

ISSN 1818-9210

PEDAGOGICS

PSYCHOLOGY

**Medical-Biological
Problems of Physical
Training and Sports
№09/2013**



Key title: Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu

Abbreviated key title: Pedagog. psihol. med.-biol. probl. fiz. vihov. sportu
ISSN 1818-9172 (Print),
ISSN 1818-9210 (Online).

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

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Journal is ratified the Higher Attestation Commission of Ukraine: (pedagogical sciences, physical education and sport) Decision of Presidium 1-05/3 from 08.07.2009.

Journal is reflected in databases:

Academic Journals Database

<http://journaldatabase.org>

CORE

<http://core.kmi.open.ac.uk>

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Electronic Library of Russia

<http://elibrary.ru>

Certificate to registration:

KB 15370-3942PR. 06.07.2009.

Frequency - 1 number in a month.

Address of editorial office:

Box 11135, Kharkov-68, 61068, Ukraine,

Tel. 38-057-706-28-08; fax: 38-057-706-15-60

<http://www.sportpedagogy.org.ua>

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THE INFLUENCE OF THE EXPERIMENTAL PROCEDURE ON THE FUNCTIONAL STATUS OF SCHOOLCHILDREN INVOLVED IN THE VOLLEYBALL SECTION.

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Annotation. The effect of the experimental procedure on the cardiorespiratory system of schoolchildren involved in the volleyball section. The experiment involved 190 students aged 14-16 years with sports experience from one to three years. The study showed that practicing volleyball for one academic year (204 hours for 6 hours per week) contribute to more efficient operation of the cardiorespiratory system of 14-16-year-old athletes. This results in lower heart rate in 14 years, figures large lung capacity at 14 and 15 years of living index in 14 years. Recommended redistribution of load volumes aerobic-anaerobic nature in favor of the dominance of aerobic exercise, the increase in the total hours of physical training, insufficient targeting of motor abilities. It is recommended to carry out at each training session (35-40 minutes). The length of time for the development of aerobic capacity of the lesson is 15-20 minutes, the reaction rate of 8-10 minutes, 7-10 minutes of flexibility. The intensity of training on heart rate on average in the range of 125-155 beats per minute.

Keywords: functional status, cardiorespiratory system, athletes, volleyball players.

Introduction

Trainings in sports circles shall be regarded as opportunity to have optimal scope of motion load, which is required for normal functioning of organism, its growth and development against the background of professional skillfulness increasing [8]. Alongside with wide spectrum of sport researches of volleyball training, health related influence of them on pupils' functional state has not been studied sufficiently yet.

Analysis of existing programs for circles' volleyball trainings [3, 5] showed that at 14-16 years old age it is recommended to increase the quantity of training hours for technical-tactic preparation at the account of reduction of general and special physical training. Alongside with it, as per already conducted researches, [1], age of 14-16 years old of tall pupils is characterized by certain straining of organism's functional systems and reducing of physical workability.

In some works there were studied development and control of special endurance of junior volleyball players [6], speed-power level of highly qualified volleyball players [4, 11]; a number of authors supply data about development of motion abilities and anthropometrical parameters of volleyball players of different qualification [9, 12, 16], there have studied influence of volleyball on cardio-respiratory system of 12-16 years old boys [15], prevention from traumatism among junior volleyball players [13], analyzed character and duration of intervals between games and in the middle of games for junior and highly qualified volleyball players. [14]. However, the problem of pupils' functional state improvement in the process of volleyball training in circles practically has not been regarded yet.

In this connection we researched influence of experimental methodic on functional state of 14-16 years old pupils, who train volleyball.

The work has been fulfilled as per combined plan of scientific-research works in the sphere of physical culture and sports for 2006-2010 of Ministry of family, youth and sports of Ukraine by subject 3.2.7.1, it. "Physical workability and its somatic vegetation and motor provision for different contingents of children and teenagers" (state registration number 0107U001186).

Purpose, tasks of the work, material and methods

The purpose of the work is to study influence of experimental methodic on functional state of 14-16 years old pupils, who train volleyball.

Methods and organization of the research

In the process of our study we applied the following methods of research: general scientific (analysis, systemizing, generalization), pedagogic (testing, formation experiment), medical-biological (spirometry, peak flow metering, pulse metering), mathematical-statistic.

Experimental methodic of training was developed considering existing experience [3, 5] and was designed for one academic year from September to May or 35 weeks (204 hours, 6 hours per week).

Main specificities of the experimental methodic are redistribution of anaerobic-aerobic loads' scopes; increasing of hours, assigned for general physical training; purposeful influence on poorly developed motion abilities, which was realized at every training (35-40 minutes and was called "block-correction", three-four times a week. Duration of time devoted to development of aerobic abilities was 15-20 minutes; development of quickness took 8-10 minutes, development of flexibility – 7-10 minutes; intensity of trainings, as per heart beat frequency, was in the range of 125-155 b.p.m. With it, we based on the fact that after training with optimal loads' parameters, post training adaptation effect preserved for 48 minutes, after 72hours it significantly reduced, after 144 minutes – practically disappears [2].

Trainings as per experimental methodic were conducted on the base of experimental site of HBO – children comprehensive school № 20, Lutsk. Formation pedagogic experiment covered 190 pupils, who train volleyball for period from one to three years. Control group included 98 persons (32- of 14 years old, 30 – 15 years old and 36 – 16 years old age), experimental group consisted of 92 persons (32- 14 years old, 30- 15 years old and 30 – 16 years old age).

At the end of academic year we examined cardio-vascular and respiratory systems by the following indicators: vital capacity of lungs (VCL) (ml), maximal speed of inhale and exhale air flow (l.p.sec.⁻¹), heart beat frequency (HBF) in rest (b.p.m.) BP (mm. of merc. col.) and life index (ml..kg⁻¹) [7].

Functional examinations were conducted on the base of functional diagnostics and physical rehabilitation laboratory of Lutsk institute of human development of University “Ukraine”.

Conclusions, concerning effectiveness of the offered program we made after comparing of data, obtained in experimental and control groups, applying such criteria as : quantity of studied indicators, significance of which substantially (on the level from $p < 0.05$ to $p < 0.001$) changed in the course of experiment, quantity of researched indicators, which had the highest values at the end.

Results of the researches

Effectiveness of optimization programs of morpho-functional, motion development and physical workability of 14-16 years old boys in the process of volleyball trainings at circle, were studied with comparing of control and experimental groups’ data at the end of academic year and by comparing of the obtained data with data of other authors (see table 1).

One of the simplest, most accessible and rather informative indicators of blood circulation indicators (and sometimes of physical condition) is heart beat frequency (HBF). It can change depending on different reasons, including emotional ones (excitation, pre-start state). Training, especially for endurance, facilitates reduction of HBF in rest. Increased HBF in rest during more than three days can be regarded as a signal about mistakes in training mode or about health disorders [10].

In the process of our researches we determined statistically significant difference between HBF indicators of experimental and control groups’ 14 years old volleyball players ($p < 0.05$). Concerning boys of 15 and 16 years old statistically significant difference was not observed.

The obtained results are quite logic, because it is a common knowledge that as a result of training loads, especially oriented on development of endurance, HBF in rest noticeably reduces [10].

As it is noted by V.I. Kovtsun [6], physiological intensity of motion activity in game conditions by data of HBF is little informative, is to compare it in age groups 13-14, 15-16 and 17-18 years old age.

It is connected with natural age dynamics of maximal HBF, level of sympathetic-adrenaline system’s response to significance of competitions, to adversary and etc.

The trend to HBF in rest reduction of all age groups’ boys of experimental group after pedagogic experiment witnesses favorable character of heart adaptation to aerobic physical loads. The data, obtained after formation experiment, point at absence of substantial changes in systolic BP. In all groups of boys there was a trend to its increasing. The trend to increasing of diastolic BP was observed in both groups of volleyball players that positively influences on pulse BP indicators and witnesses about more saving mode of heart’s work.

Table 1

Indicators of cardio-respiratory systems in rest of 14-16 years old boys of experimental and control groups after application of experimental methodic

Indicator	Age	Group	n	X	Sx
Heart beat frequency, b.p.m.	14	Control	32	79.38	3.97
		Experimental	32	76.97*	3.61
	15	Control	30	75.73	8.41
		Experimental	30	74.07	6.80
	16	Control	36	73.17	9.19
		Experimental	32	73.00	8.40
Systolic BP, mm of merc. col.	14	Control	32	112.00	11.35
		Experimental	32	112.06	9.76
	15	Control	30	117.60	21.32
		Experimental	30	116.33	19.10
	16	Control	36	118.61	12.51
		Experimental	32	117.47	9.96
Diastolic BP, mm of merc. col.	14	Control	32	68.75	11.89
		Experimental	32	68.47	11.26
	15	Control	30	75.00	15.76
		Experimental	30	74.17	14.09
	16	Control	36	76.22	9.26
		Experimental	32	75.30	8.53
Pulse BP, mm of	14	Control	32	43.25	8.69

merc. col.	15	Experimental	32	43.59	8.85	
		Control	30	42.60	9.68	
	16	Experimental	30	42.17	8.87	
		Control	36	42.39	1.,04	
	Vital capacity of lungs, l.	14	Experimental	32	42.17	9.63
			Control	32	3.25	0.26
15		Experimental	32	3.51***	0.23	
		Control	30	4.46	0.86	
16		Experimental	30	5.54***	0.80	
		Control	36	5.22	1.00	
Relative vital capacity of lungs, Life index, ml.p.kg.	14	Experimental	32	5.43	0.84	
		Control	32	52.64	3.44	
	15	Experimental	32	57.15***	4.18	
		Control	30	65.37	1.70	
	16	Experimental	30	66.97	12.21	
		Control	36	70.24	11.81	
Maximal exhale speed, l.	14	Experimental	32	72.00	9.07	
		Control	32	2.75	0.15	
	15	Experimental	32	2.80	0.18	
		Control	30	3.69	0.75	
	16	Experimental	30	3.81	0.64	
		Control	36	4.23	0.67	
Maximal inhale speed, l.	14	Experimental	32	4.36	0.59	
		Control	32	2.40	0.32	
	15	Experimental	32	2.49	0.29	
		Control	30	3.67	0.54	
	16	Experimental	30	3.70*	0.44	
		Control	36	4.69	1.11	
		Experimental	32	4.76	1.12	

Notes: * – $P < 0.05$; ** – $P < 0.01$; *** – $P < 0.001$ comparing with control group.

Thus, our research showed that volleyball trainings in conditions of experimental methodic facilitate more effective functioning of cardio-vascular system of 14-16 years old sportsmen in comparison with volleyball players of control group, that was expressed in less frequency of hear beats ($p < 0.05$) of 14 years old boys.

Main parameters, which characterize human respiratory system, are vital capacity of lings (VCL), functional tests of respiratory system, maximal volume speed of inhale and exhale (MVS).

VCL is an important functional indicator of external breathing. It depends on sex, age, size of body and physical condition. ,

Examination of VCL showed statistically significant difference between indicators of experimental and control groups (boys of 14-15 years old) ($p < 0.001$).

Study of life index of junior sportsmen showed that it was statistically significantly higher in experimental group of 14 years old volleyball players in comparison with boys of control group, with $p < 0.001$.

We found no statistically confident difference between LI experimental and control groups' indicators, concerning boys of 15 and 16 years old..

Examination of maximal volume speed of exhaled air flow (MVS of exhale) showed increase of this indicator with age both in control and experimental groups.

Power of breathing muscles, as well as bronchial conductivity, is evaluated by maximal volume speed of exhaled air flow (MVS of exhale) and inhaled air flow (MVS of inhale). Examination of MVS of exhale showed that there is no statistically confident difference between groups.

The trend of indicators' increasing with age was noticed also during analyzing of MVS of inhale results (see fig.6). Comparative analysis of MVS of inhale did not show any statistically significant difference between indicators of both tested groups' sportsmen.

Testing of respiratory system's functional state showed that volleyball trainings in conditions of experimental methodic are expressed to the largest extent in indicators of vital capacity of lungs of 14 and 15 years old boys ($p < 0.001$) and life index ($p < 0.001$) of 14 years old boys.

The carried out research proved that, considering peculiarities of morpho-functional development of 14-16 years old pupils, it is possible to raise general state of health and improve functional state. Realization of experimental methodic in complex with consideration of functional and motion development permit to raise efficiency of pedagogic process, increase pupils' interest in physical exercises' practicing and, thus, facilitate formation of pupils' optimal physical condition.

Studying of cardio-vascular system's functional state showed that volleyball trainings in conditions of experimental methodic facilitate its more effective functioning, concerning 14-16 years old sportsmen, if compare with volleyball players of control group, that is expressed in reduced heart beats frequency of 14 years old boys ($p < 0.05$).

Studying of respiratory system showed that volleyball trainings in conditions of experimental methodic are expressed in higher indicators of VCL of 14 and 15 years old boys ($p < 0.001$) and life index of 14 years old boys ($p < 0.001$).

Conclusions:

On the base of the obtained by us results we can affirm that offered experimental methodic is an effective mean of improvement of 14-16 years old boys' functional state in the process of volleyball trainings in sport circles. Application of the offered methodic during one academic year permits to achieve much higher values of cardio-respiratory systems' indicators than application of existing programs and it also witnesses effectiveness of the first.

The prospects of further researches in this direction imply studying and consideration of functional abilities of physiological systems, which ensure muscular work, in the process of training loads' planning for junior sportsmen of other age groups.

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Cite this article as: Andriychuk Y.N., Chyzhyk V.V. The influence of the experimental procedure on the functional status of schoolchildren involved in the volleyball section. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 3-7. doi:10.6084/m9.figshare.749686

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Received: 30.06.2013
Published: 30.09.2013

DYNAMICS OF PHYSICAL AND FUNCTIONAL STATUS OF STUDENTS IN THE EXPERIMENT ON APPROVALS PERSONALITY ORIENTED PHYSICAL EDUCATION

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Annotation. The results of the testing of personality-oriented physical education. In the experiment involved 640 students. Found that the greatest increase in indicators of physical fitness in young men in the experimental group revealed a flexibility test (6.67%) and flexion extension Hand-ups (5.75.) The girls showed improvement in the flexibility test (7.09%) flexion and extension of hand-ups (6.14%). Clarified the nature and content of the personal-oriented physical education, especially its use in physical education students. Pedagogical conditions of effective application of personal-oriented physical education students in self-movement towards a healthy lifestyle. The data on the importance of physical culture for the prevention of self destructive behavior (drug addiction, alcoholism, smoking).
Keywords: experiment, personal, physical education, functional, student.

Introduction

Theoretical and methodic-practical parts of academic program of HEE discipline “Physical education”, which shall facilitate origination and improvement of students’ physical culture activity, are the most difficult for realization in educational process [3, 9]. That is why in the process of pedagogical experiment it was important to receive absent at present time confident scientific data about how personality-oriented physical education reflects in indicators of students’ physical condition and functional state in order to determine the ways of improvement of educational process on “Physical education”.

The work has been fulfilled as per plan of scientific & research works of Donetsk national university.

Purpose, tasks of the work, material and methods

The purpose of the research is to theoretically ground and experimentally test effectiveness of pedagogic conditions of application of students’ personality-oriented physical education.

The object of the research: integral process of physical education of Donetsk national university’s (DonNU) students, considering results of their medical examination.

The subject of the research: the process and results of application of personality-oriented physical education of 1st-2nd year students by means of creation of external and internal pedagogic conditions.

The hypothesis of the research was based on assumption that all pedagogical conditions of students’ personality-oriented physical education’s application for formation of healthy life style would be effective under following conditions:

- student’s personality, his independent activity, intellectual and health related actions are a center of educational system that would permit for pedagogic collective to organize the process of self-progressing in improvement of own health;

- pedagogical conditions of students’ personality-oriented physical education are conceptually grounded and classified that will permit for instructor to consciously create them, for them to ensure application of students’ personality-oriented physical education in their self-progressing in healthy life style;

- for creation of required conditions in educational process pedagogical tools are used in educational process, which are determined by peculiarities of self-progressing in healthy life-style process, that will facilitate active involvement of students in different kinds of activity, stimulating their demand in such self-progressing;

- application of already developed by us diagnostic system, which will ensure obtaining of objective data about effectiveness of created conditions, leading to improvement of different indicators of students' health.

The methods and organization of the research

We used approved at DonNU tests for evaluation of students’ physical condition and functional level. In pedagogical experiment, devoted to studying of physical condition, 640 students of Donetsk national university took part (in total: two control groups and two experimental groups of boys and girls of 1st and 2nd years of study, 160 persons in each group).

Basing on our understanding of the problem, the set purpose and hypothesis of the research, we formulated the following tasks of the research.

1. Specifying of sense and content or personality-oriented physical education, especially its application in physical education of university’s students.

2. Determination of pedagogic conditions of effective application of students’ personality-oriented physical education for their self-progressing in healthy life-style..

3. Experimental testing of effectiveness of developed pedagogical conditions of students’ personality-oriented physical education’s application in their self-progressing in healthy life style (HLS).

When organizing the research we based on the fact that in the basis of students’ personality-oriented physical culture there are indicators of their physical condition and functional state, level of somatic health’s potential, attitude to

values of physical culture, level of mastering of system of theoretical and methodic-practical knowledge, skills and abilities. With it, formation of HEE students' physical culture is the most effective on the base of qualitative improvement of educational process on discipline "Physical education" and complex using of all modern pedagogic technologies' arsenal.

With organization of researches, oriented on evaluation of level of students' physical culture's formation and searching of ways for increasing of educational; process's effectiveness we considered to be important to analyze the following:

- 1) indicators, determining students' physical culture level;
- 2) indicators, characterizing peculiarities of educational process's on formation of students' physical culture organization;
- 3) possible changes in organization of educational process in non-professional physical culture education by means of new pedagogic technologies' introduction.

Results of the research

In context of the research personality-oriented approach was regarded as condition of harmonious development of student's personality, corresponding to individual features and abilities, which shift him to position of active subject of physical culture activity. As a result student acquires abilities to reconstruct it. For example, if necessary, activity can be rather recreational or health-building; owing to it content of physical culture activity can be adjusted to certain period of human life.

Pedagogic conditions of realization of personality-oriented approach were: shifting of student from position of physical education's object into position of self-organized and self-controlled subject; ensuring of subject-subjective interaction of participants of educational process; active mastering of physical culture's value potential; creation of atmosphere of success in achieved results of activity not only in the course of academic classes but in other forms of physical culture activity; creation of personality-developing situations by instructors in the course of interactive training.

The created and used pedagogic conditions of personality-oriented approach's realization and evaluation of physical condition's indicators of experimental (160 boys and 160 girls) and control (the same quantity of boys and girls) groups at the beginning of experiment (September 2012) determined specificities of physical education's construction in experimental group.

They were the following:

- application of already described technologies of non-professional physical culture education;
- stage-by-stage (from level of initial physical culture knowledge to level of advanced knowledge) formation of students personalities' physical culture;
- application of level differentiation (selective, basing on subjective appraisal of physical culture and sport department's instructor and elective, which is based on personal student's choice of the level of theoretical and methodic physical culture content's mastering).

Saturation with theoretical and methodic content of general character, stipulated by academic program on "Physical education", was provided by personality-significant material at the account of its including in lectures and talks, business (situational and role) games and trainings, built on interactive basis.

Technological provision of stage-by-stage formation of personality development's components in the field of physical culture implied:

- at diagnostic-orientating stage (September 2012) – evaluation of physical condition and level of physical culture knowledge of experimental and control groups' students;
- at program-targeted stage (October 2012) – development by students personality-significant targets in mastering of physical culture, including of new and improvement of already used HLS elements for transition to higher level of personality's physical culture;
- in the first part of operational-active stage (November 2012) – actualization of physical culture and health values, formation of personality-significant motive of the formed physical culture activity;
- in the second part of operational-active stage (December 2012- April 2013) – organization of co-activity of all elements of built at DonNU system of personality oriented physical culture education for facilitating students' achievement of personality-significant aims in mastering of physical culture;
- at evaluating-correction stage (May 2013) – we appraised results, achieved by students of experimental and control groups, corrected further activity of DonNU structural departments, which took part in improvement of created personality-oriented system of physical education.

As main scientific principles, revealing the sense of changes in student's personality in the process of realization of conception and personality oriented program of physical education, we used the following thesis and starting points.

The process of personality's formation and its future life are closely connected with construction and change of won image "I am healthy", which, as starting point, take central place in human development and self-determination.

Regarding "inner conditions" of personality' development, G.S. Kostiuk notes: "Personality's formation is a conditioned and self-developing process. It is internally necessary movement from lower to higher levels" [6, pg.13]. "Internal conditions", i.e. logic of development, should be understood as internally necessary progress of personality, its trend to self-actualization. With it, G.S. Kostiuk notes, that in the process of progressing "external reasons always act

though internal conditions". S.L. Rubinstein regards "internal conditions" not only as mechanical projection of objective reality but also as factors, which are capable to influence on external conditions and to actively change them.

At the same time it is impossible to imagine development and formation of mature "Self" conception without activity in society, without strive for success, opening of personality's potential. Active subject's attitude to own life and activity, in our opinion, should be understood not only as subject's active exploration of external space and forms of activity but also as modeling of own psycho-physical development, formation of world-vision, own opinion. Just in the process of understanding, development of inner potential person obtains ability to make own choice, to form attitude to one or another event of his life, to built model of his future existence. "Subject" is not only found and developed in his actions and acts of creative activity, he is created in them and determined" [7, pg.153,10].

From position of action's approach, adequately functioning personality is a successful and well adapted personality. "Personality's realization – I.G. Schedrin notes, - happens in the process of formation of his adapting activity, with harmonious interaction between ideals and values of group and values of personality" [8, pg.66].

Basing on the presented psychological-pedagogical ideas, we followed the following organizational-methodic requirements in the course of stage-by stage formation of personality's physical culture components:

- teaching of informational-cognitive component stipulated application of pedagogic methods and techniques, which would facilitate more complete understanding and mastering of "Physical education" in the part of independent health related physical culture trainings and improvement of HLS elements;

- formation and development of value-motivational component of personality's physical culture envisaged overcoming of negative settings (self-distrust as a successfully acting subject of physical culture activity, disbelief in possibility to actually improve own psycho-physical state and so on);

- formation of reflexive component was combined with development of demand in self-cognition, self-appraisal of own health related actions and their results, i.e. with adequate self appraisal. With it, usage and specifying of student's purpose in mastering of physical culture achievements and their implementation for increasing of own psycho-physical potential, were assumed as compulsory condition;

- formation of subject-result component was based on formation of ability for organization of independent physical culture activity, including its planning and self-control over own health.

Thus, evaluation of students' physical culture formation level was carried out both by traditional indicators of students' physical conditions, dynamics of their health level and by analyzing of students' attitude to physical culture values, by peculiarities of motivation and level of knowledge in the field of physical culture.

We share opinion of author [1] that readiness to physical culture activity is an integral, organized in system and personality-conditioned characteristics of personality as a subject of activity, which is adequate to its content and targets and which ensures practical achievement of desired results. Exactly such readiness shall be ensured by realization of Concept and programs of introduction of students' personality-oriented physical education.

As a result, generalized aim is fulfillment of physical culture activity on personality-optimal and socially-acceptable levels. As per methodology of systemic approach readiness to such kind of activity is determined by targeted orientation of pedagogical innovations, by content, mechanism of origination and development.

Concerning content of the achieved readiness, it is determined as follows:

- personal, demand-originating attitude to given kind of activity (i.e, physical culture activity), which is concretized into conscious motivation of trainings (motivational component);

- developed, mobilized self-consciousness, which conditions reflexive attitude to own physical culture activity (reflexive component);

- available desirably sufficient level of physical abilities (physical component);

- knowledge of theoretical and methodic principles of physical culture activity (informational component);

- mastering of means of physical culture activity (operational component).

It is evident that for achievement of readiness to physical culture activity it is necessary to ensure sufficient level of all mentioned components. And on the contrary, zero or low level of their development result s in disbalance, beaching or, even, stoppage of physical culture activity's process.

In pedagogic experiment on studying of physical condition 640 students of Donetsk national university took part (in total: two control groups and two experimental groups of boys and girls of 1st and 2nd years of study, 160 persons in each group).

Evaluation of physical conditions of experimental and control groups' students was carried out by results of tests, which were approved by physical education and sports department of DonNU, because as on the beginning of the experiments there were no single for all Ukrainian HEEs normative requirements on discipline "Physical education" [On organization of trainings in discipline "Physical education" at HEEs of Ukraine – Letter of Ministry of education and science of Ukraine No. 1/9-582, dt. 31.08.2009]. With it we considered that tests, results of which depend on two or more factors' combination, factors which were difficult to be evaluated objectively, interpreting the obtained results, relate to group of heterogeneous ones. There is much greater quantity of such tests, in contrast to *homogeneous* ones, results of which, mainly, depend on one factor [2, pg.19].

Analysis of results of the research was fulfilled on the base of commonly accepted methodic of mathematical statistics in physical education [2,4,5]. The obtained data were processed with the help of computer program «MS Excel 2007» in compliance with recommendations of M.A. Godik, V.M. Zatsiorskiy and P.V. Denisova et al.

Mean arithmetic value (\bar{X}) – determines the center of empiric distribution of the studied value. Mean square deviation (S) – is the main measure of statistic measurement of property's variability of population's members. Deviation of mean value (error of representativeness) (m) – is characterized between mean values of selective and general population, conditioned by the fact that selective population represents general population insufficiently accurately.

Thus, in the course of study of indicators of Don NU students' physical condition and functional state we calculated the following indicators: mean arithmetic value (\bar{x}), mean square deviation (S), deviation of mean value (error of representativeness) (m).

We used set of 8 tests, in which student had to show maximally possible result in every test (except test of Ruffiet). All tests of the set were of heterogeneous type, because results depended on a number of different factors (level of tiredness, physical condition, motivation, testing procedure and etc.).

Testing results were evaluated in units of CI system and in conventional units. Timing was carried out with the help of electronic stop-watch (accuracy – 0.01 sec); results were rounded up to 0.1 sec.; long jump was measured with measuring tape with accuracy up to 0.01 m.

Accuracy of measurements was ensured by the instruments' class of accuracy, standard character of tests and testing procedure.

Tests were carried out systematically; measurements were fulfilled by one and the same instructor at certain time as per one schema. Testing was conducted at physical education classes after preparatory part of the training.

For evaluation of strength pressing ups, raising and lowering of torso for 1 minute were used, for evaluation of quickness – 30 meters' run and for evaluation of speed-power abilities – long jump from the spot and skipping over rope for 20 seconds were used.

In tests "long jump from the spot" and "30 meters' run" student was given three attempts and the best result was entered in table. In other tests only one attempt was given.

For evaluation of general endurance we used tests "1000 meters' run" and "3000 meters walking"; it was required to pass distance at most possible pace (only one attempt was given for running distance).

Flexibility was evaluated with the help of the following test: in sitting position, with legs stretched forward, it was necessary to bend forward maximally. Distance between heels was 20 cm. We measured distance between heels and point of fingers' touching.

Ruffiet's test was used for evaluation of organism's physical workability. Only one attempt was given. Test was conducted at the beginning of training; the tested had several minutes' rest before test.

In table 1 there are presented results of testing of girls' physical condition and workability before and after pedagogic experiment as well as errors of representativeness and confident statistic differences between obtained values.

Table 1

Results of testing of girls' physical condition and functional state before and after pedagogic experiment

№	Tests		Experimental group	Control group	p
			$\bar{X} \pm m$	$\bar{X} \pm m$	
1	30 meters' run, sec.	before	6.71 ± 0.08	6.68 ± 0.08	>0.05
		after	6.62 ± 0.08	6.77 ± 0.08	>0.05
2	1000 meters' run, min.	before	5:48.34 ± 4.61	5:45.16 ± 5.51	>0.05
		after	5:54.06 ± 13.08	6:00.25 ± 5.84	>0.05
3	3000 meters' walking, min.	before	26:34.10 ± 12.75	25:27.48 ± 11.56	>0.05
		after	25:55.56 ± 13.08	26:02.25 ± 13.70	>0.05
4	Long jump from the spot, m	before	1.73 ± 0.01	1.75 ± 0.01	>0.05
		after	1.71 ± 0.01	1.71 ± 0.01	>0.05
5	Skipping over rope for 20 sec, quantity of times	before	42.46 ± 0.69	42.84 ± 0.65	>0.05
		after	43.39 ± 0.66	41.54 ± 0.68	>0.05
6	Flexibility, forward torso bending, cm	before	15.12 ± 0.32	15.05 ± 0.38	>0.05
		after	16.19 ± 0.32 *	15.31 ± 0.32	<0.05
7	Raising and lowering of torso for 1 minute, quantity of times	before	3.02 ± 0.54	36.72 ± 0.54	>0.05
		after	35.81 ± 0.48	34.92 ± 0.54	>0.05
8	Pressing ups, quantity of times	before	8.23 ± 0.20	8.26 ± 0.21	>0.05
		after	8.73 ± 0.15 *	7.98 ± 0.22	<0.01
9	Ruffiet's test, conventional units	before	10.42 ± 0.28	10.34 ± 0.33	>0.05
		after	10.02 ± 0.24	10.83 ± 0.31	<0.05

Notes: * - confident differences between values before and after certain group

From table 1 it is seen that during experiment in control group there were no confident changes of physical condition pressing ups in lying position's indicators, but in experimental group indicators of flexibility, pressing ups

confidently increased. After experiment confident differences between experimental and control groups were found in tests No/No 6,8 and 9 (flexibility, pressing ups and Ruffiet's test). (see fig.1).

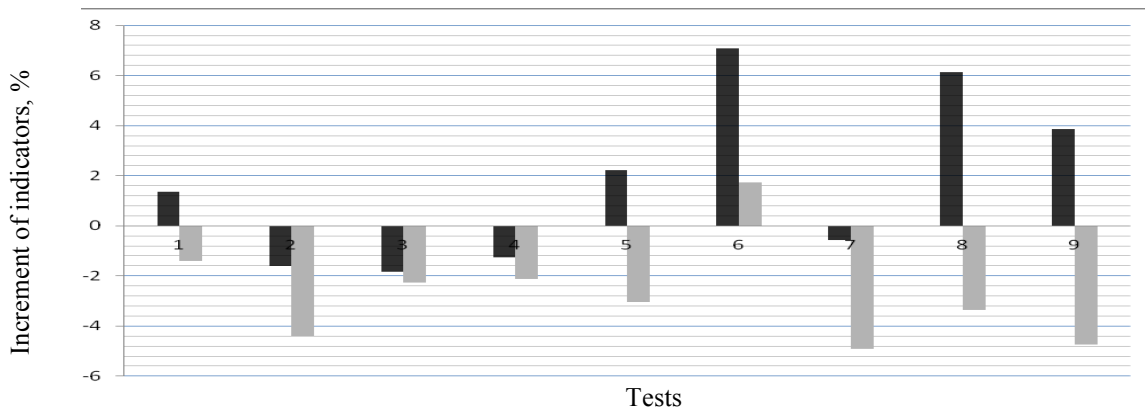


Fig.1. Increment of indicators of girls' physical condition during experiment:

EG –■, CG –■, 1 – 30 meters run; 2 – 1000 meters' run, 3 – 3000 meters' walking, 4 – long jump from the spot, 5 – skipping over rope for 20 sec, 6 – flexibility, forward torso bending, 7 – raising and lowering of torso for 1 minute., 8 – pressing ups, 9 – Ruffiet's test.

In table 2 there are presented results of testing of boys' physical condition and workability before and after pedagogic experiment as well as errors of representativeness and confident statistic differences between obtained values.

In table 1 there are presented results of testing of girls' physical condition and workability before and after pedagogic experiment as well as errors of representativeness and confident statistic differences between obtained values.

Thus, (see fig.2) analysis of the obtained results permits to reveal confident differences between indicators before and after experiment in tests for flexibility, pressing ups in lying position in experimental group; in control group there were found no such confident differences.

Table 2

Results of testing of boys' physical condition and functional state before and after pedagogic experiment

№	Tests	Experimental group		Control group		p
		before	after	before	after	
1	30 meters' run, sec.	before	5.48 ± 0.06	before	5.47 ± 0.05	>0.05
		after	5.42 ± 0.06	after	5.53 ± 0.05	>0.05
2	1000 meters' run, min.	before	4:18.26 ± 2.22	before	4:17.27 ± 2.45	>0.05
		after	4:20.53 ± 1.95	after	4:24.11 ± 2.47	>0.05
3	3000 meters' walking, min.	before	19:34.29 ± 18.64	before	19:37.34 ± 18.55	>0.05
		after	19:25.14 ± 18.62	after	20:12.28 ± 19.11	>0.05
4	Long jump from the spot, m	before	2.15 ± 0.02	before	2.16 ± 0.02	>0.05
		after	2.12 ± 0.01	after	2.08 ± 0.02	>0.05
5	Skipping over rope for 20 sec, quantity of times	before	38.83 ± 0.55	before	38.56 ± 0.54	>0.05
		after	39.31 ± 0.54	after	37.85 ± 0.53	>0.05
6	Flexibility, forward torso bending, cm	before	10.43 ± 0.24	before	10.38 ± 0.33	>0.05
		after	11.12 ± 0.25 *	after	10.12 ± 0.34	<0.05
7	Raising and lowering of torso for 1 minute, quantity of times	before	41.54 ± 0.58	before	41.59 ± 0.64	>0.05
		after	42.47 ± 0.54	after	40.93 ± 0.64	>0.05
8	Pressing ups, quantity of times	before	33.59 ± 0.62	before	33.67 ± 0.57	>0.05
		after	35.52 ± 0.60 *	after	33.79 ± 0.53	<0.05
9	Ruffiet's test, conventional units	before	9.34 ± 0.36	before	9.30 ± 0.39	>0.05
		after	8.94 ± 0.34	after	9.91 ± 0.36	<0.05

Notes: * - confident differences between values before and after certain group

After experiment confident differences between experimental and control groups were found in tests No/No 6,8 and 9 (flexibility, pressing ups and Ruffiet's test).

The highest increment of physical condition indicators of experimental group boys was found in tests for flexibility (6.67 %) pressing ups in lying position (5.75 %); in control group only one indicator increased - pressing ups in lying position (0.36 %). In girls' group improvement of indicators was registered in tests for flexibility (7.09%) and pressing ups in lying position (6.14 %), while in control group – only in test for flexibility (1.73 %).

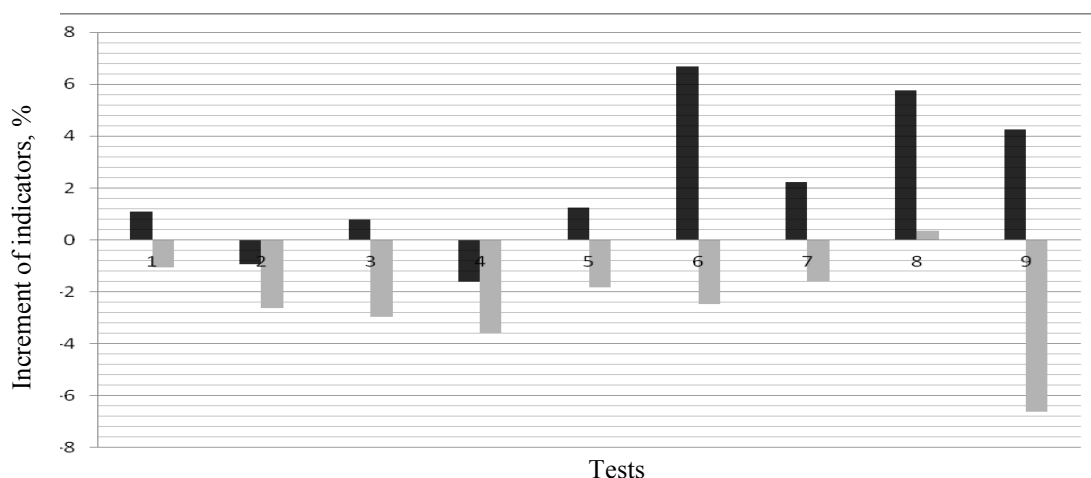


Fig.2. Increment of indicators of boys' physical condition during experiment:

EG – ■, CG – ■, 1 – 30 meters run; 2 – 1000 meters' run; 3 – 3000 meters' walking; 4 – long jump from the spot; 5 – skipping over rope for 20 sec; 6 – flexibility, forward torso bending; 7 – raising and lowering of torso for 1 minute.; 8 – pressing ups; 9 – Ruffiet's test.

At the same time, indicators of experimental group's boys in test "long jump from the spot" reduced by 1.62% and in test "1000 meters' run" – by 0.95%, while in control group the highest reduction was registered in test "long jump from the spot" – by 3.57% and in Ruffiet's test – by 6.61%. Experimental group's girls showed the highest reduction in test "long jump from the spot" (1.25%) and in "1000 meters' run" – (1.59%), while in control group the highest reduction was found in test "1000 meters' run" – (4.39%), raising and lowering of torso for 1 minute – (4.90%) and Ruffiet's test – (4.73%).

Comparative indicators of dynamics of changes during execution of tests by experimental and control groups (boys and girls) are given in table 3.

Table 3

Increment of indicators during pedagogic experiment in control and experimental groups

№	Tests	Girls		Boys	
		EG	CG	EG	CG
1	30 meters' run, sec.	1.35 %	-1.40 %	1.08 %	-1.05 %
2	1000 meters' run, min.	-1.59 %	-4.39 %	-0.95 %	-2.62 %
3	3000 meters' walking, min.	-1.82 %	-2.27 %	0.79 %	-2.96 %
4	Long jump from the spot, m	-1.25 %	-2.11 %	-1.62 %	-3.57 %
5	Skipping over rope for 20 sec, quantity of times	2.21 %	-3.04 %	1.23 %	-1.83 %
6	Flexibility, forward torso bending, cm	7.09 %	1.73 %	6.67 %	-2.46 %
7	Raising and lowering of torso for 1 minute, quantity of times	-0.58 %	-4.90 %	2.23 %	-1.60 %
8	Pressing ups, quantity of times	6.14 %	-3.35 %	5.75 %	0.36 %
9	Ruffiet's test, conventional units	3.86 %	-4.73 %	4.26 %	-6.61 %

Notes: data in % show achieved increment of indicators, "minus" means their reduction

Conclusions:

1. By the results of experiment indicators of experimental group in tests for flexibility, pressing ups in lying position and Ruffiet's test confidently differ from indicators of control group. The highest increment of experimental group boys' physical condition was registered in tests for flexibility (6.67 %) and pressing ups in lying position (5.75 %); in control group only one indicator increased - pressing ups in lying position (0,36 %). In girls' group improvement of indicators was registered in flexibility test (7.09%) and pressing ups in lying position (6.14 %), while in control group – only in flexibility test (1.73 %).

2. The carried out pedagogic experiment proved the following ways of DonNU students' physical culture formation:

- passing of full volume of theoretical and methodic-practical parts of program “Physical education, with usage of informational technologies, active methods of teaching and interaction with students (for theoretical section: lecture-visualization, lecture delivered in problem way, argued information and so on; for practical section: analysis of specific situations, game and competition methods, simulation, discussions and etc.);

- expanding of theoretical and control parts of program on topics of healthy life style principles as well as role of physical culture in health protection. Special attention shall be paid to significance of physical culture means for prevention from self destructing behavior (drugs-taking, alcoholism, smoking etc.);

- organization of independent, at extra-curriculum time, studying by students of theoretical part of program with the help of computer manual “Personality-oriented physical education of students” (Donetsk, 2013), which was created at department of physical education and sports of Donetsk national university.

