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STUDIES OF ANTHROPOMETRIC AND FUNCTIONAL PARAMETERS OF THE REFEREES OF DIFFERENT SKILLS IN FOOTBALL

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Annotation. The problems of functional training of arbitrators of different skills are considered. The study involved 12 referees for the highest, first and second league championship and the championship of Ukraine on football. The level of Simply-weights is studied. It was used the methodology of S.A. Dushanin. Revealed the results of anatomical and physiological condition of the body: heart rate, body temperature and body weight reduction referees during a soccer match. Found that the anthropometric characteristics and the length of body weight statistically significant differences between the arbitrators are not. It is noted that the weight of the arbitrators is markedly reduced during the game. The average weight loss during a major league game the referee is 2.67 kg in the first league of referees' weight decreased by 1.83 kg in the second league referees - is reduced by 1.92 kg. It is established that the level of functional training arbitrators league above the results of their younger colleagues.

Key words: referee, functional fitness, weight, body temperature.

Introduction

Football implies intensive motion actions during certain period of time. In some aspects physical loads of football umpire differ from the loads of football player on football field (umpire does not participate in football duels, does not play with ball, can not be replaced), but, at the same time, physiological peculiarities of their work are to some extent similar. Knowledge about the level of functional state of umpires organisms' systems both in laboratory conditions and during match is necessary and permits to plan training process, depending on the levels' indicators [2].

In recent researches of football refereeing the problems of initial preparation of football umpires have been discussed [8, 10], of their psycho-physiological qualities [11]. A number of scientists in their works pay attention to studying of certain aspects of highly qualified football umpires [9, 12]. Alongside with it, K.L. Vikhrov, A.M. Spirin, V.D. Petrov [4, 6, 7] think that the main criterion of evaluation of umpire's workability is indicators of his motion activity during football match. At the same time, in modern sports science there is no scientific researches, connected with functional abilities of football umpires.

Thus, determination of organism's main indicators for further planning of training process is rather important problem in preparation of football umpires.

The research has been fulfilled on the base of combined plan of scientific & research work in the sphere of physical culture of Ministry of family, youth and sports of Ukraine for 2006-2010, as per subject 2.1.10.3, it. "Optimizing of educational-training process of football players of different qualification" (state registration number 0106U011992).

Purpose, tasks of the work, material and methods

The purpose of the research is to carry out analysis of anthropometric indicators and functional state of different qualification umpires' organisms..

The methods of the research: theoretical analysis and generalization of literature sources, medical and biological methods, methods of mathematical statistics.

As morpho-functional tests we used weight-height indicators; determination of metabolism by methodic of S.A. Dushanin, maximal oxygen consumption (MOC) and threshold of anaerobic exchange (TANE). Results of umpires' organisms' functional state examinations' were obtained with the help of pulse meter, which showed indicators of heart beats frequency (HBF) during football match (see fig. 1).



Fig. 1. Sport watches "Forerunner 405" of «Garmin» production with sensor of pulse frequency

Organization of the research. The researches were conducted with three groups; every group consisted of 12 umpires: 1st group – umpires of the major league, 2nd group – umpires of the 1st league and 3rd group – umpires of 2nd league. All they participated in Ukrainian football championships.

Results of the researches

Change of football umpire's workability occurs sharply, as a result of a number of disorders in organs and systems' functioning owing to different stresses: overloading, tiredness, wrong planning of training process [1, 3]. Anthropometric and physiological indicators of football umpires' organisms are given in table 1.

Table 1

Anthropometric and physiological indicators of different qualification umpires (n₁=n₂=n₃=12)

Indicators		major league	1 st league	2 nd league
		$\bar{X}_1 \pm m_1$	$\bar{X}_2 \pm m_2$	$\bar{X}_3 \pm m_3$
Length of body, cm		183.1±1.53	182.7±1/08	181.2±1.38
Mass of body, kg		78.1±0.83	78.2±1.06	76.8±1.78
Heart beats frequency in rest (HBF) b.p.m. ⁻¹		62.9±1.22	63.3±1.22	62.3±1.14
Blood pressure, mm of merc. col.	Systolic	115.3±1.02	118.7±1.24	121.1±1.51
	diastolic	69.5±1.57	68.5±1.73	64.2±1.74
Metabolism as per electro-cardiogram (ECG) conv.un.	Anaerobic metabolic capacity (ANMC)	73.8±0.98	74.4±0.85	67.8±0.74
	Aerobic metabolic capacity (AMC)	217.2±0.98	218.9±1.07	213.8±1.28
Maximal oxygen consumption (MOC) ml.p.m.kg.		52.7±1.43	52.6±1.71	49.9±1.37
Threshold of anaerobic exchange (TANE) 5 from MOC		69.7±1.49	67.1±1.56	64.4±1.22

The obtained anthropometric indicators of body length and mass as well as heart beats frequency (HBF) permit to affirm that umpire of major, first and second leagues have no confident differences (p<0.05).

It was found that blood pressure, anaerobic and aerobic metabolic capacity of heart (ANMC and AMC) indicators of umpires, who serve football matches of different leagues are not the same, concerning systolic and diastolic pressure (major league – 115.3/69.5 mm of merc.; first league– 118.7/68.5; second – 121.0/64.2); anaerobic and aerobic capacity of cardiac muscle (major league 73.8; 217.2 conv.un.; first league – 74.4; 218.9; second – 67.8; 213.8);

Maximal aerobic capacity of umpire's respiratory system was determined by the level of maximal oxygen consumption (MOC). Results of MOC of second league umpires are lower by 3.67 ml.p.m.kg., comparing with major league (p>0.05) and by 3.58 ml.p.m.kg., comparing with the first league в (p>0.05). The level of football umpires' aerobic endurance is characterized by indicators of threshold of anaerobic exchange (TANE). Many specialists note that intensity of training process can be measured in relation to TANE level [5]. Studies of TANE showed that umpires of major and first league have confidently higher indicators, 69.7% and 67.1% correspondingly, than umpires of second league – 64.4 (p<0.05). It can be explained by the fact that umpires of higher qualification, in contrast to their younger colleagues, include in training programs exercises for development of aerobic and quickness endurance and, there fore, have better functional level indicators.

The most important criterion of umpire organism's functional state is his physiological indicators during football match. Anatomic- physiological indicators of different qualification umpires during matches are presented in table 2.

HBF is recognized as an integral indicator of umpire's load during match [4]. Mean and maximal HBF values in matches depend on the following factors: the level of umpire's workability, intensity of motion actions in every episode of a match, correlation of durations of active and passive phases of a match, individual peculiarities of cardiovascular system's functioning.

Table 2

Anatomic- physiological indicators of different qualification umpires during matches (n₁=n₂=n₃=12)

Physiological indicators	major league	1 st league	2 nd league
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HBF, b.p.m. ⁻¹		161.6±0.84	158.6±0.99	154.8±0.85
Body temperature, °C		38.4±0.04	38.3±0.04	38.5±0.04
Mass	Before match	78.1±0.83	78.2±1.06	76.8±1.78
	After match	75.5±0.97	76.4±1.05	74.9±1.71

Basing on HBF indicators of umpires of different qualification during matches we can affirm that in the 1st time HBF of major league umpires varies from 143±1.02 to 171±0.21 b.p.m.; during break it reduces up to 115±0.61 b.p.m.; in the second time umpire works in the range from 146±0,78 to 180±0,49 b.p.m. Umpires of the first league have, in the first time, HBF indicators from 142±1.12 to 175±0.54 b.p.m., in break HBF reduces to 120±0.48 b.p.m., and the second time they serve in the range from 151±0.57 to 171±1.11 b.p.m. Umpires of the second league have the following HBF indicators during match: first time – from 145±0,73 to 171±1,12 b.p.m., at break HBF reduces to 125±0.43, in the second time – from 145±0.56 to 172±0,78 b.p.m., (see fig.2).

