and Medical Consequences of Chernobyl Catastrophe. *Journal National Academy of Medical Sciences of Ukraine,* 2011, pp. 132-138.
3. Kovalenko A. N. Kovalenko V. V. Systemic radiation syndromes,. Nikolaev, NGU Petra Mogily named, 2008, 248 p.
4. Bennett B., Repacholi Z., Carr M. *Health Effects of the Chernobyl Accident and Special Health Care Programmes.* Report of the UN Chernobyl Forum Expert Group "Health", Geneva,WHO, 2006, 160 p.
5. Lukianova O.N., Poliakov A.A., Korobeynikov G.V. Non-medical psychophysiological rehabilitation of neuro-emotional status. *Medical informational technology*, 1994, pp. 82-87.
6. Jiakovenko S.I. Principles, organizational forms and methods of psychological assistance to victims of the Chernobyl disaster. *Practical Psychology and Social Work.* 2005, vol.2, pp. 13–21.
7. Fava G.A., Sonino N., Wise T.N. The Psychosomatic Assessment. Strategies to Improve Clinical Practice. *Advances in Psychosomatic Medicine.* 2012, vol 32, pp. 1–18.
8. Richard L. Kradin. Psychosomatic disorders: the canalization of mind into matter. *Journal of Analytical Psychology*, 2011, vol.56, pp. 37–55.
9. Reshetiuk A.L., Poliakov A.A., Korobeynikov G.V. *Determination of functional age and tempo of aging.* Methodical recommendation. Kiev, Public Health Ministry of Ukraine, 1996, 10 p.
10. McGee E. J., Synnott H. J., Johanson K. J. Chernobyl fallout in a Swedish spruce forest ecosystem, *Journal of Environmental Radioactivity*, 2000, vol.48(1), pp. 59–78.

Information about the authors:

Korobeynikov G.V.: george651@mail.ru; National University of Physical Education and Sport of Ukraine; Fizkultury str. 1, Kiev, 03680, Ukraine.

Drojjin V.U.: mail@luguniv.edu.ua; Luhansk Taras Shevchenko National University; Defense str. 2, Lugansk, 91011, Ukraine.

Cite this article as: Usakovsky Y.O., Bova N.I. Comparative analysis of motive activity with a ball and without in training of different playing lines of young footballers aged 11-15 years. *Physical Education of Students,* 2013, vol.1, pp. 74-77. doi:10.6084/m9.figshare.156363

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 28.01.2013
Published: 09.02.2013

ESTIMATION OF COMPETITIVE ACTIVITY IN SYNCHRONIZED SWIMMING

Shul'ga L.M., Rudkovskaya T.I.
National University of Physical Education and Sport of Ukraine

Abstract. Aim – is to develop the approach to technical complexity estimation of free routine composition in synchronized swimming**.** Were analyzed and considered free routine compositions of the strongest swimmers in European and World Championships during the period under study (2008-2011). In the research took part 32 qualified athletes different ages. Were determined the options of the constructed of free program and location the combination saturation in those programs. Were established complicated elements distribution by the minutes of the free routine composition performance and developed the approach to technical complexity estimation of free routine composition (solo) for using in training and competitive activity for qualified athletes in synchronized swimming. The total time of breath-holding makes up 40% of the time of the whole free routine composition.
Key words: synchro, free, routine, elements, approach, technical, complexity, estimation.

Introduction

According to experts, it is typical for the up-to-date competition programs to become gradually more and more elaborated and complicated [1, 2, 5]. For free routine compositions performed by the strongest sportswomen it has become characteristic to increase dramatically the complexity of their performance, which is due to rise in the number of the free routine composition components, primarily, at the expense of complicated elements in the free routine composition, of increase in length of breath-holding relative to the total composition time, rise of technical complexity, which combined with the high accuracy of the components and connective elements in the performance, high tempo together with artistic skills may allow sportswomen to hold leading positions in the world rating charts [2, 4, 6-10]. The specialists in the synchronized swimming don't have common view about how is possible to objectively estimate free routine composition and which data has to consist the methodology. Solutions of these questions can improve the quality and effectiveness of training process.