- conducting of individual consultations on organization of own physical activity, on choosing of forms and intensity of trainings, on provisioning with required theoretical and methodic-practical materials; solution of cognitive tasks in collaboration with instructor.

3. Thus, the offered forms, means and methods, which were tested in the course of pedagogical experiment, fulfilled at department of physical education and sports of Don NU in natural conditions of educational process, proved their effectiveness in formation of physical culture of student’s personality.

The prospects of further researches imply more profound studying of physical and functional state of students.

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Cite this article as: Belykh S.I. Dynamics of physical and functional status of students in the experiment on approvals personality oriented physical education. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 8-15. doi:10.6084/m9.figshare.749687

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

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Received: 31.05.2013
Published: 30.09.2013

OPTIMIZATION OF PHYSICAL REHABILITATION IN CONGENITAL CLUBFOOT

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Annotation. The aim of the study was to improve the results of treatment of children with typical form of congenital clubfoot by optimizing of physical rehabilitation. The study included the following objectives: to make the algorithm work with the child, to justify the basis of physical rehabilitation, to study its effects, to develop a framework of implementation and optimization of the physical rehabilitation of children with congenital clubfoot. In the course of the study were 62 children involved with the typical form of congenital clubfoot: the main group (n = 42) and control group (n = 42). Age children from 4 years to 7 years. Physical rehabilitation was a logical continuation of treatment. Optimization analysis was performed by clinical examination, radiometric data and indicators of functional methods of research. Comparative analysis of the results of the physical rehabilitation of children with congenital clubfoot in both groups showed a trend more pronounced positive changes in children the main group in all respects.

Key words: clubfoot, physical rehabilitation, optimization, children.

Introduction

Congenital bow legging takes one of leading positions in structure of supporting motor system's defects and is 35.8% or 0.6 – 3 cases per 1000 of new born children [5,8]. Up to the present time there have not been developed any single approach to treatment of congenital bow legging of early child age patients. There exist a great number of pathogenetically grounded methods of surgical correction of this defect. Variety of surgical operations witnesses about absence of single opinion of children orthopedists about bow legging's treatment. Great number and traumatic character of such surgical operations are very painful for growing organism. Frequency of post-operational relapses of bow legging can reach 60% [6,9,11]. The reasons of it can be incomplete elimination of foot deformation elements, scar-commissure process, which progresses after extensive foot surgical operations with extracting of ligaments of significant length, absence of full fledged rehabilitation treatment and inobservance of orthopedic regime [7].

Analysis of scientific-research, special and medical literature showed that now there exists already developed and scientifically grounded new method of treatment for prevention from relapses for forefoot at the account of anatomical interactions in forefoot [1]; it has been established that morphological changes of flexor-supinator muscles, which are connected with character of neuro-physiological abnormalities and heaviness of foot deformation, are pathogenetically significant mechanism of clubfoot [3]; There were offered interesting algorithms of fulfillment of clinical researches and diagnostic methods for verification and adequate choice of treatment method and, for the first time, there was scientifically grounded tactic of complex treatment of patients with congenital bow legging in combination with other kinds of orthopedic pathologies [4]; there has been developed and tested new device for limbs' massaging with club footing that supplements the scope of medical means in post-operation period, trains motion in ankle, normalize imbalance of shin muscles, facilitates formation of biomechanically correct gait, increase effectiveness of rehabilitating treatment [2].

Purpose, tasks of the work, material and methods

The purpose of the research is improvement of treatment of children with typical form of congenital bow legging with the help of physical rehabilitation's optimization.

The tasks of the research: formation of algorithm of child's treatment, foundation of physical rehabilitation's principles, studying of its influence, development of principles of implementation and optimization of physical rehabilitation for children with congenital bow legging.

In the basis of results' analysis there were clinical examinations, X-ray data and indicators of functional examinations. This system of congenital bow legging treatment results' estimation is a combination of commonly known clinical, X-ray and functional methods of diagnostics [2].

Results of the research

Our research covered 62 children with typical form of congenital bow legging. First (main group) consisted of 42 children with congenital bow legging, with whom the offered physical rehabilitation was carried out. The second group (control) consisted of 20 children, with whom traditionally, twice a year TPC, massage and physio-therapeutic procedures were carried out. The age of patients varied from 4 to 7 years old. Results were appraised as good, satisfactory and unsatisfactory (see table 1).

The purpose of physical rehabilitation's optimization is development of motion functions (skills), correction of their abnormalities with further progressing up to normal state. Physical exercises (trainings, procedures) are main specific physical mean for achievement of targeted influence oh child's motion; stimulators are auxiliary means. Ontogenetic successive stimulation of motion development (motogenesis), considering qualitative specific abnormalities, characteristic for different clinical forms of disease is in the basis of physical rehabilitation's optimization. Intensive stretching of muscles is carried out with the help of ontogenetically oriented kinesio-therapy.

Formation of motion stereotype was carried out in stage-by-stage manner, in the course of special exercises, considering formation level of main motion functions (skills). The task of physical rehabilitation's optimization implies orientation on using of natural, ecologically pure means, which stimulate quick restoration of child's organism; teaching of ability to apply appropriate complexes of physical exercises (with the help of parents), conditioning to the cold, thermal procedures and other means.

Table 1

Evaluation criteria of physical rehabilitation results with congenital bow legging

Evaluation of results	Examination data
Good	All components of bow legging are absent; dorsal flexion – not less than 15%, total motion amplitude – not less than 45%, no limping; muscles' strength – 4-5 points; data of X-raying, photo-plantography, electric myography podography, stability metering met standards or were close to standards.
Satisfactory	Significant reduction of anatomical and functional components of deformation; there is still insignificant camber of forefoot, reduced to 15% ; volume of movements in ankle is not less than 30%, decreasing of dorsal bending scope is insignificant – less than 15%; moderate hypotrophy of shin muscles (up to 20% from standard), no limping; deviation of X raying indicators – up to 15% from standard; indicators of photo-plantography (videlicet coefficient of forefoot – 1.3 – 1.5; angle of heel bone setting in subtalar join is up to +10°; angle of Shoparov's joint – from 180° to 170°, angle of toe deviation – up to 10°; data of electric myography, podography, stability metering were lower than standard maximum by 20%.
Unsatisfactory	Relapse of deformation or variant of hyper-correction; complaints for pains, distortions of gait; expressed hypotrophy of shin muscles (more than 20% from standard); distortions of all X ray parameters more than by 20% from standard; forefoot coefficient is more than 1.5; angle of heel bone setting in subtalar join is more than +10°; показники фотоплантографії, а саме коефіцієнт переднього відділу стопи становив більше 1,5; кут установки п'яркової кістки в підтаранному суглобі більше +10°; angle of Shoparov's joint is less than 170°; angle of toe deviation is more than 10°; data of electric myography, podography, stability metering were lower than standard more than by 20%.

The purpose of physical rehabilitation is maximally complete restoration of motion functions. This is a great, heavy work, that requires from a child patience and persistence and from rehabilitation specialist, who supervises rehabilitation process, - special knowledge, skills, availability of required rehabilitation equipment, stimulators, devices. Development and correction of personal program is fulfilled by rehabilitation specialist, besides, his task is methodological maintenance of rehabilitation process. Restoration of absent motion abilities, delay (or insufficient level) of physical condition shall be based on standards of natural physical (biological) development.

At the beginning of our research we developed algorithm of working with child (see fig.1).

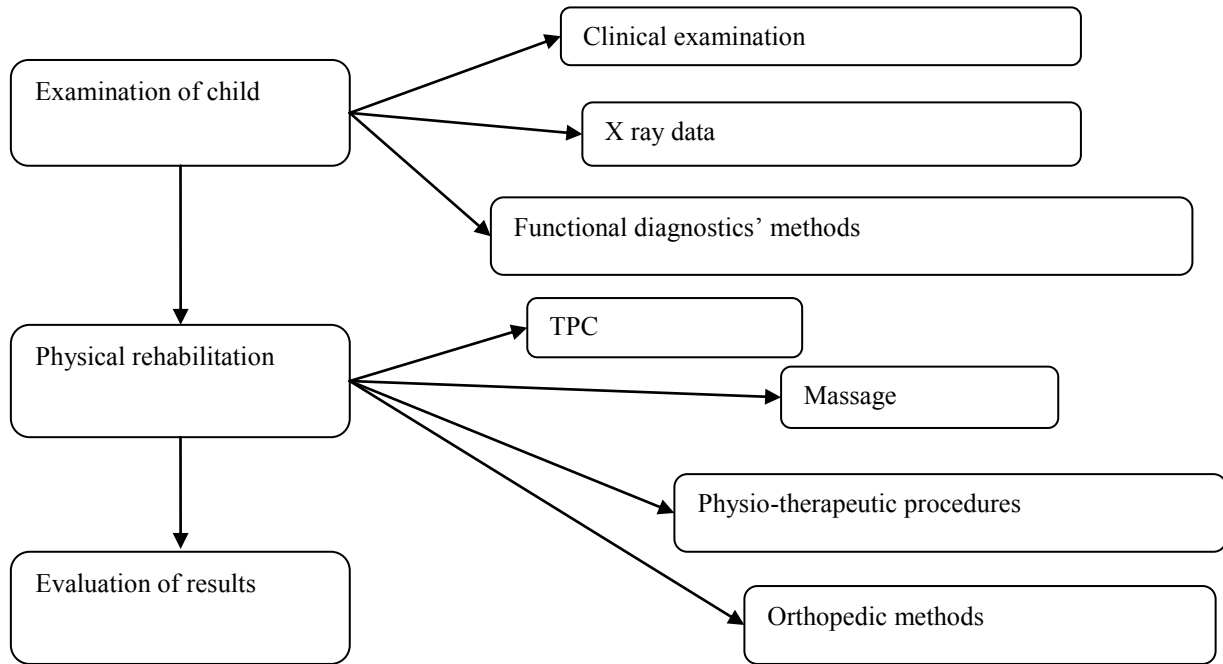


Fig. 1. Algorithm of working with child

Physical rehabilitation is a logical continuation of treatment. Methods of physical rehabilitation, which were used by us in the course of the research, admitted bio mechanical influences, were always oriented on absence of age counter indications and could be applied as prevention means, as auxiliary, which potentiate and optimize main therapy as well as in cases is effective schemas of treatment are absent, being able to be independent methods of treatment.

Rehabilitation program is a succession of actions, which shall be realized in order to restore motion functions. Main tool of rehabilitation is an exercise. Every exercise was correctly selected (considering specificity of child's organism), correctly organized (with the help of technical means, devices, special rehabilitation equipment) and correctly fulfilled. Imperative character of organization – is main principle of exercises' execution. It means that child is given all parameters of exercise's execution as necessary external conditions: trajectory and amplitude of movement, power characteristics, frequency and quantity of repetitions, intensity and so on. Such form of rehabilitation process's organization ensures methodic, planned, many hours work for obtaining of positive results. When developing experimental program of physical rehabilitation, we based on analysis of already formed in modern traumatology ideas about rehabilitation treatment of congenital bow legging, application of stimulators of new generation and choosing of available means of dynamics' estimation in the process of restoration of lower limbs' functions. General methodic of physical rehabilitation included such main procedures: TPC exercises, complex of physical exercises; different kinds of walking; physio-therapy, massage and hydro-massage; orthopedic methods.

After finishing of rehabilitation course, there were noticed positive results shown by children of main group. As a result of conducted complex estimation of physical rehabilitation's optimization results, for main children group we obtained 69.05% (29 children) good and 19,05% (8 children) satisfactory marks. Unsatisfactory marks belonged only to 11.90% (5 children). In control group good marks belonged to 25.00% (5 children) satisfactory – to 35.00% (7 children) and unsatisfactory – to 33.3% (8 children) (see table 2).

Table 2

Results of physical rehabilitation's optimizations of children with congenital bow legging

Results	Stages of research	Groups	
		main	control
Good	At the beginning	16.67% (7 children)	20.00% (4 children)
	At the end	69.05% (29 children)*	25.00 (5 children)
Satisfactory	At the beginning	40. 48% (17 children)	35.00% (7 children)
	At the end	19.05 (8 children)*	35.00% (7 children)
Unsatisfactory	At the beginning	42.86% (18 children)	45.00% (9 children)
	At the end	11.90% (5 children)	33.3% (8 children)

Notes:* - indicators of confidentiality of differences $p < 0.05$ between indicators at the beginning and at the end of research.

Comparative analysis of results of both groups' patients' with congenital bow legging rehabilitation showed in ($p < 0.05$) a trend to more expressed positive changes of main group children as per all parameters. The sum of good

and satisfactory results was regarded by us as favorable result of physical rehabilitation's applying; unsatisfactory results were appraised as unfavorable ones.

Conclusions:

Optimization of physical rehabilitation was oriented on normalization of motion functions, mastering of motion skills. Development and correction of personal program was carried out by rehabilitation specialist, besides, his tasks included methodological maintenance of rehabilitation process. Normalization of motion abilities, physical development were based on standards of natural (biological) development. As a result of fulfilled by us work main target, which we determined, was achieved, the following tasks were solved: algorithm of working with child was constructed, influence of physical rehabilitation's optimization on ankle joint was studied; physical rehabilitation methodic was developed and tested. Comparative analysis of physical rehabilitation of patients with congenital bow legging in both groups showed the trend to more expressed positive changes of main group children by all parameters.

The prospects of further researches. Our researches will be oriented on optimization of physical loads of children with congenital bow legging in the course of physical rehabilitation.

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Cite this article as: Golovakha M.L. Optimization of physical rehabilitation in congenital clubfoot. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 16-19. doi:10.6084/m9.figshare.749688

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Received: 20.07.2013
Published: 30.09.2013

ANALYSIS OF THE PHYSICAL ACTIVITY OF PRIMARY SCHOOL TEACHERS

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Annotation. The purpose of the study - to identify the ratio of primary school teachers in physical education and sport and to establish their level of physical activity, depending on the length of teaching. The volume of the experimental sample consisted of 74 people. To conduct questionnaires designed questionnaire including 29 questions open and closed. The study found that 77.3% of primary school teachers in Kaunas with 16 to 20 years of work experience were engaged in physical activity and sports. Two - three times a week, they practiced in walking, sports games, cycling, swimming, etc., with this 4-10 hour. All respondents, regardless of their teaching experience, consider physical activity and sports as an excellent means of healing and disease prevention. According to them, they should be engaged in physical activity throughout life and children need to develop positive attitudes towards physical education from their childhood.

Keywords: physical activity, teacher, elementary school.

Introduction

In ancient time there already existed knowledge about significance of physical activity for human health. Hippocrat said that gymnastics, physical exercises, walking shall firmly enter in everyday life of everybody, who wants to maintain workability, health, full fledged and happy life. Nothing exhausts organism so much as physical inactivity.

Motion is a biological demand of organism, without satisfying of which normal human life activity is impossible. In the opinion of World health protection organization, sufficient physical activity influences positively on mood and self-respect of an individual, on good appearance and carriage, reduces obesity and hypertension, cardio-vascular diseases and early mortality. Insufficient physical activity is one of the most significant factors of chronic diseases [14]. There can be a lot of reasons of it: technical progress, increasing of quantity of cars, preference of means of transport (for example lift instead of going upstairs), spending free time, watching TV sitting at computer. Age also reduces motion activity. It is recognized that every day activity decreases in the periods of third (20-29) and sixth (50-59) decades of life [8].

Physical abilities is a number of indicators, which depend on human motion activity and condition ability to fulfill physical work. Physical abilities have trend to decrease with age. Physically passive individuals have low aerobic productivity, reduced muscular force; often it is a reason of aged people transition to "sitting" way of life [2, 3, 12].

B. Sanda et al. (2012) discovered that twice a week motion activity during minimum 1 hour influences positively on upper and lower limbs' muscles, with it not practically influencing on endurance of these muscles, is exercises lack of aerobic elements, sufficient quantity [11].

Rather often there appear objections of some researchers concerning usefulness of physical activity for individual's psychological state. The works by Yu. Fukuhava et al. prove that aged individual is bent to motion passivity and it is very difficult to make him to be physically active. Against the background of these changes psychological state also worsens [4].

Physical activity in mature period is used for maintaining of general organism's state or for treatment of certain diseases. With this purpose mature people are recommended to fulfill special exercises of their modifications. Type of training (power trainings, trainings of aerobic orientation and so on), frequency and quickness of exercises' fulfillment, their intensity shall be selected individually, basing on functional abilities of a trainee [10].

Rationally chosen kind of physical activity can safely be used by mature people, because age is not a counter indication to physical culture trainings. Regular motion activity facilitates activation of cardio-vascular and blood circulation systems' functional abilities, reduces risk of different diseases and helps to avoid worsening of organism's cognitive functions [7].

According to recommendations of sport medicine college of America and American heart association it is necessary to practice physical activity of moderate intensity for 5 times a week (during 30 minutes every time), or practice aerobic exercises of higher intensity three times a week (minimum 20 minutes every training). Realizing these recommendations one can alternate motion activity of moderate and higher intensity [5]. Besides, twice a week it is worth to practice physical activity, which facilitate maintaining (or even increasing) certain level of strength and endurance. Regular motion activity, corresponding even to minimal recommendations, increases individual's physical abilities, reduces symptoms of certain diseases and even helps to avoid some of them [5].

Healthy life style of disciples can be educated by pedagogue in the following way: rendering knowledge, formation of skills and values, example of own behavior. It means that physical activity of primary classes, teachers is an important mean of educational and academic work with rising generation, because it is not a secret that in primary classes physical culture lessons are conducted by the same teachers, who teach children to read, write and count.

In order to remain motionally active during all professional activity, school teachers shall maintain at certain level their physical state and practice healthy and active life style [13].

Nevertheless, as per data, supplied by D. Visbarayte (2006), rather significant quantity of Lithuanian pedagogues have passive attitude to physical culture and sports. In this connection there appears a number of questions: 1. Could teachers of primary classes be able prove by own example teoretical knowledge about physical activity, which thje they teach, because simply accumulated information can not become way of life and behavior? 2. Can motionally passive person attract rising generation (children) to physical activity? In other words, is we wish to educate positive attitude to physical culture and sports, shall we personally practice the same kind of activity andinfluence positively by own example on our disciples?

Purpose, tasks of the work, material and methods

The purpose of the research is to determine attitude of primary classes" reachers to physical culture and sports and their level of physical activity, depending on the period of their professional activity.

The methods and organization of the research. Main methods of the research were questioning and statistical analysis of obtained data.

For questioning we developed a questionnaire, which included 29 questions of open and closed types. With the help of it we established the level of physical activity of primary classes" teachers. The questionnaire was tested in laboratory of sociological researches of Lithuanian university of sports.

Statistical processing of data was carried out with the help of package of programs of data storing and analyzing SPSS (*Statistical Package for Social Science*) 17.0. For comparing of results of different groups of tested we used χ^2 (*chi-square*) criterion. Confidentiality of differences of mean-group data was determined by Stjudent"s t-criterion with significance level of $p < 0.05$.

For theoretical foundation of the research we fulfilled review of literature sources.

Organization of the research. Anonymous questioning, in which representatives of eight comprehensive and primary schools of Kaunas took part, was carried out in autumn 2012. The scope of experimental sample was 74 persons. Participants were selected by method of random sampling on principle of series. All they were divided into groups, depending of period of their pedagogical activity (see table 1).

Table 1.

Characteristics of the tested

Group	Period of pedagogical activity (years)	Quantity (persons.)	Quantity (%)
I	15 and less	27	36.5
II	16-20	22	29.7
III	21 and more	25	33.8

Results of the research

Human physical activity is determined by many factors. In the course of the research we analyzed: frequency and duration of primary classes teachers" motion activity practicing, preferred by them, forms of trainings, attitude to physical culture and sports.

The obtained results witness that most of pedagogues practice physical culture or sports in free time. Especially group of teachers, having period of pedagogic work from 16 to 20 years, dominates. More than 77% of them ($p < 0.05$) are motionally active (practice walking, outdoor games, bicycle, swimming etc.) (see table 1, table 2).



Fig.1. Quantity of teachers, who practice physical culture and sports, depending on period of pedagogical activity (%).

Table 2.

Weekly physical activity of teachers (hours)

Group	Indicators				
	Period of pedagogic activity	N	\bar{x}	δ	S_x
I	15 and less	27	6.02	5.33	1.03
II	16-20	22	7.42	15.35	3.02
III	21 and more	25	6.64	5.73	1.15
	Total	74	6.65	9.43	1.10

Teachers with minimal and maximal period of pedagogic activity (48.1 and 48% accordingly) find time for motion activity's practicing not less than three times a week and as a result their breathing and pulse become more frequent ($p>0.05$).

Most of the questioned (independent on period of pedagogic activity) practice physical culture and sports 2-3 times a week ($p<0.05$). This kind of activity is practically ignored by 20% of teachers with great period of pedagogic work, 9.1% - with period of 16-20 years and 3.7% with the least period of pedagogic work ($p<0.05$) (see fig. 2).

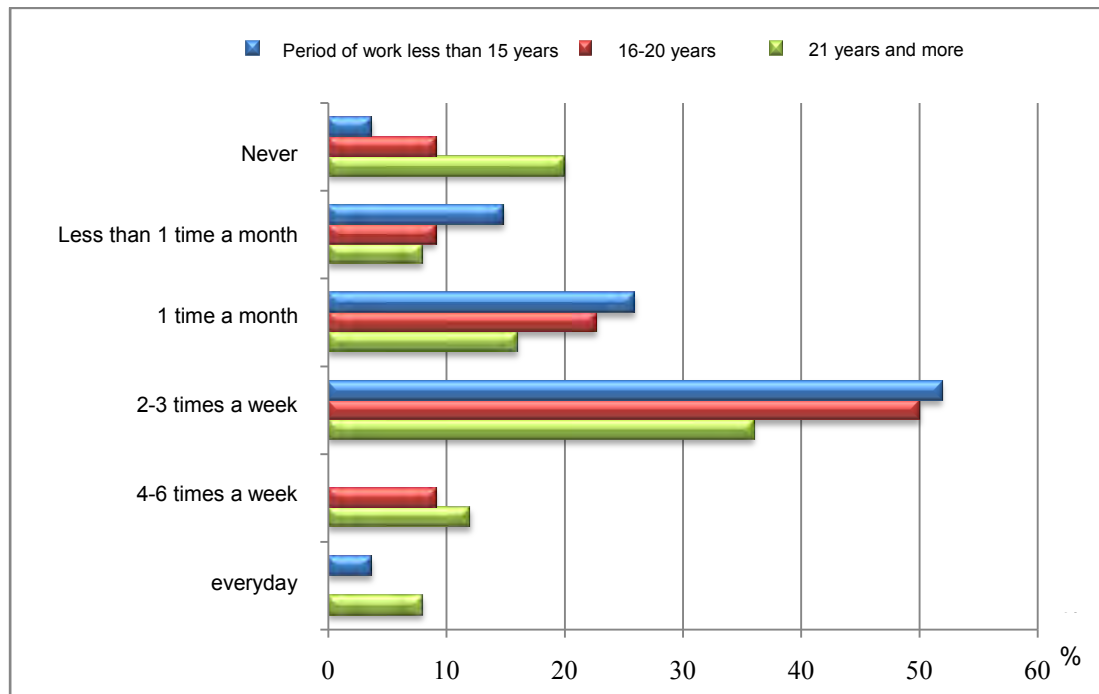


Fig.2. Frequency of physical activity of primary classes' teachers (%).

In order to improve physical education of rising generation it is necessary to know attitude of pedagogues themselves to physical culture and sports. Basing on this fact, respondents were offered questions with four variants of answers (in rank order).

The obtained data did not show any influence of period of pedagogic activity on respondents' opinion. Analysis of questioning results witness that practically all questioned, independent of their periods of pedagogic work, consider physical culture and sports an excellent mean of health improvement and prevention from diseases ($p>0.05$). In respondents' opinion physical exercises shall be practiced during all life and positive attitude to physical culture shall be cultivated to everybody since early childhood (see table 3).

Table 3.

Primary classes' teachers' opinion about physical culture and sports

Groups	Variants of answers			
	Completely agree	Partially agree	Agree but not completely	Not agree
	Physical culture and sports is the best health related mean and method of prevention from diseases			
I	81.5	18.5	0	0

II	72.7	27.3	0	0
III	72.0	28.0	0	0
Physical exercises shall be trained for all life				
I	70.4	29.6	0	0
II	68.2	31.8	0	0
III	76.0	20.0	4.0	0
Children shall be cultivated with positive attitude to physical culture since early childhood				
I	96.3	3.7	0	0
II	95.5	4.5	0	0
III	84.0	16.0	0	0

The obtained by us data contradict to the data. Supplied by Yurechko [1], who says that primary classes teachers insufficiently understand significance of physical culture for their personal self-perfection.

Studying of way of life of adult Lithuanian population showed that in the period from 1994 to 2008 percentage of inhabitants, who appraise their health as “good” or “sufficiently good” significantly increased. Increment of such persons among male population is 25% and among female – 63%, with it persons with higher educational level appraised their health in such way two times oftener than persons with not completed secondary education [5]. This fact permits to assume that among educated representatives of country's population new values began to form, among which care of own health and choice of healthy life style, with physical culture as an integral; component, are expressed.

Conclusions:

Absolutely all teachers of primary classes of Kaunas, who participated in the research, are motion active, have positive attitude to physical culture and sports and think it necessary to form such attitude to physical activity of his disciples since early childhood.

Further researches will be oriented on studying of attitude to physical activity of comprehensive schools’ pedagogues. Besides, in our opinion, it would be interesting to compare and appraise attitude to physical culture and sports of higher educational establishments’ teachers of our Republic, who train future primary and secondary classes’ teachers.

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Cite this article as: Grigoniene J.J., Skyriene V., Margeliene N. Analysis of the physical activity of primary school teachers. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 20-24. doi:10.6084/m9.figshare.749692

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Received: 25.06.2013
Published: 30.09.2013

ON THE TRANSFER OF SKILLS SKILL IN DIFFERENT CONDITIONS OF MOTOR ACTIVITY

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Annotation. The aim of the study is a metric description of the transport of mobility in terms of kinesthesia in examined in a comprehensive registration block of six different motor coordination tasks. A total of 56 students in six different test tasks coordination complexity. The results of the initial control of processed statistically. Two calculated correlation matrix 6x6. The efficiency of use in subsequent statistical operations previously only justified, metrological reliability of the results. The transfer of skills in terms of agility kinesthesia found only in two exercises of this nature, explicable by common physiological mechanisms of regulation. The results of the study confirm the well-known knowledge of the complexity of mobility and contrary to some of the original authors of the possible use of a single universal control exercise - test for evaluation.

Keywords: agility, kinesthesia, transport, skills, control, evaluation.

Introduction

We assume that urgency of question under our consideration about transferring of dexterity skills in different conditions of motion activity is conditioned by existed in scientific-methodic literature opinion about, the so-called, total coordination and application of universal test for its evaluation [11,12]. Initial cause of such, from our point of view, discussible opinion can be evident disproportion between fundamental knowledge about psycho-physiological mechanisms of dexterity [1,6], and practical knowledge about methods of measurements and evaluation of this ability in conditions of physical education and sports.

As it is known, structure of dexterity is characterized by several little interconnected its kinds. They include: dexterity of cyclic, stereotype and acyclic, not stereotype movements; manual dexterity and dexterity with participation of all body parts. Also dexterity in quickness of human responses, in rhythm of movements, in quickness of coordination's re-switching in suddenly appeared conditions of motion activity and so on. Integral criterion of dexterity is accepted to be considered complexity not of some universal test – exercise, but anyone from great variety of specific, difficult in coordination exercises, accuracy of their numerous repetitions and quickness of their mastering in the process of training [1,6,11,13,14]. These knowledge are in the base of organization of control and evaluation of dexterity of trainees in specifically conditioned loco-motions. This in itself causes doubts in opinion about efficiency of using of universal test, suitable for evaluation of dexterity of a gymnast, swimmer, downhill skier, football player and so on.

That is why opinion about dexterity as global ability against the background of fundamental knowledge about its complex psycho-physiological structure and numerous forms of its manifestation in different conditions of human motion activity is of discussible character and causes need in organization of additional researches.

Considering the fact that in the base of dexterity there is human sense of movement, in our research we made an attempt to metrically evaluate kinesthetic state of the tested in standard laboratory conditions and basing on this material to judge mediately about structure of dexterity skills and peculiarities of transfer of these skills in coordination conditions of different difficulty.

Purpose, tasks of the work, material and methods

The purpose of the research is to metrically ground peculiarities of transferring of dexterity by indicators of kinesthesia of the tested group in conditions of complex registration of several coordination-different motion tasks.

The tasks of the research:

- to calculate reliability of measurements in conditions of numerous repetitions of differentiation accuracy of motion tasks in six test exercises.
- to study character of correlation interconnection between results of accuracy of differentiation in these test exercises.

We assumed that in this case it would be possible to substantially from metrological positions observe the character of kinesthesia's state transferring of the tested in adjoining test tasks and mediately judge about structure of dexterity and means of its evaluation in system of control in pedagogical process.

The methods of the research. The research was carried out in scientific laboratory with observance of commonly accepted metrological requirements to measurement procedure, described in our previous publications [3,4,5,8]. We tested 56 students, who do not practice systemically any kind of sports. Their average age was 21.8 years old, height – 180.6 cm, mass of body -78.1 kg. Testing program included six arbitrarily selected motion tasks of different difficulty. We registered accuracy of results of numerous repetitions of every from six listed below tasks.

1. Two high jumps from the spot with rotation around longitudinal axis of body; one – to the left and one to the right in every series. Landing - in circle. Protractor – 380°. Three repetitions of series. Sums of degrees in series.

2. Accuracy of ball's throws in target in golf conditions from 9 meters' distance. Gym, floor covered with linoleum. Five series, 7 throws in each series (cm).
3. Standard Romberg's test. Computerized strain gage platform. Three repetitions (mm^2).
4. Accuracy of task's differentiation - 50% from maximal value of strength in elbow. Five repetitions (N).
5. Accuracy of task's differentiation - 50% from maximal result of long jump from the spot. Five repetitions (cm).
6. Body balance in static-dynamic conditions. Test "ellipse". Computerized strain gage platform. Five repetitions (mm.p.sec.).

Statistical analysis of data general amount was carried out as per general requirements [2,7] in the following sequence:

1. We preliminary calculated reliability of measurements of every of the tested, basing on percentage of comparability of successive attempts in every of six test tasks;
2. We characterized reliability of measurements of all group by every indicator on the base of calculation of in-test correlation (r_{it}). The total scope of measurements, which reflected accuracy of tasks' fulfillment in six test exercises, was processed with method of rank correlation. It was assumed that this method would permit to objectively evaluate the state of kinesthesia of the tested in every of six test tasks, as well as to observe the character of motion sense's transference in conditions of every test task.

Results of the researches

It was stated that in conditions of repeated changes in every test task in group, consisting of 56 tested, variability of measurements was different and was in the range V% 12.4-45.8. It meant that stability of repeated measurements' results of some tested was lower than the required metrological norms of reliability (see table 1). As it is known, measurements' reliability is characterized by degree of interconnection of repeated attempts' results. Within the limits of low, but still admissible reliability there were measurements, which correlated in the limits 0.69-0.60; admissible reliability – 0.79-0.70; middle – 0.89-0.80 and so on. [2, 8].

Table 1

Indicators of differentiation's accuracy and measurements' reliability of the tested in six test tasks

Statistical parameters	Test tasks and units of measurements					
	1(°)	2 (cm)	3 (mm^2)	4 (N)	5 (cm)	6 (mm.p.sec.)
M	884	128	552	29	4	23
δ	171	16	273	7	2	8
min	515	88	196	16	1	14
max	1300	161	1513	47	12	62
V%	39.4	12.4	45.4	24.4	45.6	34.7
Reliability of measurements (r_{it})						
M	0.399	0.599	0.388	0.444	0.402	0.506
min	0.275	0.404	0.203	0.393	0.303	0.412
max	0.618	0.817	0.615	0.796	0.637	0.808

Low mark of measurements' reliability of some tested excluded using in further statistical operations of data general population of 56 tested, because there were a lot of random, not stable measurements, which did not meet requirements of reliability. Expressed differences between the tested took place in results of accuracy of high jumps with rotation; Romberg's test; in differentiation of long jump's distance; in test "ellipse" (tasks 1,3,5,6 V%=39.4; 45.4; 45.6 and 34.7 accordingly). These differences were noticeable in comparing of minimal and maximal results of measurements of students' group in every of six test tasks and were reflected in indicators of measurements' reliability with calculating of in-test correlation (see table 1). As it can be seen in the table, certain part of the tested demonstrated comparatively high comparability of results of repeated measurements (r – in the limits of 0.615-0.817). At the same time other part of the tested distinguished by low reliability of measurements (r – in the limits 0.203-0.412).

This fact served a base for solution of main task of the research – metrical description of transferring of dexterity in conditions of different test tasks; it was necessary to use only that part of general measurements' population, which corresponded to metrological requirements of reliability. The purposefulness of such approach was proved by materials, presented in table 2, where in upper part of matrix there are correlations, calculated by data of 56 students' measurements. Here mean reliability of measurements was in low zone of reliability, within limits r_{it} =0.388-0.599. Transferring of dexterity, by kinesthesia's indicators took place, in this case, only in Romberg's test and in test "ellipse" (r =0.371).

Table 2

Results of correlation analysis of indicators of motion tasks differentiation's accuracy transferring in two sub groups of the tested

	1	2	3	4	5	6
1	x	-0,137	0.026	-0.199	0.096	-0.149
2	0.299	x	0.190	0.180	0.027	0.206
3	0.267	0.333	x	-0.145	0.112	0.371*
4	0.311	0.299	0.317	x	0.141	0.165
5	0.386*	0.199	0.289	0.293	x	0.017
6	0.233	0.354	0.502**	0.312	0.301	x

Notes: *P<0.05; **P<0.01

Results of correlation analysis of general population of measurements were duplicated in the following way. From 56 of the tested we selected only those, whose repeated measurements' accuracy difference did not exceed 21% and reliability was in the limits of correlation coefficients 0.70-0.79 and higher. In this case there were 28 such tested, including 11 with measurements' reliability within correlation limits 0.80-0.89. In total, all group of the tested was characterized by admissible and middle reliability of changes (see table 2, lower part of matrix). With it, we received two statistically significant correlation coefficients at level of P<0.05-0.01. They were in tests 1 and 5 – high jump with rotation and accuracy in long jump from the spot ($r=0.386$), and in tests 3 and 6 – Romberg's test and "ellipse" ($r=0.502$). In this case as well transferring of motion sense, videlicet - dexterity, can be explained by community of physiological mechanisms in these, similar by coordination, movements. In other combinations of control tasks correlation interconnections turned out to be insignificant.

Conclusions

As it is known, dexterity is a complex quality, with specific interaction of motor and other analyzers and participation of central and periphery sections of human nervous system in the base. These knowledge are proved by practice of physical education and sports, by examples, which witness about absence or insignificant transferring of dexterity, acquired in some conditions to other, not specific conditions of motion activity [2,6,9,10]. In this connection results of separate researches, which try to prove conceptions of global dexterity and universal method of its evaluation, cause doubts [11,12].

Proof or rejection of these conceptions can be realized only with the help of experimental data and this idea served the subject of our research. Observation of dexterity transference can be only in mediate way, basing on indicators of human motion sense (kinesthesia), which can be evaluated metrically in objective units, with the help of reliable from metrological position measurements.

In conditions of our research we based only on reliable from metrological position measurements' results in six test indicators of different coordination difficulty. However, transference of skill to differentiate motion task equally accurately was observed only in two cases: in Romberg's test and in "ellipse"; in accuracy of long jump and high jump with rotation. One can assume that in these cases transference of skill can be connected with similar physiological mechanisms, which regulate human arbitrary similar movements. In other combinations of six test exercises transference of skills was not found. It means that introduction of opinion about global coordination and universal methods of its evaluation in conceptual system of theory and practice of physical education can be considered to be rather discussible, and requiring further metrical foundations.

The prospects of further researches imply more profound foundation of universal methods of global coordination's evaluation.

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Cite this article as: Zaporozhanov V.A., Borachinski T. On the transfer of skills skill in different conditions of motor activity. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 25-28. doi:10.6084/m9.figshare.749693

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

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Received: 09.06.2013
Published: 30.09.2013

AN EXPOSURE OF PROFESSIONAL MEANINGFUL COORDINATING CAPABILITIES OF STUDENTS-TEACHERS

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Annotation. Purpose - to identify the motor abilities of students who have the greatest impact on the success of teaching. The experiment involved 264 students. It is established that the speed of operational thinking, the ability to quickly and accurately respond to the resulting job and do it exactly the goal has a positive effect on the quality of teaching. There is a high correlation with reactive and kinesthetic abilities and pedagogical skills. It was found that the speed, shift and focus of attention is closely linked to the ability to attention, memory, fidelity to the information received. It is proved that for a successful career students need to develop kinesthetic responsive coordination abilities and the ability to orient in space. It is recommended for software development content of physical education to focus on improving the coordination abilities listed.

Keywords: students, teachers, specialist, physical education, vocational and applied physical training.

Introduction

In the process of studying at HEE formation of future pedagogues' professional abilities is one of the most important tasks. The process of specialists' training at HEE includes a number of pedagogical aspects, including professionally-applied physical training. There is such section as professionally-applied physical training in discipline "Physical education" at HEE. But this section is not impregnated with appropriate content and has no clear scientifically grounded methodic instructions on organization of trainings with students of different specializations; there is no program provision of this section.

The problem of motion abilities and skills' formation in the process of professional education is connected with development of such and such coordination mechanisms on the base of control and evaluation of motor system's state and its different sub-systems [1, 2, 3, 4, 5, 6, 7, 8 et al.]. This problem really exists and it is mainly connected with development of effective methodic of physical education, with consideration of future professional activity. Its solution in frames of academic process is connected with physical culture trainings of girl-students, in the course of which development of basic coordination abilities take place, which is the base for further formation of professionally important coordination abilities.

Accordingly, determination of those coordination abilities, which will be professionally important in the process of girl-students' – future pedagogues training, is the aim of analysis and evaluation of character, quantity and degree of dependences between basic coordination abilities and professionally important skills.

Topic of the present work corresponds to direction of scientific program of physical education faculty of Chernigov national pedagogical university, named after T.G. Shevchenko and is included in general university's subject "Didactic principles of motion function's formation of persons, who practice physical education and sports" (state registration No. 0108U000854 dt. February 19th, 2008). The work has been fulfilled in compliance with direction of state-financed subject "Methodic principles of professional training of future physical education teachers and formation of modern youth's healthy life style" (State registration No 0110U000020, dt. January 29th, 2010).

Purpose, tasks of the work, material and methods

The purpose of the work at that stage of research was determination of those girl-students' motion abilities, which influence to the highest extent on successfulness of their professional activity.

The methods of the research. The research was carried out in 2008-2010 and covered 264 girl students of 1st – 3rd years of study of Chernigov national pedagogical university, named after T.G. Shevchenko and Kyiv university, named after Borys Grynchenko and who, by their state of health, were related to main health group.