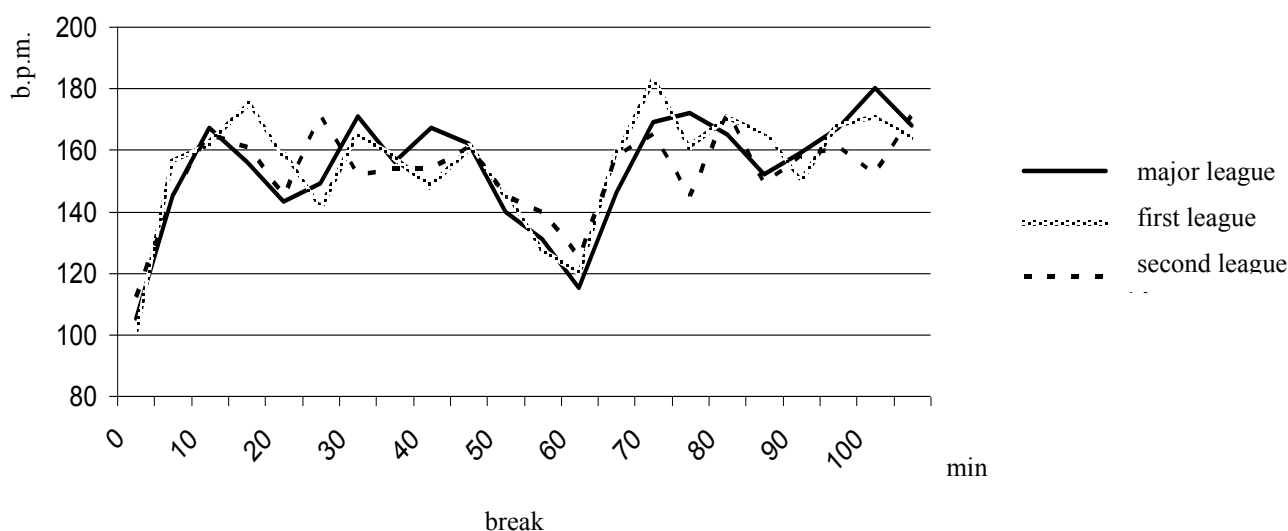


Fig.2. Dynamics of HBF indicators of umpires of different qualification during match

It is known that with physical load human organism changes its temperature. With increasing of temperature higher than 38° the volume of circulating blood and the quantity of lymphocytes increase in sportsmen's bodies, metabolism accelerates, PH changes take place in blood. So, during match body temperature of major league umpires is 38.4±0.04°C and do not confidently differ from umpires of the first league 38.3±0,04°C (p>0.05) and the second 38.5±0.04°C (p>0.05). Unlike this body temperature indicators of second league umpires are higher than the same of first league umpires (p<0.05), that witnesses that cardio-vascular and nervous-muscular systems of less qualified umpires work more intensively.

During match umpires' body mass noticeably reduces in connection with big losses of water and significant energy consumption. During match mean water losses of major league umpire is 2.67 kg (p<0.05), of first league umpires body mass reduces by 1.83 kg (p>0.05), and umpires of the second league lose 1.92 kg (p>0.05) of their mass during football match that is explained by less intensive motion activity during game.

Summary

Basing on the carried out researches, it was found out that anthropometric data of umpires, who serve different leagues' matches, have no confident difference, but at the same time indicators of functional systems are different in the following:

- Systolic and diastolic pressure (major league– 115.3/69,5 mm of merc.col.; first – 118.7/68.5; second– 121.0/64.2);
- Anaerobic and aerobic capacity of cardiac musclea (major league– 73.8; 217.2 conv.un.; first – 74.4; 218.9; second– 67.8; 213.8);
- MOC (major league– 52.7 ml.min.kg.; first – 52.6; second – 49.9);
- TANE (major league– 69.7 % from MOC; first– 67.1; second – 64.4).

The presented here data witness that there is no confident difference between indicators of functional state of major and first leagues umpires' organisms, while concerning umpires of second league they are substantially different (p<0,05).

The prospects of further researches. It is stipulated to develop program of training of different qualifications umpires depending on functional state of their organisms.

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HEALTH, PHYSICAL EDUCATION AND PHYSICAL DEVELOPMENT OF STUDENTS IN HISTORICALLY AND PERSONALLY DEVELOPING PARADIGM

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Annotation. It is considered the general health situation of the population of Europe. It is shown that in the last decade in the European Union there is a steady trend towards better health. It is noted that in the countries of the former Soviet Union, including Ukraine, the reverse process. Revealed the possibility of improved system of physical education students in improving indicators of physical development, functional status and health of students and the general population. It is noted that the intense physical activity of young people is only 3 - 4 minutes per day, and moderate and total - just over 1 hour. It is noted that the enhancement of the educational component of university discipline Physical Education is defined professional and personal characteristics of teachers of physical education departments, their willingness to self-improvement and development. The prospects for the use of personal-oriented campaign in the reform of university academic discipline Physical Education.

Keywords: health, population, physical education, student, physical condition, functional status.

Introduction

Since 2005 governments of most countries, members of EU, have accepted the concept, which implies not only struggle with diseases but also propaganda of healthy life style, reduction of inequality in reaching of healthy state. In the whole the health of EU population has improved for recent decades and it is witnessed by increase of expected life duration with birth of a child. However, in different regions of European continent there is progressing inequality in life duration, which is conditioned by gender, social and economical factors [The European health report 2009: health and health systems. <http://www.euro.who.int/PubRequest?language=Russian>.].

Data about health and mortality of different European countries significantly differ. I.e., in CIS, including countries of Central Asia and Kazakhstan (CARK), in general, higher levels of morbidity and mortality are registered. In European region the highest expected life duration with child's birth was 82.0 years in Switzerland (2006) and the lowest – 66.4 years- in Kazakhstan (2007).

On European continent the main reason of mortality is chronic non-catching diseases, which are responsible for more than 85% from 9 million deaths, which occurred, by calculated data, between 2003 and 2007. Diseases of blood circulating system are the main reason of death and determine 48% of all deaths, varying from 35% in EU countries to 65% in CIS countries, with it, gradually reducing in most of EU countries [The European health report 2009 : health and health systems. <http://www.euro.who.int/PubRequest?language=Russian>.].

For reference: in Ukraine negative increment of population, increase of mortality and reduction of population's health are observed [2].

It has been established that diseases, which condition nearly 40% of the lost DALY (disability-adjusted life-years), can be reduced. Because, they, as usual, are connected with smoking, alcohol drinking and accidents at transport. The quality of eating and physical activity also play important role [The European health report 2009 : health and health systems. <http://www.euro.who.int/PubRequest?language=Russian>.].

The topic of population's health, including the health of students, is important because it is exactly that informative complex, social-hygienic indicator, which generalizes biological, demographic and social processes, intrinsic to the given society, reflects the level of its economical and cultural development. Thus, health is a reliable integral indicator of life quality of a country's population in its objective manifestations [6, pg.70]. It is well known, that physical activity decreases the risk of appearance of different diseases, including colon cancer, hypertension, diabetes, not connected with deficit of insulin, osteoporosis and depressive states [13]. While sedentary life is the main independent factor of risk, for example, of ischemic heart disease [12].