It determines actuality of the chosen topic and scientific need for development.

Purpose, tasks of the paper, material and methods

The aim of the research – is to develop the approach to technical complexity estimation of free routine composition in synchronized swimming**.**

Methods of the research:

In the research took part 32 qualified athletes different ages. We watched 32 video recording free routine compositions during the 2008 – 2011 on the European and World Championships.

Results of the research.

Free routine compositions analysis of the world's strongest swimmers during the period under study (2008-2011) revealed rise in the number of complicated components, requiring tour de force: repeated push-outs in upside-down position together with different position changes, with position locks and prolonged spinning rotations, popping with various hand positions, multiple fast upright spins and rotations in different planes.

In free routine finalists' compositions at the world's championships and at the ones of Europe one of the leading places belongs to such spinning movements as rotations, fast upright spins, vortexes (swirls), which relate to the group of movements with high factor of technical complexity. Thus, their quantity in the free routine composition as well as the quality of their performance substantially influence total index of technical complexity of the composition being performed.

The use of various rotations in the free routine composition can get it to be not only more spectacular and interesting from the artistic point of view but also may make the conceived performance far more complicated, which, in its turn, raises high demands for both technical and specific physical qualifications.

One of the most important features of the free routine synchronized swimming composition is its complexity. Principal structural elements of the free composition which characterize its technical complexity are the connective ones, i.e. a set of the elements fulfilled by the swimmer while the breath is being held. Connective elements comprise a number of components and motions having various length of their performance and also are characterized by different levels of technical complexity.

In synchronized swimming, it is accepted to break connective elements into the following groups – simple, medium-complicated and complicated (advanced) depending both on the quantity of the elements and on their complexity as well.

The connective element which consists of 2-3 components, 2D figures and simple motions is considered simple. Connective movements of medium complexity comprise 4-8 elements, in which complicated motions are combined with simple ones. Connective movements comprising 9-12 elements are related to complicated, including such elements which require prolonged breath-holding, lifted-up extremities position lock, changes in pace of the movements being performed depending on the rhythm of musical accompaniment.

doi: 10.6084/m9.figshare.156364

Moreover, in order to improve spectacularity, free routine composition should be directed towards the main grandstands of the pool, so that the most effective, culminating moments might be seen by the judges and audience in the most advantageous view. Our research suggests that in the majority of cases, the best sportswomen of the world gain additional points for building up the trajectory of their movement in the pool during the performance – sometimes up to 3-4 points - to their advantage on the basis of this statement.