The level of girl-students' *accuracy* was evaluated with the help of the following tests:

1) *accuracy of the set value of force* was determined with hand dynamometer.

2) *accuracy of fulfillment of the set movements' amplitude* was measured with the help of kinematic meter of M.I. Zhukovskiy.

Responding abilities (dexterity) were evaluated with the help of the following tests:

1) test for determination of *quickness* (test "catching of ruler", S.A. Dushanin, 1978).

2) test for determination of *response to moving object*. For testing we used computer program "Prognoz", created by Institute of physiology, named after O.O. Bogomolets, of Academy of Science of Ukrain, Kyiv.

3) test for *visual-motor quickness* (simple and complex). For testing we used computer program "Prognoz", created by Institute of physiology, named after O.O. Bogomolets, of Academy of Science of Ukrain, Kyiv.

4) test for determination of *quickness* (test "catching of stick", I.V. Afanasyev, 2008).

5) complex coordination test, oriented on *determination of accurate, differently directed power-quick movements for certain period of time* (computer program "Prognoz", created by Institute of physiology, named after O.O. Bogomolets, of Academy of Science of Ukrain, Kyiv).

For evaluation of *balance abilities* we used the following tests:

- 1) *static balance* (Romberg's test - posture of "Stork").
- 2) *dynamic balance* was evaluated with the help of test "Turns on gymnastic bench" (P.Hirtz et al, 1985).

Orientation abilities were tested with the following:

- 1) test "Labyrinth" (I.Yu. Gorska, 2000).

Professionally important abilities of girl-students – future pedagogues were evaluated with the following tests:

- 1) determination of *distribution of attention* (test "Seeking of figures", A. Sizanov, 2003).
- 2) *scope of mechanic memorizing* (test "Quantity of little men", A. Sizanov, 2003).

3) determination of *distribution of attention and quickness of operative thinking* (test assembly of puzzles for certain time». I.V. Afanasyeva, 2008).

- 4) determination of *operative thinking quickness* "bricks of Koss", L.F. Burlachuk, 2000).

5) *quickness of attention's concentration and re-switching as well as accuracy of task's fulfillment* were determined with the help of special device (S.I. Kirichenko, 1998).

Results of the researches

After fulfillment of multiple correlation analysis we constructed correlation matrix, in which the obtained information was analyzed, considering character, quantity and degree of closeness of the received interconnections; only statistically significant indicators were considered. It was found that all studied by us indicators of future pedagogues' professional qualities are interconnected with indicators of certain basic coordination abilities. At the same time the fulfilled analysis permitted to reveal ambiguous character of interdependences as per different kinds of future teachers' professional qualities.

Correlation analysis permitted to reveal dependence of indicator, which characterizes *distribution of attention level* (test "Seeking of figures") of girl-students with indicator of test "Labyrinth", which characterizes *ability to orientate in space, to quickly and accurately fulfill motion task*. In this case correlation coefficient equals to 0.67 and reflects the level of the studied indicators' interconnection. It is necessary to note that, when fulfilling test "Labyrinth" time and curacy of task's fulfillment was evaluated as well as during test "Seeking of figures" attention and time were evaluated. Activity of such kind takes place in professional work.

In table 1 we presented analysis of correlation matrix of parameters, which determine dependences of indicator, characterizing *level of attention, operative memory development, quickness of memorizing and accuracy of reproduction of the received information* (test "Quantity of little men") with indicators of tests "Labyrinth", *complex visual-motor response, "Catching of ruler"* – characterizing *response, kinesthetic ability and ability to orientate in space*. Analysis of interconnection of such important for future professional activity qualities as *attention ability, operative memory, accuracy of reproduction of received information* (test "Quantity of little men") with indicators of tests, which characterize degree of *responding, orientation and kinesthetic* abilities of girl-students permits to assume that developing these coordination abilities it is possible to influence on development of professional skills. Degree of parameters' closeness is moderate and it is witnessed by correlation coefficients, which vary in the range from 0.61-0.77.

Table 1

Interconnections of indicator, which characterizes levels of attention, operative memory, quickness of memorizing and accuracy of received information's reproduction (test "Quantity of little men) with indicators of orientation, responding and kinesthetic abilities

Indicators	Correlation coefficients
Orientation ability (accuracy of reproduction of the set trajectory of movement, test "Labyrinth")	0.61
Responding ability (test C3MP)	0.72
Responding ability (test "Catching of ruler")	0.64
Responding ability (test "Catching of stick")	0.63
Responding ability (test П3MP)	0.68
Responding ability (response to moving object)	0.74
Distribution of attention (test "Seeking of figures")	0.77
Dynamic balance	0.68
Static balance	0.63
Complex coordination test	0.72

The determined character of interconnections witnesses about significance of *responding, orientation and kinesthetic coordination abilities* of girl-students for quick and effective solution of professional; tasks, connected with necessity of accurate perception in the shortest time and keeping in memory of huge scope of space and other information.

We established interconnection of test "Assembly of puzzles", which characterizes *level of fine motor abilities' development* with indicators of "Bricks of Koss" test, characterizing *level of operative thinking quickness*, abilities for constructive praxis. Degree of studied parameters' closeness is high and it witnessed by correlation coefficient, equal to

0.75. Test for quickness of operative thinking is a complex one and characterizes not only the level of girl-students' motion skills but also shows a component of mental processes. It permits to say that it is necessary to improve such coordination abilities of girl-students, in the process of their studying at pedagogic HEE, like ability *for constructive praxis, quickness of operative thinking, ability to quickly and accurately respond to received task and fulfill it accurately in compliance with the set purpose.*

General level of girl-students' professionalism was determined with the help of evaluating points from tests of discipline "Pedagogic skillfulness". In the process of correlation analysis we found interconnection of this indicator with indicators, which characterize *level of development of kinesthetic and responding abilities* (test "Response for moving object"), test ("Reproduction of the set amplitude of arm's movement"). Analysis of character of the found dependences between evaluation points' indicator and indicator of kinesthetic ability's development (test "Reproduction of the set amplitude of arm's movement") witnesses about presence of expressed connection, correlation coefficient equals to 0.80. Interconnection of girl-students' professionalism indicator with indicator of test for responding ability (test "Response for moving object") can be appraised as moderate, correlation coefficient equals to 0.62.

In table 2 we present analysis of correlation matrix of parameters, which shows dependences of indicators, characterizing *level of development of quickness, re-switching and concentration of attention and accuracy of task's fulfillment* (test "Balls") with indicators of other tests.

Analysis of interconnection of such important for future professional activity qualities as *concentration ability, operative memory, accuracy of reproduction of received information* (test "Balls") with indicators of tests, which characterized *level of responding, orientation and kinesthetic abilities* of girl-students, permits to assume that developing such abilities it is possible to influence on development of professional skills. Degree of parameters' closeness is moderate and high; it is witnessed by correlation coefficients, which vary in the range from 0.55-0.86.

Table 2

Interconnections of indicators, which characterizes level of quickness, re-switching and concentration of attention and accuracy of task's fulfillment (test "Balls") with indicators of orientation, Responding and kinesthetic abilities

Indicators	Correlation coefficients
Responding ability (test C3MP)	0.76
Responding ability (test "Catching of ruler")	0.85
Responding ability (test "Catching of stick")	0.86
Responding ability (test П3MP)	0.79
Responding ability (response to moving object)	0.82
Distribution of attention (test "Seeking of figures")	0.63
Dynamic balance	0.58
Static balance	0.55
Scope of mechanical memorizing (test "Quantity of little men")	0.67
Distribution of attention and quickness of operative thinking (test "Assembly of puzzles")	0.77
Quickness of operative thinking (test "Bricks of Koss")	0.69
Accuracy of reproduction of the set force	0.75
Accuracy of reproduction of the set movements' amplitude	0.74

Conclusions:

Thus, the fulfilled correlation analysis of interconnections of professionally important abilities' indicators of future pedagogues with indicators of basic coordination abilities' development showed that they are in rather wide and close interaction, influencing more or less each other. The data, obtained as a result of correlation analysis, permit to make a conclusion that for successful professional formation of girl-students it is necessary to develop to larger extent their *kinesthetic, responding, coordination abilities* as well as *abilities for orientation in space*. However, not all kinds of coordination abilities have correlation connections. For example, there was not observed any high interconnection of professional skills and ability to keep static balance. It can be explained by the fact that girl students have rather good level of static balance, as far as static posture is habitual for them. Though, it would be difficult to maintain this posture for long time during work.

With development of program content of physical education, it is necessary to accentuate attention to just improvement of above mentioned coordination abilities. It is urgent also because the conducted analysis of indicators of kinesthetic, responding and orientation abilities from 1st year of study to the 3rd one showed that negative dynamics. Already at 1st year of study girl-students' indicators of such tests as "Catching of vertically falling object", "Response for moving object", of complex coordination test are lower than middle age norm. So, pedagogic influence shall be started since the 1st year of study, in order for girl-students to have necessary professionally important abilities and skills by their graduation.

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Cite this article as: Kolumbet A.N. An exposure of professional meaningful coordinating capabilities of students-teachers. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 29-32. doi:10.6084/m9.figshare.749694

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

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Received: 25.06.2013

Published: 30.09.2013

THE STUDY FEATURES OF TEST PROCEDURES OF STUDENTS' KNOWLEDGE ON THE PHYSICAL TRAINING LESSONS

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Annotation. The aim is to determine the significance of the relationship and special professional skills necessary to detect and correct errors and evaluating students in physical education classes. The surveys were a group of qualified teachers (n = 31) with different pedagogical experience. Each teacher was asked to arrange the professional quality of the places from 1 to 10. It was found that all investigated have a certain quality and a high level of relationship, but they are manifested in different periods of teaching. It is shown that the process of organizing and carrying out checks of expertise includes logically related mental operations which are the basis of test procedures of students' knowledge on the physical training lessons. Found that the most weighty qualities were related to skills: a rating, comment exposed estimate visually identify the error and determine its significance.

Key words: mistake, skill, observation, reason, consequence, connection, perception, comparison, estimation.

Introduction

Analysis of the literature as for the methods of students' knowledge control in physical training lessons is shown enough by several authors and is considered from the position of systemic-structural approach [1; 2; 4; 5]. For effective students' knowledge control teachers should have specialized professional skills such as excellent knowledge of the theme that is checked by him, determine the range of possible mistakes and their classification by correcting, evaluate students' action in general. The process of organizing and conducting testing includes logically related mental operations. The first one and the most important is the operation of monitoring students' actions because all the next operations depend on it because if this operation has some mistakes all the next ones will be also incorrect. In order to avoid mistakes a teacher should not only have excellent knowledge of all elements of the action that is estimated and also take the best place to monitor the action that is performed. The second operation is the operation of analysis of identified mistakes. The third one includes the mistake correction using the suitable methods. The fourth operation foresees putting the mark and its interpretation. Getting knowledge as for each operation and the ability to use them in practice is required in the system of methodical preparation of teachers of physical training.

Purpose, tasks of the work, materials and methods.

The aim of the paper is to determinate the composition, significance and correlation of specific professional skills that are necessary to detect and correct mistakes in the students' action in physical training lessons. According to published data the composition of specialized skills are identified in table 2. For an objective assessment of the significance of each professional pedagogical feature the questionnaire of qualified teachers (n = 31) with different teaching experience was held (table 1).

Each teacher was asked to put all the professional skills, that were listed in table 1, arrange from 1 to 10, giving the first place to the most important skill, and the last place to the less significant in their point of view.

Results of the researches.

The actor analysis was used for the processing of the data. It made possible to place the results of features that are studied in each group of teachers in the semantic space where the system of organized features that constitute and differentiate objects of a particular subject area is understood. In our case, the semantic space that characterizes the structure of "definition of mistakes and their elimination" is analyzed.

Table 1

Teachers who took part in the survey

Age	Years of teaching experience		
	Up to 10 years	From 10 to 20 years	over 20 years
20-30	9 person		
31-40	3 person	4 person	1 person
41-60		6 person	8 person

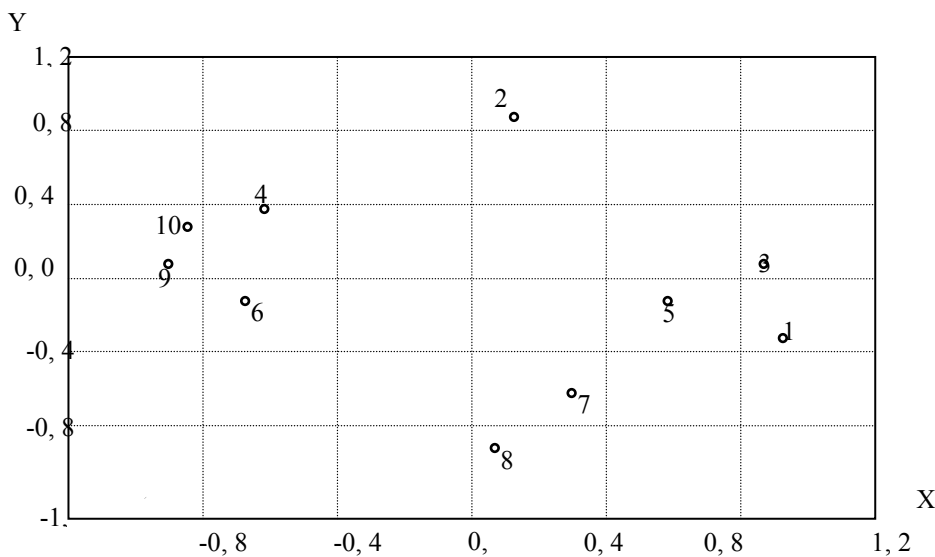
Table 2

The special skills that are necessary to test students' knowledge

№	Skills and its interpretation
1.	Visual detection of mistakes. Based on excellent knowledge of technique of physical exercises and opportunities to compare this knowledge with student's action.
2.	Selection the method and the place of observation, depending on the mistake. Taking the best place for complete review.

3. **Identifying the significance of the mistake.** The knowledge that includes the dividing of mistakes for major and minor and is based on scientific research in the fields of biomechanics, physiology, and so on.
4. **Identification of the result depending on the particular mistake.** Means the ability to set up the influence of a specific mistake on a final result.
5. **Setting the reason of appearance of mistake and its pedagogical interpretation.** Means the ability to explain the students the reason of appearance of mistake.
6. **Using the figurative comparisons for the prevention and correction of mistakes.** Ability based on knowledge of psychology and physiology and is to select the appropriate figurative comparisons for specific age groups of students.
7. **Using the physical help that is directed to sense of motion to correct the mistake.** Indicates mistake correction using contact, steering help.
8. **Selection and using specific exercises that are directed to mistake eliminating.** This ability is based on a knowledge of specific exercises and their directed using.
9. **Ability to set the mark for student action.** Means the ability to relate students' action to the criteria requirements adopted by the school.
10. **The ability to comment the putting mark.** Means an argued response to a question why the student was given the particular mark, but it can be done in a fully possessing nearly all the above-defined properties.

Semantic space of the first group of teachers with teaching experience up to 10 years is presented in table 1. Coordinate axis of the graph can be determined by the greatest performance of certain features. So the coordinate X axis is called the ability to "put a mark" (-0.950), and the axis Y - "to use special exercises" (0.963).

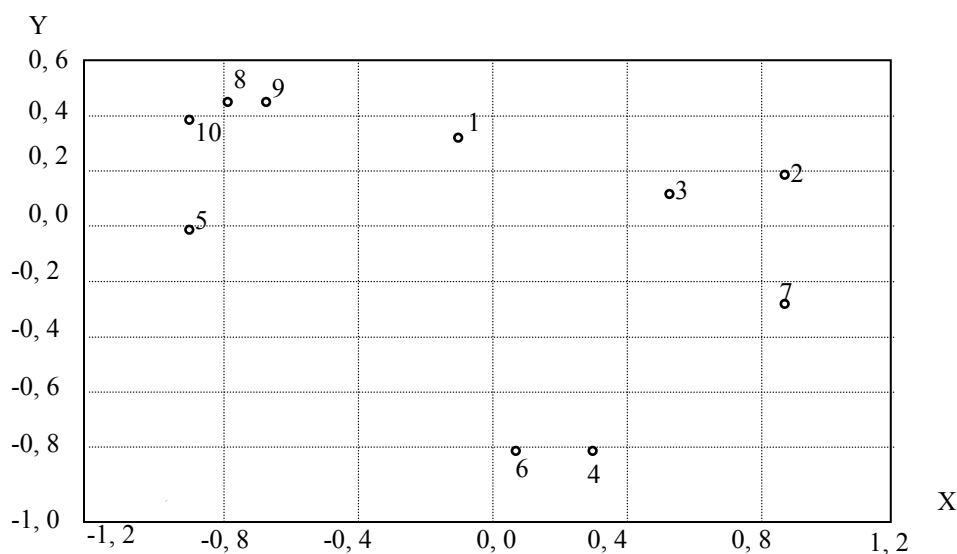


Picture 1. Semantic Space of teachers with teaching experience up to 10 years

In this space the studied skills were grouped into three galaxies. The first one includes those skills that have number 4, 6, 9, 10, which have their correlation coefficients. They are 0.613, -0.694, -0.950, -0.867. The second galaxy includes those skills that have number 1, 3, 5 with their coefficients. They are 0.924, 0.852, and 0.594. The third galaxy has 7 and 8 features with their coefficients 0.320 and 0.088.

And apart from with a very low correlation (0.095) is the feature that is connected with the ability to choose the method and place of observation, depending on the mistake. Obviously, in this category of teachers the most significant features are related with the next skills: put marks (-0.950), comment the mark (-0.867), visually determine the mistake (0.924) and to determine the degree of its significance (0.852). Now let's have a look at the semantic space of the second group of teachers with experience from 10 to 20 years (table 2), so the coordinate X axis is called "commenting the mark" (-0.885) and Y - "creating the notion of motion" (-0.827).

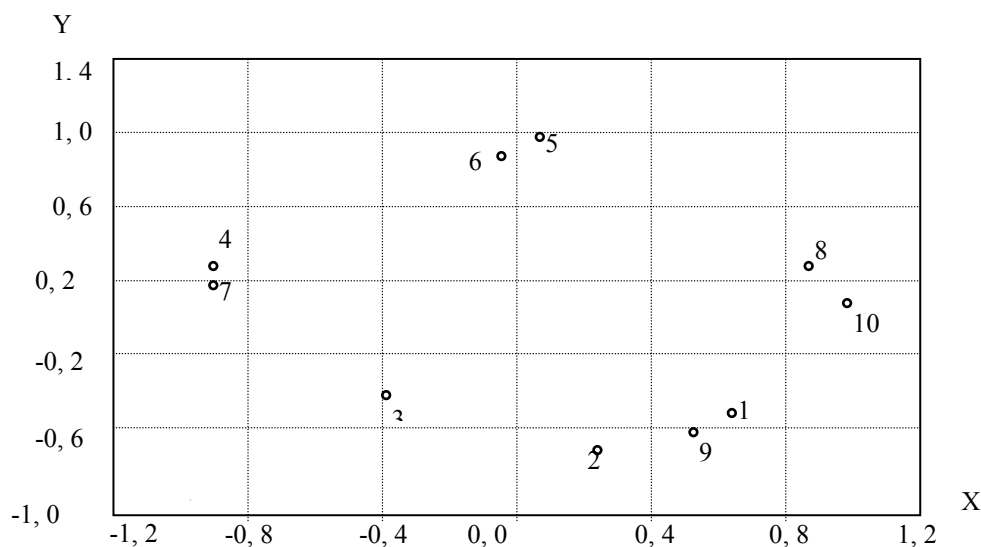
Here features were grouped into three galaxies. The first category includes the abilities that have numbers 5, 8, 9, 10 with the coefficients -0.871, -0.801, -0.670, -0.885. The second galaxy is outlined in abilities that have numbers 2, 3, 7 with the coefficients 0.863, 0.520, 0.860. The third galaxy includes number 4 and 6 with correlation 0.242 and 0.063. The first indicator of the quality of -0.099 cannot be attributed at least to any galaxy because of its specific location. As for correlation parameters such skills as setting specific reason of mistake appearance and its pedagogical interpretation (-0.871), the selection and using specific exercises (-0.801), commenting the mark (-0.885), the choice of method and place of observation (0.863), using of physical help (0.860) should be recognized.



Picture 2. Semantic Space of teachers with teaching experience from 10 to 20 years

The next semantic space is presented in table 3. Axis X is also "commenting the mark " (0, 973) and Y - "determine the cause of the mistake" (0.968).

In this group we have 4 galaxies. The first one combines skills number 4, 7 with the same correlations -0.940. The second galaxy, which includes skills number 8 and 9 with correlations 0, 830 and 0, 973. The third galaxy has skills number 1, 2, 9 with the correlation 0.607, 0.218, 0.544. The fourth galaxy has skills number 5, 6 with the correlation 0.076 and -0.031. And skill number 3 is separated with coefficient 0.405. The most informative are the next qualities: determination of the result depends on the specific mistake and the using of physical help (to -0.940), selection and using of specific exercises (0, 830), commenting the mark (0, 973).



Picture 3 Semantic Space of teachers with teaching experience over 20 years

These data indicates that all qualities that are mentioned in the article have rather high level of informativeness, but it manifests in different periods of educational activities. Difference in semantic space with simultaneous migration of certain qualities is observed, so there is no tendency according to their structure.

In all groups of teachers high correlation coefficients to the ability to set the mark was shown. This was the first sign that deposits on the X axis of the investigated space. The second feature that is defined on the axis Y, is not repeated in each category of teachers. Ability to use specific exercises to eliminate mistakes become a major in the first group, the second, it expands to creation a visual picture of the movement and in the third group it finally ends as the ability to set a specific reason of mistake appearance.

With this consideration there is a movement from "simple" to "complex" of integrated skills, and as a result the importance of student assessment increases. That is, it relies on more interconnected and complicated professional skills which appear while teaching experience increasing.

Conclusion

The process of organizing and conducting testing involves thinking logically related operations that are the basis of methods of testing students in physical training lessons.

Defined professional skills are quite significant and tight correlation, and their systematic use shows positive result in testing students.

As a result the development of methods of teaching students the ability to check the students' knowledge at the physical training lessons paying attention at specific kind of sports.

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Cite this article as: Korobejnik V.A. The study features of test procedures of students' knowledge on the physical training lessons. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 33-37. doi:10.6084/m9.figshare.749695

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

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Received: 08.07.2013

Published: 30.09.2013

**IMPACT ON THE DISPLAY OF POWER CHEERLEADING ABILITY OF UNIVERSITY STUDENTS I-II
LEVELS OF ACCREDITATION**

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Annotation. Reflects the dynamics of indicators of the level of development of power abilities of students under the influence of specially selected exercises cheerleading. The study involved 385 students (age 15-17 years). The level of the forces will determine by tests: flexion-extension hand-ups, lifting the torso in the saddle for 1 minute, jumping on one leg with the progress, carpal dynamometry. Revealed low levels of manifestation of the power in the first stage. Most significantly improved the results of flexion-extension hand-ups (I course to 32,28%, II course at 21,77%, III course for 25.60%;). According to the results of the lifting body in the saddle improved results of 12.41%, 10.80%, 11.98%, respectively. According to the results of the hops on one foot with the progress - by 5.78%, 4.70%, 4.97%, respectively. According to the wrist of the dynamometer, at 6.31%, 5.36%, 5.89% respectively. The most significant growth results have been observed mainly at students aged 15 years.

Key words: students, power capabilities, physical education, cheerleading.

Introduction

Recent time, in Ukraine there is a steady trend to worsening of students' health and physical condition [2,4]. The area of priority in solving of this problem is physical education – important element of comprehensive students' development, formation of their principles of healthy life style, organization of useful, active leisure, development and restoration of physical and mental forces, strengthening, rehabilitation and correction of health, education of moral and will qualities and so on [2,5]. With it, in the works by O. Mitchik, O. Sapoznik et al. [6, 10] There are presented data, which reflect reduction of youth's interest to physical exercises' practicing. That is why there appears a necessity to improve physical education process at HEE at the account of implementation of new means, methods and forms of physical education [4,5].

As a result of questioning, which was carried out by us [6], we determined that students are attracted by non-traditional or new kinds of academic material, in particular, cheerleading. Cheerleading is a kind of sports, including great number of different movements: acrobatic, gymnastic, dancing and etc. Under competent guidance of an instructor cheerleading is a powerful, complex mean of human motion sphere's formation [9].

With it, it should be noted that the problem of cheerleading's influence on different aspect of students' physical condition (of 1st, 2nd accreditation level HEEs) has not been studied yet.

In human development one of leading places is taken by power training, on which, to large extent, person's social adaptation and labor potential depend. A number of authors dealt with problems of power abilities' level improvement in the process of physical education of different age contingent. For example, T. Bala, I. Masliak [1] applied cheerleading exercises for strength training of secondary classes' pupils; S. Nikolayev, Yu. Nikolayev [10] trained 10-11 forms pupils with means of athletic gymnastics; S. Grytsiliak, B. Zubritskiy – used basketball exercises for students' training [3]; A. Fangina trained students with health related kinds of swimming with the help of computer programs [14,16] et al.

Analysis of recent scientific publications showed that in modern scientific sphere different aspects of physical culture and sports are regarded, but, in our opinion, the problem of physical education of 15-17 years old students has not been paid sufficient attention to. This age - is age of early youth, when world vision is formed, ideas and positions, when formation of full fledged idea about oneself is formed. Attitude of growing personality to own self is based both: on own analysis of own intellectual, moral and physical abilities and on the base of appraisals of other people.

The research was carried out in compliance with combined plan of scientific & research works in the sphere of physical culture and sports for 2011-2015 of ministry of education & science, youth & sports of Ukraine in direction 3. "Theoretical-methodological and technological principles of physical education and sports for everybody", by problem: "Improvement of program-normative principles of physical education in educational establishments" (State registration number 0111U001733).

Purpose, tasks of the work, material and methods

The purpose of the research is to determine degree of influence of specially selected cheerleading exercises on level of 15-17 years old students' power abilities.

The tasks of the research:

1. Determination of power abilities' level of 1st-2nd accreditation's level HEEs students.
2. To find out changes of the studied parameters after application of specially selected cheerleading exercises in the process of physical education.

The methods of the research: analysis and generalization of scientific-methodic literature, stating and formation comparative pedagogical experiment, pedagogical testing, methods of mathematical statistics. For

determination of power abilities' level we used tests, offered by V.A. Romanenko [13]. They are: pressing ups in lying position (quantity of times), raising of torso from lying position in sitting one for 1 minutes (quantity of times), one-leg jumps, moving forward (meters), hand dynamometry (kg).

Organization of the research

The research was carried out on the base of pedagogic college of Kharkov humanitarian-pedagogical institute during 2009-2010 academic year. It covered 385 1st-3rd year girl-students of non-physical culture profile, from whom we formed 3 control and 3 experimental groups: 1st group – girl-students of 1st year of study, 2nd- 2nd year girl students and 3rd- 3rd year girl students. Experimental groups included 278 persons (1st group – 75, 2nd – 108 and 3rd – 95), control groups included 107 persons (23, 34, 50 girl students accordingly). All girl students, who participated in experiment, were related to main and preparatory health groups. In the course of experiment students of control group were trained as per commonly accepted physical education program for HEEs of 1st and 2nd level of accreditation, while for experimental group, academic process on physical education included specially selected cheerleading exercises. Cheerleading exercises were trained as a separate component of physical education program.

Results of the researches

The level of power abilities we determined by results of the following tests: pressing ups in lying position (quantity of times), raising of torso from lying position in sitting one for 1 minutes (quantity of times), one-leg jumps, moving forward (meters), hand dynamometry (kg).

Analysis of the obtained results showed absence of confident differences between experimental and control groups' indicators ($p > 0.05$).

Analyzing power abilities' indicators in age aspect we found that results of pressing ups in lying position and hand dynamometry are improved with age, but these differences are, mainly, unconfident ($p > 0.05$). Exclusions are only indicators of hand dynamometry of 1st and 3rd groups and pressing ups in lying position of 2nd and 3rd experimental groups' girl students and 1st and 3rd control groups, the differences between which were ($p < 0.05$). When analyzing rising of torso from lying position into sitting one and one leg jumps we found that girl students of 2nd group have better results than 1st and 3rd, but these differences were not confident ($p > 0.05$). Exclusions were only one leg jumps' results of 2nd and 3rd groups students as well as torso rising from lying into sitting position of 1st and 2nd experimental groups' girl students, the differences between which were confident ($p < 0.05 - 0.01$).

Comparing results of pressing ups in lying position with normative, represented in state program on physical education, we determined that they corresponded to mark 3 points (1st group girl students), 2 points (2nd group girl students) and 1 point (2rd group).

Comparing results of torso rising from lying into sitting position with normative, represented in state program on physical education, we determined that they corresponded to mark 3 points (girl students of 1st and 2nd age group) and 2 points (girl students of 3rd group).

Comparing results of one leg jumps with normative marks, offered by V.A. Romanenko [13], we determined that they corresponded to mark 1 point for all age groups.

Comparing results of hand dynamometry with normative marks, offered by V.A. Romanenko [13], we found that they correspond to 4 points (students of 1st group) and 3 points (students of 2nd and 3rd groups).

Thus power abilities level of 1st-3rd year girl students correspond in average to mark "unsatisfactory".

Studying the data obtained after application of specially selected cheerleading exercises at physical culture classes (see table 1) we determine that all indicators of experimental groups girl students significantly and confidently improved ($p < 0.05 - 0.001$).

For example results of experimental group's 1st year girl students of pressing ups in lying position improved by 32.28%, of 2nd year girl students – by 21.77%, of 3rd years – by 25.60%; results of torso rising from lying position into sitting one improved by 12.41%; 10.80%; 11.98% accordingly; results of one leg jumps with forward moving improved by 5.78%; 4.70%; 4.97% accordingly; results of hand dynamometry – by 6.31%; 5.36%; 5.89% correspondingly. Thus, the most substantial changes happened in indicators of pressing ups in lying position. The highest increment of power abilities results was observed among girls of 15 years old.

Regarding control groups' data, obtained after experiment, we determined that they also improved to some extent, but these changes were not as substantial as in experimental groups and there were unconfident ($p > 0.05$) (see table 1). For example, results of pressing ups in lying positions of 1st group girl students improved by 17.57%; 2nd – by 14.37%; 3rd – by 11.77%; indicators of torso rising from lying position into sitting one improved by 9.12%, 9.81%; 8.85% correspondingly; results of one leg jumps improved by 2.92%; 2.13%; 3.23% accordingly; indicators of hand dynamometry – by 4.26%; 3.65%; 3.22 % accordingly.

Analysis of repeated data in age aspect showed absence of significant differences in comparison with initial data. With it, it should be noted that in experimental groups differences became confident ($p < 0.05 - 0.001$), excluding only pressing ups, indicators of which were completely unconfident ($p > 0.05$) (see table 1).

Comparing of pressing ups in lying position experimental groups' results, obtained after experiment with state normative, showed that 2nd group girl students improved their mark by 1 point, and became 3 points. Marks of 2nd and 3rd groups remained unchanged, in spite of significant and confident improvement ($p < 0.05$), i.e., like before experiment they were 3 and 1 points accordingly.

Table 1

Dynamics of power abilities' indicators of experimental and control groups' girl students before and after experiment

Groups	I		II		III	
	Indicators $\bar{X} \pm m$					
	Experimental	Control	Experimental	Control	Experimental	Control
<i>Pressing ups in lying position (quantity of times)</i>						
Before experiment	7.31± 0.78	7.17± 0.74	8.22± 0.34	7.79±0.45	8.63± 0.67	9.00±0.44
After experiment	9.67± 0.76	8.43± 0.81	10.01± 0.34	8.91± 0.49	10.84± 0.64	10.06±0.41
t	2.16	1.15	3.71	1.67	2.39	1.77
p	<0.05	>0.05	<0.001	>0.05	<0.05	>0.05
<i>Torso rising from lying position into sitting one (quantity of times)</i>						
Before experiment	32.69± 1.04	33.43± 1.23	36.66± 0.83	36.56± 1.77	33.29± 0.80	32.98± 1.18
After experiment	36.75± 0.96	36.48± 1.19	40.62± 0.77	40.15± 1.65	37.28± 0.76	35.90± 1.12
t	2.87	1.78	3.50	1.48	3.63	1.79
p	<0.01	>0.05	<0.001	>0.05	<0.001	>0.05
<i>One leg jumps (meters)</i>						
Before experiment	4.15± 0.06	4.10± 0.09	4.25± 0.04	4.21± 0.06	4.02± 0.04	4.02± 0.06
After experiment	4.39± 0.07	4.22± 0.09	4.45± 0.04	4.30± 0.06	4.22± 0.04	4.15± 0.06
t	2.62	0.96	3.56	1.07	3.26	1.45
p	<0.01	>0.05	<0.001	>0.05	<0.001	>0.05
<i>Hand dynamometry (kg)</i>						
Before experiment	26.75± 0.54	26.48± 0.72	27.19± 0.39	27.35± 0.63	28.83± 0.51	29.12± 0.76
After experiment	28.44± 0.54	27.61± 0.68	28.65± 0.38	28.35± 0.62	30.53± 0.50	30.06± 0.73
t	2.23	1.14	2.66	1.14	2.37	0.89
p	<0.05	>0.05	<0.01	>0.05	<0.05	>0.05

The same comparison of control groups students' results did not show any changes in marks.

Comparison of repeated data of experimental girl students' torso rising from lying position into sitting one with normative marks from state program showed that the mark of 3rd groups' girl students increased by 1 point and became equal to 3 points. The marks of 2nd and 1st groups' students remained unchanged in spite of confident and significant increment of indicators (p <0.01 – 0.001) and were 3 points. Comparing control groups marks did not show any changes.

Comparison of repeated data of experimental girl students' one leg jumps with normative marks, offered by V.A. Romanenko [13], showed that in 1st and 2nd age groups marks improved by 1 point and became 2 points. Evaluation of 3rd group's indicators, in spite of significant and confident increment of results ($p < 0.01 - 0.001$), showed no changes of mark; it remained equal to 1 point as it was before experiment.

Comparison of repeated data of experimental girl students' hand dynamometry with normative marks, offered by V.A. Romanenko [13], points at increasing of mark by 1 point (from previous 3 points to 4 points) of 3rd group students both of experimental and control groups. Marks of 1st and 2nd experimental groups remained unchanged, in spite of significant and confident increment of results ($p < 0.01 - 0.001$). Comparing of 1st and 2nd control groups marks did not show any changes. Thus, power abilities' level increased and nearly approached 3 points' mark.

In our opinion, positive changes in indicators of power abilities' level, which were registered after experiment, were not reflected in mark scale, to certain extent, owing to imperfection of existing normative criteria.

Conclusions:

1. Results of preliminary researches witness about low level of 15-17 years old girl students power abilities, which, in average, correspond to mark "unsatisfactory". In age aspect indicators, mainly, do not differ confidently. With it there are observed changes of different character with common trend to improvement of results with age.

2. After introducing of specially selected cheerleading exercises in process of physical education of experimental groups' girl students we revealed significant and confident increment of indicators of power abilities' level of 15-17 years old girl students by all parameters ($p < 0.05$). The most significant improvement was of indicators of pressing ups in lying position.

3. The most significant increment of results was registered among 15 years old students.

4. Results of the conducted researches permit to recommend introduction of cheerleading's elements in process of physical education of students of 1st and 2nd accreditation level.

Further prospects in this direction can be realized by mean of determination of cheerleading exercises' influence on level of other motion abilities' progressing.

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Cite this article as: Kryvoruchko N.V., Masljak I.P., Zhuravlyova I.N. Impact on the display of power cheerleading ability of university students I-II levels of accreditation. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 38-42. doi:10.6084/m9.figshare.749696

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Received: 05.03.2013
Published: 30.09.2013

DYNAMICS OF PSYCHOPHYSIOLOGICAL STATE OF THE BOXERS INFLUENCED BY THE STANDARD OF SPECIALIZED DEMANDS OF SPECIALIZED BASIC TRAINING

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Annotation. Examined the psychophysiological state of boxers with 9 types of reactions to the anticipation stage of the specialized basic training. In the experiment involved 18 male boxers aged 18-20 years. We investigated the dynamics of the reactions of anticipation in boxers under the influence of standard specialized loads. In the main part of the session boxers improved individual series 4-5 shock the boxing bag with the installation of the most strongly and quickly strike (loading dose - 9 rounds of 3 minutes each with an interval of 1 minute rest). Upon completion of the boxers performed strength training with weightlifting neck and stuffed ball. The regularities of the occurrence of each type of response in this group of athletes, provides a way of their use as criteria for assessing the psycho-physiological state of boxers.

Keywords: boxing, dynamics, reaction, anticipation, psychophysiological, loads.

Introduction

Achieving a high athletic performance depends on how effectively realized the potential inherent in the genes, boxer's individual features in the process of sports improvement [3, 8, 13].

Scientists believe that the indicator of the human central nervous system may be indicators of the visual analyzer [4]. It is shown that the performance of physical work is accompanied by the excitation of the cerebral cortex to changes in arousal threshold visual analyzer [5, 6].

Availability instrumental psychophysiological techniques that allow us to investigate the central nervous system by monitoring changes in performance of the visual analyzer, justifying the feasibility of their use in combat sports [10]. In addition, using the methods of estimation of physiological parameters, we can evaluate the performance impact of specialized exercises to develop and improve the speed of movement of vehicles [3, 8]. That is, to apply those techniques as a means of pedagogical control [4, 11].

In addition, the methods of measuring sensorimotor reactions are effective for the study of human central nervous system [1, 3, 4]. It is believed that the diagnosis of the human condition only by one method is inadequate [6]. Scientists emphasized informative hand-eye coordination in determining the excitation and inhibition of neural processes that occur in the body of athletes [3, 4, 5, 9, 15].

Absolute numbers of sensorimotor reactions are psychological manifestations of strength and balance nerve processes of athletes [4, 7, 15, 16]. However, a more informative for boxers of different skills, as research is difficult sensorimotor reaction [3, 4, 9, 12, 14]. In the highest state of readiness of qualified boxers reach these thresholds speed complex sensorimotor reactions that are close to those of simple reaction [14].

Sensorimotor reaction is one of the methods for determining the strength of the nervous system of athletes [15] and objective criteria for assessing their level of fitness [3, 4, 10].

Along with the use of methods for measuring sensorimotor reactions for the study of neural processes in terms of the visual analyzer, broad introduction to the sport also received psychophysiological methods of measuring the critical frequency scintillation light (CFSL). This method was used in studies liability of nervous processes [4], the fatigue of the body [1, 8, 15], mental tension and performance [6], the influence of stress on the body [2, 4], and the study of individual characteristics of athletes [12].

Thus, psycho-physiological research methods of sensorimotor reactions and CFSL are effectively used as diagnostic tools of the body, as well as for teaching control for timely correction and optimization of training athletes [10, 11].

However, in the scientific and methodological literature on boxing insufficient attention is paid to the study of individual indicators of competitive boxers. Sensor motor response anticipation is not enough used to study the dynamics of psycho-physiological state of boxers at the stage of specialized base preparation, and individual characteristics of psychophysiological field of each athlete individually.

Studies were conducted in accordance with the theme 2.9. "Personalization training process of skilled combat" Consolidated Plan research in the field of physical culture and sports in 2011-2015.

Purpose, objectives, material and methods.