Purpose, tasks of the work, material and methods

The purpose of the research is to analyze publications of leading domestic and foreign authors, to evaluate the existing situation in the universities of Ukraine and determine the prospects of perfection of students' physical education.

The methods and organization of the research: review of scientific-research literature, theoretical analysis and synthesis. The research was carried out at department of physical education and sports of Donetsk national university.

Results of the research

Physical culture-health improving activity in HEEs of many foreign countries implies organic integrity of efforts of states and governments, different public and private organizations and institutions of this field of educational process. In countries, in which principle of government's non-interference in HEE's physical education is prevailing, physical culture and sports activity, though it is considered socially significant, reflects free and autonomous initiative of HEEs themselves that, as experience shows, owing to creative approaches, often is justified and efficient. A bright

example of such model is US, where physical culture and sports in HEEs do not receive direct financial assistance from federal government [7].

In developing states on the contrary, the model of “interference” in physical culture and sports sphere of HEEs is acting; governments take responsibility and liability on their development. In such countries the responsibility for physical culture and sports is entrusted on certain ministries, councils, committees on central level [7, pg.102].

For example, in Algeria the tasks of ministry of youth and sports are: scientific development and formation of national system of physical education in educational establishments; preparation and effective using of physical culture specialists; perfection of infrastructure, based on principles of state governing; development of material base and its optimal application; wide attraction of pupils and students of different age to practicing of physical culture and sports. Besides, it is: development of sports, including sports of the highest achievements; development and realization of sports competitions’ system, ensuring maximally mass character of physical culture movement and increasing of sportsmanship; coordination of production plans and distribution of sports equipment; development of plans of scientific researches in the field of physical culture and sports; organization of medical provision; using of mass media for propaganda of physical culture and sports [7, pg.102-103]. It is evidently that approximately in the same scope governmental participation in development of HEE’s physical education is declared in Ukraine.

Physical development, as well as students' health, was regarded in doctrine of physical education, which was characteristic for USSR, also as exclusive prerogative of appropriate organizations’ and specialists’ efforts. With it a student was regarded as an object of monitoring, videlicet as an executor of volition of physical education instructors, whose efforts were concentrated on training motion actions and selecting of exercises for development of trainees’ physical qualities. Command system of physical education process, built on relations: subject (instructor) – object (student), is remarkable by the fact that the highest results are always demonstrated by students in the period of physical culture trainings and are noticeably lost after finishing of physical culture course.

It has been established that recent years in CIS countries students’ level of physical preparedness and functional state have reducing from the first to the third year of study. The trend of indicators’ reduction is observed both in the tests, which reflect the levels of quickness, quickness-power and strength qualities, and in the tests, which evaluate progressing of endurance. With it the highest rates of results’ worsening were marked in tests “chin ups” and «PWC₁₇₀», which reflect the level of power endurance and aerobic workability [4, pg.43].

It should be noted that in the present time, participation in physical culture activity is being reduced in all age groups of population of many countries. By the data of domestic and foreign authors, by the 21st year of life, i.e., by graduation from HEE, regular physical exercises are practiced only by not more than 40% of men and 30% of women [11]. With mature these negative trends increase in other countries as well: only 22% of mature Americans participate in regular physical activity of high intensity [11]. Meanwhile, sharp reduction of physical activity is noticed among young people (15 - 19 years old) and people of first maturity (21 - 25 years old). About 50 % of our student practice physical exercise not longer than 2-3 hours a week and 45 % do not practice them at all [5].

At the same time, results of national questionings, which were carried out in the USA, showed that approximately two third (63,7 %) of secondary schools’ pupils, 37,6 % of college students and 14,0 % of adults regularly participate in highly intensive physical culture activity. Regular participation in physical culture activity of moderate intensity turned out to be more steady in different age groups (pupils of secondary schools - 21,1 %, college students - 19,5 % and adults - 19,7 %) comparing with practicing of highly intensive physical culture activity [12]. These facts witness that *educational establishments are those key links, in which it is possible to successfully carry out the policy of attraction to regular physical culture exercises and to form social set for motion- active life style.*

In one of demonstrative for us experiments in researching of physical state, the results of which we shall discuss, owing to their importance for evaluation of situation in modern Russia, more than 1000 students of St. Petersburg state polytechnic university took part [3, pg. 3-4].

In this experiment, evaluation of physical state was carried out by the following indicators: the level of systolic BP, heart beat frequency (HBF) in rest, vital capacity of lungs (VCL), time of HBF restoration after dozed physical load, level of somatic health (by G.L. Apanasenko, 1992). Evaluation of physical preparedness was fulfilled by the results of compulsory tests, recommended by “Physical culture” discipline’s program for HEE of Russian Federation: 1) 100 m run, 2) 3000 m run for men and 2000 m run for women, 3) chin ups for men and rising torso from lying position into sitting position (hands behind neck) 4) by general quantity of points for fulfillment of the mentioned above tests.

For studying of indicators’ dynamics of students’ physical state in educational process we tested the students of five groups of sports specializations, which were related to main department: “Handball” (n = 46), “Volleyball” (n = 57), “Football” (n = 45), “Gymnastics” (n = 55), “Basketball (n = 56) and other at the 1st and 2nd years of study (in total four semesters).

The level of somatic health of students (by G.L. Apanasenko, 1992), who trained handball, was $5,19 \pm 0,43$ points, football - $3,85 \pm 0,53$, volleyball - $5,79 \pm 0,55$, wrestling - $4,74 \pm 0,64$ points and turned out to be “lower than middle” (the 2nd level of somatic health) of students, who trained weight lifting - $7,18 \pm 0,36$, - “middle” (3rd level), basketball - $6,77 \pm 0,49$ and swimming - $6,80 \pm 0,20$ points – closer to “middle”, to be more exact at the border of the 2nd and 3rd levels). The level of somatic health of gymnasts (female) is $-3,71 \pm 0,34$ points and is on the border of the 1st (“low”) and 2nd (“lower than middle”) levels. Considering that “safety level” of somatic health is between the 3rd and 4th levels and corresponds to 12 points by scale of somatic health evaluation, we can conclude that health levels of all

tested students groups is lower than the threshold, which is responsible for adapting abilities of organism and do not protect organism from influence of diseases risk factors.

Generalized physical state data of students of St. Petersburg state polytechnic university are also of interest. The received information showed that actually the levels of men's and women's somatic health are the same – about 6 points – on the border between “middle” and “lower than middle” levels; generalized indicator of physical preparedness level is about 3 points and says about relatively low anaerobic- aerobic endurance, which, to the greatest extent, determines the level of human physical state.

With comparing indicators of students physical state in this research it was found, that there is actually no significant difference, depending on sports specialization. So, unsatisfactory results of 3000 m run, probably, says about low level of students' general physical preparedness that, in its turn, make their level of somatic health low.

In the next experiment 389 first year students of $17.6 \pm 0,02$ years old of Surgut state pedagogical university (SurSPU) took part. In the frames of pedagogical influence in order to change behavior activity, connected with health 344 students (163 boys and 181 girls) completely fulfilled seven days report of time budget (SRTB) and filled in questionnaire on physical activity for students (PAQ-S), which was developed on the base of recommendations of American college of sports medicine (ACSM) and London institution of psychiatry. The norm of response for PAQ-S was 88,4 %.