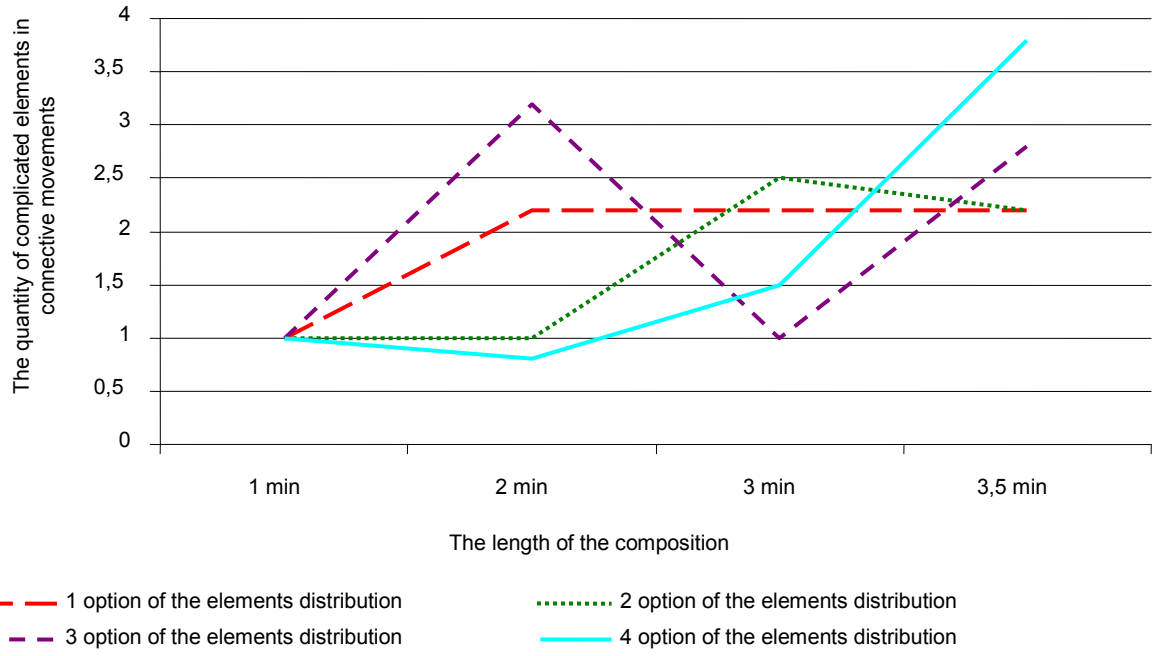
One of the factors taken into consideration by us in the present analysis, was the length of swimming in the free routine composition. While estimating the free composition, the judges also evaluate the distance covered by the swimmer during the performance on the surface of the pool which must comprise over 50 m. The distance covered by the sportswoman in fulfilling her free composition correlates with the level of her mastery skills and performance effectiveness – the length of the swimming trajectory of the world's best swimmers during the free routine composition performance comes up to 90 - 100 meters. Analysing the best swimmers free routine compositions it can be concluded that the length of swimming may be increased at the expense of the following factors:

- by increasing the speed of motion;
- by increasing the quantity of the elements carried out in motion: push-outs, swimming over-and underwater;
- by reducing static elements in number.

Furthermore, in estimating free routine compositions it was taken into account how many complicated connective movements and separate elements of high complexity both at the beginning and at the end of the composition were included into the free composition by the swimmers.

The research done by us into the distribution of the complicated elements under breath-holding and by the minutes of the performance revealed that there are existing a number of options to create combinative intensity in the free routine compositions for qualified sportswomen in synchronized swimming (pic. 1).

The research revealed that all the finalists of the World and European Championships possessed the following options of combinative intensity distribution by the minutes of their free routine compositions performance (pic. 1):



Picture 1. Options of the complicated elements distribution by the minutes of the free routine composition performance.

- High level of the combinative intensity in the 1st minute, which reduced by the beginning of the 3rd minute and stabilized by the end of the performance (option 1);
- High level of combinative intensity in the 1st minute of the performance which reduced considerably by the end of the 2nd minute, and the increased slightly by the 3rd minute and finally stabilized in the 4th minute (option 2);
- Medium level of combinative intensity in the 1st minute,which increased in the 2nd minute, then fell slightly by the 3rd minute and stabilized or increased in the final part (option 3);
- High level of combinative intensity in the 1st minute which gradually fell by the 3rd minute and rose in the 4th minute of the performance (option 4).

In individual cases, there has been revealed even distribution of combinative intensity over a period of the whole performance.

The index of the free routine composition technical complexity is the criterion of the technical preparation, which is a part of sport mastery skills. The criterion of sport mastery skills results in the expected sport outcome.

Consequently, the estimate of the free routine composition in the view of its technical performance and the index of its technical complexity which are tightly coupled with each other thus identifying the level of the swimmer's mastery skills influences sport outcome considerably.

On the basis of the analysis of the free routine compositions of the finalists at the World and European Championships in 2008-2011 (n = 32), there were identified by us several main components of the performance estimated by judges: main elements of the composition, connective movements, their complexity and performance quality, artistic impression on the viewers. There was also designed by us the approach to the technical complexity estimation of the free composition (solo performance), which provides for the analysis of the structural elements of the composition.

The approach to the freestyle composition estimation designed by us provides for the quantity registration, length of the elements performance and connective movements of the composition, their level of complexity, performance accuracy, elements distribution, movements of different levels of complexity in the composition.