Purpose of research - to study the dynamics of psychophysiological state of boxers under the influence of standard specialized load stage of specialized base preparation.

Research objectives:

1. Determine the performance dynamics of reactions in anticipation of boxers in different parts of training sessions under the influence of a specialized standard load.
2. Identify criteria for evaluating psychophysiological state of a boxer using anticipation reactions.

Methods of research: theoretical analysis and synthesis; neurochronometry, methods of mathematical statistics.

The organization and methods of research. In study involved 18 male boxers aged 18-20 years, who train at the stage of basic specialist training (first-level sport - 7 candidates for Master of Sports - 9 masters of sport - 2). The study was conducted at the end of the preparatory period.

Indicators of anticipation reactions in training session measured in each boxer three times: the first measure took place before the preparatory part, the second - in the middle of the main part of the lesson, the third - at the end of the final session. The main workout of boxers improved individual striking 4-5 series on punching ball with the stance as hard and fast strike (loading dose - 9 rounds of 3 minutes with an interval of 1 minute rest, which is a specialized workload standard for the boxer training for one). Upon completion of special work on the equipment boxers perform strength exercises with lifter stamped and stuffed ball. The final part of the session included gymnastic exercises to develop flexibility and muscle relaxation.

We determined the 9 types of reactions anticipation [10], conventionally divided into three blocks: the first block - a slow direct (SD), slow sine wave (SSW), slow diagonal (SDL), the second block - rapid direct (RD), rapid sine wave (RSW), rapid diagonal (RDL), the third unit - a complex direct (CD), a complex sine wave (CSW), a complex diagonal (CDL). Accordingly, each successive unit reaction is more complicated from the previous one. For convenience in the processing and analysis, measuring of each reaction in different parts of the training sessions had its labeling. For example, measuring a slow direct reaction (SD) to the beginning of preparation has marking SD-a, in the main - SD-b, at the end of the session - SD-c, etc.

The data were processed by methods of mathematical statistics, namely, using a standard computer program "Statistics 7" of StatSoft. We analyzed the following groups of parameters: the arithmetic average, minimum and maximum values of variation, the range of variation, standard deviation of the arithmetic average, correlation analysis by Brave Pearson, t-test for dependent samples by Student.

Results of research.

An analysis of the medium group values of the first block of anticipation responses (Table 1) is defined relative stability in their performance under the influence of standard specialized loads - differences between measures in different parts of the training are unreliable. Thus, in terms of a slow direct reaction (SD) measures between SD-a and SD-b $t = -0,717$ ($P > 0,05$) between the measures of SD-b and SD-c $t = 0,003$ ($P > 0,05$). The difference between measures of SD-a and SD-c is also not significant ($t = -0,974$, $P < 0,05$). This fact, in our opinion, indicates that the standard specialized load at the end of the preparatory period did not significantly affect the physiological state of the studied boxers in the diagnosis of this type of anticipation reaction - probably it is for athletes at this stage of long-term preparation is quite simple, and therefore influenced by familiar for them fatigue of their body, boxers demonstrate a relatively stable performance.

Table 1

Dynamics of anticipation reactions a slow direct, a slow sine wave, a slow diagonal under the influence of standard specialized load in boxers (n = 18) during specialized basic training.

Type of anticipation reaction	Measure	Arithmetic average	Minimum value	Maximum value	The range of variation	The standard deviation
Slow Direct	to the beginning of preparation part of training session (SD-a)	8,44	3	14	11	+ _{3,601}
	in the main part of training session (SD-b)	9,22	3	16	13	+ _{4,332}
	at the end of training session (SD-c)	9,22	2	13	11	+ _{3,687}
Slow sine wave	to the beginning of preparation part of training session (SSW-a)	7,67	3	14	11	+ _{4,058}
	in the main part of training session (SSW-b)	9,89	1	25	24	+ _{7,506}
	at the end of training session (SSW-c)	8,89	4	16	12	+ _{4,042}
Slow diagonal	to the beginning of preparation part of training session (SDL-a)	11,11	1	20	19	+ _{5,769}
	in the main part of training session (SDL-b)	9,56	3	19	16	+ _{4,605}
	at the end of training session (SDL-c)	9,44	3	16	13	+ _{4,630}

The same is observed in the analysis of performance anticipation reaction a slow sine wave (SSW) (Table 1) - differences between performance measures of unreliable SSW-a and SSW-b ($t = -1,194$, $P < 0,05$), SSW-b and SSW-c

($t = 0,654$, $P < 0,05$), SSW-a and SSW-c ($t = - 0,840$, $P < 0,05$). Thus there is a slight (no significant) increase the performance of a slow sine wave in boxers in the middle of the main part of the training session. Analysis of the anticipation reaction a slow diagonal (SDL) (Table 1) shows a similar pattern - differences between them in different parts of the of training session as false: between performance measures of SDL-a and SDL-b ($t = 1,466$, $P < 0,05$), SDL-b and SDL-c ($t = 0,079$, $P < 0,05$) between performance measures of SDL-a and SDL-c ($t = 1,314$, $P < 0,05$). In the group of boxers there is only a slight tendency to decrease a slow diagonal under the influence of load (Table 1). We can assume that this is due to natural mobilization of mental athletes.

Thus, we can conclude that this unit of anticipation reactions is relatively easy for boxers, so even under the influence of fatigue due to specialized standard load values are not significantly changed.

In the study of first block anticipation reactions simultaneously performed correlation analysis of each anticipation reactions separately, resulting in a proved reliable correlation relationships between indicators of measures SD-a and SD-c ($r = 0,568$; $P < 0,05$), SD-b and SD-c ($r = 0,851$; $P < 0,001$), SSW-b and SSW-c ($r = 0,504$; $P < 0,05$), SDL-a and SDL-b ($r = 0,644$; $P < 0,01$), SDL-a and SDL-c ($r = 0,483$; $P < 0,05$), confirming the above statement about the stability indices anticipation reactions a slow direct, a slow sine wave, a slow diagonal in boxers regardless of psychophysiological state of their body.

The analysis of the data of the second block of anticipation reactions (Table 2) revealed instability in their terms. Yes, there is a significant decrease a rapid direct reaction (RD) in a group of boxers between measures RD-a and RD-b ($t = 3,366$, $P < 0,01$). We can assume that in the middle of training session under the influence of stress was mobilized psychophysiological state of boxing, and that this type of anticipation reaction is strongly reflected. At the end of training session parameters unreliable increased between measures RD-b and RD-c ($t = 1,158$, $P < 0,05$). There is no difference between the first and third parameters of measure - between RD-a and RD-c ($t = 1,318$, $P < 0,05$). That is, the level of psychophysiological state of boxers at the end of the training session returns to the source. Thus, we can assume that this type of anticipation reaction reflects the level of CNS excitation of a boxer.

When analyzing the performance anticipation reaction a rapid sine wave (RSW) (Table 2) observed a significant increase in the group of boxers in the middle of the main part of workout - between measures RSW-a and RSW-b ($t = - 2,396$, $p < 0,05$). That is, under the influence of the effects of stress boxers do not have time to deal with the complexity of this type of reaction - it can be assumed that they have lost visual perception under the influence of fatigue. At the end of training session performance of this type of anticipation reaction returned to the original level: differences between measures RSW-b and RSW-c ($t = 1,465$, $P < 0,05$) and a RSW-a and RSW-c ($t = -0,001$, $P > 0, 05$) are unreliable. Thus, we can assume that this type of anticipation reaction can be a criterion of psychophysiological assessment of fatigue boxer at the time of measure.

Table 2

Dynamics of anticipation reactions a rapid direct, a rapid sine wave, a rapid diagonal under the influence of standard specialized load in boxers (n = 18) during specialized basic training.

Type of anticipation reaction	Measure	Arithmetic average	Minimum value	Maximum value	The range of variation	The standard deviation
Rapid Direct	to the beginning of preparation part of training session (RD-a)	14,22	4	24	20	+ _{7,224}
	in the main part of training session (SD-b)	10,22	4	20	16	+ _{4,697}
	at the end of training session (SD-c)	12,22	2	24	22	+ _{7,908}
Rapid sine wave	to the beginning of preparation part of training session (RSW-a)	12,22	8	16	8	+ _{2,981}
	in the main part of training session (RSW-b)	15,55	10	26	16	+ _{5,883}
	at the end of training session (RSW-c)	12,22	6	22	16	+ _{5,776}
Rapid diagonal	to the beginning of preparation part of training session (RDL-a)	15,11	4	24	20	+ _{6,516}
	in the main part of training session (RDL-b)	16,22	6	32	26	+ _{7,417}

at the end of training session (RDL-c)	14,89	4	24	20	+_6,659
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When analyzing the performance anticipation reaction a rapid diagonal (RDL) (Table 2) there is unreliable tendency to increase in the middle of the main part of workout (between measures RDL-a and RDL-b ($t = -0,597$, $P < 0.05$)) and returns to the original level at the end of the training session (between measures RDL-b and RDL-c ($t = 0,502$, $P < 0.05$) and RDL-a and RDL-c ($t = 0,124$, $P < 0.05$)).

That is, the performance anticipation reaction a rapid diagonal can complement the performance anticipation reaction a rapid sine wave.

Simultaneously reactions in this block performed correlation analysis separately between parameters measuring of each rapid reaction in different parts of the workout. Established reliable statistical relationship between performance measure and RD-a and RD-b ($r = 0,719$; $P < 0,001$), and RD-a and RD-c ($r = 0,642$; $P < 0,01$), indicating that the proportional changes in the dynamics of these indicators in boxers under the influence of standard specialized load. This fact confirms the foregoing statement that all boxers in the middle of training sessions were involved in significant mobilization of psychophysiological state exactly in terms of performance anticipation reaction a rapid direct (RD). There are no reliable relationships separately between indicators of measure RSW-a, RSW-b, RSW-c and RDL-a, RDL-b, RDL-c, indicating that the instability of these indicators of boxers. Thus, this fact confirms the foregoing statement that these types of anticipation reactions as a rapid sine wave (RSW) and a rapid diagonal (RDL) are psychophysiological assessment criteria of fatigue of boxers just during loading.

The analysis of indicators anticipation reactions of the third block (Table 3) found significant differences in their dynamics. Analysis of the dynamics of reaction a complex direct (CD) indicates a significant increasing of them in the second part of the training session (the difference $t = -3,436$, $p < 0.01$) between performance measure CD-b and CD-c and at the end of training session (difference $t = -3.419$, $P < 0.01$) between indicators of measure CD-a and CD-c). The difference between CD-a and CD-b is not significant ($t = -0,797$, $p < 0,05$). That is, the facts indicate accumulation in the boxers influenced by psychophysiological fatigue loads are specialized standard in the main body, and more - at the end of workout. This suggests that this type of anticipation reaction can be criterion for evaluating the fatigue of the body of a boxer under the influence of special loads. Simultaneously correlation analysis revealed a reliable correlation coefficient between performance measure CD-b and CD-c ($r = 0,818$; $P < 0,001$), confirming the proportional increase in the direct performance of reaction a complex direct in a group of boxers exactly at the end of workout.

In analyzing the performance a complex sine wave (CSW) (Table 3), however, identified a significant decrease in their end of the session compared to its beginning. So, the current significant difference between indicators of measure CSW-b and CSW-c ($t = 3,282$, $P < 0.01$) between indicators of CSW-a and CSW-c ($t = 5,529$, $P < 0.001$). However, no significant difference between indicators of measure CSW-a and CSW-b ($t = 0,252$, $p < 0.05$), in the first part of workout. Simultaneously correlation analysis revealed no significant correlation relationships between indicators of all measures reaction complex sine wave (CSW), indicating that the instability of group performance. However, a significant decrease in group performance exactly CSW at the end of training session indicates the presence of positive changes in the psychophysiological state of boxing, despite objective fatigue. This suggests that this kind of reaction reflects the individual internal mobilization (adaptation) of psychophysiological state a boxer to load.

Table 3

Dynamics of anticipation reactions a complex direct, a complex sine wave, a complex diagonal under the influence of standard specialized load in boxers (n = 18) during specialized basic training.

Type of anticipation reaction	Measure	Arithmetic average	Minimum value	Maximum value	The range of variation	The standard deviation
Complex Direct	to the beginning of preparation part of training session (CD-a)	12,09	6,4	16,0	9,6	+_3,393
	in the main part of training session (CD-b)	13,33	8,0	24,0	16,0	+_5,488
	at the end of training session (CD-c)	16,00	12,8	24,0	11,2	+_3,557
Complex sine wave	to the beginning of preparation part of training session (CSW-a)	14,13	9,6	17,6	8,0	+_2,689
	in the main part of training session (CSW-b)	13,17	10,4	22,4	12,0	+_3,915
	at the end of training session (CSW-c)	9,24	5,6	16,8	11,2	+_3,643
Complex diagonal	to the beginning of preparation part of training session (CDL-a)	18,62	10,0	25,2	15,2	+_5,763

in the main part of training session (CDL-b)	15,33	10,8	24,0	13,2	+_3,876
at the end of training session (CDL-c)	10,71	6,4	13,6	7,2	+_2,572

In analyzing the performance a complex diagonal (CDL) observed a similar to a complex sine wave (CSW) pattern. There is a significant decrease in its performance at the end of the training session: between performance measures CDL-b and CDL-c ($t = 5,085$, $P < 0.001$) between indicators of CDL-a and CDL-c ($t = 5,773$, $P < 0.001$). Unreliable only difference between indicators of measures CDL-a and CDL-b ($t = 1,751$, $P > 0.05$) - in the first part of workout. . Simultaneously correlation analysis shows no significant relationship between all indexes measures reaction a complex diagonal (CDL). In other words, this type of anticipation reaction duplicates characteristics of a complex sine wave (CSW).

The study additionally conducted correlation analysis between indicators of all anticipation reactions. The results complement the above patterns.

So determined, in the third block there is a dialectical opposition between performance reaction a complex direct (CD) and reaction a complex sine wave (CSW), indicators of reactions a complex direct (CD) and a complex diagonal (CDL): established inverse relationship between indicators of CD and CSW ($r = -0,633$; $P < 0,01$), between indicators of CD and CDL ($r = -0,642$; $P < 0,01$). That is, these reactions reflect different aspects of psychophysiological state of boxers.

A rapid diagonal (RDL) has a high correlation of own reliable performance with indicators of a complex direct (CD): $r = 0,702$; $P < 0,001$. Both types of reactions reflect increase performances in the boxers influenced by fatigue (standard specialized load).

The first block of anticipation reactions (a slow direct, a slow sine wave, a slow diagonal) has a tight correlation of indicators between themselves, SD and SSW ($r = 0,797$; $P < 0,001$), SD and SDL ($r = 0,766$; $P < 0,001$), SSW and SDL ($r = 0,741$; $P < 0,001$). It shows their uniformity. These reactions have low information content for these troop boxers at the stage of basic specialist training.

Some related reactions have among themselves trusted relationship. Thus, the indicators of reaction a slow direct associated with indicators of reaction a rapid direct ($r = 0,882$; $P < 0,001$), indicators of reaction a slow sine wave associated with indicators of reaction a rapid sine wave ($r = 0,687$; $P < 0,01$).

Indicators of reaction a slow sine wave have a high reliable correlation of indicators of reaction a complex direct ($r = 0,733$; $P < 0,001$), and a complex diagonal ($r = 0,707$; $P < 0,001$).

Conclusions.

1. In the study of dynamics of the indicators of anticipation reactions under the influence of specialized standard load in boxers' training session ($n = 18$) during basic specialized training were identified such patterns:

- Found stability in the indicators of anticipation reactions a slow direct, a slow sine wave, a slow diagonal - the differences between the indicators of measures such reactions in different parts of the training sessions are not reliable ($t = 0,003 - 1,466$, $p < 0,05$).

- Found a significant decrease of anticipation reactions of a rapid direct in a group of boxers in the middle of the training session ($t = 3,366$, $p < 0,01$). The level of psychophysiological state of boxers at the end of the session according to this reaction returns to the original.

- The analysis of indicators of anticipation reaction a rapid sine wave observed a significant increase in the group of boxers in the middle of the main part of the training session ($t = -2,396$, $p < 0,05$). At the end of training session indicators of this type of reactions returned to the original level: the differences between the indicators at the beginning and the end of the session are inaccurate ($t = -0,001$, $p < 0,05$).

- The analysis of the indicators of reaction a rapid diagonal observed inaccurate tendency to increase in the middle of the main part of the training session ($t = -0,597$, $p < 0,05$), they return to the original level at the end of training session ($t = 0,502$, $P > 0,05$), the equality of indicators between the beginning and the end of training ($t = 0,124$, $p < 0,05$).

- Analysis of indicators of the dynamics of anticipation reaction a complex direct testifies their significant increase in the second part ($t = -3,436$, $p < 0,01$) and at the end of the training session ($t = -3,419$, $p < 0,01$). The difference in performance between the beginning and the middle training session is not significant ($t = -0,797$, $p < 0,05$).

- Determined a significant decrease of indicators of reaction a complex sine wave at the end of training session ($t = 3,282$, $p < 0,01$) and compared to its beginning ($t = 5,529$, $P < 0,001$). The difference between indicators in the first part of training session is not significant ($t = 0,252$, $p < 0,05$).

- Determined a significant decrease of indicators of reaction a complex rapid diagonal at the end of the training session is not significant ($t = 5,085$, $P < 0,001$) and compared to its beginning ($t = 5,773$, $P < 0,001$). The difference between indicators that received in the first part of training session is not significant ($t = 1,751$, $p < 0,05$).

2. Identified the following criteria for evaluating of indicators of psychophysiological state of boxers using anticipation reactions:

- anticipation reactions a slow direct, a slow sine wave, a slow rapid diagonal have little information for boxers at the stage of specialized base preparation, as under the influence of fatigue loading indicators of standard specialized in boxers have no significantly changes;

- anticipation reaction a rapid direct characterizes the level of CNS arousal of a boxer and can be used as a criterion of evaluation of its mobilization;

- Anticipation reaction a rapid sine wave may be psychophysiological assessment criteria of fatigue a boxer at the time of measuring (or during exercise). Indicators of reaction a rapid diagonal can complement indicators of a rapid sine wave;

- Anticipation reaction a complex direct may be a criterion of evaluation of overall fatigue body of a boxer (including under the influence of special loads);

- Anticipation reaction a complex sine wave and a complex diagonal may make criterion of individual internal mobilization (adaptation) of psychophysiological state of a boxer to stress.

Prospects for further research in this direction.

In further studies on the basis of the above provides definition specific features of the dynamics of psychophysiological state of a boxer on the stage of specialized base preparation, taking into account his individual style of competitive activity.

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Cite this article as: Martsiv V.P. Dynamics of psychophysiological state of the boxers influenced by the standard of specialized demands of specialized basic training. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 43-49. doi:10.6084/m9.figshare.749697

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Received: 01.07.2013
Published: 30.09.2013

THE GENDER ASPECT OF THE FORMATION OF VALUES OF PHYSICAL TRAINING OF STUDENTS IN HIGHER EDUCATION

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Annotation. The analysis of the place of physical education in the hierarchy of values of university students. Addresses gender characteristics of the formation of values in physical education students. The study involved students in the amount of 419 people (206 boys, 213 girls) and first-year students (35 girls, 16 boys). The findings suggest that a combination of slightly traditionally masculine and feminine qualities in one person. It was found that in the study of gender differences in the choice of human traits observed distinct gender stereotypes. Among the young men identified the following personality traits: the ability to achieve goals by any means, physical strength, sociability, communication skills. Girls are the following traits: sociability, communication skills, good looks, intelligence and a wide range of interests, the ability to behave in public, optimism and prudence.

Key words: gender, students, physical education, values.

Introduction

Modern Ukrainian society is on such stage of its development, when knowledge and information are main resource and driving force of its effective existence. In such conditions system of higher education is one of the most important social institutions, which is closely connected with fundamentals of society, its social-economic and political systems, being a significant factor of its development.

At the same time higher education shall solve other important social problem: formation of new, intellectually and physically developed personality, who possesses formed gender understanding of realization of his rights and abilities [11,12].

As on to day, sphere of physical education and sports is one of the most favorable for gender researches. In the frames of regarded by us problem it is important to open the role of gender approach to physical education in order to form youth's values of physical culture. It is conditioned by substantial changes, which happened in content, forms and methods of academic classes on physical education at HEE, in which first place is, now, taken by personality of a disciple, consideration of health level, physical condition in context of modern trends to differentiation and humanization of physical education on the base of personality-oriented approach.

Review of literature sources witnesses that modern state of physical culture shows contradictions of gender approach in physical education, which, by its specificity, considers in educational process vital interests and psychological features of boys and girls that is one of conditions of gender culture's formation in society [6,7].

Scientists pay attention to the fact that excessive accentuation of motion component (physical development, physical condition and so on) influences negatively on intellectual and social-psychological components and is one of main reasons of the fact that physical culture is far from being a vital demand of every person (V.M. Vydrin, 1996). That is why, first of all, the work with mental sphere of a person is offered – his views, knowledge and abilities, emotional attitude, value orientations [4].

In theory of physical culture, in contrast to any other humanitarian discipline, natural principles of sex distinctions are considered. Numerous researches in the field of sports concern, mainly, dimorphism (S. Sokha, 1991, G. Sokha, 1991; M. Mesner, 2000; L. Shakhlina, 2006; 2010). Distinctions in motives, youth's interests in the field of physical culture and sports are regarded in works by T.Yu. Krutsevych (2010), T.V. Bezverkhia (2009), M.V. Moskalenko (2010). However, the carried out by us analysis of scientific sources proved insufficient level of revelation of gender specificities' problem in formation of youth's values orientations in physical.

The research was fulfilled in the frames of scientific-research work, approved by Ministry of education and science, youth and sports of Ukraine. Code 3.1 "Improvement of program-normative principles of physical education at academic classes" №01110001733 УДК.,7.,ДВ.,077.5.

Purpose, tasks of the work, material and methods

The purpose of the work implies studying of gender distinctions in formation of students' physical culture values.

The methods of the research: theoretical analysis and generalization of scientific-methodic literature data, questioning, mathematical-statistic processing of research's results.

Results of the research

In the research 419 pupils of comprehensive schools No.13 and 14 of Poltava took part (206 boys and 213 girls).

For analysis of age dynamics of gender distinctions in formation of physical culture values, research was fulfilled in stage-by-stage way with different age categories of respondents.

This questioning covered 1st year students of Poltava University of economics and commerce: 16 boys, who went in for athletic gymnastics, and 35 girls, who, by results of medical examinations, were related to special health groups.

In order to study gender specificities of value orientation's in the sphere of physical culture formation level of HEE students, we carried out questioning of respondents. Analysis of students' questioning results witnesses about

many sided interests and hobbies of boys and girls in leisure time. Main distinction is place, which is taken by hobby in rating (see table 1).

Table 1

Students' hobbies in leisure time

No/No	Answers	HEE departments			
		Athletic gymnastics (boys) n = 16		Special health group (girls) n = 35	
		Mean value (x)	Rating (R)	Mean value (x)	Rating (R)
1	Communication with friends	4.375	2	4.171	2
2	Reading of fiction	6.625	6	5.629	4
3	Playing on musical instruments	8.533	11	6.735	9
4	Listening in music	4.75	3	3.914	1
5	Attend disco clubs	6.688	7	6.686	8
6	Sports training	3.875	1	6	5
7	Learn foreign languages	7.5	9	5.2	3
8	Play computer games	5.875	4	6.057	6
9	Painting	10.53	12	7.314	10
10	Contriving	7.875	10	8.559	13
11	Watch TV	7.063	8	7.618	12
12	Help parents	6.25	5	6.286	7
13	Attend folk circles	12.2	14	7.471	11
14	Other	11.67	13	9.257	14

Improvement of physical condition's level is a demand, satisfaction of which is connected with physical activity, for the sake of which this demand is satisfied (3). The fact that 1st place among offered kinds of leisure is taken by sports (boys' answers), which is alternative to smoking, drugs and alcohol taking, is a positive one. It is explained also by the fact that "boys pay great attention to how their body and appearance comply with stereotype standard..." [7].

Further, in 2nd place by rating, boys noted "communication with friends" 3rd place – "listening in music", 4th place – "play computer games", and 5th place – "help parents" are also of priority. Unfortunately, "reading fiction" took 6th place. Last places, as per rating, were taken by "learning of foreign languages", "watching TV", "contriving".

Girls noted as hobbies of priority the following: listening in music, communication with friends, learning of foreign languages, reading of fiction. "Sports" was put on 5th place by them. But, though this kind of hobby does not take 1st place, it is in group of priority.

Scientists have proved that the most important reason of person's fulfilling physical exercises is demand in health improvement. And the fact that girls, who were in special health group, put "sports" on 5th place witnesses about their understanding of dependence between state of health and systemic practicing of physical exercises.

Further, kinds of leisure were distributed, as per rating, in the following way: "play computer games" – 6th place, "help parents" – 7th place, "attend disco clubs" – 8th place. It is interesting that "help parents" was put on 5th place by boys and on 7th place – by girls. But girls pay much more attention to learning foreign languages. Probable it is connected with hopes to pass professional practical work abroad.

Analyzing students' answers to questions one can determine some mutual boys' and girls' interests of priority. They are such kinds of leisure like communication with friends and listening in music. In general boys' and girls ways of leisure spending so nor coincide. We consider positive physical activity of girls, who are members of special health groups, owing to their state of health. It witnesses that a person with weak health understands significance of this value and considers it necessary to devote some time to fulfillment of physical exercises for improvement of physical condition and health level.

In the opinion of M.S. Kagan, system of values is formed in any person, in the process of his including in domestic or game practice, then it is strengthened or changed, or diametrically transforms depending on his practical being [6].

Content of physical culture values is understood as peculiarities of culture's components, first of all, consciousness, feelings and behavior, which permit for a person to satisfy his demands and serve as bench marks of social and professional activity, which is directed at achievement of socially significant target [9]. Value aspect of physical culture is represented by wide number of material and spiritual values, specially created for effective physical human perfection. In our opinion, for studying of formation level of youth's value orientations in the sphere of physical culture first it is necessary to find out, what human values attract students in general. Is there a difference between girls and boys in their selecting of personality's features, which are the most important for them?

In questioning students were offered to place by rating personality's features, which are the most important for them (see table 2).

Table 2

Features, appraised by students the most positively

No/No	Answers	HEE departments			
		Athletic gymnastics (boys) n = 16		Special health group (girls) n = 35	
		Mean value (x)	Rating (R)	Mean value (x)	Rating (R)
1	Handsome appearance	5.38	5	4.57	2
2	Friendliness, communicability	4.88	3	4.37	1
3	Refinement, wide circle of interests	6.06	6	4.66	3
4	Fine dress	8.13	9	6.06	7
5	Skill to behave properly in society	5.31	4	5.40	4
6	Physical strength	4.31	2	6.63	8
7	Ability to achieve target by any means	4.25	1	5.97	6
8	Intransigence	7.88	8	7.17	11
9	Cruelty and categoricity	9.31	12	7.31	12
10	Ability to subdue other people	8.69	11	6.91	10
11	Gentleness and ability to change own point of view	8.19	10	6.62	8
12	Adventurism and impudence	10.9	13	7.71	13
13	Optimism and even temper	7.06	7	5.77	5

Analysis of students' questioning results permits to learn how personality's features, noted by students, distinct. Boys, who train athletic gymnastics, marked out the following personality's features: 1st place – "ability to achieve target by any means", 2nd – "physical strength", 3rd – "friendliness, communicability". Then, the group of priority included such personality's features as "ability to behave properly in society" (4th place) and "handsome appearance" (5th place). It is probably that such order of features was caused by the fact that the boys train athletic gymnastics and pay a lot of time to physical perfection.

Girls marks out other, attractive for them, features of personality. They are located in the following succession: first place – friendliness, communicability, second – handsome appearance, third – refinement and wide circle of interests, forth – ability to behave properly in society, fifth place – optimism and even temper.

The obtained results permitted to determine gender distinctions in choosing of human features, which are of value for HEE students. The most significant, in average, by expressiveness is "physical strength", which boys located on 2nd place and is in group of priority, though girls located it on 8th place. Boys put on 1st place such individual feature as "ability to achieve target by any means". Girls put this feature on 6th place. Unanimous opinion was found concerning rejected values (by distribution of M.S. Yanitskiy). "Ability to subdue other people" was put by boys on 11th place, by girls – on 10th, "cruelty and categoricity" - 12th place, "adventurism and impudence" - 13th place. But the mentioned hierarchy of personality's features is of time-dependent character, because students have dominating pragmatic, but not romantic intentions. Also the fact, that such quality as "ability to behave properly in society" is of priority both for boys and for girls, attracted attention. In other marked features there is insignificant difference between boys and girls.

Conclusions

In our opinion the rendered by students data, concerning choosing the most attractive personality's features, as well as concerning their leisure, contain gender stereotypes of masculine and feminine character, as per which man and women have their own psychological features of personality. These stereotypes, as a rule, oppose man and women in hierarchic way. For example, men are characterized by domination, aggressiveness, emotionality. Women are characterized by submission, dependence, emotionality, tenderness. We should note importance of the fact, which determines existence of chosen by students coinciding features. It can witness about certain androgenic features of modern students, that proves opinion of many scientists [7,2,10,5] about existing androgenic features of youth. They manifest in harmonious combination of traditionally male and female qualities. People of androgenic type are most of all adapted for life and least of all are influenced by stressed, connected with sex-role conflicts.

Our further scientific experiments will be devoted to determination of gender identity of pupils and students with the help of questionnaire, developed by Sandra Bam.

The prospects of further researches imply studying of all aspects of formation of physical culture values by higher educational establishments' students.

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Cite this article as: Marchenko O. Iu. The gender aspect of the formation of values of physical training of students in higher education. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 50-54. doi:10.6084/m9.figshare.749698

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

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Received: 01.07.2013
Published: 30.09.2013

THE USE OF SUGGESTION IN SPORTS PRACTICE

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Annotation. The aim of the study is to provide a comprehensive, integrated modified technique of personal psycho-physiological regulation based on a system of Raja Yoga. The study involved candidates and masters of sports of freestyle skiing in the amount of 21 people aged 17 to 23 years. Found that athletes co 2 and stage 3 of the hypnotic state successfully acquired by dhyana and can apply it in preparation for a competition. The proposed method includes a high quality optimal fighting condition, modeling and programming training and competitive processes using deferred units, the correction of motor skills. Athletes in their imagination run program of the second day of competition. Then, the third day of competition modeled, programmed overall health. Are told that in the day of the event will have a good mood, great feeling, a surge of strength, vigor, vitality, desire to show all of their sporting qualities.

Keywords: suggestion, dhyana, psychotraining, hypnosis, Raja-Yoga, athletes.

Introduction

Cultural oriental traditions are closely connected with psychological training. Application of techniques of psychological influence leads to improvement of human organism's functional abilities.

In 6th century (A.C.) Indian missionary Bodhidharma brought Raja yoga knowledge to Shao Lign monastery. Technical secrets of this Doctrine were carefully guarded and served not only for spiritual self-perfection but also for perfect mastering of martial arts for defense. With the lapse of time these secrets were open not only in China but also abroad.

As per classification of Yoga, made by Patanjali in 2nd century B.C., in Radja yoga dhyana is practiced after pratyahara and dharana [4,10,11]. Dhyana is meditation about changes in state of consciousness.

Mastering of Yoga steps take a number of years, that is why in sports – special, sport variant of auto generous training by A.V. Alekseyev – psychological regulation training (PRT) is widely practiced) [1].

The founder of auto generous training is doctor I. Shultz. He developed auto generous training on the base of Radja yoga. Shultz based on assumption that if to teach a person to activate own sensations corresponding to sensations, felt in hypnotic trance, it will bring him in close to hypnotic state.

Mastering of auto generous training requires several weeks, but it significantly weaker than dhyana, because it does not ensure such deep “sinking” in alternated state of mind as dhyana.

By its indications auto generous training equals to pratyahara and weak hypnosis [9].

Ideomotor and hypno-ideomotor trainings are known methods of improvement of sportsmanship [3,6]. As far as ideomotor training is carried out in awakened state, its efficiency depends on the level of concentration of attention and on the level of imagination. Ideomotor act can be easily interrupted by outside sound effects, which reduce its quality. Usually sportsmen, who even have no idea about ideomotor training, “plays” in mind their actions before competitions. Image of movement causes the movement itself that is manifested in ideomotor acts – muscles' micro-movements.

Hypno-ideomotor training requires participation of hypnologist, who suggests appropriate actions, though it is capable to ensure high level of attention's concentration owing to hypnosis. Hypno-ideomotor act has evident advantage, comparing with ideomotor one, as far as it is realized in hypnotic state with maximal level of concentration of attention on imaginable fulfillment of of possible movements of training or competition process. During deep hypnosis (3rd stage of hypnotic state) sportsmen only hear the words of hypnologist. During middle hypnosis (2nd stage) outside sounds are heard but they do not distract attention; more over it is possible to suggest that they do not distract attention or are poorly heard.

With weak hypnosis (1st stage of hypnotic state) effectiveness of suggestion is minimal by clear reasons [2,7,8]. Suggestion (from Latin suggestio) – is the process of foreign idea's introduction into human psychological sphere (will decision in the forms of thoughts, emotions, acts).

In sport practice there is an acute problem of permanent work on improvement of technical sportsmanship, which takes a lot of time and energy. Methods of ideomotor and hypno-ideomotor trainings for correction of motion skills make this task much easier.

In scientific literature there are data about effective application of auto- and hetero-regulation in sports: L.P. Grymak (1972,1973,1974), P.I. Bull (1968), A.V. Alekseyev (1978,1985), G.S. Beliyev, M.L. Valuyeva (1967), Ye.S. Volkov (1994,1995), I.P. Volkov (1973), A.T. Filatov (75,79,1982), Ye.P. Ilyin € (1980,1983), V.P. Nekrasov, N.A. Khudakov (1985), K. Tappervien (1997), O.S. Doroshenko (2008) et al., but there are no scientific data about influence of complex integrated modified methodic of special psycho-physiological regulation with correction of sportsman's motion parameters, on the base of Radja yoga. This fact served as the reason of our research, which resulted in methodic described below.

The work has been fulfilled as per plan of scientific & research works of School of advanced sportsmanship.

Purpose, tasks of the work, material and methods

The purpose of the work is creation of complex, integrated modified personality's psycho-physiological regulation methodic with correction of motion skills' parameters, including achievement of optimal competitive state, modeling and programming of training and competition processes, applying post-hypnotic suggestions on the base of Radja yoga.

The tasks:

- 1 . Determine sportsmen's hypnotic state depth.
- 2 . Teach sportsmen methods of Radja yoga.

We assumed the following hypothesis: creation of complex, integrated modified psycho-physiological regulation methodic on the base of Radja yoga's dhyana can ensure improvement of sportsmen's training for competitions. Sportsmen, who sank in the deepest hypnotic state, can use this methodic independently.

The methods of the research: theoretical analysis of scientific literature, pedagogic observation, methods of psychological influence.

Organization of the research. The research covered candidates and masters of sports of freestyle (21 person, age – 17-23 years old, who were on training session in Nikolayev. At the 1st stage we selected sportsmen, able to sense 2nd and 3rd stage of hypnotic state.

All sportsmen, who were at training session, were hypno-able. 11 sportsmen with 2nd and 3rd stages of hypnotic state were included in experimental group, 10 sportsmen of 1st hypnotic state stage – in control group.

The 2nd stage of research was training of dhyana.

At first day there was one training with both groups. Sportsmen were delivered information about pratyahara. Hypnotic session was carried out, during which pratyahara's sensations were activated. Then post-hypnotic suggestion about sportsmen's ability to activate the same sensation independently, was made. Sportsmen "sink" in pratyahara's state independently. Pratyahara is characterized by relaxation of muscles.

At second day training is also conducted with both groups together. Sportsmen receive information about dharana. Than hypnotic session was carried out in order to cause sensations characteristic for dharana and give post hypnotic suggestion about ability to activate these sensations independently. Dharana is deeper "sinking" in changed state of consciousness with high concentration of attention.

At 3rd day training is carried out only with experimental group. Sportsmen receive information about dhyana. Than hypnotic session was carried out in order to cause sensations characteristic for dhyana and give post hypnotic suggestion about ability to activate these sensations independently.

3rd stage of research is correction of motion skills, creation of optimal competition state, modeling of future competitions, post-hypnotic suggestions and "impersonation" in sportsmen of higher class.

At trainings devoted to correction of technical skills we modified methodic of V.P. Nekrasov "reportage" [5]. The advantage of our modification is that correction of sportsmen's motion skills was carried out by coach, who was also in dhyana state together with the tested. Such approach was justified by the fact that nobody except coach can be to the fullest extent familiar with all specificities of technical sportsmanship; with it coach's logical thinking was activated with sensual imagination of sportsman's, whom instructions were given, movements.

At trainings sportsmen of experimental group independently "sank" in dhyana state. Coach in the same state gives instructions individually to every sportsman and general ones, which concern executive technique off different exercises' fulfillment, depending on availability of any mistakes. Sportsmen in dhyana state review their fulfillment of exercises and fulfillment of exercises by other sportsmen with the help of video records. The, after correction of exercises in dhyana state, sportsmen fulfill them in awakened state. We used method of motion skills' correction, adapted for dhyana state [6]. With the help of dhyana sportsmen also activate optimal competition state (OCS), simulate training and competition processes, train "impersonation", receives post hypnotic suggestions, recreate psychic and physical forces.

For better mastering of dhyana psycho-training of Radja yoga was adapted for sportsmen, considering their mentality. Coaches appraise results at trainings and as per results of competitions.

Example 1: Sportsmen, who independently entered dhyana state, are explained how to achieve OCS state; they are offered to independently remember one of competitions, where they showed the best results. Then achievement of OCS in dhyana is compared with remembered sensations, felt during competitions in awakened state.

Example 2: Sportsmen in dhyana state adjust themselves to coach's voice. Coach in dhyana state address to D.: "You have mistakes to be corrected. You should develop feeling of confidence. You should say to yourself, that I can everything, for long years I have been gone to victory and now I can prove to everybody my abilities".

Example 3: Coach says to K.: "You enter gym, you feel light excitation, muscles become springy, spirit rises, you are attentive and concentrated, you practice exercises in thought. Let us start with acrobatics. Take initial position, make two steps, arms stretched high upward. "Cartwheel" is rolling, repeat several times. Return to start, make two steps, swing and "cartwheel". Everybody fulfill "cartwheel" in twice in thoughts. You feel all body, you fell how good socks fit, you have feeling of moving ahead. Everybody come to wall bars, hang on it, relax arms' muscles. You feel arms became longer. Now fulfill exercise, in which it is necessary from bent position, unbending enter position "arch". Your flexibility is high, look at those, who fulfill this exercise better than you and do in the same manner. Now I am working with B. And K. You are going to fulfill exercise and other will watch you attentively. From shifting ahead in stand enter "arch" shoulder move far, push off with hands and rise. Everything is OK. Stand on track. Lie on shoulder

blades. Arch chest. Stand up in waving manner. Repeat one more. Legs are upright, arms are long, breast is open. Push off with hands, stand up in waving manner. Now, altogether enter in "arch" position from stand on hands. Stand on hand. Shoulders close ears, arch a little, open abdomen, push off with hands, stand up".