The obtained data witness that intensive physical activity of boys and girls is only 3-4 minutes a day, while moderate and general ones turned out to be a little higher than 1 hour. Let us remember that on the base of ACSM recommendations intensive physical activity includes run, walking with high speed, sport dances, aerobics and etc., i.e. kinds of activity, resulting in significant rising of pulse frequency, breathing with rich sweating (work in zone 50 ± 75 % of aerobic capacity or 6 - 9 MET). Moderate physical activity includes most kinds of physical labor, walking, physical exercises with moderate rising of pulse frequency, breathing with insignificant sweating (work in zone 25 ± 50 % of aerobic capacity or 3 - 6 MET).

The data concerning the time, which was spent for SurSPU students' physical activity of moderate intensity (57 min. per day – girls and 67 min. per day – boys) correspond to information of other authors: 60 min. per day of physical activity for Holland teenagers, independent on their sex, 52 min. per day (boys) in England or two times higher than Swedish teenagers (26 min. per day – boys and 32 min. per day – girls). The girls from England – 15 min. per day; American 18 years old boys – 30 min. per day and the girls of the same age – 24 min. per day. At the same time Surgut students spend much less time for physical activity of high intensity (in average 3-4 min. per day) that is less in comparison with senior pupils from Northern Ireland (7 min. per day – boys and 12 min. per day – girls).

Important results were obtained with studying of difficulties, connected with physical activity, self-feeling and relations with other people. In particular, it was detected that 42,3 % of SurSPU boys and 46,9 % of girls have little, but nearly 10 % of girls rather serious difficulties of behavior character. Duration of most of light difficulties, which are common for people in the process of their communication, varies within the limits 1 - 5 months. 11,6 % of boys and 16 % of girls have serious difficulties, which continue from 6 months to 1 year. 22 % of boys and 38 % of girls are insignificantly upset by their difficulties. 10% of girls are seriously upset by difficulties of communication.

With it, most of students do not face any difficulties and have no behavioral problems in domestic communication, friendship, leisure. However, the fact, that insignificant and serious difficulties in these parameters are confidently higher among girls than among boys, attracts attention. The fifth part of girls of the tested sample has definite problems in life, family and friendship and for every fourth girl-student these difficulties are obstacles in her study at university. In leisure 14% of boys and 23% of girls have insignificant difficulties, 6% of boys and 4% of girls have serious ones.

Concerning Ukraine, in our country we can observe permanent reduction of indicators of HEE (of I-III levels of accreditation) students' physical preparedness and it witnesses that command approach to physical education is, like in post-Soviet Russia inefficient [7, pg.6].

E.g., for the students of National agrarian university, most of whom are from *rural area*, the following diseases are characteristic: abnormalities of posture (scoliosis) – 35.4%, therapeutic pathologies – 15.7%, diseases of urogenital system – 8.6%, eyes – 9.9%, gynecologic diseases – 4.2%, liver – 4.0%, cardio-vascular system – 3.6%, gastric intestine diseases – 3.6%, endocrine system – 3.6% and psycho-neurologic – 1.7% [10, pg.6].

In HEE, in which mainly *urban youth* study, morbidity picture is, to some extent, different. In 2010-2011 in National mine university (Dnepropetrovsk) there prevailed: cardio-vascular system's diseases -39.02%, diseases of supporting motor system – 26.83%, eyes diseases – 14.63%, endocrine and secretory systems – 7.32% each, all other diseases – 4.88% [10, pg.5]. These data are confirmed by the results of other researches as well.

It has also been noticed that medical reports of three medical boards: medical examination after leaving school, medical examination of first year students and medical examination by draft board -0 very often do not coincide either by diagnosis or by final decision concerning attendance of physical culture classes, which are connected with physical loads. General trend is that physical culture marks in secondary school have “satisfactory” level very seldom; great majority of applicants have “good” and “excellent” in “Physical culture”. But in the process of control testing at department of physical education of HEE these marks in most cases are not confirmed and do not comply with the data of physical preparedness of school-leavers, entering HEEs.

As G.L. Apanasenko writes: “Health is a category not only medical-biological, but social as well. It is true that biological principle – is a human implementator of all social. Thus, fulfillment of biological and social functions by

an individual can be interpreted as manifestation of health. The higher individual's ability to realize his biological and social function is, the higher is his level of health" [1, pg. 36]. The author of the cited article notes that ability to manifest one's health, i.e., to realize biological and social functions are significantly influenced by psychic qualities of a person, whose importance we describe below.

Regarding specificities of psychic load's components, which influence on human health, we can say that the more sum of negative factors in informational-operational, situational and personality's components is the higher is the level of psychic load's influence on organism and psychic manifestations of a person in general.

The level of activity of self-regulation mechanisms is an integral manifestation of main components of psychic load that is why it is important to first of all consider and study psychic mechanisms of human self regulation in the process of his adapting to conditions of life activity, including starting of physical culture activity.

Self-regulation is defined as mechanism of inner psychic human activity in the process of adapting to conditions of life activity. It is a mechanism of mobilizing and actualizing of human abilities, compensation and regulation of psychic manifestations in connection with demands and aims of life activity. Personality's ability to regulate and organize his life as something integral, which subordinates to its aims, values – is the highest level and genuine quality of a subject of life.

Let us note that on post-Soviet area the quantity of students, who study in special health groups, has already approached 40 %. With it, only 18% from the questioned students in Byelorussia, which is a supporter of Soviet doctrine of physical education, consider that they have sufficient level of knowledge, required for self control of own organism.

It is also important to establish what are distinctive features of physical culture students' own health, of students, who will be, possibly future instructors of "Physical education" in HEEs and civil position and professional competence of whose will influence on the culture of health of those, whom they will train?

Let us refer to the research, in the course of which 400 students of Russian cities (Moscow, Vladimir, Voronezh) and three cities of Southern Korea (Seoul, Kang Chzhu, Ken Chzhu) were questioned.

According to he received answers 54.2% of Russian students and 62.2% of Korean students of Institutions of physical culture have motivation for health maintaining by physical culture/ 28.0% of Russian students and 36.9% of Korean students try to ensure healthy eating, 27.8% of Russian students and 41.9% of Korean constantly observe their weight and try to take measures for its preservation. 10.8% of Korean students answered that they use alcohol and 26.5% of Russian students answered that they use alcohol often [8]. As it can be seen, the supplied data are unfavorable for Russian.

Concerning way of life, let us mark out features, which are characteristic for healthy life style. Having analyzed different definitions, we stopped on definition, which we follow in the course of our research: "Healthy life-style (HLS) is a complex of health improving measures, which ensure harmonious development and strengthening of health, increase of human workability, prolongation of creative life. It includes: fruitful labor activity, giving up harmful habits, optimal motion regime as a kind of regular physical culture trainings and sports" [6, pg.73]. Accepting of such HLS sense gives clear idea about required orientation of physical education and non professional physical education of students, as its important component.

It is known that most of risk factors, determining the level of human health, depend on subjective factors, videlicet, on behavioral peculiarities. Analysis of these factors permits to imagine orientation of educational component in "Physical education" discipline at HEE. With it, scholarship in health preservation sphere is manifested in the fact that up to 95% of students do not have systemic knowledge and belief in importance of HLS [6].

The same subjective factors determine orientation, content and results of "Physical education" discipline's teaching at HEE: "Analysis of physical education state, carried out by scientists in more than 200 higher educational establishments of Ukraine, determined, ...actual system of students' physical education...is inefficient. It does not ensure to full extent psychophysical readiness of higher educational establishments' graduates to life activity and professional labor; 60% of young specialists, who come to production, are not physically ready in regime, rate and intensity, which are required by market economy" [9, pg.216].