The approach to the estimation of the free routine composition technical complexity comprises three main blocks:

1. differential estimation of connective movements: characteristics of the connective movements complexity (simple, medium-complicated and complicated); accuracy of the connective movement performance (centrality holding – body position holding is to be estimated relatively to one of the planes while the figure or the element is being performed);height of the body position lock; height of the overwater lifted-up extremities holding;
2. estimation of the body position height in egbite;
3. artistic impression: artistic skills, (ability to reveal the idea and the depth of the performance, arousing corresponding emotional experience of the judges and the audience); conformity of the carried out motion with music and artistic image.

All the awarded points are summed up and the integral estimate is calculated reflecting the level of the technical complexity of the free routine composition.

Additionally, without awarding points, there are also estimated such qualities as:

- quality of the elements which the connective movement consists of and the quantity of the complicated elements in the connective movement; length of the connective movement (is calculated from the beginning of the swimmer's immersion under water until the moment of the appearance over the water surface and is fixed in seconds);
- temporal and quantitative operation factors of the composition: total composition time; total quantity of connective movements, egbite position quantity, time of egbite performance; total quantity and total time of swimming; popping (total time of breath-holding sec, percentage of the time of breath-holding relative to the total time of the composition performance, %);
- swimming length and trajectory over the surface of the pool, is depicted with lines depending on both how and in which direction the sportswoman swam and is calculated in the total number of the meters covered by the swimmer while performing the composition.

With the purpose to improve and raise the effectiveness of qualified sportsmen training in synchronized swimming, rational creating and filling the composition, unbiased officiating and registration optimization of the main elements of the freestyle composition on the whole and in parts (individual elements or motions), we have designed and approved of the approach to the estimation of the free routine composition (solo) (table.1).

Table 1

Approach to the free routine composition estimation (solo)

Competitions, date, city:
Sportsman's full name, country:
Points for technical performance:
Points for artistic impact:
Total points (score):

Estimation criteria	Connective 1	Egbite and swimming	Connective 2	Egbite and swimming	Connective 3	Egbite and swimming	Connective 4	Egbite and swimming	Connective 5	Egbite and swimming	Connective 6	Egbite and swimming	Connective 7	Egbite and swimming
1. Quantity of the elements														
2. Quantity of complicated elements														
3. Connective element length (sec)														
4. Quantity of push-outs: - including rotations:														
360°														
540°														

720°														
- without rotations														
5. Quantity of fast upright spins														
6. Quantity of rotations														
7. Time of preparatory underwater action (sec)														
8. Connective element characteristics: - simple (0)														
- medium complicated (4)														
- complicated (8)														
9. Accuracy of connective element performance: - centrality holding(1/0)														
Lifted-up extremities position lock: - low (0)														
- average (3)														
- higher than average (6)														
- maximal(9)														
Overwater extremities height:														
- maximal(15)														
- higher than average (10)														
- average (5)														
- low(0)														
∑ of points:														
10. Egbite and swimming movements: Height in egbite position:														
- maximal (6)														
- higher than average (4)														
- average (2)														
- low (0)														
∑ of points:														
- duration of performance in egbite position (sec)														
- quantity of poppings														
- quantity and duration of swimming movements in the «upright angle with two» position (times / sec)														
-quantity and time of swimming movements in the «upright angle with one» position (times/sec)														
- duration of the swimming movements on back with moving extremities, sec														
- swimming length and trajectory on the pool surface (picture): TotalΣ of meters:														
11. Artistic impact: - artistic skills (1/0)														
- conformity of fulfilled motions with musical accompaniment (1/0)														
∑ points:														
12. Total composition duration, min														
13. Total time of breath-holding, sec														
14. Total quantity of connective elements														
15. Total quantity of swimming														
16. Total quantity of egbite														
17. Total ∑ of points:														

Summary.