Example 4: In dhyana state sportsmen are suggested that "in competition day it is raining, it is windy, but, in spite of this mood is fine, weather does not influence on mood. Mentally you adjust to competition, memorize your good performances; now you are prepared better, you enter gym, intuition prompts you that you will fulfill exercises in the best way. You are in excellent form, you will show all your skills to win. Start fulfilling exercises of first competition day. You notice well developed feeling of muscles. Your body is completely obedient, you feel no fear: these exercises were fulfilled by you for dozens of times. All thoughts are concentrated only on fulfillment of exercises. Nothing can distract your attention. Movements are accurate and confident. You finish performance and obtain high mark. Now you are watching other sportsmen's performances and analyze them. Before every performance you experience high surge of forces, feel cheerfulness, have clear thoughts and wish to struggle and to win."

In their imagination sportsmen pass the program of second competition day. Then, third competition day's program is simulated and general state of organism is programmed. It was also suggested that in competition day sportsman will have excellent mood and self-feeling, surge of forces, cheerfulness, buoyancy, strive for demonstration of all sport qualities.

Results of the researches

In experimental group, which included 11 sportsmen with hypnoability, corresponding to 2nd and 3rd stages of hypnotic state, we registered good mastering of dhyana techniques after three trainings with psycho-therapeutic specialist.

In control group, which consisted of 10 sportsmen, with lower hypnoability, there were no positive results in mastering dhyana techniques.

Sportsmen of control group, in connection with their lagging in Radja yoga, were given recommendations on independent trainings with the help of lecture materials and special literature. Naturally, control group sportsmen showed worse than experimental group sportsmen results in competitions after 13 days training session.

Testing of dhyana techniques in order to discover all its potentials was passed also by senior and chief coaches of the team and we registered its positive influence on psycho-emotional and psych-physical spheres of their organisms. Dhyana potentials for activation of OCS state in experimental group, consisting of sportsmen with high level of imagination, manifested better than in control group.

Ideomotor act in dhyana state permitted not only to feel the work of muscles but even to see environment like in awakened state.

The depth of dhyana state permitted for sportsmen to carry out independently post hypnotic suggestions, when simulating competition period and programming competition actions with programming of psycho-emotional and physical state.

In contrast to hypno-ideomotor training, in which sportsman's role is passive with complete obedience to commands of hypnologist, dhyana state is characterized by active position, permitting for sportsmen to act independently.

Sportsmen of experimental group, who mastered dhyana method, were able to "impersonation in other sportsmen" rather quickly and it significantly improves their fulfillment of difficult exercise.

Conclusions:

1. By the results of control competitions, indicators of sportsmen with 1st stage of hypnotic state (control group) were worse than the same of sportsmen with 2nd and 3rd stages of hypnotic state (experimental group).

2. The offered complex integrated modified personality-oriented methodic of psycho-physical regulation with correction of sportsmen's motion skills on the base of Radja yoga's dhyana, which includes high quality of optimal competition state's achievement, simulation and programming of training and competition processes with the help of post hypnotic suggestions, showed itself as effective mean for pre-competition sportsmen's training.

Further researches will be oriented on determination of the offered methodic influence on sportsmen of different kind of sports.

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Cite this article as: Omelyanenko V.I. The use of suggestion in sports practice. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 55-58. doi:10.6084/m9.figshare.751554

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Received: 24.06.2013
Published: 30.09.2013

BIOMECHANICAL INDICATORS OF KEY ELEMENTS OF SPORTS EQUIPMENT GYMNASTIC EXERCISES

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Annotation. The aim of this study is to analyze the biomechanical performance of the kinematic and dynamic structures of key elements of sports techniques of basic exercises performed gymnasts aged 12 - 14 years to the vaulting and on the bars of different heights, on the basis of the method of postural orientation movements. The study involved 11 gymnasts doing exercises on the vaulting and 9 gymnasts - on the boards of various heights. It is shown that the method of video - computer analysis of the type Yurchenko vault and dismount from the bars of varying heights, in conjunction with the method of postural orientation movements possible to isolate and identify the node elements. The indicators characterizing the node elements of sports equipment movements gymnasts in the phase structure of the vault and dismount from the bars of different heights have specific features and characteristics. Learned node elements sports equipment is the basis for the measurement, analysis and evaluation of the kinematic and dynamic structures and other types of exercises all-around gymnastics.

Key words: biomechanics, posture, phase jump, gymnastics.

Introduction

Analysis of scientific-methodic literature witnesses about importance of studying of gymnastics' and acrobatics' techniques and their training considering knowledge about posture and position of sportsman's body. In this connection, for researching gymnastics exercises' technique, V.N. Boloban, Ye. V. Biriuk [1] offered using the method of movements' posture-bench marks. Method of movements' posture-bench marks is the method of bio-mechanical study of sport exercises by means of analysis of preceding and posterior body postures, positions of body and their multiplication in phase structure of executed movement in order to learn key elements of sport technique. Key element of sport technique is a pilot posture of movement, which preconditions effectiveness of movement task's solution by a sportsman. Method of movement's posture-bench marks was developed at the end of seventies. The following years, conception and methodology, scientific-practical application were improved in works by V.N. Boloban (1988 – 2013), as well as in the works by Ye. Sadovskiy, T. Nizhnikovskiy, A. Mastaleg, V. Vishniiovskiy, M. Begaylo (2003 – 2013), V. Potop (2012), N. Andreyeva (2013), et al [2,3,6,13,15,17 -20,26,29].

With the help of movements' film-analysis, as well as video-computer program APAS 2000 we carried out bio-mechanical study of key elements of the following exercises' techniques: jump by step; jump by step- jump by step; ball throw in jump "Cossack" – catching in spin on two arms and back in rhythmic steps; ball throw in jump touching into ring - catching in spin on two arms and back in rhythmic steps; forward spin – forward somersault in tuck position; rondat –back somersault in tuck position; rondat - back somersault, sagging; rondat - back double somersault in tuck position; rondat - back double somersault, sagging; rondat - back double somersault, sagging in combination with pace somersault and so on. Then, with the help of method of movements' posture-bench marks authors identified the following key elements of sport techniques in the listed above exercises: in phase of preparatory movements key element is starting posture of body –position of body bio-mechanically rational for entering main phase of exercise; in phase of main movements key element is multiplication of posture (postures) of body; multiplication of postures (MP), being a key element of sport technique, is regarded as the process of successive fulfillment of instant fixed postures of one profile (e.g. triplex back somersault in tuck position) or combined profile of movements (e.g. triplex back somersault in tuck position with turn by 360° in first somersault) for creation of integral motion action with controlled change of body postures, body positions; MP determines composition and structure of exercise; in phase of finalizing movements key element is final position of body, which characterizes stability of body on support for completion of exercise or creation of conditions for next combination of exercises.

The conceptual essence of method of movements' posture-bench marks is that every preceding position of body shall positively influence on bio-mechanics of the following posture in exercise, fulfilled by a sportsman that permits to fulfill this exercise without extra motion actions in order not to accumulate technical mistakes when demonstrating exercise or combination of exercises. As an example we supply our written evaluation for exercise on bars executed by Aliya Mustafinova (Russia), champion of OG 2012. She fulfilled highly difficult, highly elegant and beautiful exercise. All movements "fitted" position to position, i.e. all previous and following movements of the exercise were fulfilled technically accurately; the sportswoman used inner energetic potential of movements through effective transmission of properties (power, space and time) of the preceding position to the following one, without accumulating technical mistakes that permitted for the sportswoman to demonstrate exemplary sport technique of revolutions, rotations around longitudinal axis of body, recessions, risings, flights, flights over bar, dismount – double somersault with one and half of pirouettes. [www.youtube.com. Alija Mustafina].

“Newly coming always desires to follow the previous... And like reasonable disposition of all beings all appearing make not a simple succession, but a certain admirable disposition” – Marcus Aurelius. Reflections. Book forth.

It is very interesting and instructively written in Tai Chi Yuan – martial art and health related gymnastics. For mastering of exercises of this system with high quality disciple shall pass three compulsory stages. “First stage ... embedding of foundation ... development of correct body position ... stability of steps. Second stage ... transition to mastering of main postures or final positions and methods of movements from one position to another. Third stage... full understanding of all movements...” [http://dharuma.ru/?p=222. Magazine of Dharuma, 2008.].

Bio-mechanical researches and pedagogic experiments proved purposefulness of method of movements’ posture-bench marks as effective method of analysis and evaluation of sport techniques’ elements and as a base for development of didactic technologies for training of sports exercises of different coordination complexity [4,5]. In researches [16] there are presented recommendations to use method of movements’ posture-bench marks for track and fields running. Authors specify three postures: posture of running, posture of barrier attack and coming from it; in high jumps – running posture, posture of repulsion and posture above bar; in long jumps: running posture (during running and flight by “scissors” method), posture of repulsion starting step and posture of landing. Authors also underline that exactly body posture and reproduction of postures shall be the object of study. Researching elements of structure’s elements of track and field sportsmen’s technical level V. Gamaliy, M. Ostrovskiy [9, pg.96] write that the process of formation and perfection of exercises’ sport technique shall be based not on the principle of rising of bio-mechanical movements characteristics’ absolute values, but on studying and formation of mechanisms of their achievement when carrying out competition actions.

In this connection N.G. Suchilin [22,23] points at the fact that every phase of movement contains leading element of coordination, which can be determined on bio-mechanical, physiological and pedagogical levels. Leading coordination element pre-determines development of controlling action in certain phase of movement and gives it specific form and character and determines its structure. It plays trigger role in inter muscular coordination and with maximal forces serves as a mean of increasing of muscular contractions’ speed. Correctness or incorrectness of leading coordination element’s technique is judged in the base of analysis of control position in the middle of phase, where boundary and leading elements are also determined that permit to substantially order description of sport technique. Phase of technical actions, the author notes, can include even finer components. For example, phase of main flight actions when carrying out double or triplex somersaults in tuck position includes sub-phases of tucking and maintaining tuck position.

Actions by program of body posture is nothing but active unconditioned fundamental principle of realization of full movements’ program, quintessence of technique, mean of implementation of the set formal program of position. Just this program component of action-movement is a key and informal part of movement’s structure, which shall be mastered in the process of training. “Loco-motor and game kinds of physical exercises – Yu..K. Gaverdovskiy writes – are built, in program respect, mainly as combination of movements – movements of posture and location program. Exercises of synchronized swimming, in their essence, are executed in fixed space zone and are connected, first of all, with movements of posture program and, to less extent, with orientation” [7, pg.259]. Using this approach to analysis of program- kinematic content of exercises in any kind of sports, it is possible to determine more precisely didactic specificity of material and develop, from scientific-methodic positions, approaches to its practical mastering.

Thus, method of movements’ posture-bench marks, as a mean of bio-mechanical research of sports exercises by analyzing of previous and following body postures in phase structure of the fulfilled exercise, in order to learn key elements of sport techniques, is effective and is being realized in sport science. It is in the base of bio-mechanical analysis and evaluation of key elements of exercises’ technique of sport kinds of gymnastics; it is the base of development of conception of long-term training programs in structure of sports training’s macro-methodic [24].

The present work has been fulfilled as per plan of scientific & research works of Ecology University in Bucharest.

Purpose, tasks of the work, material and methods

The purpose of the research is bio-mechanical analysis of kinematic and dynamic structures’ indicators of basic exercises’ sport technique’s key elements, which were fulfilled by 12-14 years old female gymnasts on vaults and bars of different height on the base of method of movements’ posture-bench marks.

The tasks of the researches:

1. Identification of key elements of sport technique in phase structure of basic gymnastic exercises, fulfilled by 12-14 years old female gymnasts on vaults and bars of different level on the base of method of movements’ posture-bench marks.
2. Bio-mechanical analysis and evaluation of kinematic and dynamic structures’ indicators of basic exercises’ sport technique’s key elements, which were fulfilled by 12-14 years old female gymnasts on vaults and bars of different level.
3. Evaluation of the extent of connection of kinematic and dynamic structures’ indicators of basic exercises’ sport technique’s key elements, which were fulfilled by 12-14 years old female gymnasts on vaults and bars of different level with points received by female gymnasts in individual all-round events and in final at championship 2012 in Rumania.

Methodology and methods of the research:

1. Analysis of scientific-methodic literature.

2. Method of movements' posture-bench marks [1] – analysis of body postures, body positions and their multiplications on support and in space without support in phase structure of basic exercises in vaults and on bars of different height in order to reveal key elements of sport technique and to evaluate time of exercises phase' fulfillment.

3. Video recording of exercises- vaults of Yurchenko type: back somersault, ragging (YuBSR) and back somersault, ragging with turn by 360° (YuBSR 360); dismounts from bars of different level in tuck position; double back somersault in tuck position (DST), double back somersault in tuck position with turn by 360° in first somersault (DST 360 in first), double back somersault, bending (DSB), double back somersault, ragging (DSR) and back somersault, ragging with turn by 720° (SR 720) – was carried out with the help of Panasonic Full HD 3D Camcorder, which was located perpendicular to the plane of movement (sagittal plane). We used program Pinnacle Studio for converting of video record in AVI format, speed of video recording was 30 sh, p. sec; then there was preparation of individual video shots of movement for bio-mechanical computer analysis.

4. Application of computer program «Kinovea» for measuring of joint angle of body's parts in key elements in vaults and with dismounts from bars of different height.

5. Bio-mechanical analysis, with the help of program «Physical ToolKit» for obtaining of kinematic and dynamic characteristics of movements' trajectory of spoetswomen bodies' parts, resulting speed of ankle joint, knee, shoulder, wrist joints and GMC in vaults; resulting GMC power as well as kinematic and dynamic characteristics of rotational movement around apparatus's (pole) axis for preparatory movements of body flight in dismounts from bars of different level.

6. Mathematical statistics with the help of computer program "KyPlot".

Organization of the research

11 female gymnasts, fulfilling exercises in vaults and 9 female gymnasts – performing on bars of different level, from whose 6 persons are reserve of combined gymnastics team of Rumania, took part in the research. The research was carried out in period 25-27.10.2012 in Deva, championship of Rumania in individual all round events and in final by apparatuses. In the article we have presented results of study of key elements of exercises' sport techniques in vaults of Yurchenko type: YuBSR, YuBSR 360 and dismounts from bars of different level: DST, DST 360, DSB, DSR, SR 720.

In tables 1 and 2 we have presented anthropometric and bio-mechanical indicators of female gymnasts for analyzing of vault exercises and exercises on bars of different level with the help of program Physical ToolKit.

Table 1

Anthropometric and bio-mechanical indicators of junior, 12-14 years old, female gymnasts, for analyzing of sport technique of Yurchenko-type vaults (n = 11)

	Names	V	Height (m)	Height with raised arms (m)	Mass, (kg)	IM (kgm ²)	RM / GMC, (m)		
							Ankle	Shoulder joints	Wrist joint
1	V.K.	YuBSR	1.49	1.90	36.6	81.25	0.75	0.437	0.611
2	Ch.A.	YuBSR	1.44	1.80	36.6	75.89	0.708	0.407	0.592
3	O.A.	YuBSR	1.54	1.92	40.4	95.81	0.757	0.454	0.658
4	O.A.	YuBSR 360	1.54	1.92	40.4	95.81	0.735	0.421	0.528
5	S.Sh.	YuBSR	1.52	1.90	40.4	93.34	0.841	0.441	0.647
6	S.Sh.	YuBSR 360	1.52	1.90	40.4	93.34	0.748	0.448	0.587
7	I.A.	YuBSR	1.38	1.77	32.1	61.13	0.696	0.423	0.535
8	Zh.L.	YuBSR	1.32	1.74	30.1	52.45	0.716	0.40	0.542
9	Zh.L.	YuBSR 360	1.32	1.74	30.1	52.45	0.677	0.349	0.487
10	Z.S.	YuBSR	1.45	1.86	31.5	66.22	0.661	0.394	0.556
11	Z.S.	YuBSR 360	1.45	1.86	31.5	66.22	0.695	0.367	0.518
Mean			1.45	1.85	35.46	75.81	0.73	0.41	0.57
SEM			0.02	0.02	1.35	5.17	0.01	0.01	0.02
SD			0.08	0.07	4.48	17.13	0.05	0.03	0.05

Legend: V- vaults, YuBSR – Yurchenko's back somersault, ragging, YuBSR 360- Yurchenko's back somersault, ragging, with turn by 360°, IM inertia of movement, RM – radius of movement, GMC- general mass center, Mean – mean mark, SEM – error of mean arithmetics, SD – mean square deviation.

Table 2

Anthropometric and bio-mechanical indicators of junior, 12-14 years old, female gymnasts, for analyzing of sport technique of dismounts from bars of different height (n = 9)

Names	Dismounts	Mass, kg	Height with raised arms, (m)	IM kgm ²	RM, (m)			
					GMC	Ankle	Knee joints	Shoulder joints
V.A.	DST	34.1	1.88	120.52	1.559	2.089	1.835	1.333
Ch.A.	DST 360°	33.1	1.80	107.24	1.359	1.716	1.564	1.238
P.A.	DSB	31.4	1.80	101.74	1.363	1.837	-	1.094
I. A.	DSB	32.1	1.77	100.57	1.42	1.892	-	1.151
O.A.	DSB	40.4	1.92	148.93	1.345	1.803	-	1.021
M.I.	DSR	41.5	1.91	151.39	1.805	2.219	-	1.584
T.D.	DSB	31.2	1.78	101.71	1.389	1.806	-	1.155
T.P.	DSB	38.5	1.95	146.39	1.314	1.81	-	0.972
S.Sh.	SR 720°	40.4	1.90	145.84	1.48	2.028	-	1.194
Mean		35.86	1.86	124.93	1.45	1.91	1.69	1.19
SED		1.43	0.03	7.62	0.05	0.05	0.14	0.06
SD		4.28	0.07	22.85	0.15	0.16	0.19	0.18

Legend: DST - double back somersault in tuck position; DST 360° - double back somersault in tuck position with turn by 360° in first somersault; DSB - double back somersault, bending; DSR - double back somersault, ragging; SR 720° - back somersault, ragging with turn by 720°.

Results of the research

On the base of bio-mechanical analysis of gymnastic vault exercises of Yurchenko type – the following key elements of sport technique were identified: starting position of body (SPB1) – position of gymnast’s body in stand on jumping off place before back flight in half of turn; SPB2 – position of gymnast’s body in stand on hands, supporting on gymnastic table before one and half back somersault, ragging flight and one and half back somersault, ragging, with turn by 360 degrees; multiplication (MP1) of spring-rigid body posture, straighten in first flight with raised and deflected a little backward arms in back half-turn after repulsion from springboard; multiplication (MP2) of sportswomen’s body posture in pain phase of exercise of second flight, after repulsion from gymnastic table (somersault, ragging, and somersault, ragging, with turn by 360 degrees); finalizing body posture (FP) in phase of finalizing movements – landing (key element, which characterizes stable landing of vaults is half-squatting with forward half bent of body in narrow stand with feet apart, arms stretched forward and apart as well).

Besides, key elements of sport technique of exercises on bars of different level (dismounts) were also identified: double back somersault in tuck position, double back somersault in tuck position with turn by 360 degrees in first somersault, double back somersault, bending, double back somersault, ragging, back somersault, ragging with turn by 720 degrees. It was found that phase of preparatory movements consists of two sub-phases: first – passing under lower bar (PP1) and completion of big back rotation with insignificant deceleration of thighs (second sub-phase – PP2) – this body position is determined as PP – i.e. the most rational gymnast’s body position for entering in main phase of dismount (with dismount – back somersault, ragging, with turn by 720 degrees in second sub-phase – PP2 – is registered for more long time; with it speed of legs’ movement is less); MP – multiplication of body posture, with which maximal speed of GMC flight is demonstrated in dismounts and exercises’ fulfillment with some technical errors of body posture’s control; FP – finalizing posture – landing (key elements, which characterize stability landing from bars of different level, is half-squatting with forward half bent of body in narrow stand with feet apart, arms stretched forward and apart as well).

Bio-mechanical analysis of key elements of Yurchenko’s vaults’ sport technique, which are characterized by joint angles’ indicators in PP1, PP2. MP1. MP2 and FP are given in table 3 and in fig 1.

Table 3

Indicators, which characterize kinematic structure of key elements of Yurchenko’s vaults’ sport technique by data of joints’ angles of junior, 12-14 years old, female gymnasts, who participated in sSport gymnastics championship 2012, Rumania.. (n = 11)

	Name.	Vaults	SP1(degrees)	MP1 (degrees)	SP2 (degrees.)	MP2 (degrees)	FP (degrees)
1	V.K.	YuBSR	93	98	92	135	152
2	Ch.A.	YuBSR	100	87	84	130	129
3	O.A.	YuBSR	101	90	82	135	136
4	O.A.	YuBSR 360°	96	87	68	159	84
5	S.Sh.	YuBSR	94	87	81	143	117
6	S.Sh.	YuBSR 360°	98	86	83	165	83
7	I.A.	YuBSR	105	103	80	121	96

8	Zh.L.	YuBSR	98	93	83	142	142
9	Zh.L.	YuBSR 360°	95	98	82	160	95
10	Z.S.	YuBSR	92	92	82	130	138
11	Z.S.	YuBSR 360°	98	91	84	142	129
Mean			97.27	92.00	81.91	142.00	118.27
SED			1.15	1.17	1.68	4.23	7.44
SD			3.82	5.57	5.57	14.04	24.68

Legend: SP1- starting posture – body position in stand: feet on jumping off place before repulsion – angle of ankle – shoulder joints; MP1 – elastic-rigid posture with insignificant ragging and raised arms, a little deflected backward to the floor in back half turn after repulsion from jumping off place – angle of ankle – shoulder joints; SP2 gymnast’s body position for flight after resting on apparatus – angle of wrist- knee joints; MP2 - multiplication of postures – maximal height of GMC – angle: thigh – body; FP – final posture, angle: thigh-body – landing; Mean – mean mark; SEM – error of mean arithmetic value; SD square deviation.

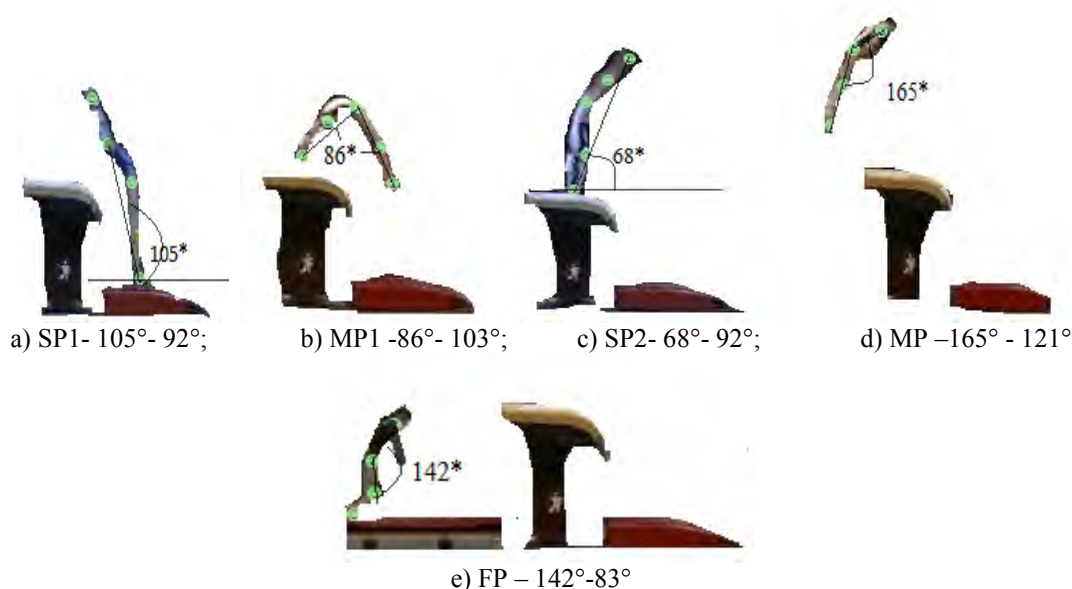


Fig.1. Indicators of joints' angles of Yurchenko's vaults' sports technique's key elements

Analysis of individual indicators of kinematic structure of sport technique's key elements in vaults of Yurchenko type by data of joints' angles (with the help of program «Kinovea») of junior, 12-14 years old female gymnasts – participants of gymnastics championship 2012, Rumania, witness that every sportswoman has own characteristics of joints' angles of key elements and every key element has close to optimal joint angle and even convenient sector of space (see table 2 and table 3): SP1 [92°-105°]; MP1 [86° – 103°]; SP2 [68°-92°]; MP2 [121°- 165°]; FP [83° – 152°].

In table 4 and fig 2 indicators of space-time characteristics of key elements' technique of vaults of Yurchenko type are given by the data of movements' trajectory of junior female gymnast S.Sh., 14 years old, which were fulfilled on sport gymnastics championship 2012 in Romania.

Table 4

Indicators of space-time characteristics of key elements' technique of vaults of Yurchenko type by the data of joints movements' trajectory of junior female gymnast S.Sh., 14 years old, which were fulfilled on sport gymnastics championship 2012 in Romania.

Key elements	Vaults	TKE (sec.)	GMC(m)		Ankle (m)		Shoulder joint. (m)		Wrist joint (m)	
			X	Y	X	Y	X	Y	X	Y
SP1	YuBSR	0.1	1.15	1.085	1.018	0.317	0.952	1.468	0.846	1.97
	YuBSR 360°	0.133	1.004	1.121	1.043	0.313	0.834	1.551	0.548	1.903
MP2	YuBSR	0.167	0.82	1.653	1.058	1.031	0.331	1.626	-0.013	1.362
	YuBSR 360°	0.2	0.639	1.747	1.095	1.082	0.222	1.656	-0.081	1.291
SP2	YuBSR	0.233	0.172	2.142	0.648	2.631	0.013	1.732	-0.053	1.283
	YuBSR 360°	0.3	-0.13	2.255	0.091	2.985	-0.104	1.799	-0.156	1.395
MP2- MFH	YuBSR	0.367	-0.595	2.38	-1.124	1.957	-0.119	2.446	-0.37	2.208

	YuBSR 360°	0.4	-0.73	2.347	-1.577	2.112	-0.326	2.399	-0.365	2.438
FP	YuBSR	0.667	-2.089	0.808	-2.063	0.304	-1.798	1.111	-1.547	0.833
	YuBSR 360°	0.7	-2.539	0.837	-2.565	0.332	-2.113	0.997	-2.242	0.713

Legend: x – horizontal movement; y – vertical movement; MFH – maximal height of second flight of vault; TKE – time of key elements' fulfillment;

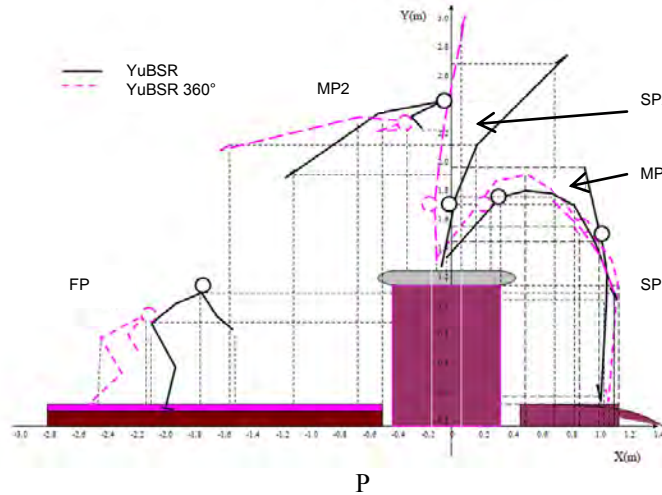


Fig.2. Key elements of Yurchenko's vaults' sport technique: YuBSR, YuBSR 360°. The tested: junior female gymnast, 14 years old, S.Sh., champion of Rumania in vaults.

Results of comparative analysis of space-time characteristics' indicators of Yourchenko's vaults' key elements by the data of joints movements' trajectory of the tested S.Sh. show that time of analysis of vault YuBSR 360° is longer by 1 video frame. In YuBSR 360° jump, with fulfillment of starting position SP1, position of body has greater bent before repulsion from jumping off place than in YuBSR (angle shoulder- shin = 98°); multiplication of posture (MP1) is longer and higher in back half-turn – GMC = 1.747m; starting posture SP2: there is no deceleration of legs in supporting curvet (from stand on hands) – angle = 83°; multiplication of posture (MP2) – flight in second phase of jump was fulfilled with greater bent backward and lower (GMC= 2.347m), bending in hip joints was registered in MP2 that is a technical mistake; final posture (FP) – distant landing -2.565m, with significant forward bent of body.

In table 5 and in fig 3 we present indicators of resulting GMC power, angle speed of parts of S.Sh.'s body in vaults of Yurchenko type.

Table 5

Indicators of resulting GMC power, angle speed of parts of S.Sh.'s body, 14 year old, in vaults of Yurchenko type.

Key elements	Vaults	TKE (sec.)	GMC	Ankle joint.	Shoulder joint	Wrist joint
			F, N	Omega, rad/s	Omega, rad/s	Omega, rad/s
SP1	YuBSR	0.1	5010	10.548	33.926	35.384
	YuBSR 360°	0.133	5930	7.892	17.843	26.621
MP1	YuBSR	0.167	3620	6.578	28.097	33.1
	YuBSR 360°	0.2	2480	18.817	15.243	12.206
SP2	YuBSR	0.233	4810	42.374	21.018	13.722
	YuBSR 360°	0.3	1570	19.887	13.761	6.309
MP2- MFH	YuBSR	0.367	5770	35.52	31.622	29.865
	YuBSR 360°	0.4	3160	18.143	16.988	25.218
FP	YuBSR	0.6	650	10.915	18.874	22.051
	YuBSR 360°	0.633	476	23.607	28.229	27.947

Legend: see table 1 and 3, F –force, Omega – angle speed.

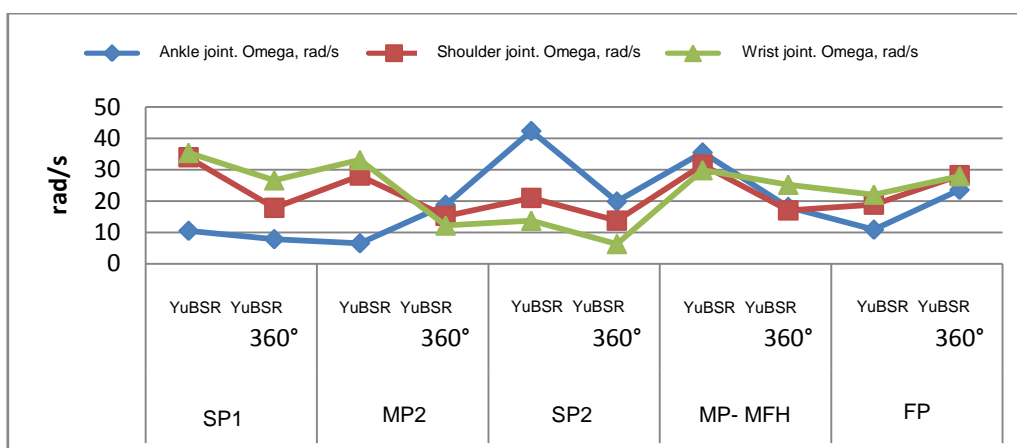


Fig.2. Angle speed of body parts of 14 years old female gymnast S. Sh. In vaults of Yurchenko type.

During fulfillment of SP1 we registered significant resulting GMC force in vault YuBSR 360° - 5930N and less angle speed in ankle, shoulder and wrist joints (7.89 m.p.sec. - 26.6 m.p.sec.); slower jump on springboard was fulfilled; in MP1 – in back half-of-turn – resulting GMC force was 2480N, angle speed in ankle joints was 18.82 m.p.sec., which did not permit for gymnast to effectively control curvet part of SP2; key element of MP2 – maximal flight height of GMC has less resulting force - 3160N and angle speed in joints (16.9 – 25.2 m.p.sec.), that do not facilitate effective finalizing of rotation in somersault with taking convenient for landing final posture of body (FP)- (result – forward bent of torso and shoulders, lower than technical norm, determined by ФИЖ).

Results of vaults, executed by junior, 12-14 years old, female gymnasts at sport gymnastics championship in Rumania, 2012, in individual all round events and in finals by apparatuses are given in table 6.

Table 6

Results of vaults, executed by junior, 12-14 years old, female gymnasts at sport gymnastics championship in Rumania, 2012 (n = 7)

№/№	Names	All round events			Finals, apparatuses	
		Comp.	Ex.	F.M.	Result	Place
1	V.K.	4.400	9.100	13.500	13.088	5
2	Ch.A.	4.400	8.775	13.175	13.075	6
3	O.A.	5.000	9.100	14.100	13.500	3
4	S.Sh.	5.000	8.800	13.800	13.562	1
5	I.A.	4.400	8.800	13.200	-	-
6	Zh.L.	5.000	9.000	13.900	13.387	4
7	Z.S.	5.000	8.800	13.800	13.537	2
Mean		4.74	8.91	13.64	13.36	
SEM		0.12	0.06	0.13	0.09	
SD		0.32	0.14	0.35	0.22	

Legend: (see table 1): Comp. – complexity of vaults; Ex. – points for execution; F.M. – final mark.

Two types of Yurchenko’s vaults were executed: YuBSR and YuBSR 360°, complexity of vaults 4.400 points and 5.000 points accordingly; mean mark for execution – 8.91 points; final mark in individual all round events– 13.64 points; finals by apparatuses – mean mark of two vaults – 13.36 points. Analysis showed that junior gymnasts land on springboard insufficiently springing-rigidly after rondat and owing to this fact AP1 for moving by back half-of-turn is fulfilled too slowly, with some technical mistakes, like repulsion by half-bent legs, imprecisely raised arms. These make difficulties for fulfillment of following key elements in phase structure of vault. In particular it worsens opportunities for fulfillment of SP2, MP2, FP, i.e. rotation speed in somersault reduces, that results in not high flight after repulsion from table by hands and inactive raising of torso at beginning of MP2, i.e. more high entering somersault; as a result – too distant flight of gymnast in finalizing phase of vault, final body posture – landing are fulfilled with mistakes.

Results of bio-mechanical analysis of body parts’ trajectories as well as GMC resulting force indicators and angle speeds of 12-14 years old gymnasts’ body parts, when fulfilling dismounts from bars of different height, are presented in table 7 and 8 and in fig. 4.

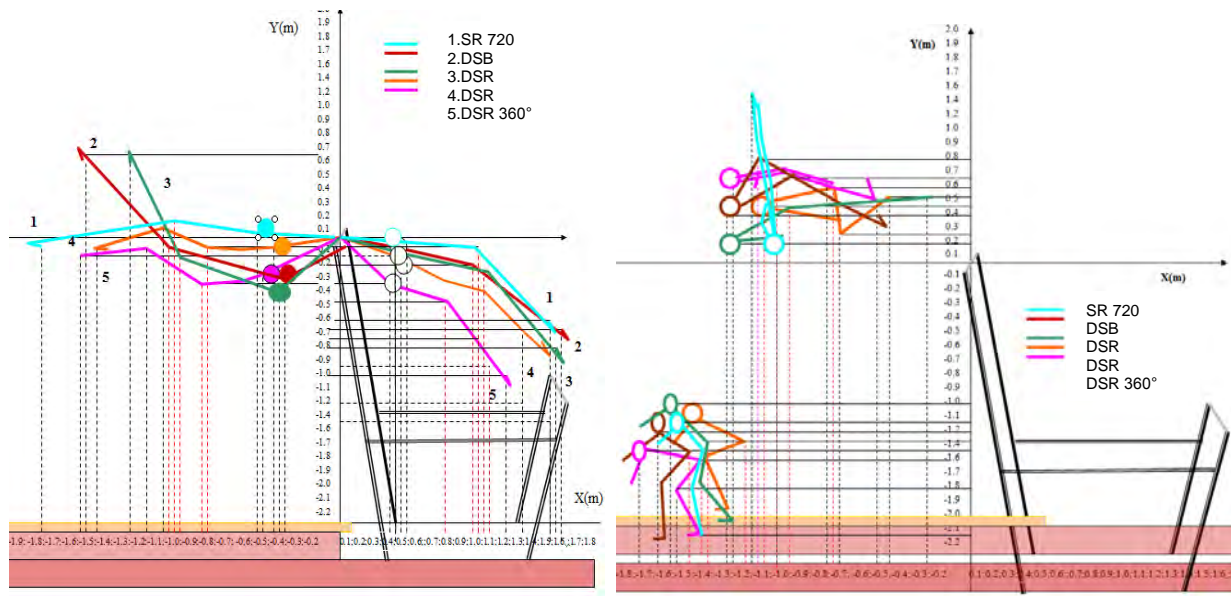
Table 7

Indicators, characterizing kinematic structure of key elements of dismounts from bars of different height sport technique as per data of joints' angles of the tested – junior female gymnasts of 12-14 years old, who fulfilled these dismounts at sport gymnastics championship 2012 in Rumania. (n = 5)

Key elements		Dismount	Names	Torso-thigh (degrees)	Arms- torso (degrees)
PM	SPh1	DST	B.A.	147	
		DST 360°	Ch.A.	160	
		DSB	I.A.	158	
		DSR	M.I.	153	
		SR 720°	S.Sh.	132	
	SPh2-SP	DST	B.A.	129	143
		DST 360°	Ch.A.	124	144
		DSB	I.A.	112	143
		DSR	M.I.	143	117
		SR 720°	S.Sh.	210	173
MP - MFH	DST	B.A.	87		
	DST 360°	Ch.A.	100; 93		
	DSB	I.A.	75		
	DSR	M.I.	141		
	SR 720°	S.Sh.	151		
FP	DST	B.A.	94		
	DST 360°	Ch.A.	70		
	DSB	I.A.	111		
	DSR	M.I.	117		
	SR720°	S.Sh.	127		

Legend: PM –preparatory movements; SPh1 – first sub-phase in preparatory movements for dismounts, SPh2 – second sub-phase, transition into SP of dismounts; MP and MFH – multiplication of postures – maximal flight height of GMC; FP – final position of body with landing.

Analysis of sport techniques' key elements' kinematic structure of dismounts from bars of different level, which were fulfilled by tested junior, 12-14 years old, female gymnasts at sport gymnastic championship 2012, Rumania and were registered with the help of program «Kinovea», witnesses that every sportswoman had individual characteristics of joint angles of key elements' sport technique; besides, all key elements had mean indicator of joint angle, own sector of space, in which there is optimal joint angle and interval of angles' indicators (see table 7): SPh1 [132°-160°], SPh2-SP [112° – 210°], torso- arms [117°-173°], MP – MFH [75°-100°], FP [70°-127°]. Characteristics of key element's joint angles and technical mistakes (e.g. in dismount SR 720 angle thigh – torso is 210° at the moment of leaving bar) determine kinematic structure of dismount (see fig. 4). For example, significant ragging of tested S. Sh.'s lumbar spine in dismount SR 720 dis-coordinates system of movements, required for gymnast's entering in pirouette rotation. One more mistake. Concerning other gymnast- Ch. A.: there was registered uncompleted 360 degrees' rotation in first somersault in dismount DSR 360, however in MP she reached maximal height of GMC raising; combined rotation around longitudinal and front (cross) axes in tuck position was fulfilled also with technical mistakes ("broken" tuck position); FP- landing in dismount DSR 360 was carried out with torso forward bent, in unstable manner.



a) PM: SPh1, SPh2 – SP

b) MP – MFH, FP

Fig.4 Key elements of dismounts from bars of different height sport technique. Abbreviated names of dismount and gymnast:

DSR – B.A.; DSR 360° - Ch.A.; DSB – I. A.; DSR – M. I.; SR 720 - S. Sh.