Summary

Traditional system of authoritarian, clearly programmed, "grouped" physical education gives temporary, usually only visible, effect, expressed though passing control tests in physical training. However, it is known, that after passing the last test, student, who has no actualized value "to be healthy", does not understand the motives of physical culture trainings, has no system of competences, permitting to monitor his own workability and health, has no even initial experience of independent training, becomes passive from physical culture point of view.

Educational aspect in the course of students' physical education shall increase psychological and valeologic components of their professionally-oriented competences, independent on the chosen specialty. With it, increasing of educational component of "Physical culture" discipline at HEE will be to large extent determined by professional and personal characteristics of physical culture departments' instructors, by their readiness for self perfection and development.

In the course of further researches, it is necessary to find out the place, which is determined by students for the topic of improvement and maintenance of own health in general structure of their life activity. It is necessary to establish the peculiarities of personality-oriented physical education in the course of study at HEE by the chosen

specialty, including orientation and content of non professional physical education – important aspect of “Physical education” discipline at HEE.

At the same time, situation in the system of special, professional physical culture education permits to assume that one of important reasons of advanced technologies’ slow mastering to large extent is connected with the absence of pedagogic system of physical culture institutions students’ attraction to means of search, analysis and application of existing scientific data about processes of renewal of future professional activity’s forms and content.

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EDUCATIONAL AND SOCIAL PRIORITIES OF IMPROVING THE SYSTEM OF PHYSICAL EDUCATION STUDENTS

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Annotation. Purpose - pedagogical and sociological research priorities in the system of physical education of students. The study involved more than 800 students. Described educational and social priorities of improving the system of physical education students, the basic ideas and principles of conservation and health by means of physical culture. The necessity of the restructuring and improvement of the physical education of youth in accordance with the level of social demands. It was found that the problem of physical culture as a social phenomenon is closely linked to the problem of formation of physical culture of the individual. In turn, the problem of identity formation in physical education is a challenge to improve the foundations of physical education among young people and students. Confirmed the hypothesis on the need for adjustment and improvement of the physical education of youth.

Keywords: educational, social, priorities, physical education, student motivation, physical culture.

Introduction

It is well known that the most important factor of health improvement, workability's increasing and creative longevity's prolongation is physical culture and sports. Evaluating health improving significance of physical culture, it is necessary also to mark its general cultural importance and multi-functional character, which put it in the rank of socially useful information, in which students' social activity and creativity are formed. The data of researches permit to affirm that skills of social and professional activity, obtained owing to physical culture trainings, are successfully extrapolated to other kinds of activity. Physical culture permits to present some aspect of human self in specific forms and directions, creates conditions of social activity [5].

Physical culture facilitates manifestation of the best features of human personality. By the power of its influence on a person physical culture takes one of main places in cultural life of society. However, in spite of its tremendous educational importance, the problem of its implementation in everyday life has been still remained unsolved [5].

The trend of health worsening of our country's population appeared long ago. Researches, which were fulfilled in different regions of our country, found out constant reduction of health level, low level of physical development, and preparedness of youth, insufficient knowledge of young generation and their parents about effectiveness of strengthening and maintaining of their health.

Considering up-to-date life realities, worsening of youth health requires implementation of modern methods and approaches. Pre-conditions for solution of this problems are reflected in the works by pedagogues (T. Boytchenko, G. Goloborodko, O. Dubogay, T. Krutsevych, S. Kyrlyenko, V. Orzhekhovska, S. Svyrydenko, M. Solopchuk), medical scientists (M. Amosov, G. Apanasenko, V. Voytenko, N. Kyseliova, N. Borysenko) et al. As per the data of sociological studies, [<http://dsmsu.gov.ua/index/ua/material/9520>; <http://dsmsu.gov.ua/index/ua/material/7106>;

http://www.rusnauka.com/10_ENXXIV_2007/Pedagogica/21528.doc.htm], our country is on the sixth place among other countries of the world by span of life, after Libya and Kenya. At present, in Ukraine strong neurotization of children and youth is observed. Chronic deficit of children's motion activity impedes their normal physical development, threatens their health. Scientists witness (V.I. Dubrovskiy, V.I. Krutsevych, N.Yu. Kuts et al.) that children with low motion activity have high level of morbidity owing to reduction of general immunity, that, in its turn, results in premature aging of human organism, early losing of workability.

The health of population, especially of children and youth, worsens catastrophically quickly, as well as their physical preparedness. The quantity of disabled people is increasing (even as per incomplete data they are more than 4 million people in our country) and they face acute problem of social adapting and rehabilitation (National doctrine of development of education: approved by Order of President of Ukraine No. 347, dt. April 17th, 2002//Education.- 2002. – No.26.- C.2-4; Decision of Cabinet Council of Ukraine No.1697, dt. September 15th, 1999 “On approval of national program of patriotic education of population, formation of healthy life style, development of mentality and strengthening of society's moral principles”).

So, starting from 9-10 forms, the quantity of pupils, who want to practice physical culture, is decreasing. On the one hand it is explained by increasing variety of senior pupils' interests, on the other hand – by increasing, after puberty period, of impeding influence of inner organism's balance, which is manifested in reducing of demand in motion activity. It manifests especially brightly among girls. Analogous situation is observed among students, that is witnessed by scientific works of recent years

[2, 3, http://www.rusnauka.com/10_ENXXIV_2007/Pedagogica/21528.doc.htm].

Analysis of students' and youth's questioning results permitted to find out the most important factors, which influence negatively on health:

- Girls opinion: ecology, stresses, heredity and smoking;
- Boys' opinion: ecology, heredity, stresses, drugs;

- Parents' opinion: ecology, drugs, low quality of medical assistance.

By the results of questioning, respondents' answers concern, mainly, external factors, environment, i.e., both youth and parents do not take responsibility for health preservation and own life style [1].

The work has been fulfilled as per plan of scientific & research works of Rivno state humanitarian university.

Purpose, tasks of the work, material and methods

The purpose and the tasks of the work are study of pedagogical and social priorities in system of students' physical education.

The methods and organization of the research. For solution of our tasks we used the following methods: analysis of literature sources, questioning. More than 800 of first year students of Rivno state humanitarian university, Rivno institute of Slavonic studies, Rivno national university of water industry and nature management took part in the research.

Results of the research

Physical culture is a kind of culture and includes the same processes that culture but rather specifically. That is why physical culture is one of the basic kinds of young generation's culture, it is one of the most important methods of formation of human (students') general cultural level, ensures high level of life activity. The level of youth's physical culture is determined, first of all, by special knowledge in this field, by conscious demand in using physical exercises and other kinds of motion activity for health improvement and comprehensive self perfection. All these is directly intrinsic to sphere of physical culture, which on previous historical stage was formed by government on pragmatic positions of perfection of psycho-biological nature of individual and in development of its main directions and organizational forms it "subordinated" to solution of tasks of purely state system of education. Developing in the frames of such system, physical culture lost social-cultural functions and was understood by human mind as identical to the process of physical education. Such transformation of culture into "pedagogical element" reflected also in peculiarities of physical culture development as social phenomenon, which was developed in paradigm "not physical culture for a person, but a person for physical culture" and became by definition subjectiveless.