1. It was established that the free routine programs of the strongest athletes in Europe and of the world consist of many complex elements, a variety of rotations, push-ups, and connective elements of only medium complicated and complicated level. The total time of breath-holding makes up 40% of the time of the whole free routine composition;
2. To increase the technical complexity of free routine composition athletes use a variety of walking motions in egbite, though much less swimming motions on the back, sides, etc.;
3. Furthermore, it was identified that there are four options of the complicated elements distribution by the minutes of the free routine composition performance, used by athletes, but their application depend on the level of physical, technical and tactical preparedness;
4. And basing on that we identified the main components of the program performance, as measured by the judges: the basic elements of composition, connective elements, their complexity and quality, artistic impression. Besides, it was developed that the approach to technical complexity estimation of free routine composition in synchronized swimming provides analysis for structural elements of the free routine program.

References:

1 Alentejano T., Marshall D., Bell G. A time – motion analysis of elite solo synchronized swimming. *International Journal of sports Physiology and Performance.* 2008, vol.3, pp. 31-40.

2 *Coaching intermediate synchronized swimming effectively*. U. S. Synchronized Swimming; Ed. by K. E. Van Buskirk. Champaign (Illinois): Human Kinetics, 1997, VII, pp. 75-88.

3 Synchronized swimming: elegance, effort, performance / Ed. by Pedro Adrega. *Fina Aquatics world magazine,* 2012, vol.3, pp. 52-55.

4 Volodymyr Adashevsky, Sergii Iermakov, Krzystof Prusik, Katarzyna Prusik, Karol Gorner. *Biomechanics: theory and practice.* Gdansk, Zdrowie-Projekt, 2012, 184 p.

5 Kartashov I.P., Vasil'eva T.V. *Analiz proizvol'nykh programm* [Analysis of the arbitrary programs], Moscow, Physical Culture and Sport, 1986, pp. 43-46.

6 Laputin A.N. *Nauka v olimpijskom sporte* [Science in Olympic Sport], 2001, vol.2, pp. 38-46.

7 Maksimova M.N.*Teoriia i praktika fizicheskoj kul'tury* [Theory and practice of physical culture], 1983, vol.4, pp. 8-11.

8 Rudkovs'ka T.I. *Teoriia i metodika fizichnogo vikhovannia i sportu* [Theory and methods of physical education and sport], 2010, vol.3, pp. 57 – 61.

9 Rudkovs'ka T.I. *Aktual'ni problemi fizichnoyi kul'turi i sportu* [Actual problems of physical culture and sports], 2011, vol.21(2), pp. 28 – 32.

10 Stepanova T.P. *Kontrol' special'noj podgotovlennosti sportsmenok specializiruiushchikhsia v sinkhronnom plavanii na raznykh etapakh sportivnogo sovershenstvovaniia* [Control of the special preparedness of sportswomen specialized in the synchronous swimming on different етапах of sporting perfection], Cand. Diss., Kiev, 1993, 23 p.

Information about the authors:

Shulga L.M.: pgr@ukr.net; National University of Physical Education and Sport of Ukraine; Fizkultury str. 1, Kiev, 03680, Ukraine.

Rudkovskaya T.I.: 4rudkovskaya@gmail.com; National University of Physical Education and Sport of Ukraine; Fizkultury str. 1, Kiev, 03680, Ukraine.

Cite this article as: Shul'ga L.M., Rudkovskaya T.I. Estimation of competitive activity in synchronized swimming. *Physical Education of Students,* 2013, vol.1, pp. 82-86. doi:10.6084/m9.figshare.156364

The electronic version of this article is the complete one and can be found online at: http://www.sportedu.org.ua/html/arhive-e.html

Received: 29.12.2012
Published: 09.02.2013

Information Sponsors, Partners, Sponsorship:
Belgorod State Shukhov Technological University,
National Research University Belgorod State University,
Siberian State Aerospace University,
Olympic Academy of Ukraine,
Ukrainian Academy of Sciences.

SCIENTIFIC EDITION

Physical Education of Students. 2013, vol.1, 82 p.

.....

A layout is made by editorial and publishing department of KSADA:
certificate DK №860 20.03.2002.
layout - Masterova Y.
technical editor - Iermakova T.
designer of a cover - Bogoslavets A.
site admin - Ulanchenko Y.
passed for printing 09.02.2013. Format A4.

PES

PHYSICAL EDUCATION OF STUDENTS