Let us regard indicators of space-time characteristics of key elements' sport technique of dismounts from bars of different height, by the data of joint movements' trajectories of tested 12-14 years old female gymnasts, who participated in sport gymnastic championship 2012, Rumania. These data will ring us nearer to understanding the importance of analysis, evaluation and registration of sport technique's key elements' indicators in phase structure of junior sportswomen's movements. For profound study of body postures, positions and their multiplications in structure of key elements of sport techniques of dismounts from bars of different level, analysis of video-materials was divided into two parts: first part – sub phase of PM (SP) was calibrated every 5 video frames, the second part- other gymnasts' movements, were calibrated every 3 video frames (see table 8).

Table 8

Indicators of space-time characteristics of sports technique's key elements of dismounts from bars of different height by data of joint movements' trajectories of tested junior, 12-14 years old, female gymnasts, who fulfilled them at championship 2012, Rumania

(n = 5)

Key elements	Dismount	MTKE (sec.)	GMC(m)		Ankle joint. (m)		Knee joint. (m)		Shoulder joint. (m)		
			X	Y	X	Y	X	Y	X	Y	
PM	SPh1	DST	0.133	1.117	-0.393	1.525	-0.798	1.387	-0.62	0.514	-0.16
		DST 360°	0.133	0.812	-0.537	1.212	-1.012	1.025	-0.775	0.487	-0.325
		DSB	0.167	1.05	-0.231	1.637	-0.694	-	-	0.498	-0.142
		DSR	0.1	1.125	-0.313	1.623	-0.867	-	-	0.535	-0.111
		SR 720°	0.133	1.084	-0.052	1.573	-0.612	-	-	0.507	-0.052
	SPh2- SP	DST	0.033	-0.829	-0.125	-1.439	-0.078	-1.095	0.109	-0.453	-0.125
		DST 360°	0.033	-0.899	-0.362	-1.551	-0.174	-1.145	-0.159	-0.536	-0.29
		DSB	0.033	-1.07	-0.054	-1.534	0.624	-	-	-0.392	-0.357
		DSR	0.033	-0.978	-0.078	-1.226	0.574	-	-	-0.466	-0.404
MP- MFH	SR 720°	0.033	-1.029	0.158	-1.773	-0.032	-	-	-0.586	0.032	
	DST	0.133	-0.782	0.532	-0.438	0.5	-0.735	0.266	-1.188	0.469	
	DST 360°	0.167	-1.044	0.652	-0.522	0.478	-0.739	0.681	-1.218	0.638	
	DSB	0.133	-1.124	0.767	-0.475	0.232	-	-	-1.32	0.392	
	DSR	0.1	-0.947	0.404	-0.248	0.497	-	-	-1.273	0.186	
FP	SR 720°	0.133	-1.108	0.475	-1.224	1.44	-	-	-1.029	0.063	
	DST	0.4	-1.204	-1.392	-1.251	-1.845	-1.423	-1.595	-1.486	-1.126	
	DST	0.4	-1.406	-1.609	-1.406	-2.131	-1.508	-1.812	-1.711	-1.421	

	360°									
	DSB	0.4	-1.445	-1.623	-1.605	-2.248	-	-	-1.641	-1.302
	DSR	0.4	-1.397	-1.381	-1.257	-1.956	-	-	-1.599	-1.04
	SR 720°	0.367	-1.425	-1.488	-1.472	-1.963	-	-	-1.636	-1.172

Legend: (see tables 2 and 7). Abbreviated names of dismounts and gymnasts:
DST – B. A.; DST 360° - Ch. A.; DSB – I. A.; DSR – M. I.; SR 720° - S. Sh.

In table 8 there are presented individual indicators of key elements' sport technique's kinematic structure of dismounts from bars of different level. Key element – SP – is realized in PM phase and contains two sub-phases of movement SPh1 and SPh2 – the moment of passing under lower bar and the moment before leaving upper bar. Position of body and movements in shoulder and hip joints at the moment of passing under lower bar and before leaving upper bar have individual style of fulfillment, different pace-rhythmic structure and space-time indicators. However, in all, analyzed by us, dismounts time of key element's (SP – in Sph2) fulfillment equals to 0, 033sec. The moment of leaving of upper bar is quick and the same by time, while length and height of GMC and parts of body flight (vertical movements (X) and horizontal (Y)) with fulfillment of MP and FP are different, which witness that bio-mechanics of dismounts is complex and structurally different; more over dismounts were fulfilled with technical mistakes of body positions' regulation and body positions in key elements of exercises phase structure.

On fig. 5 there are given indicators of angle speed of body parts (phase of preparatory movements) of 12-14 years old female gymnasts in dismounts from bars of different level.

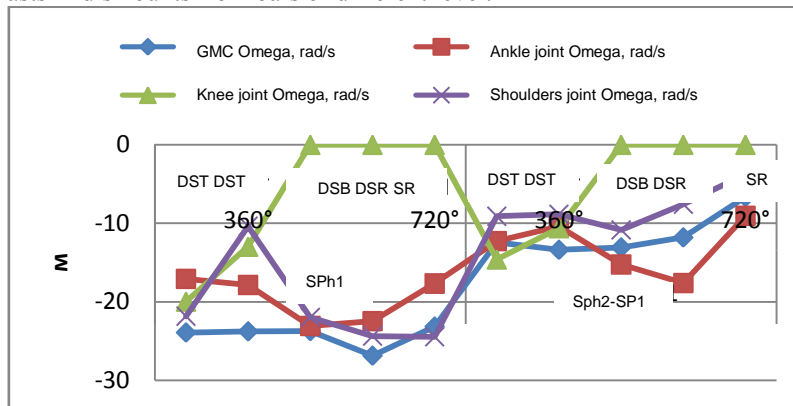


Fig.5. Angle speed of body parts in phase of preparatory movements (PM) of 12-14 years old female gymnasts in dismounts from bars of different level (n = 5)

Analysis of individual indicators of sport techniques' key elements' kinematic structure of dismounts from bars of different level, 9in group dynamics, n=5) witnesses about their variability. For example, in phase PM (SP), in SPh1 angle speed of body parts in DSR dismount had the following indicators: GMC - 26.849 m.p.sec. ankle joints 22.44m.p.sec., shoulder joints - 24.338 m.p.sec. In dismount SR 720 – SPh2 – moment before leaving of bar, there was registered reduction of angle speed for fulfilling of accelerated body rotation around longitudinal axis. Angle speed of rotation around frontal (cross) axis was also reduced: GMS – 6.643 m.p.sec., ankle joint - 9.041 m.p.sec., shoulder joints.- 3.749 m.p.sec.) In key element MP – maximal height of flight in every dismount has its own kinematic characteristics, including different angle speed in joints: GMC in dismounts DST, DST 360° and SR 720° has positive low speed and in dismounts DSB and DSR – negative high speed. In key element FP (DSR dismount) for fixation of stable landing gymnasts had to have high GMC angle speed - 7.814 rad.p. sec. WE also studied dynamic indicators of GMC and parts of body. It was evident that movements' system of junior gymnasts needs physical potential, which would ensure solution of dismount movements' task in compliance with standards of sport technique. One more scientific fact was also evident: need in active didactic work of coaches on training of female gymnasts for them to fulfill technically correct body postures and positions in phase structure of sport gymnastics' exercises (see table 9).

Table 9

Results of junior, 12-14 years old, female gymnasts' performances on bars of different level at championship 2012, in Rumania (n = 9)

Names	Individual all round events			Finals, apparatuses	
	Comp.	Ex.	FM	Result	Place
V. A.	4.500	8.500	13.000	12.725	4
Ch. A.	4.800	6.775	11.575	-	-
P. A.	3.600	8.575	12.175	11.075	8
I. A.	5.300	8.900	14.200	13.125	2
O. A.	5.100	8.550	13.650	12.600	5
M. I.	4.400	8.275	12.675	11.125	7
T. D.	4.800	7.425	12.225	12.125	6

T. P.	5.100	8.525	13.625	13.100	3
S. Sh.	5.000	8.450	13.450	13.500	1
Mean	4.73	8.22	12.95	12.42	
SEM	0.17	0.22	0.28	0.32	
SD	0.51	0.67	0.86	0.91	

In table 9 there are presented results of junior female gymnasts performances at championship of Rumanis in individual all round events and final on bars of different level; in table 10 there are given mathematical dependences of bio-mechanical indicators of kinematic and dynamic structures of exercises' key elements, fulfilled by 12-14 years old female gymnasts in vaults and on bars of different level as well as marks, received by them for individual all round events and in final on apparatuses at championship of Rumania, 2012 (complexity of exercise – 4.73 points, execution of exercise – 8.22 points, final mark – 12.95 points and 12.42 points – final mark for competition on apparatuses).

Table 10

Degree of connection of kinematic and dynamic structures of key elements' structures, fulfilled by 12-14 years old female gymnasts in vaults and on bars of different level with gymnasts' marks for individual all round events and in final on apparatuses at championship of Rumania, 2012 2012 година (n= 16)

Statistical indicators*	Vaults		Bars of different level	
	RF GMC (N) – AS ankle (rad/s) - RARE(points)	RF GMC (N) – AS Ankle (rad/s) – FRA (points)	RF Ankle. (N) – AS Ankle (rad/s) – RARE (points)	RF Гол. (N) – AS Ankle (rad/s) –FRA (points)
t(0) – Cont. correct. t0 ≤2	3.37; P <0.001	3.19; P <0.01	4.21; P <0.001	4.04; P <0.001
t - Cont. correct. t0 >2	3.42; P <0.001	3.25; P <0.01	4.24; P <0.001	4.06; P <0.001

Legend: *Wilcoxon Rank Sum Test (Mann-Whitney U Test) for Unpaired Data; RF GMC - resulting force of GMC; AS ankle – angle speed of ankle joint; RARE – results of individual all round events;; FRA final's results on apparatuses.

Conclusions:

1. Method of video-computer analysis of Yurchenko's type vaults and dismounts from bars of different level in combination with method of movements' posture-bench marks [1-4] permitted to mark out and identify key elements, studying of which makes understanding of gymnastic exercises' sport technique deeper and permit to develop up-to-date programs of their training [4,5,13,20]. Conceptual essence of method of movements' posture-bench marks is in the fact that every preceding position of body in fulfilled by sportsman exercise, shall positively influence on bio-mechanic of next posture that permits to execute exercise without extra motion reconstructions in order not to accumulate technical mistakes in the process of exercise's or combination of exercises' demonstration.

2. Vaults of Yurchenko type. Key elements of sport techniques: starting posture of body- one (SP1) – straighten position of sportswoman's body (with slight throatic spine ragging) on springboard before back half-of turn flight; starting posture – two (SP2) - straighten position of sportswoman's body in stand on hands with rest on gymnastic table before back half and one somersault, ragging, with turn by 360°; key element of body posture's multiplication – one (MP1) – spring-rigid, controlled posture of straightened body, ragging in first flight with raised upward arms, slightly deflected backward in back half-of turn after repulsion from springboard; multiplication –two- (MP2) in main phase of second flight, after repulsion from gymnastic table by arms (ragging and ragging with turn by 360°); key element final body posture (FP) in the phase of finalizing movements – is posture of landing.

3. Dismounts from bars of different level. The following key elements were marked out with fulfillment of double somersault in tuck position, back double somersault in tuck position with turn by 360 degrees, in first somersault, back double somersault bending, back double somersault, ragging, back double somersault, ragging, with turn by 720°: in phase of preparatory movements – starting position of body (SP), which consists of two sub-phases: first – passing under lower bar (SPh1) and the second sub-phase, main – completion of big back turn (SPh2), taking of rational body position for effecting removal from bar and entering into main phase of dismount (see fig. 4, a): 1-5); in phase of main movements there were marked out: multiplication of posture (postures) of body (MP), which determines content and structure of exercise in phase of finalizing movements; final body position (FP)- landing (half – squatting with forward torso half-bending in narrow position with feet apart and arms raised upward and also apart). Indicators, which characterize key elements of sport technique of female gymnasts' movements in phase structure of vaults and dismounts from bars of different level, have individual peculiarities and characteristic features.

4. The studied by us, with the help of modern means of research, key elements of sport technique in phase structure of Yurchenko's vaults and dismounts from bars of different level, which were fulfilled by junior female gymnasts, who are the immediate reserve of Rumanian combined sport gymnastics team, and their objective indicators are the basis for measuring, analysis and evaluation of kinematic and dynamic structures and other exercises of gymnastic all round events, for development of programs, devoted to training of preceding and following body postures, bio-mechanically rational transmitting of optimal power, space, time and other movements' parameters and indicators in phase structure of gymnastic exercise.

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Cite this article as: Potop V.A., Grad R., Boloban V.N. Biomechanical indicators of key elements of sports equipment gymnastic exercises. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 59-72. doi:10.6084/m9.figshare.751559

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Received: 25.06.2013
Published: 30.09.2013

INFLUENCE OF PHYSICAL EDUCATION MEANS UPON FUNCTIONAL STATE OF RESPIRATORY SYSTEM OF STUDENTS WITH CHRONIC LUNG DISEASE

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Annotation. The objective of the work was to study the dynamics of chronic lung diseases in students of the higher educational institutions and the influence of physical education means on the improvement of functional activity indices of respiratory system, indices of biological age (BA) and the level of physical fitness of first-year students. 94 students (56 of experimental and 38 of control group) subjected to different methods of physical education, participated in the experiment. Studies were conducted in 2006-2010. Peculiarities of physical load influence upon indices of timed expiratory and inspiratory capacity and vital capacity have been determined. Application of correlation, regression and factor analysis has permitted to determine the degree, the direction and the form of studied interrelations with biological age of students and present them in respective mathematical models.

Key words: chronic diseases, lungs, physical activity, study, society.

Introduction

Due to recent development of clinical pharmacology and elaboration of new highly efficient technologies of therapy certain success has been achieved in treatment of patients with chronic lung diseases (CLD) {1, 2}. However, chronic character of pathology and increased apnea, decreased level of physical fitness of students with the given nosology of the disease result in restriction of functional capacities and condition the necessity of constant medical monitoring {3, 6, 7}. All these changes as well as decreased physical load tolerance, unsatisfactory psychoemotional state as a result of CLD exert influence on modification of diseased student way of life, which in its turn, initiates high degree of maladjustment of patients and decline of education quality and life.

According to recommendations of The World Health Organization (WHO) quality of life represents an individual evaluation by the person of his/her position in the society in relation to personal capabilities. Quality of life evaluation is also influenced by several factors such as, physical, psychoemotional and social, ability of patient to adapt to nosology of the disease and feel comfortably in this state. Therefore, besides clinico-laboratorial remission and pathology progress prevention, of great importance is also the improvement of well-being and all aspects of life quality.

Physical rehabilitation means such as, physical culture means, massage, physiotherapy, dietary nutrition, to name but a few, play a key role in improvement of the state of students with CLD and prevention of this disease. According to the latest mutual recommendations of American Thoracic Society (ATS) and European Respiratory Society (ERS) pulmonary rehabilitation is multidisciplinary, based on evidential base full-fledged system of measures, aimed at achievement of optimum indices of functional state, success in education and quality of life by students with chronic lung pathology {4, 8}.

The results of foreign {8, 10, 11} and national {6} studies demonstrate that the most efficient method consists in combining medication of students with CLD with physical exercise performance. In order to achieve the desired result the student should be clearly explained the objectives of physical exercise training and the necessity to exert maximal efforts so that to reach set goal. Of tremendous importance is also smoking cessation and training of proper application of inhalers.

Objective, tasks, materials and methods.

The objective of studies was to reveal the impact of physical education means on the improvement of respiratory system functional activity and the level of physical fitness of students with nosology of chronic lung disease.

In the course of studies indices of biological age according to V.P.Voitenko (1991), vital capacity, timed inspiratory and expiratory capacity have been determined along with analysis of the results of medical examination in student polyclinic of the city of Kyiv.

Results of studies.

Studies were conducted during 2009-2010 academic year with participation of 94 first-year students of the National University of Bioresources and Nature Management of Ukraine with respiratory system diseases (56 students of experimental group and 38 students of control group). Training sessions in experimental group were conducted according to experimental methods (during physical education sessions and individual performance of physical exercises besides general conditioning and special exercises, specially selected exercises for respiratory system, including recreational walking and running, were applied. Well-being status, peculiarities of disease nosology and physical fitness level were taken into account during physical exercise performance.

Physical education sessions in control group were conducted according to traditional methods used for students of special medical department.

Analysis of statistical data of student polyclinic for 2006-2010 has demonstrated every year increase of the prevalence of respiratory system diseases among students. This is best illustrated in comparison with prevalence of cardiovascular system diseases (Table 1).

Table 1

*Comparative characteristics of the dynamics of some disease nosology in
2006-2007 – 2009-2010 academic years, %*

Disease nosology	Academic year			
	2006-2007	2007-2008	2008-2009	2009-2010
Cardiovascular system	3,9	4,0	4,2	4,7
Respiratory system	3,3	3,9	2,8	5,1

For instance, prevalence of cardiovascular system diseases at the beginning of 2009-2010 academic year as compared to 2006-2007 has increased by 0,8 %, whereas that of respiratory system has increased by 1,8 % during the same period, i.e. more than twofold. In general education institutions, as a rule, the pupils with health problems are hardly involved in physical culture classes; they are lacking elementary knowledge about physical exercise impact on enhancement of the body system functional activity, health promotion and improvement of feeling. Thus, only after admittance into higher educational institutions this category of students begins to become familiar with physical culture.

To reveal the impact of physical exercise training upon functional activity of students with CLD, studies were carried out aimed at determining physical exercise influence on respiratory system and correlation between respiratory system indices and biological age. Although well-known methods of biological age determination fail to measure the degree of molecular genetic “wear and tear” induced by deteriorated functional activity of human body, while the differences in conditions and ways of life of the various strata of society “wash out” conformities between markers of aging and vitality (V.P.Voitenko, 1991), biological age, nevertheless, remains one of the most probable indices of human body vital activity.

Analysis of the results of study carried out during academic year has indicated significant differences in athletes of different groups. For instance, data of young females of experimental special medical group (SMG) have significantly differed from those of control group. For instance, by the end of academic year the indices of vital capacity of young females of experimental SMG group have increased statistically significant by 165,4 ml ($p < 0,01$), whereas those of the subjects of control group have decreased by 121,8 ml, although statistical significance has not been confirmed ($p > 0,05$). Besides, the increase of negative correlation (r) between the value of vital capacity (VC) and biological age (BA) from $r = -0,321$ ($p < 0,01$) to $r = -0,444$ ($p < 0,002$) has been revealed in young females of experimental SMG group.

Negative correlation between the value of VC and BA of young females of experimental SMG group may be presented in the form of the following equation of linear regression:

$$y = 46,0321 - 0,0039 * x,$$

where: y – biological age, years, x – vital capacity, ml.

Graphical model of this dependence is presented in Figure 1. Mathematical and graphical models indicate BA decrease along with VC increase and vice versa. However, calculated coefficient of determination ($d = 0,197$) at this correlation shows that prognostic significance of this model constitutes 19,7 % ($p < 0,002$), that is, about 1/5 of BA variation of young females of EG depends on VC value.

Similar tendency is peculiar for indices of timed expiratory capacity too.

As concerns alteration of indices of timed inspiratory capacity, the studies have shown their increase by 7,6 s in young females of experimental SMG by the end of academic year confirmed by high degree of statistical probability ($p < 0,001$), whereas in the subjects of control SMG only the tendency to improvement by 1,7 s ($p > 0,05$) has been observed (Fig. 2).

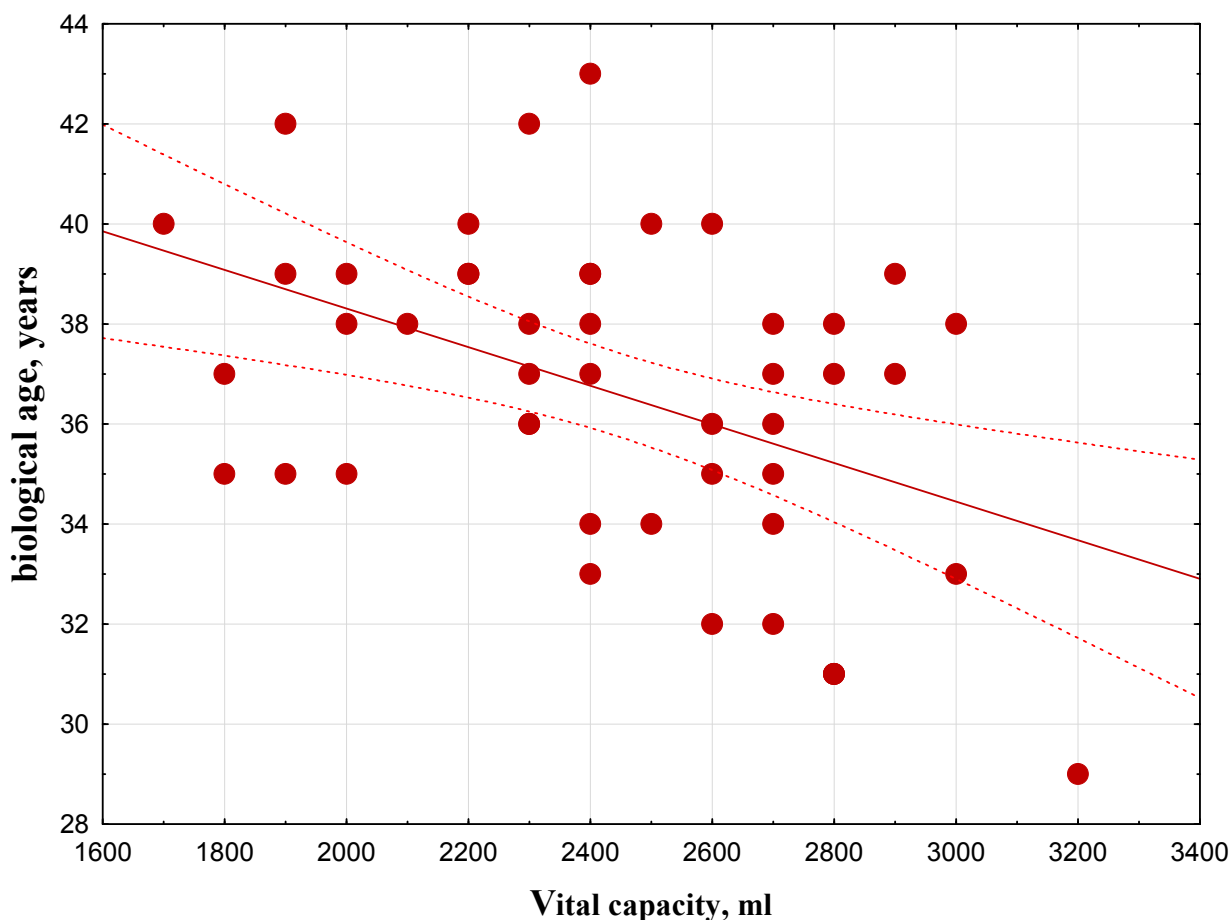


Fig. 1. Graphical model of biological age dependence on VC of young females of experimental special medical group by the end of 2009/2010 academic year.

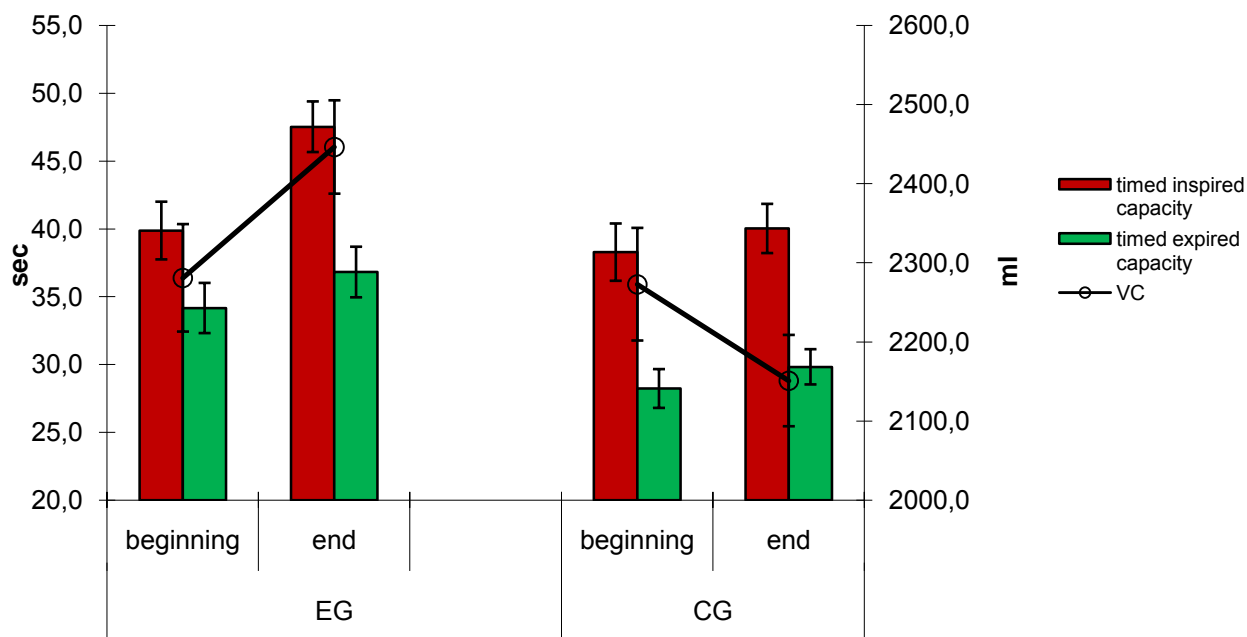


Fig.2. Dynamics of respiratory system indices of young females of the first year of special medical group depending on the model of health protective technology during 2009/2010 a.y.

Indices of timed expiratory capacity have been almost similar. They have increased by 2,6 s and 1,6 s in young females of experimental SMG and control group, respectively. Study of increase of these indices has indicated the tendency which is not confirmed by statistical probability ($p > 0,05$).

Below is given mathematical model in the form of multiple regression equation, which reflects dependence of BA of young females of EG on indices of their physical development:

$$y = 38,288 + 0,08x_1 + 0,138 x_2 + 0,307x_3 - 0,005x_4 - 0,126x_5 - 0,048x_6,$$

where: y – BA of young females, x_1 – body mass, kg, x_2 – VC/bm, x_3 – left hand strength, kg, x_4 – VC, ml, x_5 – strength index, x_6 – timed expiratory capacity, s., ($r = 0,643$, $p < 0,001$, $d = 0,413$).

Among model parameters the most influence upon BA is exerted by: VC/ml, x_3 – left hand strength, x_4 – VC, x_5 – strength index. Body mass and timed expiratory capacity effect BA to a lesser extent, although their ratio is of some importance for the final result of the model. The impact of this multiple regression model may be explained by alteration of 41,3 % of BA values in young females of EG by the end of the experiment.

The highest increase of statistically average value in young males has been noted in subjects of control SMG (308,3 ml). In young males of experimental SMG the increase of vital capacity by the end of academic year has constituted 210,7 ml, whereas in subjects of the basic medical group – only 159,1 ml.

Analysis of timed inspiratory capacity indices has revealed significant differences in indices of young males of experimental SMG as compared to subjects of other groups. For instance, by the end of academic year the increase of timed inspiration capacity indices in experimental group has constituted 14,3 s ($p < 0,01$), whereas in control group it has decreased by 4,2 s as compared to that at the beginning of academic year (Fig. 3).

In young males of basic medical group indices have also decreased by 5,4 s. Meanwhile, decrease of timed inspiratory capacity results in the last two groups indicates the tendency to deterioration of indices, while statistical probability is not observed ($p > 0,05$).

To reveal the influence of physical education process as well independent physical exercise performance on respiratory system, students of special medical group were divided into subgroups according to disease nosology.

The first subgroup included students with diseases of cardiovascular and respiratory system.

The second subgroup included students with diseases of gastrointestinal tract, liver, urogenital and endocrine system.

The third subgroup included students with diseases of visual organs, locomotorium and surgical disorders, neurological diseases and disorders of the ear, nose, and throat.

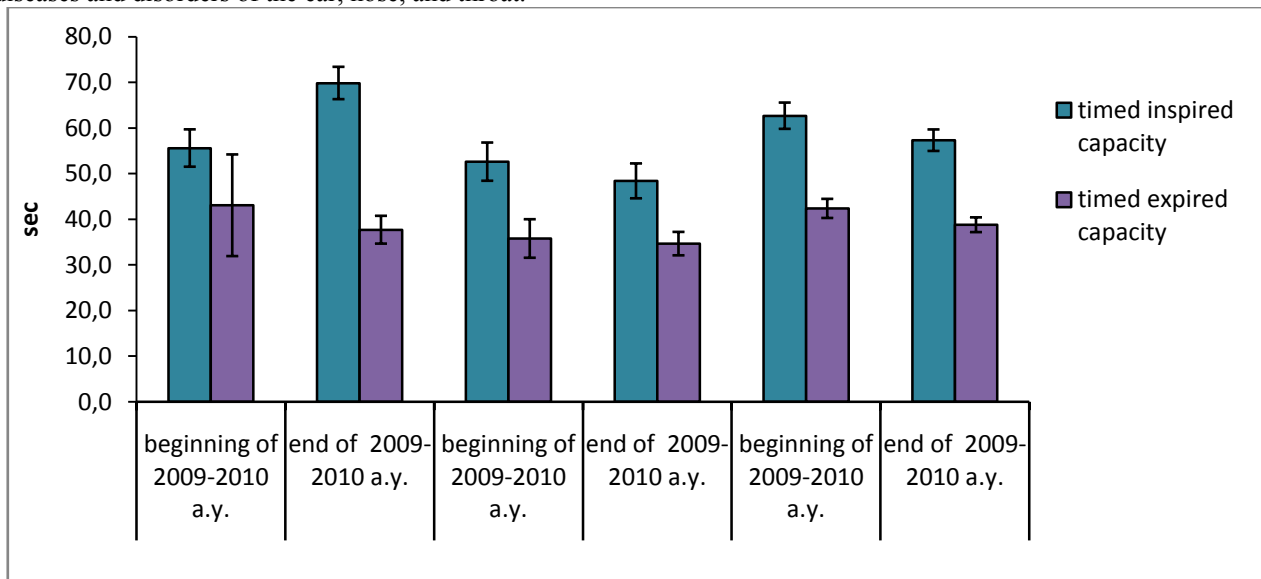


Fig. 3. Dynamics of the indices of respiratory system of young males of the 1 year of study of special medical group depending on the model of health protective technology during 2009/2010 academic year.

The findings are indicative of the increase of vital capacity indices in all groups of experimental group of young females. The best result has been noted in young females of the first subgroup (236,9 ml) which is confirmed by statistical probability ($p < 0,01$). Increase of indices by 147,1 ml and 135,7 ml has been also observed in the second and the third group, respectively. However, only the tendency to improvement has been noted; statistical probability has not been observed (Table 2).

In young females of control SMG an improvement of VC indices by 52,6 ml as compared to the value at the beginning of academic year has been noted only in the third group. In the first group VC indices have been decreased by 119,3 ml, which is not, however, confirmed by statistical probability ($p > 0,05$). The result of young females of the second group has been decreased by 293,8 ml, which is confirmed by statistical probability ($p < 0,01$) (Table 3).

Table 2

Average statistical indices of respiratory system of young females of experimental special medical group of the first year of study in 2009/2010 academic year

Entry	Groups of study	Stat. ind.	Estimation criteria		
			VC, ml	Timed inspiratory capacity, sec	Timed expiratory capacity, sec
Beginning of academic year					
1.	Diseases of cardiovascular and respiratory system	M	2321,0	40,6	34,6
		± m	102,5	2,89	3,08
2.	Diseases of gastrointestinal tract, liver, urogenital and endocrine system.	M	2152,9	38,7	32,9
		± m	93,8	3,67	3,00
3.	Diseases of visual organs, locomotorium and surgical disorders, neurological diseases and disorders of the ear, nose, and throat.	M	2407,1	40,2	34,8
		± m	81,1	4,59	3,25
End of academic year					
1.	Diseases of cardiovascular and respiratory system	M	2557,9	48,9	35,2
		± m	66,2	2,80	1,77
		t	2,81	2,92	0,24
		p	< 0,01	< 0,01	> 0,5
2.	Diseases of gastrointestinal tract, liver, urogenital and endocrine system.	M	2300,0	43,9	34,0
		± m	87,0	2,15	1,43
		t	1,62	1,78	0,49
		p	> 0,2	> 0,1	> 0,5
3.	Diseases of visual organs, locomotorium and surgical disorders, neurological diseases and disorders of the ear, nose, and throat.	M	2542,8	49,9	35,4
		± m	135,1	4,27	2,70
		t	1,25	2,18	0,20
		p	> 0,5	< 0,05	> 0,5

Analysis of timed inspiratory capacity indices has shown the following. In all groups of young females of experimental group the indices have increased from 5,2 s to 9,7 s by the end of academic year, however statistical probability of result improvement has been observed in the first group ($p < 0,01$) and the third subgroup ($p < 0,05$). Only the tendency to result increase by the end of academic year has been noted in the second group ($p > 0,01$).

Table 3

Average statistical indices of respiratory system of young females of control special medical group of the first year of study in 2009/2010 academic year

Entry	Groups of study	Stat. ind.	Estimation criteria		
			VC, ml	Timed inspiratory capacity, sec	Timed expiratory capacity, sec
Beginning of academic year					
1.	Diseases of cardiovascular and respiratory system	M	2300,0	41,8	28,5
		± m	100,0	3,30	1,60
2.	Diseases of gastrointestinal tract, liver, urogenital and endocrine system.	M	2300,0	37,4	32,3
		± m	141,2	3,38	3,27

3.	Diseases of visual organs, locomotorium and surgical disorders, neurological diseases and disorders of the ear, nose, and throat.	M	2216,6	33,0	26,1
		± m	153,3	2,90	2,06
End of academic year					
1.	Diseases of cardiovascular and respiratory system	M	2180,7	38,1	31,5
		± m	93,6	2,36	1,48
		t	1,23	1,30	1,94
		p	> 0,5	> 0,2	> 0,1
2.	Diseases of gastrointestinal tract, liver, urogenital and endocrine system.	M	2006,2	40,1	30,6
		± m	83,6	2,62	2,25
		t	2,61	0,90	0,61
		p	< 0,01	> 0,5	> 0,5
3.	Diseases of visual organs, locomotorium and surgical disorders, neurological diseases and disorders of the ear, nose, and throat.	M	2269,2	37,9	29,3
		± m	93,9	2,25	1,42
		t	0,42	1,90	1,83
		p	> 0,5	> 0,1	> 0,1

The results of timed expiratory capacity in young females of experimental and control SMG have been characterized by some differences.

For instance, in all groups of diseases of young females of experimental SMG insignificant increase of indices from 0,6 s to 1,1 s has been observed by the end of academic year. This increase has been statistically improbable with only the tendency being noted.

In young females of control SMG, except for the third group of diseases, insignificant decrease of timed expiratory capacity indices has been observed by the end of academic year as compared to the beginning from 1,7 s in the second group to 3,0 s in the first one. However, this tendency has been improbable both in control and experimental group (from $p > 0,05$ to $p > 0,01$).

In experimental groups of both young males and females improvement of VC indices by the end of academic year has been also noted. For instance, in the first and the third group the results have increased by 80,0 ml and 250 ml, respectively, whereas in young males of the second group of diseases they have significantly increased by 540 ml. However, indices of young males of all groups of diseases concerning improvement of VC indices by the end of academic year have not been confirmed by statistical probability and remained within the range of $p > 0,05$ - $> 0,01$. Thus, we may only speak about the tendency to improvement of the results of VC.

Conclusions.

Therefore, application of physical education means during studying at the higher educational institution of students with CLD is the important and integral constituent, which significantly improves the outcomes of treatment, increases physical load tolerance, decreases the degree of dyspnea, enhances quality of life, reduces the number of hospitalizations, contributes to development of motivation to use physical exercises in order to strengthen health. Ignoring this aspect of rehabilitation measures will naturally result in increase of pharmaco-economic expenditures and reduced motivation of students to active participation in disease control, leading to decrease of academic achievements.

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Cite this article as: Prysiashniuk S.I., Pryimakov O.O. Influence of physical education means upon functional state of respiratory system of students with chronic lung disease. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 73-79. doi:10.6084/m9.figshare.751560

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

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Received: 07.07.2013
Published: 30.09.2013

RATIONALE OF PHYSICAL REHABILITATION OF PATIENTS WITH VIOLATION CORONARY CIRCULATION

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Annotation. The aim of the study is to examine the risk factors that lead to the violation of the coronary circulation. Rationale for the use of physical rehabilitation to restore optimal hemodynamics in the myocardium. Considered views on the causes of the high mortality rate of the population of Ukraine of cardiovascular disease. It is shown that the main cause of death is coronary heart disease. Suggested that the major risk factors for coronary heart disease is high cholesterol, hypertension and obesity. Proposed to use exercise therapy, dosage walking, psychotherapy, autogenic training and diet therapy in rehabilitation program patients with impaired coronary circulation.

Key words: factors, risk, coronary, circulation, physical rehabilitation.

Introduction

In spite of conducted in Ukraine prophylaxis measures and treatment of arterial hypertension, cardiac-vascular and cerebral-vascular diseases they still remain a significant medical-social problem [1,2,21,22].

In Ukraine, in 2007 specific weight of mortality form diseases of blood circulation system (DBCS) was 63% in all structure of mortality, including deaths form different reasons [5,11].

Recent years gradual increasing of mortality from all forms of blood circulation system's diseases has been being registered. For example, in 2009 mortality index increased up to 65%, in 2011 it was already 66.3% [11,16,22].

In the structure of mortality from cardiac-vascular diseases main place is taken by coronary heart disease (in modern interpretation – CAD – ischemic heart disease) [1,2,4].

In the opinion of well-known Ukrainian cardiologist M.I. Lutay, the mentioned growth of Ukrainian population's mortality form CAD (coronary disease) can be connected with the following factors.

Informational level of Ukrainian doctors – cardiologists about modern medical preparations and their optimal combinations is rather high, and it is proved by results of “PRESIGE” research, published by the author [15].

However, significant discrepancies between “PRESTIGE” data and actual situation, in author's opinion, are likely connected with poor adherence of sick people to treatment with statines, which are preparations, reducing cholesterol level, patients take them irregularly, for short period of time and in insufficient quantity [15].

Poor adherence of sick people to treatment with statines can be explained, in our opinion, by high price of these preparations as well as by necessity of their taking for long period of time – from 4 to 12 months and even more; by sometimes appearing gastroenteric complications; by need in repeated analysis of cholesterol's content in blood after 4 and after 8 months that is connected with significant material expenditures.

The work has been fulfilled as per subject 4.4 “Improvement of organizational and methodic principles of physical rehabilitation process's programming with dysfunctional disorders in different systems of human organism” and as per plan of scientific & research works in the field of physical culture and sports for 2011-2015 (state registration number 0111U001737).

Purpose, tasks of the work, material and methods

The purpose of the research is to regard, on the base of analysis of scientific literature data, risk factors, which lead to breaching of coronary circulation and to ground application of rehabilitation means for restoration of optimal hemo-dynamics in myocardium.