Available, in connection with this, practical alienation of physical culture from a person, from his individual motives and demands, from active attitude to his physical nature, from possibilities to fully master and further to uses its essence, conditioned passive attitude of society to physical culture as phenomenon of culture [6, 7]. Crises in state system of physical education, intrinsic to present period, and relative not readiness of physical culture itself to develop out of this system, turned into a number of negative consequences for the society, which reflected in excluding of this phenomenon from life activity of modern person. To these consequences, though they are of temporary, transitive character, we can relate the following:

- reduction of interest in physical exercises, especially in traditional forms; demands, motives and value orientations of a person's transformation of own physical nature are considered insufficiently;

- insufficient readiness of a person to organize independent forms of physical activity, to actively and purposefully solve the tasks of cultural transformation of own physical nature, to strengthen his health and increase creative longevity;

- incompliance of physical culture instructors' competence with up-to-date requirements, which is manifested in their insufficient professional level, in inability to master new content and forms of trainings, new, modern technologies, which require new approaches to systems, methods and forms of educational process's organization;

- desolation and ruining of sports sites and stadiums owing to functional not readiness of their personnel to organize and cultivate non traditional kinds of physical activity, to implement in human life style new forms of physical culture measures, which have becoming wide spread in world society [5, 8,10].

The content of trainings, their educational potential, forms of organization do not satisfy individual and collective wishes of students, do not promote development of motivation-demand sphere, do not appropriately influence on personality and social-professional readiness. There is no logical transition of physical education process into physical self education and self perfection, without which it is impossible to speak seriously about effectiveness of educational process. Transformation of obtained at classes knowledge, skills and physical level in general cultural development of student, his healthy life style and etc. is not ensured.

The researches, which were carried out by us, showed, that at schools and HEEs physical culture classes are oriented mainly on development of body, on physical development but not on perception and understanding of physical culture values. Attention, first of all, is paid not to knowledge but to external, specific indicators instead of formation of culture, of mastering knowledge.

At higher educational establishments there is a contradiction in technology of physical education process, which is oriented, on the one hand on execution of certain normative and on the other – on mastering by students certain level of physical culture knowledge and skills about lows, means and methods of own development and health strengthening. Orientation on certain indicators of motion activity, on increasing of trainings' motor density does not permit to solve educational tasks in their process. That is why they are not distinguished by sufficient general cultural and educational level in the field of physical culture [8, 9].

The basis of this contradiction lies in the nature of human essence, as far as from the very beginning in a person there is no demand in fulfilling of somebody's volitional instructions, he has quite an opposite demand in resisting to any pressure. That is why it is impossible to breed demand in physical perfection by command methods is practically impossible. Effect of command-drill methods, which are dominating at physical culture trainings, is quite

opposite. It manifests as defective transformation of demand-motivation sphere of students. Most of students avoid not only independent physical exercises trainings but also miss academic classes in physical culture, wish to leave trainings as early as possible, do not take part in competitions, show no interest in physical culture literature.

P.F. Lesgaft wrote that pedagogues "...do not suspect about physical culture health improvement..., in the best case they speak about development of body". That is why prestige of physical culture drops, possibility of its understanding as a value reduces; it impedes formation of active attitude of youth to own physical development.

With normative approach to building of educational process purely external processes instead of young people became the center of attention. It results in forced adjustment of personality to some, come from "superiors", normative, which evidently contradict to idea of freedom of personality and humanistic principles of human development and education.

Results of such researches witness that system of youth's physical development does not correspond to up-to-date requirements and level of development of new forms and methods of students' physical education. Recognizing to large extent criticism of RLD* complex and especially organization of its norms' fulfillment, we can help agreeing with decision about full refusal of unified system of testing of physical development level. Because testing system fulfills several functions. I.e., besides evaluation of physical level, adequacy and accessibility of tests and exercises, it plays important role in motivation for systematic physical culture and sports trainings, is a stimuli for physical self perfection [3, 6].

Unfortunately, at the present time, in Ukraine there is no unified testing system of pupils' and students' physical level. Coming from own experience and possibilities, instructors of educational establishments solve themselves the problems of tests' selection and it results in appearing of many testing systems, in absence of unified requirements to youth's physical level and makes impossible comparison of human physical levels in different periods of time, of youth from different educational establishments, colleges and so on. Finally, all these result in the absence of control of Ukraine population's physical development level (Decision of Cabinet Council of Ukraine No.1697, dt. September 15th, 1999 "On approval of National program of population's patriotic education, formation of healthy life style, development of mentality and strengthening of moral principles of society"). Such situation brings to certain idea that demand in unified system of testing of physical level can not be reduced primitive problem of evaluation and comparing of results. We mean that it is necessary to change the practice of training and evaluation of physical education of all rising generation of the country (Order of President of Ukraine about approval of Target complex program "Physical education – the health of nation"//Bulletin of Verkhovna Rada = 1998.-No.18.- Pg.37).

In the contest of the above said it can be understood that the problem of physical culture as social phenomenon is integrally connected with the problem of formation of personality's physical culture. In its turn, the problem of personality's formation in the sphere of physical culture is a problem of perfection of physical education principles among rising generation and students. And, as far as up to the present time, even when now we have a number of scientific-pedagogical works on this problem, it has been remaining impossible to carry out transition to the process of objective personality's physical culture development without their permission, we should like to mark out the following:

- every day pedagogic practice is carried out without scientifically grounded setting for active mastering of physical culture values by students, which, actually, are changed by settings for perfection of human physical status;
- in scientific-methodic approaches there constantly present dilemma in determination of functional orientation of physical education: priority of biological or social student's development, accent to training of motion exercises or breeding of physical abilities, formation of demand in sports training or in independent training of physical culture forms;
- educational programs are characterized with discreteness and fragmentation, absence of wholeness in stage-by-stage mastering them in different age periods, that is explained by insufficient understanding of the fact that physical culture as an aspect of culture is an integral formation, which does not permit formation of partially cultural or partially not cultural student;
- not worked out age approach to mastering of physical culture values, which is, first of all, oriented on passport age, partially on biological, but in any way on social age of a person;
- strict adjustment of pedagogue and instructor especially on learning activity of student leaves out of attention students' own individual value orientations and settings in physical culture, which, in addition, have age specificity.

Analysis of reasons, which bring to these mistaken ideas, shows at the absence of teachers' modern thinking, which, in conditions of changes in higher education, is extremely required for self-perfection.

The absence of vision of complex physical education influence on student personality's development is a severe disadvantage of teachers' professional thinking (Order of President of Ukraine about approval of Target complex program "Physical education – the health of nation"//Bulletin of Verkhovna Rada = 1998.-No.18.- Pg.37).

Summary

The carried out by us research proved our hypothesis about necessity in re construction and improvement of system of youth's physical education.

In students' physical education there appeared a problem situation, which means its effectiveness's non compliance with the level of social demands. One of the reasons of this is insufficient level of individualization

methodic of independent trainings – the basis of organizational-methodic form of independent physical extra curriculum trainings.

That is why main directions of reconstruction of students' physical education at higher educational establishments of Ukraine stipulate further increasing of importance and scope of students' independent forms of work for further prospects of their studying and implementation among students of Ukrainian higher educational establishments.

- RLD- "Ready for Labor and Defense" system of mass physical culture preparation, which existed in the USSR (*note of translator*).

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**THE PHYSICAL CONDITION FOR THE FIRST TIME ACCEPTED THE SERVICE OF OFFICERS OF
INTERNAL AFFAIRS OF UKRAINE**

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Annotation. The analysis of the level and dynamics of the physical condition and the adaptive capacity of the first accepted the service of police officers. The study involved 112 employees of the first medical-age group, which took initial training courses. The index of physical condition and the adaptive capacity of the cardiovascular system was analyzed. Found that the initial level of physical condition in 52.7% of employees is defined as the average. Adaptive capabilities of the majority of workers (76.8%) are characterized by stress adaptation mechanisms. Found non-significant deterioration in the value of the index of physical condition and the adaptive capacity of the first year of service. Proven lack of effectiveness of physical training of workers in the period of initial training. Found that one of the ways to improve the physical fitness of workers is to validate the content of physical training with regard to their physical condition and the posts to which they are assigned.