Results of the research

From positions of etio-patho-genesis breaching of coronary circulation in more than 90-95% of cases is a result of progressing of atherosclerosis in coronary vessels, which make coronary vessels hard inelastic and their diameter reduces.

It results in reducing of blood supply, development of ischemia in cardiac muscle, worsening of metabolism in it with further weakening of its contraction function, in insufficiency of blood circulation of different degree and appearing of unfavorable consequences such as stenocardia of physical load, which gradually progresses in stenocardia of rest, which, in its turn, often results in cardiac infarction [1,9,13,14].

However in the process of atherosclerosis's progressing in vessels of heart, brain, in kidneys and in lower limbs in organism there appear disorders of the mentioned above organs' functioning in the form of CAD, breaching of cerebral circulation, breaching of blood circulation in kidneys as kidney hypertension, endarteritis in lower limbs. Abnormalities of blood circulation's physiology in kidneys and lower limbs increase periphery blood resistance, which make contraction heart function in maintaining hemo-dynamics more difficult and create conditions for BP increasing in vessel and for appearing of hypertension [3,10,17,24].

Excessive cholesterol in human organism switches on the process of breaching of lipid exchange, which results in excessive weight and obesity of different degree [3].

More over there is a definite connection between hyper-cholesterol content and blood pressure [3,10,19,22].

Connection between BP and risk of atherosclerosis's progressing is proved by the fact that atherosclerotic lesion is characteristic only for vessels, in which BP exceeds 100 mm.merc. col., though other mechanisms of athero-genesis (lipidic abnormalities, humoral and hormonal factors) affect in equal degree on all other parts of vessel risk [9,22].

Combination of cholesterol excess, arterial hypertension, excessive weight and obesity become clear reasons of coronary circulation's abnormalities or CAD [8,9,10].

This opinion about etio-patho-genesis of coronary disease (CAD) comes from results of long term researches, which were begun in 1948 in Fremingam (USA) and initiated creation of "Conception of risk factors".

According to this conception hyper cholesterol content, increased hypertension and obesity are risk factors of CAD progressing (W.B.Kannel, 1999).

Excessive weight, as a rule, is accompanied by reduction of person's motion activity, i.e. by appearing of hypokinesia [17].

Acceleration of scientific-technological progress, modern technologies as well as computerization facilitate human hypokinesia, while changes of economical relations in society result in excessive nervous-psychoic overloads, which breach human psycho-emotional state and cause different unhealthy states.

These are, in general, risk factors of coronary circulation disorders or ischemic heart disease.

Literature data witness that physical rehabilitation means – therapeutic physical culture, massage, physical therapy can be successfully applied, owing to mechanisms of their therapeutic influence, at different stages of myocardium circulation' abnormalities [2,3,15,22].

In particular, therapeutic physical culture is a mean, which effectively influences on etio-psth-genesis of coronary circulation, i.e. on progressing of atherosclerosis in coronary vessels, thus, blocking progressing of myocardium's ischemia [2,3].

More over, therapeutic physical culture positively influences on second factor of etio-patho-genesis of myocardium ischemia – tonus of vessels, i.e. on increasing of BP [10].

It has been proved that with hypertension of 1st degree therapeutic physical culture gives positive result, because with physical loads activity of sympathetic nervous system reduces, resulting in reduction of catecholamine's (adrenaline, nor-adrenaline) level [10].

It has also been established that risk of cardiac vascular diseases is closer connected not with level of motion activity but with endurance, i.e. with state of organism, which appears as a result of long term influence of physical exercises.

Human endurance is progressing only under influence of aerobic exercises. Just aerobic exercises increase ability of blood circulation system to supply tissues with oxygen and to assimilate oxygen.

During physical trainings the work of oxygen supply system to such organs as heart and brain improves, speed of blood circulation increases as well as heart stroke volume, the net of capillaries and collaterals develops. In the future it facilitates improvement of oxygen supply of these organs in state of rest [17,19,21,22].

Aerobic exercises are such dynamic exercises as walking, swimming, dosed running, gymnastics, bicycle racing. The mentioned aerobic exercises, first of all, train cardiac-vascular and respiratory systems that is expressed as reduction of heart stroke blood emission in rest, decreasing of sympathetic vessels' tonus that influences favorably on BP. People of high physical activity have risk of hypertension by 35-50% lower in comparison with physically passive people [10,21].

It is also known that physical exercises of dynamic character improve lipidic spectrum of blood – decrease cholesterol and triglyceride level that, in its turn, reduces risk of CAD, stenocardia and myocardium infarction [3,9,16,22].

The same authors think that physical exercises in aerobic regime increases oxidation-restoration processes, facilitate energy consumption and decreasing of body mass.

Physical exercises, consisting of dynamic and static muscular contractions, which are used for treatment of patients with diseases of cardio-vascular system, make different hemo-dynamic effect on this system, depending on many factors: intensity of executed physical exercises, groups of muscles, loaded by these exercises, duration of their application, correlation of dynamic, static or combined exercises, workability level of patient's organism, functional state of his cardio-vascular system, his psychological state and many other factors [17,18,20,23].

It is interesting that with fulfillment of dynamic or static exercises differences in hemo-dynamic effect become noticeable even with one-time loads.

With using of dynamic exercises relaxing speed of patients' myocardium increases, and owing to this fact the quantity of rich with oxygen, organ blood increases in it, as well as organic substances and electrolytes, required for meeting metabolic demands of intensively working myocardium [17,18,20].

At the same time, with static loads, when organism uses anaerobic energy supply, the changes, which appear in cardio-vascular system, differ from changes, characteristic for dynamic loads [19,21].

Even moderate static load is accompanied by pressing of vessels in contracted muscles and by reduction of blood circulation in them.

If with dynamic physical loads substantial change in patient's cardio-vascular system is significant reduction of total periphery vessels' resistance (TPRR), caused by accumulation of metabolic vasodilators and by decreasing of vessels' resistance in actively contracted skeleton muscles, that finally result in decreasing of BP and making easier

work of cardiac muscle, then with static loads TPRR does not decrease as a rule but can even increase, is large muscles' groups are strained.

Thus, trainings with using of static physical exercises are accompanied by increasing of load on heart, by additional work and straining of cardiac muscle.

Nevertheless, in opinion of some authors, after using of isometric physical loads, ischemic changes are registered by ECG much rarer than after using of cyclic physical loads [18].

They mean indicators of central hemo-dynamics, double product, less frequency of ischemic responses and these permitted for the a.m. authors to affirm that static loads are more favorable for cardio-vascular system.

However, in spite of the fact that the question about application of static loads for treatment of patients with diseases of coronary vessels is still a discussable one, as on to day it has been considered to be proved that only dynamic physical loads facilitate increasing of physical workability (PW), because they cause more significant increasing of functional abilities of patient's blood circulation system [18,19].

Nevertheless, the same authors point that physical exercises only of dynamic or of static type do not exist separately in the process of labor or sport activity, including therapeutic physical culture.

Just owing to this fact, as the authors affirm, the most optimal variant can be application of combined static-dynamic loads for treatment of patients with cardio-vascular system's diseases [17,18,21].

Application of static-dynamic loads for rehabilitation of patients with blood circulation system's disease was developed by prof. I.Yu.Tiomkin in 1977. The author developed indications and counter-indications to application of exercises in isometric regime and grounded necessity of combining of isometric and dynamic exercises for some cardio-vascular diseases, including atherosclerosis of myocardium's vein vessels.

Summarizing different authors' points of view about application of static-dynamic and dynamic physical exercises for patients with pathology of coronary vessels and other heart diseases, it should be noted that authors, who recommend application of static-dynamic physical loads for rehabilitation of patients with diseases of cardio-vascular system are likely more right. However, the authors, who prefer dynamic physical exercises, are also right, moreover both groups of authors render numerical data and results of their statistical processing [12,17,18,20].

Different opinions of authors seem to be connected with contingent of patients, they examined (healthy people, patients with different heart diseases, sportsmen), with intensity of loads, different age of the examined, quality of abnormalities' diagnostics, methodic of formation of one-type groups, duration of trainings and with many other factors, such as presence of attendant pathology – excessive weight (obesity of different degree), insular diabetes, arterial hypertension, diffuse goiter.

From all above presented it is clear how difficult is the process of creation of rehabilitation programs for patients with coronary circulation disorders with application of physical rehabilitation means, in particular therapeutic physical culture.

The question of application of therapeutic gymnastics (TG) for patient shall be solved considering indicators of complex appraisal of his functional state – the state of his hemo-dynamics, physical workability and patient's functional class, HBF and BP under physical load.

It is also known that with coronary circulation disorder nearly 50% of patients have progressing of different psycho-pathological syndromes – anxiety, depression, hypochondria that worsen physical state of patient and became a reason of coronary circulation disorders [6,7,23].

That is why the mentioned authors recommend for such patients to use psychotherapy and autogenous training, for improvement of psycho-emotional and general state of patients that is likely connected with improvement of coronary circulation [6,7,21,23].

Conclusions:

In spite of conducted in Ukraine prophylaxis measures on cardiac-vascular diseases mortality indicators still remain high.

Main reason of high mortality is disorders of coronary circulation.

Hyper cholesterol content, arterial hypertension and obesity are main risk factors of coronary circulation disorders.

For weakening of negative influence of the mentioned risk factors means of physical rehabilitation are effective: therapeutic physical culture, dosed walking, psycho-therapy, autogenous training and diet therapy.

The prospects of further researches imply development of new methodic of physical rehabilitation's application for patients with coronary circulation disorders.

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Cite this article as: Pour Heidari Roudberi Anvar Morad, Manzhulovskyy V.M. Rationale of physical rehabilitation of patients with violation coronary circulation. Pedagogics, psychology, medical-biological problems of physical training and sports, 2013, vol.9, pp. 80-84. doi:10.6084/m9.figshare.751561

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

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Received: 24.06.2013
Published: 30.09.2013

SPORTS MAGAZINES IN THE SYSTEM OF SCHOLARLY COMMUNICATION

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Annotation. The paper presents the sports scientific journals that form the system of documentary research information. We describe the formation, development and progress of scientific publications and their typological features of forming and problem-oriented content. Outlined sufficiency specialized sports magazines. Analysis of scientific publications in Ukraine, Russia, Belarus, presented their names and entry into the national and international abstracting. Posted sports for scientific publications USA, UK, China, Poland and many other countries that carry information for sports, sports training, medical and biological problems of physical education. It is shown that most of the study sports science publications printed in the United States, slightly less than in the UK, Poland and Germany. Determined that scientific journals help speed the spread of sports information, disseminate the results of modern research.

Key words: sports periodicals, scientific journals, system, documentary, information.

Introduction

The level of informatization of society is determined not only information content but also level of efficiency of its use, that, in same queue, predefined by quality of management informative resources. The important source of search and operative mean of distribution of new scientific information are scientific magazines. Exactly magazine editions are the comfortable mean of publication of the personal and collective ideas, hypotheses, projects, for critical consideration of new theories and conceptions and they are today counted exactly [1]. With appearance of network the Internet appeared a new type of electronic information is an electronic scientific magazine. Advantages of electronic publications entailed advancement from the magazine model of distribution of scientific information to the model of the electronic article which provides users fast and free access to the high-quality, criticized scientific information with a right to read, to copy, to diffuse, to unseal and allude to the databases complete texts. Electronic editions also have many advantages above a paper [2]. Today scientific electronic magazines divide into parallel electronic magazines (electronic versions of paper copies); original (those which are given out only in an electronic kind); computer-integrated (print in two formats which complement each other) [3]. It allows scientific periodicals to occupy a ponderable place in the system of scientific communications and in advancement of science on the whole, and also in the receipt of the personal prestige and reputation of separate scientist or scientific collective [4].

Foreign experience testifies that electronic scientific magazines become the important source of receipt of information, receipt of knowledge, in all areas of SciTech. They play all a noticeable role in the system of scientific communications, exactly the first place belongs to the magazine articles in the system of scientific communication – 68% queries of the American scientists are made by the articles [5].

Research is executed within the framework of basic theme 1.5 the Erected plan of advanced research study in the field of physical culture and sport on 2011 – 2015 years.

The purpose of the article is to probe the sporting scientific magazines of Ukraine and other countries, which are included in the system of documentary scientific information from a physical culture and sport.

Research results.

History of mass (MASS-MEDIA) medias was formed under act of numerous objective and subjective factors which stipulated maintenance and character all it structural lanocs. During decades periodicals were under an authoritarian press. It executed apologetic functions, depriving informative materials of scientific principles of historical method, objective and to veracity. Its forming took place a few stages: closing of uncommunist editions and becoming of the soviet press (1920–1922); socialthematic differentiation (1923–1925); forming of magazine periodicals as systems of documentary scientific information (a middle is an end of 20th of the last century). Bases of ideological pressure and orientation were at the same time mortgaged on implementation of concrete political, ideological, economic and economic tasks, and in course of time change of structure of magazines took place in the aspect of their profiling, which allowed to create the different types of magazines and newspapers which must were satisfy the informative necessities of different layers of population and answer the different levels of political and educational culture of that population. It resulted in differentiation and specialization of periodicals. New editions were formed – thematic magazines, which satisfied the informative queries of readers, lighted up the question of science, technique, are specialized, in particular and physical culture and sport taking into account the specific of working and peasant audience.

Sporting and scientific magazines are specialized organically entered in administratively command system of the new state of 1917 of the last century, as arose up and formed in time of socio-economic policy of military communism and military-communist ideology, and a few stages, which differed one from other those which changed their character and designed in the integral system to typology. Sporting periodicals became one of the main ducting's of mass communication with the permanent and actual concentration of informative streams from every separate type of sport and physical education of different groups of population.

Today sporting periodicals, especially scientific, considerably differs from the periods of its creation, forming and development. Editions belong to the unique typology group, inherent them problem thematic orientation (specialized), general typology of signs (primary: publisher, purpose and task, reader audience; second: author collective, structure, genres, registrations; formal: periodicity, language of edition, drawing). At the same time all sporting editions (scientific and all Ukrainian) give information for the readers of different level, divide informative materials into information for all, for the wide circle of specialists of industry of physical culture and sport (for those, who is interested in its certain directions), scientific and specialized. Independence of the specialized sporting magazines appears in the specific of their audience, having a special purpose task and character (genre-stylish structure) of text. The aggregate of these signs grounds for the selection of group of the sporting specialized magazines among other representatives newspaper-magazine systems of information.

Scientific sporting periodicals are directed on a heterogeneous audience, its content (informative text filling) differs after different criteria, in particular and professional. Thus for its audience characteristic knowledge is with scientific researches in industry of physical culture and sport and subjects allied with it: by medicine, biology, sociology, by pedagogic, by psychology, and others like that. The important typology forming sign of sporting periodicals is its functional setting. On the pages of magazines among scientific theoretical, scientific methodical and scientifically methodical questions examine the ethics, legal and other aspects of different types of sport in the context of whole industry, directed on implementation of different functional tasks. The problem of availability of exposition of informative material consists in the specialized maintenance, as a main user of information is a geared-up reader, well-informed with the concrete type of sport, sporting terminology, directions of preparation of specialists of physical education and health of man.

Today the informative providing of sporting science is carried out by scientific periodic and continued editions which, in particular in Ukraine, form the system of documentary sporting scientific information. *Scientific* magazines belong to them („Pedagogic, psychology and medical-biological problems of physical education and sport”, „Physical of education of students” (Kharkov), „Physical activity, health and sport”, „Physical rehabilitation” (Lvov), „Announcer of the Prykarpattya university. Series: physical culture”, Ivano-Frankovsk); *scientifically methodical* magazines („Physical education is at modern school”, „Physical education in schools of Ukraine”, „Basis of health, and physical culture” (Kyiv), „Theory and method of physical education” (Kharkov), „Theory and practice of physical education”, Donetsk); *scientific theoretical* magazines („Theory and method of physical education and sport”, „Science in Olympic argue”, „Sporting medicine” (Kyiv), „Suburb scientifically sporting announcer” (Kharkov), „Sporting announcer of Pridniprov'ya”, Dnipropetrov'sk); *continued editions* („Issues of the day of physical culture and sport” (Kyiv), „Young sporting science of Ukraine”, „Healthy way of life” (Lvov), „Announcer of the Zaporozhe national university. Series: Physical education and sport” (Zaporozhe), „Announcer of the Tchernihiv national pedagogical University of the name of T. G. Shevchenko. Series: Pedagogical sciences. Physical education and sport” (Tchernihiv), „Scientific magazine of the National pedagogical university of the name of M. P. Dragomanova. Series: Scientifically pedagogical problems of physical culture (physical culture and sport)” (Kyiv), „Physical education, sport and culture of health, in modern society” (Lutsk), „Physical culture, sport and health of nation” (Vinnytsya), „Youth scientific announcer. Series: Physical education and sport” (Kyiv), „Conception of development of industry of physical education and sport”, Rivne).

Most scientific magazines are included in the system of forming of national abstract resources of „Ukrainika scientific” [6], in particular scientific and scientific theoretical magazines: „Pedagogic, psychology and medical-biological problems of physical education and sport”, „Physical of education of students”, „Theory and method of physical education and sport”, „Science, in Olympic argue”, „Sporting medicine”, „Suburb scientifically sporting announcer”. In the National library of Ukraine of the name of V. I. Vernadskogo the created database is for free access to information about the results of scientific activity of domestic scientists and specialists, that is instrumental in activation of including of Ukraine to the international system of scientific electronic communications [7].

Out of that a few sporting scientific editions, in particular scientific and scientific theoretical magazines „Pedagogic, psychology and medical-biological problems of physical education and sport”, „Physical of education of students”, „Science in Olympic argue” and the continued scientific edition „Young sporting science of Ukraine”, organically included in the system of international of database „IndexCopernicus” [8], what allows to trace influence of scientific publications of separate scientists or scientific establishments on a world scientific association. And scientific magazines „Pedagogic, psychology and medical-biological problems of physical education and sport,” and „Physical of education of students” are included also in the catalogue of magazines with the opened access (DOAJ) [9], that gives possibility scientific community to read, to load, to copy, to diffuse, to print and allude to complete text of publications; but to the informative analytical database the „Russian index of the scientific quoting” [10]. These international bases of scientific abstracts determine the high standard of scientific quality of these editions by an expert estimation and index of meaningfulness of scientific labours of research workers and amounts of quoting are on these publications; carry out the operative providing of scientific researches actual bibliographic information and estimate effectiveness and efficiency of activity of research organizations, scientists and level of scientific magazines

Publications in scientific magazines after an operationability are always other types of publications and at the same time were and remain the most effective mean of publication of scientific information, and with appearance of network the Internet and new form – electronic scientific magazine – entailed a number of changes both in the system of scientific communication and in all its constituents (author – scientific labour – publication – publishing house – library – reader) [11]. Swift development of scientific magazines entailed creation of sporting electronic scientific

edition „Sporting science of Ukraine” (a publisher is the Lviv state University of physical culture) [12]. It is the unique electronic magazine of industry of physical culture and sport, in which the problems of olympic and professional sport, physical culture, physical education of different groups of population, physical rehabilitation light up operatively.

The analysis of sporting periodicals of Russian Federation (RF) rotined that the amount of scientific editions in this country considerably exceeded the amount of scientific sporting magazines of Ukraine. In particular, the system of the sporting documentary scientific informing of RF is presented known enough, created yet in the days of forming of industry of physical culture and sport (beginning of 20th of the last century), by editions. *Scientific theoretical* belong to them: „Theory of practical worker of physical culture”, „Scientist of message of Universities of P. of F. Lesgaft”, *scientific magazines*: „Announcer of Sport science”, *scientifically methodical* magazines: „Physical culture: education, education, training”, „Physical culture to school”, „Theory and practice of the applied and extreme types of sport” and great number of scientific practical and scientifically informative magazines. These scientific editions are formed on the unique typology sign, their swingeing majority is included in an informative analytical database the „Russian index of the scientific quoting”.

From Ukrainian and Russian sporting scientific editions substantially scientific editions of Republic will be selected Byelorussia. Unfortunately, are modern sporting periodicals in this country presented only two scientific magazines, in particular by a scientific magazine „the World of sport” – unique from the problems of physical culture, sport and tourism, and scientifically methodical by a magazine „Physical culture and health”, that print for the teachers of physical culture schools, leaders of sporting sections and groups and also. At the same time only the „World of sport” is incorporated in the International center of standard numeration (Paris, France) and has ISSN (an international identifier (serial number) is in electronic and printing editions of the world).

he analysis of world sporting periodicals rotined that plenty enough of scientific magazines, which print the results of researches from development of sport, sporting training, physical education, health protection and sport role, in him, sporting medicine, physical rehabilitation, is, physiotherapy and others like that. Most sporting scientific magazines print the United States of America, as a result of research of them counted about 30. It is magazines, which present scientific developments from medical-biological direction of development of sport, sporting preparation, physical exercises. To such magazines belong: „The American Journal of Sports Medicine”, „Journal of Orthopedic and Sports Physical Therapy”, „Clinics in Sports Medicine”, „Archives of Physical Medicine and Rehabilitation”, „International Journal of Sport Nutrition and Exercise Metabolism”, „Clinical Journal of Sport Medicine”, „Medicine & Science in Sport & Exercise”, „Sports Medicine and Arthroscopy Review”, „American Journal of Physical Medicine & Rehabilitation”, „Current Sports Medicine Reports”, „Physical Therapy in Sport”, „Journal of the International Society of Sports Nutrition”, „Journal of Sport Rehabilitation”, „Operative Techniques in Sports Medicine”, „Athletic Training & Sports Health Care”, „Physician and Sportsmedicine”, „Research in Sports Medicine”, „International Journal of Sports Physiology and Performance”, „Athletic Therapy Today”, „Sports Health: A Multidisciplinary Approach”, „International Journal of Sports Physical Therapy”, „Journal of Athletic Training”. The problems of sporting science, psychology of sport, history of sport and health protection, probe magazines: „European Journal of Sport Science”, „Exercise and Sport Sciences Reviews”, „Journal of Sport & Exercise Psychology”, „History of sport”, „ACSM's Health & Fitness Journal”.

A next country which prints plenty of sporting scientific magazines is Great Britain. To the number of magazines, which publish the results of scientific researches from the problems of the sporting training, types of sport, different aspects of sporting science, medical-biological problems of sport and physical exercises, scientific magazines belong, in particular: „Qualitative Research in Sport, Exercise”, „Journal of Sports Sciences”, „British Journal of Sports Medicine”, „Sports Medicine, Arthroscopy”, „Rehabilitation, Therapy & Technology”, „Sports Engineering”, „Journal of Sports Engineering and Technology”, „International Journal of Sports Science and Engineering”, „Physical Education and Sport Pedagogy”, „Physical Education Matters”.

Extraordinarily ramified is the system of scientific sporting communication in Chinese Folk Republic. Scientific magazines are printed by the universities of cities of Beijing, Chengdu, Tyanczin, Liaoning, Shandong, in particular: „Journal of Chengdu Sport University”, „Journal of Tianjin University of Sport”, „Journal of Beijing Sport University”, „Liaoning Sport Science and Technology”. For them light up scientific researches from the different aspects of sporting science, sporting technologies, biomechanics, sporting games, physical education, and others like that.

Republic does not yield in the grant of professional sporting information Poland. Sporting scientific magazines are presented in this country, in particular, by such editions as „Kultura fizyczna”, „Medicina Sportiva”, „Biomedical Human Kinetics”, „Sport Wyczynowy”, „Roczniki Naukowe AWF”, „Postępy Rehabilitacji”, „LIDER – Promocja zdrowia, kultura zdrowotna i fizyczna”, „Baltic Journal of Health and Physical Activity”, „Physical Education and Sport”, „Biology of Sport”, „Human Movement”, „Fizjoterapia”, „Fizjoterapia Polska”, „Praktyczna Fizjoterapia i Rehabilitacja”, „Polish Journal of Sport and Tourism”, „Human Kinetics”, „Physical Culture and Sport, Studies and Research”. Part of the transferred magazines is printed both in a paper and in electronic formats by English.

Sporting scientific magazines print also in Australia („Journal of Science and Medicine in Sport”, „Sport Health”), Africa („South African Journal of Sports Medicine”); Denmark („Scandinavian Journal of Medicine & Science in Sports”), Spain („Apunts Medicina de l'Esport”), Italy („Medicina dello Sport”, „Sport Sciences for Health”), Macedonia („Journal of Special Education and Rehabilitation”), Netherlands („Psychology of Sport and Exercise”), Germany („International Journal of Sports Medicine”, „Knee Surgery, Sports Traumatology, Arthroscopy”),

New Zealand („Sports Medicine”), Romania („Medicina Sportiva”, „Sport Science Review”), Serbia („Serbian Journal of Sports Sciences”), of Slovenia („Science of Gymnastics Journal”, „Revija Šport”), Croatia („Hrvatski športskomedicinski vjesnik”), Islam Republic Iran („World Journal of Sport Sciences”). Magazines are published by the basic results of scientific researches from physiology, biochemistry, immunology, orthopaedic, sporting loadings, physical exercises, feed, diagnostics, treatment, and others like that. The most world magazines print English, only a few scientific editions are published in language of that country, which they present. For the publication of the articles in magazines editorial colleges invite the scientists of the whole world and pull out identical requirements: scientific researches must be original, nowhere published before, to contain practical results, have the statistical working of information. At the same time world sporting scientific magazines, in particular to the USA, Great Britain, Germany included in scientists databases (abstract or bibliographic, that allow to watch quoting of the articles of scientist), in particular „Indexcopernicus”, „Scopus”.

It costs to notice that all transferred scientific magazines were created yet in the last century, foundation many arrives at from 1976 year, but they and to this day have a high scientific level of exposition of informative material; their periodicity hesitates from annual to one on a month, they are well illustrated, finding them is possible in the different informative searching systems of network the Internet.

The analysis of foreign sporting scientific periodicals rotined that analogues have most magazines in an electronic format. A research worker which does not own English to perfection is in a position to read them in translating into an accessible language (it allows to carry out informative searching system „Google”). At the same time some foreign sporting scientific magazines are published only in an electronic kind, in particular „The Sport Journal” (electronic with complete text magazine of Association of sport of the USA, which presents scientific researches from the sporting training, sporting management, sporting medicine, fitness and health; examines the problems of management in industry of sport, safety of sporting buildings, sporting preparation, and others like that), „Athletici Isight” (an on-line-magazine is from psychology; the USA), „The Hospitality, Leisure, Sport & Tourism Network” (education is in industry of hospitality, organization of rest, sport and tourism; electronic magazine of Academy of higher education of Great Britain).

Conclusions.

The conducted research allowed to discover and analyse sporting scientific editions, which are organically included in the system of documentary scientific information of Ukraine, Russian Federation and Republic, Byelorussia. It is set that all of them belong to the unique typology group, inherent them problem thematic orientation (specialized), general typology of signs. All sporting scientific editions give information for the wide circle of specialists of industry of physical culture and sport (for those, who is interested in its certain directions), and also scientific and specialized. Importance of the specialized sporting magazines appears in the specific of their audience, having a special purpose task and character of text. Exactly they inform a scientific association about development of physical culture and sport.

The analysis of research of the system of documentary world sporting scientific information rotined that it is formed by such countries, as the USA, Great Britain, Germany, Poland, China. Exactly there print the far of scientific sporting periodicals, which contains publications in relation to development of sport, sporting training, physical exercises, medical-biological problems of sport, pressing questions of sporting science.

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Cite this article as: Svistel'nik I.R. Sports magazines in the system of scholarly communication. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 85-90. doi:10.6084/m9.figshare.751562

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

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Received: 25.05.2013

Published: 30.09.2013

IMPROVING THE TRAINING OF MANAGERS IN THE SPHERE OF PHYSICAL CULTURE AND SPORTS IN UKRAINE

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Annotation. Analyzed contemporary research on the training of managers in the sphere of physical culture and sports in Ukraine and abroad. Analyzed 50 references, which dealt with various aspects of the preparation of sports managers. It was found that in higher education of Great Britain, Germany, France, Switzerland, Russia is working to prepare managers for the sphere of physical culture and sports. It was found that training of managers in Ukraine is carried out only on the basis of two universities. Found that the content of the training of sports managers in our country needs to be improved, taking into account international experience and current market conditions of the functioning of sports organizations. Identified the main ways of improving the training of managers in the sphere of physical culture and sports in Ukraine.

Keywords: system, preparation, perfection, manager, director.

Introduction

Modern conditions of physical culture-sports organizations' functioning are characterized by complexity and dynamics. In order to survive and develop in existing conditions management of these organizations shall seek new approaches to effective managing of their activity [16,18].

It conditions demand of physical culture-sports organizations in specialists, who could effectively realize management functions in compliance with market demands. The task of higher educational establishments is to train future physical culture-sports organization's manager to adapt to constantly changing conditions, to creatively think, to permanently renew his professional knowledge, to learn all that is new [12].

In connection with the above said the problem of improvement of managers' training in sphere of physical culture and sports becomes especially important. In scientific-pedagogical literature [4,5,13,14,19,20] sport managers' training in HEEs of Great Britain, France, Switzerland, Germany, Russia is regarded in the most complete way. Authors [1,6,15,17] concentrate special attention at description of HEEs' curriculums, analysis of disciplines' content and study of professional, personality qualities, skills and knowledge, which are required for future manager.

Analysis of researches and publications, devoted to our topic, showed that up to present scientists have not been paying proper attention to problems of managers training's improvement in sphere of physical culture and sports in Ukraine, with exclusion of several works by M.V. Dutchak [2,3,4].

At the same time studying of system of sport managers' training in our country requires application of complex approach and searching of practical, realistic ways of improvement. This determined necessity of the present scientific research.

The work has been fulfilled in the frames of combined plan of scientific & research works in the sphere of physical culture and sports for 2011-2015 by subject 1.7 "Theoretical-methodological and applied aspects of innovative technologies' application in sports management".

Purpose, tasks of the work, material and methods

The purpose of the work: determination of ways of manager training's improvement in sphere of physical culture and sports in Ukraine.

The tasks of the work:

1. Analyze the data of modern scientific literature, which deals with managers' training in sphere of physical culture and sports.

Material and methods: analysis and generalization of 50 literature sources of domestic and foreign authors.

Results of the research

Origination of sport management, as profession, is connected with appearance of positions managers of physical culture-sports organizations. Main posts, which at present sport managers take, are the following: head, deputy head, heads of structural departments, administration boards on problems of physical culture and sports; headmaster and deputies headmaster of ChJSS (children-junior sport school), ChJSGD (children-junior school of general development), SHS (sport school of higher sportsmanship), specialized, educational establishments of sport profile; chairman (president) and deputies chairman of sport club; directors (heads) of sport facilities; president, vice-president of sport federation; chairman, deputies chairman of FSO; team manager on game kinds of sports; personal manager of sportsman-professional (in tennis, football, hockey, boxing); director of fitness center, of health related physical culture center, of sport-entertaining club [9].

In different countries of the world, system of sport managers' training at higher educational establishments began to form since the second half of 80-es in 20th century. Researcher M.V. Dutchak [4] notes that at that period managers' training included two main branches. In USA and Canada higher educational establishments oriented on highly specialized managers, who could work mainly in baseball, boxing and golf. Educational practice of managers' training and educational establishments of Western Europe was based on universal principles.

In Great Britain, France, Switzerland, Germany there exists multi-level system of education, academic disciplines and special courses on general theory and applied aspects of management are clearly determined, and they consider specificity of physical culture-sports organizations and periodically are revised in order to improve the content of training [4].

Great Britain is considered a European leader in training of managers for physical culture and sports. It should be noted that in higher educational establishments of Great Britain and Germany training of sport managers is carried out by two educational levels: bachelor and magister. Higher educational establishments of France and Switzerland train managers only on educational-qualification level of magister [13].

It is necessary also to pay attention to experience of managers' training in Russian Federation. In advanced higher educational establishments of physical culture-sports profile managers' training began in 90-es of 20th century. In 1993 Moscow state academy of physical culture opened specialization of sport managers' training, in 1995 – Russian state university of physical culture, sports and tourism [9]. To day these educational establishments prepare specialists-managers, who can take different administrating positions that is ensured by discipline "Management of organizations" (in addition to previously existed specialization "Sport management").

The created in Russia Directory of sport remote education is of special interest. This nonprofit organization was created for preparation of qualified specialists for governmental organs of municipal administrations and business. Education is carried out on the base of 15 advanced HEEs with the help of remote educational technologies and electronic programs on different important directions of physical culture and sport management and administration [4].

In Ukraine training of managers for physical culture and sport sphere began from 2001, when, on base of Kharkov state institute of physical culture, department of physical culture was created, which started to train specialists in "Physical education" with specialization "manager of physical culture, instructor of physical education".

In 2007, on base of National university of physical education and sport of Ukraine, department of management and economics was created, which started to train specialists in branch "Sports" with specialization "manager (administrator) in sphere of physical culture-sport activity, instructor of physical education".

At present, training of sport managers in Kharkov state academy of physical culture and in National university of physical education and sports of Ukraine is carried out by two educational-qualification levels: bachelor and magister. In our opinion, to day demand of physical culture-sports organization in managers can not be satisfied only by graduates of these two departments, however insufficient finance and personnel provision, "narrow" places of our educational system are the main obstacles for optimization (expanding) managers' training on the base of higher educational establishments of physical culture-sport profile.

We divide opinion of O.N. Elbreht [5], that in modern situation change of management education's model must influenced in advanced way on stereotype of manager thinking, manager's professional culture, national culture in general. Transition to multi-level system of education in Ukraine has not determined clearly so far qualitative distinctions in qualifications "manager-bachelor", "certified specialist" and "magister" and, therefore, do not ensure to full extent adaptation of Ukrainian educational system to new requirements of market economics and mobility of labor resources. The author stresses that managers' training has still been being under influence of academic conception, which continues to dominate in higher educational system in general, without consideration specificity of managers' professional activity as oriented on practice as well as without consideration of certain demands of consumers of this education's kind – enterprises and individuals.

We also think that for improvement of sport managers' training in our country it would be purposeful to consider and use foreign experience, in particular experience of our Russian colleagues. For example, T.E. Kruglova and V.B. Viakonkov note in their work that one of main problems of formation and realization of educational managers' training programs in sphere of physical culture and sports is underestimation of future specialist personality's spiritual development, its ideals, world-vision, values, which he will realize in professional activity. The authors developed generalized model of students' management-training at physical culture higher educational establishments. It should be noted that this model is regarded from the point of view of systemic approach, however, sufficient attention to content of such management-training in the frames of this model is not paid to in this work.

In the opinion of one of advanced scientists in the field of sport management I.I. Pereverzin [9], Main ways of improvement of sport managers' training are the following: mastering of management computer technologies and informational provision of this branch; profound learning of foreign language; expansion of list of studied management applied disciplines. The author offers to include in curriculums of sport managers' training disciplines on managing of physical culture-sport organization's office work, on audit and accounting in physical culture and sport organization, on culture of speaking.

Qualified manager shall combine in his personality organizer, instructor, friend, expert, leader and ability to listen to other people [17]. In our opinion it is ensured not only by content of training process, but by manager's personality himself, his individual qualities and abilities.

As authors [1,6], affirm, the following abilities are the most important for management activity: domination, self assertion, emotional balance, communicability, stress-resistance, creativity, striver for achievement of targets, spirit of enterprise, responsibility, reliability in fulfillment of tasks, independence.

It should be also remembered that in modern conditions the higher and higher importance for sport managers is acquired by skill and ability to communicate in foreign language. We agree with opinion of S.F. Panov [8], that it is

necessary not only assign proper place in sport manager's training program to learning foreign language, but to regard it rather as a mean of professional information's exchange than an academic subject.

As M.V. Dutchak thinks [3] that differentiation of managers' training corresponding to specificity of their future profession: managers of advanced sports and managers of mass sports is a perspective direction of managers' professional level's improvement. However, we think that in this direction there will be required certain scientific-methodic, personnel and financial resources.

In our opinion the most important problem of managers' training in sphere of physical culture and sports is absence of profession "manager" in National register of Ukraine "Register of professions ДК 003:2010". It should be noted that in scientific-methodic literature this problem was discussed in work by M.V. Dutchak [2], but up to present time it has been remaining unsolved and requires attention of governmental administration boards.

We think that for rising of quality of managers' professional training in Ukraine, it is necessary to pay special attention to formation of students' management abilities in educational process, to actively use innovative forms and methods of teaching, to constantly renew curriculums in compliance with demands of practice,. All these will facilitate compatibility of such specialists in modern market conditions.

Considering the above said, professors-teachers staff of physical culture department of Kharkov state academy of physical culture developed a number of manuals on credit-module system "Organization and management of physical culture for students of specialization "Management in sphere of physical culture and sports". In manual for 1st year students [10] role of state in development of physical culture and sports' sphere, legislation and theoretical principles of management in this sphere are elucidated. In manual for 2nd year students [11] regularities of development and management, principles, functions and methods of physical culture and sports, typologies of physical culture and sport organizations, their organizational structures are described, as well as aims and tasks of their functioning. In manual for 3rd year students [12] financial-economical activity of physical culture-sports organizations in modern market conditions, psychological aspects of management activity are regarded, recommendations concerning fulfillment of scientific researches are supplied.

Thus, in manuals, for the first time, basing on systemic approach activity of sport manager in modern market conditions, which includes all main functions of management: planning, organization, motivation, taking management decision, control, are elucidated.

Conclusions:

1. To day need in managers' training, confidently acting in market conditions of physical culture and sport organizations' functioning, is out of the question. Great Britain, France, Switzerland, Germany, Russia made and continue to make an efforts for formation of national systems of sport managers' professional training. It is purposeful to use foreign experience of training of management personnel for improvement of managers' training in sphere of physical culture and sports in Ukraine.

2. It is purposeful to regard as main ways of manager training's improvement in Ukraine the following: optimization of manager's training system itself on the base of higher educational establishments of physical culture and sports profile; raising of level of scientific-methodic provision of academic process and of scientific –pedagogic personnel's qualification; upgrading of academic process's content, in particular, mastering of management computer technologies and informational provision of the branch, profound learning of foreign language, expansion of list of studied disciplines, including of business, situational and design games

The prospects of further researches in this direction concern studying of sports managers labor market demands in Ukraine.

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Cite this article as: Stadnik S.O., Prihodko I.I. Improving the training of managers in the sphere of physical culture and sports in Ukraine. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 91-95. doi:10.6084/m9.figshare.751563

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

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Received: 30.06.2013
Published: 30.09.2013

MODERN APPROACHES FOR THE COURSE OF MEDICAL REHABILITATION OF PHYSICAL CULTURE IN ELDERLY PATIENTS WITH GONARTHROSIS

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Annotation. The effect of the complex exercise using static stretching along the axis of voluntary rehabilitation for elderly patients with gonarthrosis. The study involved 20 elderly women suffering from bilateral gonarthrosis 1-2 stages. Noted a more pronounced beneficial effect of locomotor functions and physical performance patients compared with conventional methods. The main group indicator function improving lower extremity and the Leken index exceeded those of the control group by 50%. Also significantly increased quadriceps muscle force in patients on the basis of 33.3% on the right and 25% left. Indicators extension in the knee joints in the study group achieved a 12% larger values than those in the control group. In the main group was significantly increased exercise performance by 32.6% as compared to the control group and reached the lower limit of the age norm.

Keywords: elderly, rehabilitation, gonarthrosis, stretching.

Introduction

Deforming osteoarthritis (OA) of knee joint is observed in 50.6% -54.5% of cases among patients, who suffer from dystrophic diseases of large joints of lower limb [1]. In 86% of cases gonarthrosis affects persons of workable age and in 6.5% -14.6% of cases results in disability [2]. Frequency of OA diseases increases with age and among persons, older than 60 years old it reaches 97% [3, 10], that determines social significance of the problem. Quantity of patients, having late stages of these diseases, (2nd and 3rd), reaches 75% [4]. Special scientific- popular literature, mass media contain numerous advices on organization of motion activity of patients, on carrying out of therapeutic gymnastics. These recommendations are not always adequate for patients, who have chronic pathology [5, 6]. All mentioned above preconditioned choice of our research's purpose.

The research was carried out in compliance with plans of scientific and research works of physical rehabilitation and human health department of Tavricheskiy national university, named after V.I. Vernadskiy, state registration number: 0112U003112 .

Purpose, tasks of the work, material and methods

The purpose of the work is studying of physical exercises complex's influence with application of static will axial stretching for rehabilitation of patients with gonarthrosis.

For achievement of this purpose the following *tasks* were solved:

1. Examination of anthropometric indicators, functional state of knee joints and indicators of physical workability of patients with gonarthrosis in control and main groups before rehabilitation.
2. Examination of anthropometric indicators, functional state of knee joints and indicators of physical workability of patients with gonarthrosis in control and main groups after rehabilitation.
3. Evaluation of effectiveness of complex rehabilitation, which was carried out with the help of physical exercises and will axial stretching, applied to patients with gonarthrosis.

Materials and methods

The research part of the work was fulfilled on the base of Center of social-domestic rehabilitation of pensioners and disabled in settlement Gresovskiy, in December 2009 – January 2010. We examined 2 groups of women of 55-60 years old age, who had diagnosis "bilateral gonarthrosis of 1-2 stages, remission phase" in compliance with diagnostic criteria of EULAR [7].

The first group (n=10) was a control one, in this group rehabilitation was carried out as per generally accepted for this pathology schemas and included massage and therapeutic physical culture (TPC) as traditional therapeutic gymnastics (TG) and morning hygienic exercises (MHE) as well as thermo-galvanic-mud treatment with extract of therapeutic mud (deposit field – Saki).

The second group (n=10) was main one and passed rehabilitation as per offered by us methodic (besides massage, MHE and thermo-galvanic-mud treatment we applied TG complex by L.V. Korniyenko's methodic [8] with using of static will axial stretching).

In both groups before and after rehabilitation we determined the following diagnostic indicators: index of body mass (IBM), total algo-functional index of Leken <http://dic.academic.ru/dic.nsf/ruwiki/301540> - cite_note-9, evaluation of heaviness of lower limbs' functioning abnormalities, strength of quadriceps muscle of thigh. For studying of physical workability we conducted test "Time of 600 meters walking" at maximal pace with following calculation of PWC₁₇₀ [9].

We studied the following anthropometric indicators of patients with gonarthrosis: height (m), mass of body (kg) and index of body mass (kg.p.m²). In both groups of the examined we found increasing of body mass index up to 41.0±1.1 kg.p.m² in control group and up to 41.4±1.3 kg.p.m² in main group. IBM of both groups' patients corresponded to excessive mass of body.

Thus, both groups' patients had increased load on knee joints owing to excessive mass of body. This was also proved by the fact that before rehabilitation measures the state of knee joints of both groups' patients was characterized by limited scope of passive movements (see table 1).

Table 1

Anthropometric indicators, functional state of knee joints and indicators of physical workability of patients with gonarthrosis in control and main groups before rehabilitation

Indicators		Control group (n=10)	Main group (n=10)
Group			
Height, m		1.67±0.04	1.68±0.1
Weight, kg		76.4±5.2	78.2±3.8
Index of body mass, kg.p.m ²		41.0±1.1	41.4±1.3
Leken's index, points		2	2
Disorders of lower limbs' functions %		20	20
Angle of bending, °	Right leg	89.1±1.3	89.3±1.1
	left leg	90±0.5	89.9±3.6
Angle of unbending, °	Right leg	72.3±2.5	71.7±2.4
	left leg	71.9±2.5	72.7±1.9
Strength of quadriceps muscle of thigh, points	Right leg	3	3
	left leg	3	3
PWC ₁₇₀ , kgm.p.min		355.1±70.4	379±30.6

Scope of passive bending in sagittal plane was 89.1±1.3° (right leg) and 90±0.5° (left leg) in control group; in main group is was: 89.3±1.1° and 89.9±3.6° (right and left legs accordingly). Such values of scope were about 75% from normal value of passive bending.

Scope of passive unbending in sagittal plane was 72.3±2.5° (right leg) and 71.9±2.5° (left leg) in control group; In main group is was: 71.7±2.4° and 72.7±1.9° (right and left legs accordingly). Such values of scope were about 80% from normal value of passive unbending.

Disorders of knee joints' functions were accompanied also by reduction of strength of quadriceps muscle of thigh. This indicator was 3 points for right leg and for left one in both control and main groups that pointed at expressed reduction of this muscles' strength.

Changes of knee joints' functional state were accompanied by expressed pain syndrome and constraint in the morning that was pointed at by Leken's index (2 points for both groups).

Heaviness of abnormalities of lower limbs functions was evaluated as 20% in both groups that corresponded to middle level of disease's heaviness.

Disorders of loco-motor function of patients with gonarthrosis were accompanied by expressed reduction of their physical workability. Indicator PWC₁₇₀ was 355.1±70.4 kgm.p. min. in control group and 379±30.6 kgm.p.min. in main group, that is about 50% of this age norm.

Thus, lesion of knee joints resulted in expressed disorders of loco-motor functions and reduction of general workability of patients, who suffer from bilateral gonarthrosis.

After two courses of rehabilitation, the following changes in state of patients with gonarthrosis, were registered (see table 2).

IBM unconfidently changed by 1% in control group and by 5.3% - in main. Nevertheless, reduction of load on knee joints resulted in confident improvement of functional state of the latter in main group, that was proved by decreasing of Leken's index up to 1 ($p < 0.05$) and by reduction of lower limbs state heaviness up to 8.5% ($p < 0.01$), i.e. by 50 % from initial values. In control group the mentioned coefficients did not significantly change.

Table 2

Effectiveness of complex rehabilitation with using of physical exercises and static will axial stretching of patients with gonarthrosis

Indicators		Control group (n=10)	Main group (n=10)	p contr.- main.
Height, m		1.67±0.04	1.68±0.1	-
Weight, kg		75.4±4.6	73.5±3.8	-
Index of body mass, kg.p.m ²		40.6±0/9	39.2±1.9	
Leken's index, points		2	1*	0.05
Disorders of lower limbs' functions %		17	8.5**	0.05
Angle of bending, °	Right leg	96.8±1.5**	99.5±0.7**	-
	left leg	96.8±1.3**	99.4±0.6**	-
Angle of unbending, °	Right leg	80.1±1.9**	89.5±0.5**	0.05
	left leg	80.1±3.2*	89.7±0.5**	0.05
Strength of quadriceps muscle of thigh, points	Right leg	3	4*	0.05
	left leg	4	5*	0.05
PWC ₁₇₀ , kgm.p.min		437.4±44.7	580±56**	0.05

Notes: differences are confident in respect to background researches, where * - p<0.05; ** - p<0.01; Confidentiality of Leken's index, functions of lower limbs and strength of quadriceps muscle were determined by criterion T-White.

P_{contr./main} – confidentiality's degree with comparing of groups after course of correction.

Scope of movements of lower limbs of both groups' patients confidently increased. In control group sagittal bending increased by 8.6% (right leg) and by 7.6% (left leg) (p<0.01), unbending – by 10.8% (right leg) and by 11.4% (left leg) (p<0.05). In main group the scope of bending increased by 11.4% (right leg) and by 10.56% (left leg) (p<0.01). Scope of knee joints' unbending in the mentioned group increased by 25% (right leg) and by 24% (left leg) (p<0.01).

At the same time, together with increasing of knee joints' mobility, the strength of quadriceps muscle of thigh increased and reached confident values in main group (4 points – right leg and 5 points – left leg) (p<0,05).

Improvement of strength characteristics and flexibility of lower limbs resulted in increasing of physical workability, the level of which reached confident values only in main group (increasing by 53%) (p<0,01), comparing with control group.

Thus, the carried out rehabilitation influenced positively on loco-motor function and physical workability of patients, who suffered from bilateral gonarthrosis of 1st-2nd stage in remission phase.

In our researches we stated that complex rehabilitation with using of physical exercises and static will axial stretching influences more positively on loco-motor function and physical workability of patients, who suffered from bilateral gonarthrosis of 1st-2nd stage in remission phase, in comparison with traditional methodic (see table 2).

First of all in main group indicators of lower limbs' function increased the same indicator of control group by 50% (p<0.05); Correlation of Leken's coefficients in both groups (p<0.05) was the same. It was evident that that mentioned positive dynamics became possible at the account of knee joints' flexibility improvement, which was achieved owing to application of stretching and relaxing TPC techniques in our complex.

The latter was proved by achievement of higher by 12% indicators of bending in knee joints in main group in comparison with the same indicators of control group (p<0.05).

Methodic, in which static will axial stretching is used, includes also in work red muscle fibers and improves condition of white muscles fibers. In our researches it was proved by confident increasing of strength of quadriceps muscle of thigh of main group's patients by 33% (right leg) and by 25% (left leg) (p<0.05) comparing with analogous indicators of control group.

Slow fulfillment of exercise, stipulated by our methodic, permits to approach muscles contraction to isometric and to obtain increment of their strength against the background of static will stretching of axial muscles, limbs' muscles in initial position, lying on back, on abdomen, on side. The mentioned positive influences on supporting motor system in general and on lower limbs in particular resulted in expressed confident increasing of physical workability of main group's patients by 32% (p<0.05) in comparison with the same indicators of control group and its reaching lower

boundary of age norm. Due to the fact that we evaluated physical workability by test “Time of 600 meter’ walking”, improvement of lower limbs’ functions undoubtedly played positive role in restoration of physical workability of main group’s patients.

When analyzing of the obtained data it became clear that execution of physical exercises in kneeled, on all fours positions influences negatively on knee joints’ state, facilitates aggravation of arthrosis, progressing of synovial symptoms. Fulfillment of developed by us complex influence positively on knee joints’ state: clinical symptoms of gonarthrosis of all main group patients reduced.

All above presented witnesses about positive influence of rehabilitation treatment’s complex, in which static will stretching is used, on regulation of loco-motor function of main group’s patients.

Including of such exercises in TPC influences mobilizing on motor neuron system and facilitates restoration of lost functions in the quickest way. Fulfillment of movements in smooth, slow manner permits to switch in work both white (phase) and red (tonic) muscular fibers. Optimization of tonic muscles’ functions of axial muscular system facilitate maintaining of correct vertical posture. With carrying out of static will axial stretching muscular and ligament structures of SMS are mobilized and, owing to this fact, both: functions of mechanical receptors and ligament organs of Goldgy are normalized, together with normalization of muscular tonus [8, 11].

Thus, there is ground for application of physical exercises with using of static will axial stretching in complex of therapeutic measures and for prophylaxis of gonarthrosis and combination of gonarthrosis and osteochondrosis. The conducted complex treatment with application of the developed physical exercises is more effective both: in respect to pathologies in lumbar spine and in knee joint

Conclusions:

1. Before rehabilitation knee joints of both groups’ patients were excessively loaded owing to increased by 37% (comparing with normal) IBV. The state of joints was characterized by reduced mobility in sagittal plane up to 75-80% from normal scope of movements, that resulted in disorders of lower limbs’ functions up to 20% by indicator of lower limbs’ functions and changing of knee joints state up to 2 points as per algo-functional Leken’s index. Abnormalities of knee joints’ functions were accompanied by reduction of strength of quadriceps muscle of thigh up to 3 points (right and left legs) in both groups. The mentioned changes resulted in reduction of physical workability in both groups by 50% from age norm.

2. After two rehabilitation courses there happened confident improvement of knee joints’ state in main group, that was p[roved by decreasing of Leken’s index up to 1 ($p < 0.05$) and by decreasing of heaviness of lower limbs’ state by 50% from initial values ($p < 0.01$). The mentioned coefficients did not change significantly in control group. Scope of affected joints’ movements of both groups’ patients confidently increased. In control group sagittal bending increased by 8.6% (right leg) and by 7.6% (left leg) ($p < 0.01$), unbending – by 10.8% (right leg) and by 11.4% (left leg) ($p < 0.05$). In main group scope of bending increased by 11.4% (right leg) and by 10.56% (left leg) ($p < 0.01$). Scope of unbending of knee joints in the mentioned group increased by 25% (right leg) and by 24% (left leg) ($p < 0.01$). Strength of quadriceps muscle of thigh increased and reached confident values in main group (4 points (right leg) and 5 points (left leg) ($p < 0.05$)). Level of physical workability reached confident values only in main group; it increased by 53% ($p < 0,01$) comparing with initial of the same group.

3. Complex rehabilitation with using of physical exercises and static will axial stretching influences positively more strongly on loco-motor function and physical workability of main group’s patients with bilateral gonarthrosis of 1st-2nd stage in remission phase, in comparison with traditional methodic. In main group indicator of lower limbs functioning’s improvement and Leken’s coefficient were better than the same of control group by 50% ($p < 0.05$); besides, strength of quadriceps muscle of thigh of main group’s patients confidently increased by 33.3% (right leg) and 25% (left leg) ($p < 0,05$) comparing with the same indicators of control group. Indicators of unbending in knee joints of main group reached more by 12% values in comparison with the same of control group ($p < 0.05$). The patients of main group has had confident increase of physical workability by 32.6% ($p < 0.05$) comparing with the same indicators of control group and reached lower boundary of age norm.

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Cite this article as: Shramko Y.I., Zhmurova T.A. Modern approaches for the course of medical rehabilitation of physical culture in elderly patients with gonarthrosis. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 96-100. doi:10.6084/m9.figshare.751564

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

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Received: 27.07.2013
Published: 30.09.2013

DECISION MAKING STYLES AND PROFESSIONALIZATION OF SPORTS: EXPERIENCE OF MANAGERS OF THE OFFICES OF YOUTH AND SPORTS IN YAZD PROVINCE

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Annotation. Managers of the Offices of Youth and Sports are part of decision making processes in sports and play a significant role in the development of Professional Sports in the country; as such it seems the analysis of their decision making styles would have a significant importance in the better guidance of the country's sports toward professionalism. The main objective of this research is to study and inspect the decision making styles of the managers of the Offices of Youth and Sports in Yazd Province in relation to the development of Professional Sports in that area. Population and respondents of this research were all the managers and vice managers of the Offices of Youth and Sports in Yazd province the total number of whom was 39. The research method was descriptive and in purpose an applicable one. Instrument for data gathering was the standard survey questionnaire of Scott and Bruce containing 25 questions in order to measure the 5 decision making styles (Rational, Intuitive, Dependent, Spontaneous and Avoidant). The gathered data were analysed using descriptive statistical methods (Mean, Standard Deviation, Charts/Figures) and deductive (non-parametric) methods (Kolmogorov-Smirnov test, Friedman, Spearman and Pearson). The results showed that the Avoidant style of decision making has a greater significance and importance among managers and vice managers of the Offices of Youth and Sports in Yazd province while the Rational style has the least significance among them. It was also found out that there is a significant direct relationship between decision making styles of Rational and Spontaneous; Intuitive and Dependent and the decision making styles of Spontaneous and Avoidant of the managers and vice managers of the Offices of Youth and Sports in Yazd.

Keywords: style, rational, intuitive, office, youth, sport, professional.

Introduction

Professional Sports is defined as Physical Education or sports as a job; because of its great influence on the promotion and progress of the championship sports, athletic gains and international successes as well as gaining income and job creation, professional sports has attracted the attention of the government [5]. This is not only about what happens in the field but also it has transformed into a huge business and those who participate in professional sports are important and influential people in world arena. Professional sports get the most media coverage and almost all sponsorship and group supports go to this area. Also, since professional sports are at the top of the sport's pyramid, it creates a suitable basis for the creation of financial sources and cultural development of athletic organizations [4].

As the sport moves toward professionalism it requires better and stronger decisions; as a result sport administrators (managers) need to have the required skills in different situations to guide their organizations effectively and responsibly with appropriate and correct decisions [2]. Decision making is considered one of the inseparable parts of management and is manifested in each tasks of management [3].

Each manager chooses a specific style or combination of styles as his basis for decision making and choosing a suitable decision making style for the manager is a very essential factor not only of his own success but also of the entire organization. Managers, especially Physical Education Managers, in order to succeed need to pay more attention to the decision making styles and need to make their decisions based on the level of preparedness of the organization. Increased efficiency of processes at the Offices of Youth and Sports as the trustees of sports will have a significant role in the development of sports of our country and it is a no denying fact that the method of decision making of the managers of these offices would be an important factor to make the country's sport globalized and professionalised. Nowadays, the need for management and leadership is tangible and essential in all aspects of social activities [9]. Decision making is the basis of managerial tasks and a manager's skill in decision making is manifested in his task performance and the services he provides. Performing their tasks, managers are constantly faced with situations that require them to make decisions; this fact illustrates the important influence and position of decision making task in all managerial duties and organizational processes [19].

Simon says management and decision making are synonyms. Aside from Simon, other group of scholars including Peter Drucker have also defined management and decision making as one and have considered management nothing but decision making; they believe decision making is the core of management and performing tasks such as planning, organizing and control indeed are nothing but the decision making on how to perform these activities. In the vantage point of these researchers principle of management is decision making because it is with decision making that a manager performs all his duties. Newman believes quality of management follows the quality of decision making. He claims that decision making alone and on itself is the most significant task of a manager because the quality of plans and programs, effectivity and efficiency of strategies and the quality of the results of actions are all followers and consistent with the quality of the decisions made by the manager [6].

A manager usually considers decision making his main task because he always needs to think and decide which way to choose, what to do, how to divide tasks among others, and to decide which task needs to be done by whom, when, where and how [14].

Decision making is choosing a solution among two or more options in a preventive manner and in order to achieve a goal or a certain outcome with the least amount of risk possible; when we are faced with many options we have to decide and make a decision. Decision making is a complicated process and in order to use it effectively it is essential to know and understand it at first [13]. Decision making style of each person demonstrates the habitual pattern he uses when deciding on matters. In other words decision making style of each individual is a representative of his personality approach in understanding and reacting toward his decision making task [20].

According to Nutt studying decision making styles is a way to understand why managers use different decision making processes and decide differently in same situations. A manager's decision making style also depends on level of preparedness of his subordinates [1]. Decision making styles of managers has a direct influence on activities of the organization and employees and is an essential matter; due to this fact managers have the ability and power to create an environment that motivates employee's creativity and entrepreneurship with their appropriate and right decisions [21].

Rowe and Mason have introduced four methods of decision making; namely: Directive, Analytical, Conceptual, and Behavioural [16]. Hersey and Blanchard had given emphasis on the influence of situations that managers are faced with and based on that had enumerated four different methods of Telling/Directing, Participating/Supporting, Selling/Coaching and Delegating for decision making [1]. In point of view of Rringues two styles and dimensions, Authoritarian and Collaborative, are used by managers for decision making [16]. Scott and Bruce in their studies on decision making styles and influential factors on them, had paid special attention to internal and individual factors and personal differences and based on that had introduced The General Decision Making Styles consisting of five different styles. These five styles are: Rational, Intuitive, Dependent, Spontaneous, and Avoidant [17].

Decision making styles has been studied and analysed by many researchers. Najaf Aghayi et al. (1381) in a research entitled "Study and Analysis of the Decision Making Styles of the Physical Education Administrators of Universities Accredited by Ministry of Science, Research and Technology" had concluded that level of preparedness of subordinates on itself is not a determining factor of decision making styles of managers; however level of preparedness of the manager himself is in fact a determining factor [11]. Parvande and Koohestani (1384) had mentioned that there is a relationship between management knowledge and decision making styles but it is not significant [7]. Hadizadeh et al. (1387) in a study entitled "Analysis of the Relationship of General Decision Making Styles of Managers in Public Organizations" had reached to the conclusion that there is a significant negative relationship between Rational and Intuitive styles and there is a significant positive relationship between Rational, Avoidant, Intuitive and Spontaneous decision making Styles [12]. Amery (1388) had described that there is no significant relation between Dependent, Intuitive, Avoidant and Spontaneous styles in decision making and the organizational environment; however a significant negative relationship exists between Rational style of decision making and the organizational environment as well as between organizational environment and job attachment of the employees [8].

Thunholm (2004) in his research on general decision making styles, studied 206 Swedish army officers' decision making styles and found out that there is a significant reverse relation among Rational decision making style and each of Intuitive, Avoidant and spontaneous styles of individuals; on the other hand he discovered that there is a significant positive relationship between Dependent and Avoidant decision making styles [20]. Spicer & Smith (2006) in analysis of the five decision making styles under discussion, examined two groups each consisting of 200 students of Commerce in a university in England. In the first group between the Rational style and each of Intuitive, Spontaneous and Avoidant styles a significant negative relation; between Intuitive and Spontaneous style and between Dependent and Avoidant decision making styles significant positive relationships were found. In the second group of students, the relationships between decision making styles were the same as the first group; in addition to that in the second group the existence of a significant positive correlation between the Avoidant and Spontaneous styles was proven [19].

As a result, managers based on professional necessities are decision makers and the quality of these decisions is the determinant of organizational success in accordance to organizational objectives. Each manager chooses a style or combination of styles as a basis for his decision making and choosing an appropriate style of decision making by the manager is an essential factor for his success as well as the effectively and efficiency of the entire organization [21].

Multiple number of factors such as organizational factors and environmental changes can affect the decision making style greatly and in fact in similar conditions managers may pick different styles. One of the other factors which can affect the decision making style is the individual differences such as gender and education but the literature on this area is unfortunately limited [12].

Offices of the Youth and Sports in provinces as the trustees of sports in each province, have a crucial role in increasing growth and development of the sports in the whole country as well as the international and globalized sports and with no doubt appropriate and correct decisions of the managers of these offices would be an important factor in the development of country's sports. Managers of these offices are faced with different conditions that are constantly changing and require them to make decisions, as a result managers need to be familiar with different decision making styles and relationship between and among them in order to be able to make the best decision when in different environmental conditions to survive the threats and dangers of the new condition and also to be able to take the most advantage of the new opportunities to advance and develop the sports in country. Based on careful studies and analysis of the theoretical and practical significances of this research as well as the cruciality of paying attention to decision

making styles of the managers as a significant factor in the development of sports, the researchers are aiming to study and analyse the decision making styles of managers and vice managers of the Offices of Youth and Sports in Yazd province and the existing relationship between these styles.

Methodology

This research has been a descriptive study yet it has been done practically; it has studied and analysed the relationship between decision making styles of the managers of Offices of Youth and Sports of Yazd province as well as the relationship between decision making styles of the above mentioned managers and their demographic characteristics; in other words this research is categorized as an applicable one. Population and respondents of this research were all the managers and vice managers of the Offices of Youth and Sports in Yazd province which was 39 persons. The pre-tested number of respondents was equal to the actual population. Considering the objectives of this study a survey questionnaire was the instrument of data gathering; this was the standard Scott and Bruce survey questionnaire for general decision making styles to measure and evaluate decision making styles of managers and vice managers of the Offices of Youth and Sports of Yazd province. This survey questionnaire consisted of 25 questions. In this survey questionnaire there were five questions in order to measure each decision making style (Rational, Intuitive, Dependent, Spontaneous, Avoidant) and to answer each of these questions Likert spectrum was used. The Cronbach’s Alpha coefficient was 0.86. Demographic information of the respondents such as age, years of experience and level of education was also analysed. In this study the gathered data were carefully analysed using descriptive statistical methods (mean, standard deviation and charts/figures) and deductive [non-parametric] methods (Kolmogorov-Smirnov test, Friedman, Spearman and Pearson). The statistical analysis and calculations were done using the SPSS software.

Findings

As it was discussed earlier, demographic characteristics of respondents were crucial information in conduct of this research. Based on the results, 28.2% of the respondents were female and 71.8% were male. The mean age of male respondents was 39.43 and of females 42.27 years old. 10.4% of the respondents had an Associate degree (2 year college degree), 56.4% Bachelor’s degree and 28.2% Master’s degree. Last but not least the mean/average work experience among the respondents was 16.08% years.

Figure 1 illustrates that the average usage of Avoidant and Dependent decision making styles among male and female managers and vice managers was the same. However, the average of Spontaneous and Rational decision making styles among female managers and vice managers was higher compared to their male counterparts; also the average of Intuitive decision making style is higher among male managers and vice managers compared to females.

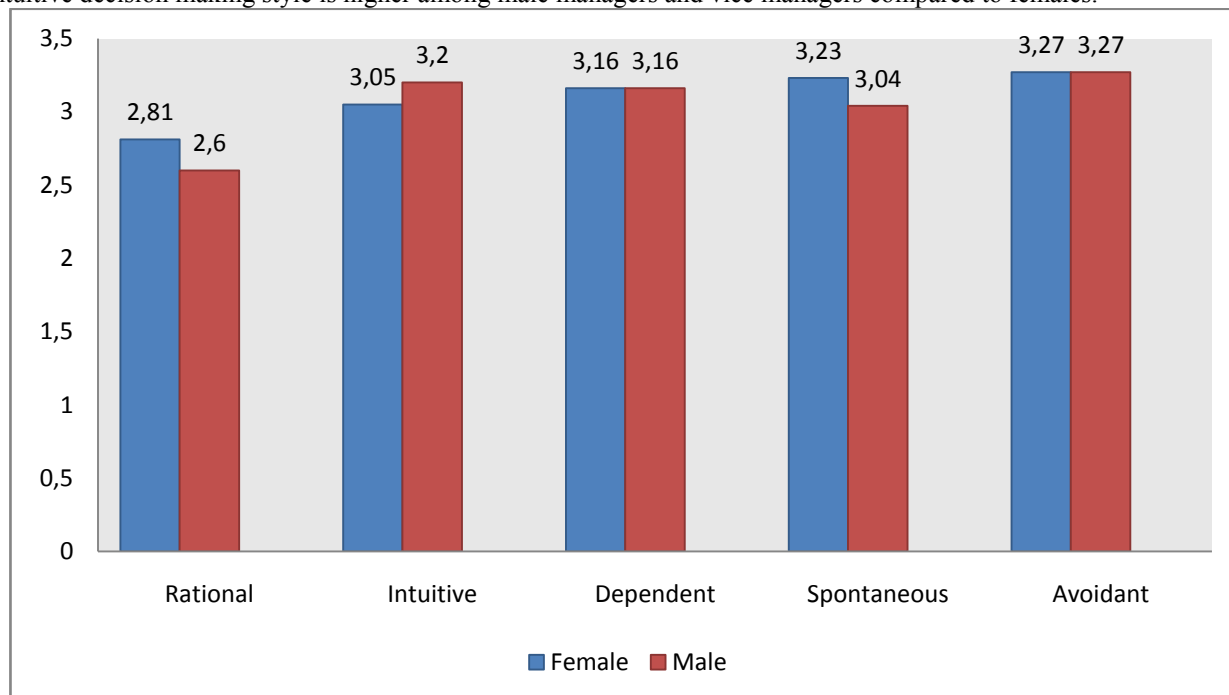


Figure 1. Comparison of the Mean of Different Styles Based on Gender

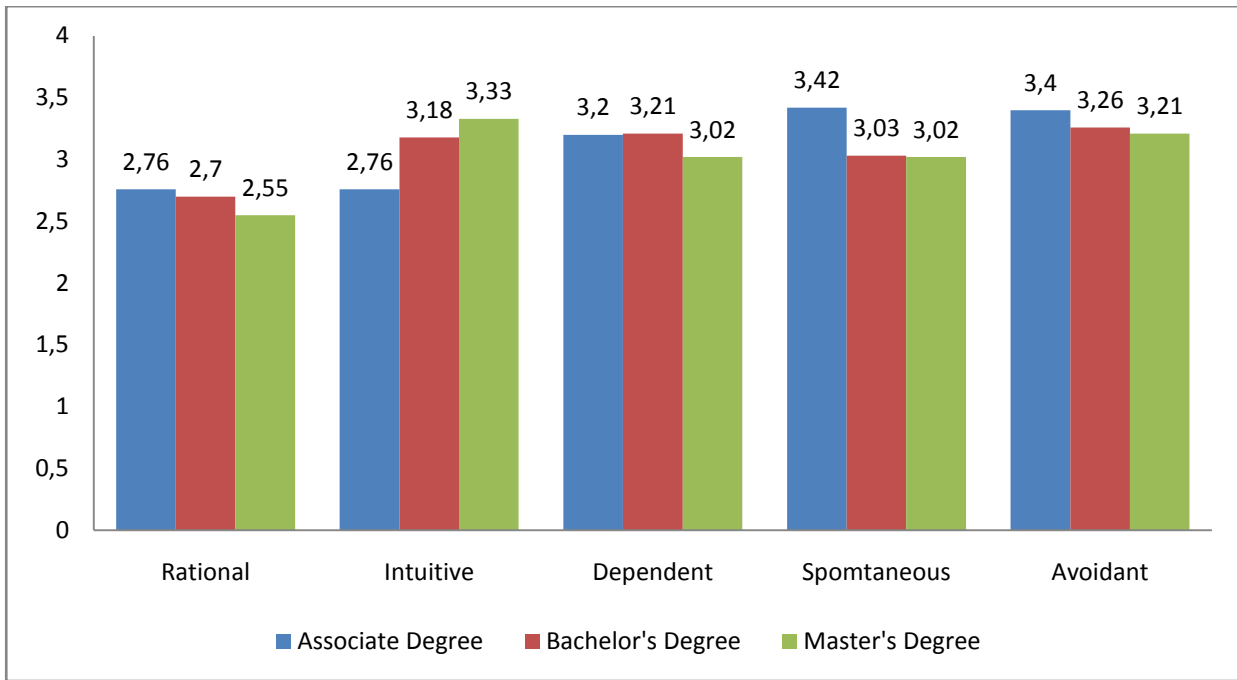


Figure 2. Comparison of the Mean of Different Decision Making Styles Based on Educational Attainment

Based on the results shown in figure 2, with the increase in educational attainment of respondents the use of Rational decision making style decreases and the average of Intuitive decision making increases. It is also evident that Spontaneous decision making style among Associate degree holders, Avoidant style among Bachelor's degree holders and Intuitive decision making style among Master's degree holders has a higher mean and average.

Table 1.

Results of the Kolmogorov-Smirnov test

Statistical Indicators of Decision Making Styles	Mean ± Standard Deviation	Z	Significance Level
Rational Style	2.67 ± 0.51	1.61	0.011
Intuitive Style	3.16 ± 0.59	1.23	0.097
Dependent Style	3.16 ± 0.36	1.11	0.171
Spontaneous Style	3.09 ± 0.44	1.01	0.257
Avoidant Style	3.27 ± 0.46	0.97	0.299

As it can be seen in table 1 the data and reached results are abnormal and for this reason non-parametric test was used to achieve reliable results.

Table 2.

Results of the Friedman Test; Comparison of the Priority of Decision Making Styles

Row	Decision Making Style	Mean ± Standard Deviation	Mean of Ranks	Chi-Square	Degree of Freedom	Sig.
1	Avoidant Style	3.27 ± 0.46	3.60	38.44	4	0.001*
2	Intuitive Style	3.16 ± 0.59	3.44			
3	Dependent Style	3.16 ± 0.36	3.17			
4	Spontaneous Style	3.09 ± 0.44	3.12			
5	Rational Style	2.67 ± 0.51	1.68			

* Significant level of $P \leq 0.05$ is the basis.

It can be seen in table 2 that results of the Friedman test showed that based on the arrived significant level, there is a significant difference between priorities of decision making styles; in other words the decision making styles

at the top rows of the table such as Avoidant and Intuitive have more significance and importance among respondents while the Rational decision making style has the least significance among them.

Table 3.

*Comparison of the significant level of Dimensions of Decision Making (Spearman and Pearson Correlation Test)**

noissiceD selytS gnikaM	evitiutnI elytS		nednepeDt elytS		suoenatnopS elytS		elytS tnadiovA	
elytS lanoitaR	sig	0/471	sig	0/207	sig	0/036	sig	0/523
	r	0/119	r	0/207	r	-0/337*	r	0/105
elytS evitiutnI			sig	0/001	sig	0/882	sig	0/439
			r	0/511**	r	-0/025	r	0/128
elytS tnednepeD					sig	0/055	sig	0/058
					r	0/309	r	0/307
suoenatnopS elytS							sig	0/001
							r	0/606**
*P<0.05 ; **P<0.01 ; n=39								

* In shaded areas nonparametric test of Spearman has been used due to the abnormality of data. On the other hand in the white areas because of the normality of gathered data the Pearson's parametric test has been applied.

Results of Pearson and Spearman's Correlation Test can be seen in table 3 in order to answer the question whether there is a significant relationship between each of the decision making styles among managers and vice managers of the Offices of Youth and Sports in Yazd province. As it can be seen there is a significant direct relationship between Rational and Spontaneous styles [0.337], Intuitive and Dependent styles (0.511) and Spontaneous and Avoidant styles [0.606] of the respondents.

Discussion and Conclusion

Based on the results of this study, the mean of Avoidant and Dependent decision making styles among male and female managers and vice managers are equal and the same. On the other hand the mean of Spontaneous and Rational styles among female managers and vice managers are higher than males and the mean of Intuitive style is higher among male respondents compared to their female counterparts. The results show that female managers and vice managers most often use Spontaneous and then Rational styles in their decision makings, in other words female managers with Spontaneous decision making style when faced with a decision making situation, decide immediately and without hesitation which is a sign of the feeling of urgency in decision maker and her urge to make the final decision in the fastest and shortest time possible. These findings are in accordance with Spacer and Saddler's (2005) point of view [19]. Female managers also use the Rational decision making style which is an indicator of decision maker's tendency to identify all possible solutions, to evaluate the result of each solution from all angles and finally to choose the best desirable solution in situations that require decision making. These decision makers are completely logical and possess enough information; they decide based on research, careful and comprehensive analysis and they acquire information from both internal and external sources. These findings are in accordance with vantage points of Parker (2007), Moorhead & Greyhen (1995) and Oliveria (2007) [10,15,17]. Male managers use the Intuitive style most often; this could be due to inherent and innate responses as well as general experiences and based on internal feelings and emotions. Same findings are also claimed by Paton and Kahneman (2003) [18]. Based on the discussion above it is clear that in doing businesses and achieving the goals and objectives of sports organizations, among which professionalism is at the top of the priorities, when there is a need for careful research and analysis and immediate decision making is required female managers are more suitable and appropriate for the position. On the other hand male managers are recommended in situations where experience is crucial. In the modern era, with the advent of globalized sports both of these conditions are happening at the same time and are equally crucial and sports administrators should pay special attention to it.

It can also be claimed that with the increase in the level of educational attainment the mean of Rational style had decreased while the mean of Intuitive decision making style had increased; Spontaneous style among Associate degree holders, Avoidant style among Bachelor's degree holders and Intuitive style among Master's degree holders had higher means. This result explains that managers with lower educational attainment use the Avoidant style, meaning to say while faced with a situation (problem or opportunity) they delay decision making as much as possible and avoid reacting to the situation; on the other hand with increase in educational level, managers use their feelings and experiences more often. These findings are in line with views of Parker (2007) and Spicer and Saddler (2005). As a result, sports organizations need to have people with higher educational levels in managerial positions in order to achieve organizational goals and objectives [17, 19].

Results from the Friedman test in this research demonstrated that there is a significant difference in priorities of decision making styles; Avoidant and Intuitive styles are more significant and apparent among managers and vice managers of Offices of Youth and Sports in Yazd province while Rational style is the least significant and apparent among them. It can be concluded from these results that the respondents avoid situations that require decision making and when put in such situations mostly use the Intuitive style which is based on internal emotions and feelings as well as previous experiences. This conclusion is in some ways similar to vantage point and studies of Spicer and Saddler (2005) [19].

The results in this research also demonstrate that among Spontaneous and Avoidant decision making style there is a significant positive and direct relationship; this is in accordance with results of the study of Moghadam, Spicer and Smith; however it is divergent and against results of Thunholm. Based on this discussion, it is fair to conclude majority of the managers and vice managers of the Offices of Youth and Sports in Yazd province when faced with a situation [either problem or opportunity] try to delay decision making as long as possible and avoid taking any action toward the so called situation. In case they are forced to take action and decide on the matter their final decision would be taken immediately and in the shortest period of time possible.

Other set of result tells us there is a negative significant relationship between Rational and Spontaneous decision making styles. It can be concluded that the tendency of these managers and vice managers while making decisions is to identify all possible solutions, to evaluate the outcomes of each solution from all angles and finally to decide based on comprehensive research and analysis of all information from both internal and external sources. Nowadays and in actual decision making situations because of the complications and constant changes, it is impossible to make decisions solely based on Rational style and as a result in reality managers decide urgently and fast.

There is also a significant positive relationship between Intuitive and Dependent decision making styles. Meaning to say that managers and vice managers who have Intuitive style do not necessarily reject rational analysis of a matter or situation rather, they believe in certain situations wherein careful analysis and study and systematic information on the situation is impossible or absent intuition and inner insights would be helpful tools to make an appropriate decision. This type of managers needs to have another person by their side to act exactly in accordance to his ideas while faced with problems and opportunities. Rather than consulting with others and making the final decisions themselves, these managers are completely dependent on views and ideas of other people when deciding on important matters. This point is in line with studies of Parker (2007) [17].

At the end, it is recommended that the managers of the Offices of Youth and Sports, in an orderly and consecutive manner allocate parts of their time to matters and topics of decision making to enable them to develop and enhance country's sports to the professional level; in this way they would be able to choose the most appropriate decision making style in changing and varied conditions to achieve organizational objectives. It is also recommended to the future researchers to study and research on the relationship of decision making styles of managers and their other behavioural characteristics in order to help managers understand the dimensions of decision making better and more in depth.

Acknowledgment

Authors' sincere gratitude goes to all the respondents, Managers and Vice managers of the Offices of Youth and Sports in Yazd province, who allocated their time selflessly to answer the survey questionnaire honestly and truthfully; without their cooperation this research would not be possible. The authors would also like to deeply thank all those who have helped and contributed to this paper in any manner.

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Cite this article as: Nooshin Benar, Nastaran Yeganeh Far, Saeid Fallah Mehrabadi, Mostafa Entezary Zarej. Decision making styles and professionalization of sports: experience of managers of the offices of youth and sports in Yazd province. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.9, pp. 101-107. doi:10.6084/m9.figshare.751565

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Received: 21.07.2013
Published: 30.09.2013

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SCIENTIFIC EDITION (journal)

Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports. 2013, vol.9, 112 p.

Editorial to the publisher department KSADA:

certificate DK №860 20.03.2002.

designer - Masterova Y.

editing - Iermakova T.

editing - Krasnikova S.

designer cover - Bogoslavets A.

administrator of sites - Ulanchenko Y.

passed for printing 15.09.2013.

Format A4.

KSADA.

Red Banner str. , 8, Kharkov, 61002, Ukraine.