Keywords: physical state, adaptive capacity, initial training, physical training, worker.

Introduction

One of negative characteristics of professional activity of most regular personnel of (MHA) Ministry of Home Affairs of Ukraine higher educational establishments (HEE) is low motion activity [2, 3].

By the present time the fact of internals' pathology, resulted from limited motion activity, has been commonly recognized; practically there is no organ or system, which would remain unchanged under influence of motion deficit. Hypo-dynamic mode of activity results in a complex of functional disorders, which spread on functions of blood circulation and respiratory systems, supporting motor system, metabolic processes and result in significant worsening of organism's adapting abilities, owing to what it can not effectively resist the complex of negative factors of activity. As a result health worsens, workability and efficiency of service activity reduces [3, 4, 9].

An important criterion of physical workability of a specialist of any profile is his physical level. It is determined by a number of factors, the main of which are indicators of cardio-vascular system, body mass, age and some other. From biological point of view, physical state of a person is determined by a combination of interdependent characteristics (functional state of organs and systems, physical development and level), which characterize human personality, the state of health, posture and constitution [1, 6].

A number of authors [1, 5, 6, 9] notes that evaluation of physical level and adapting abilities of Home Affairs officers can be used as criterion of health improving efficiency of physical training process as well as a criterion of health and readiness for efficient execution of duties.

Researches of physical level and adapting abilities of Home Affairs officers will permit to plan selection of means and methods of physical training for improvement of their health and physical level.

In special literature (V.L. Karpman, 1988; Ye.A. Pyrogova, 1989; R.M. Bayevskiy, 1986; L.Ya. Ivaschenko, N.P. Strapko, 1988 et al.) a lot of tests is offered, with the help of which it is possible to evaluate physical state and adapting abilities of a person. Index of physical state (IPS), which is determined by regression equation, developed by Ye.A., Pyrogova (1989), can be considered to be an integral indicator of physical state, which reflects the state of functional reserves and level of physical health. The base of IPS is formula of interconnection between physiological indicators in rest and the level of maximal physical workability. Components are: heart beats frequency (HBF), arterial blood pressure, body mass, height and age.

For evaluation of adapting abilities methodic of determination of adapting potential (AP), offered by R.M. Bayevskiy (1979), is used. As far as generalized indicators of adapting responses of all organism is cardio-vascular system, then adapting potential is regarded as complex indicator of interconnection of age, blood circulation system' indicators (HBF, BP) and physical development (body mass and height).

Analysis of special literature showed that significant quantity of works is devoted to researches of physical trainings' efficiency of police officers and cadets of HEE of MHA of Ukraine [2, 5, 7, 10]. However, insufficient attention has been paid to the problems of physical state's evaluation of newly taken on Home Affairs service officers as well as to scientific foundation of their physical training. That is why, determination of physical state and adapting abilities of just taken on service officers is an urgent direction of scientific researches in order to improve academic physical training program in the period of initial preparation.

The work has been fulfilled as per combined plan of scientific & research works in the sphere of physical culture and sports for 2011-2015 of Ministry of family, youth and sports of Ukraine, in the frames of subject 3.8. "Theoretical-methodological principles of system of mass control and evaluation of different population's groups' physical level and development" (state registration number 0111U000192).

Purpose, tasks of the work, material and methods

The purpose of the work is to study the level and dynamics of physical state of just taken on Home Affairs service officers.

The tasks:

- 1) Determine initial level of IPS and AP of just taken on Home Affairs service officers;
- 2) Study dynamics of physical state indicators of just taken on Home Affairs service officers, their adapting abilities during first year of service.

The methods of the research: analysis of literature sources, pedagogic observation, testing, methods of physical state and adapting potential's evaluation, methods of mathematical statistics.

Results of the researches

In order to determine physical level of just taken on Home Affairs service officers we analyzed IPS and AP of cardio-vascular system. Examination were carried out with personnel staff of first medical-age group (men) of preparatory courses at National academy of Home Affairs (NAHA) (n=112), who studied in the period from 2008 to 2012. The examined personnel staff included also officers, who did not study at HEEs of MHA of Ukraine.

Analysis of privacies, of just taken on Home Affairs service officers, permitted to divide them into three groups depending on their previous activity:

1 group – those, who had been on active service in Armed Forces of Ukraine before they were taken on Home Affairs service (49 persons; 43,8%);

2 group – persons, who were taken on service just after graduating from civil HEE of Ukraine (41 officer; 36,6%);

3 group - those, who had been on active service in Armed Forces of Ukraine, but worked in different branches without any physical training for some time before they were taken on service (22 persons; 19,6%).

Using the methods of mathematical statistics, we determined mean indicators of physical state of just taken on Home Affairs service officers: HBF in rest; BP (systolic, diastolic and average); age; body mass and height (see table 1). It was found that groups have different initial level of the researched indicators.

The best initial IPS was registered at first group – 0.683 conv.un.- that corresponds to physical level higher than middle (see table 1). IPS of second group members was 0.666 conv.un. and corresponded to middle level. In the third group initial physical level was also evaluated as “middle” at the moment of its members' entering the courses, but it was the lowest in comparison with other groups and was 0.635 conv. units. Calculation of confidentiality of the obtained data showed that difference between IPS of the first and second groups is 0.017 conv.un. ($P<0.05$), between second and third groups – 0.031 conv.un., ($P<0.01$), between first and third groups – 0.045 conv.un. ($P<0.001$).

Table 1

Initial level and physical state of just taken on Home Affairs service officers after first year of service (2008–2012, n=112, $\bar{X}\pm m$)

Indicators of physical state and adapting abilities	Groups					
	1 st group (n=49)		2 nd group (n=41)		3 rd group (n=22)	
	Initial level $\bar{X}\pm m$	After 1 st year of service, $\bar{X}\pm m$	Initial level $\bar{X}\pm m$	After 1 st year of service, $\bar{X}\pm m$	Initial level $\bar{X}\pm m$	After 1 st year of service, $\bar{X}\pm m$
HBF in rest, b.p.m.	72,6±0,30	72,8±0,44	73,1±0,48	73,7±0,51	74,9±0,73	74,7±0,68
BP syst. mm.merc.col.	118,9±0,63	118,5±0,62	120,2±0,66	120,8±0,67	124,1±1,50	123,9±1,44
BP diast. mm.merc.col.	74,1±0,57	74,2±0,54	76,5±0,62	76,9±0,51	78,2±0,61	78,0±0,59
BP average mm.merc.col.	89,0±0,44	89,1±0,41	91,1±0,48	91,5±0,42	93,5±0,77	93,3±0,76
Age, years	19,5±0,12	20,5±0,12	22,8±0,20	23,8±0,19	23,6±0,17	24,6±0,17
Body mass, kg	72,9±0,82	73,2±0,74	76,0±0,57	75,8±0,66	78,3±1,58	78,7±1,21
Height, cm	176,8±0,71	177,2±0,64	175,5±0,77	175,7±0,75	176,2±1,20	176,2±1,21
IPS conv.un.	0,683±0,004	0,682±0,005	0,666±0,006	0,658±0,006	0,635±0,009	0,638±0,007
AP conv.un.	2,12±0,01	2,13±0,01	2,25±0,02	2,28±0,02	2,37±0,03	2,38±0,03

In general initial level of 59 just taken on service officers (52,7%), during first year of study at preparatory courses is determined as “middle”, for 53 – it is determined as “higher than middle” (47,3%). It is important that such physical levels as “low” or “high” were not registered at all.

Analyzing dynamics of physical state after one year of service, we should note that IPS practically did not change in all three groups (see table 1). So, in first and second groups IPS unconfidently worsened in relation to results,

which were registered at the moment of entering the preparatory courses ($P>0.05$), in the third group it improved by 0,003 conv.un., but difference is also unconfident ($P>0.05$). IPS evaluation showed that physical levels of officers did not change during one year of service. Correlation of initial level and IPS level of just taken on service officers is shown in fig.1.

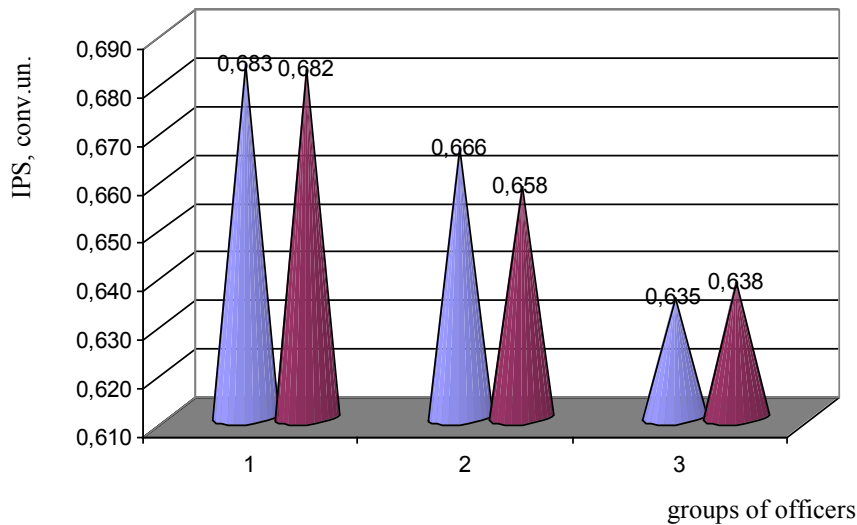


Fig 1. Initial level and the level of index of physical state of just taken on Home Affairs service officers after 1st year of service (2008-2012, n=112, y.m.o.d.)

- initial level of index of physical state
- level of index of physical state after 1st year of service officers.

The study of dynamics of such important indicators of physical state of just taken on service officers as body mass, HBF, BP permits to note that they did not confidently improve in all groups during one year of service ($P>0.05$). It witnesses about insufficient effectiveness of existing academic program on physical training in the aspect of police officers' physical state improvement.

A number of scientists note [4, 6], that the problem of physical state and level's improvement should be approached from positions of adapting theory. Adapting is the process of adapting of organism's functions to environmental conditions [6]. It has been also proved that physical exercises are the main mean of training of all organism's functional systems, as far as adapting mechanisms are trained as a result of interaction of physical, psychological load and restoration. The more trained organism is the quicker adapting progresses. The higher adapting abilities of blood circulation system are the less is BP.

With it, scientists [1,4,6] accentuate that under the influence of different negative factors of service activity, the primary response of organism is ensured by certain physiological systems: cardio-vascular and respiratory. So, for provision of successful adapting process of newly taken on service officers it is necessary, with the help of physical training, to increase functional abilities exactly of systems, supplying organism with oxygen – cardio-respiratory system. And this is possible to be realized in the process of general physical training, with the help of aerobic exercises, oriented on development of endurance.

Analyzing initial BP value of newly taken on service officers and its dynamics after first year of service, it we should note reduction of this indicator in all examined groups. However, no confident difference of the obtained results was found ($P>0.05$), (see table 1).

In all three groups of newly taken on service officers BP is evaluated as "straining of adapting mechanisms". Initial BP of the members of first group was 2,12 conv.un., that by 0,13 conv.un. is better ($P<0.001$), than the same of the second group's members (2,25 conv.un.) and by 0,25 conv.un. ($P<0.001$) – than the same of the third group's members (2,37 conv.un.) (see table). Difference between BP values in second and third groups is 0,12 conv.un. and is confident ($P<0.01$).

In the whole, initial level of adapting abilities of 86 of newly taken on service officers (76,8%) is characterized by straining of adapting mechanisms, of 26 officers (23,2%) – by satisfactory adapting (see fig.2). At the end of research correlation of BP levels changed to worsening of officers' adapting abilities (77,6% against 22,4%). It is important to note that BP in third group at the beginning as well as at the end of studying at preparatory courses of 100% of all officers was evaluated as "straining of adapting mechanisms".

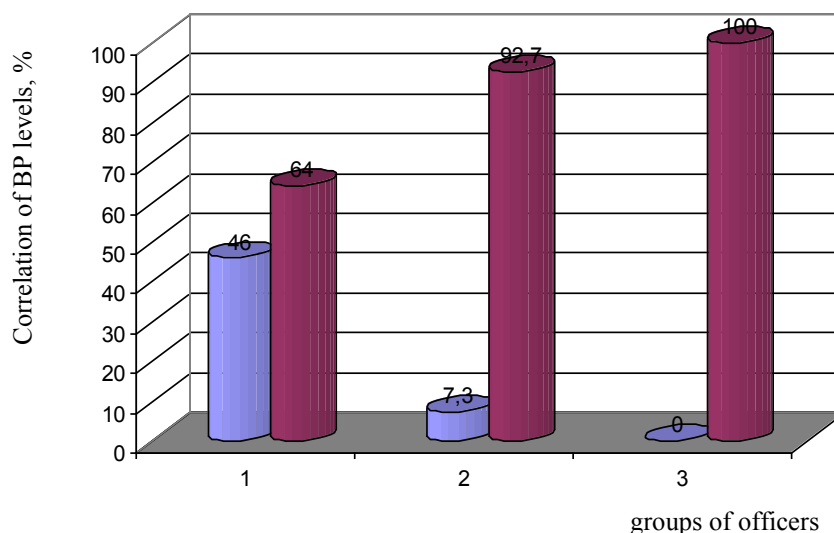


Fig.2. Correlation of BP levels of just taken on Home Affairs service officers at the moment of entering preparatory courses (2008, n=112, y %)

– satisfactory adapting
 – straining of adapting mechanisms

BP increasing after first year of service witnesses about negative dynamics. After first year of service BP of members of the first group worsened by 0.01 conv.un., and of the second – by 0.03 conv.un.; of the third – by 0.01 conv.un. Difference between BP initial and final results is unconfident in all groups ($P > 0.05$).

Summary

Analysis of indicators of physical state and adapting abilities of newly taken on service officers permitted to find out that their level is insufficient for strengthening of health, increasing of workability and ensuring of future service activity with high efficiency level.

It has been established that one of directions of physical training's perfection of newly taken on service officers in the period of primary preparation is foundation of physical training's content, considering their physical state and positions, to which they are assigned.

The prospects of further researches. It is envisaged to develop and ground the program of physical perfection of newly taken on Home Affairs service officers with different physical levels.

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THE USE OF MECHANOTHERAPY MEANS IN BASKETBALL PLAYERS RECOVERY AFTER THE INJURIES OF THE LOWER EXTREMITIES

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Annotation. The aim is to develop methods of physical rehabilitation of basketball players with injuries of the lower extremities. Summarizes the experience of use of mechanical therapy for the recovery of athletes with injuries to the lower extremities. Analyzed the nature of lower extremity injuries and their consequences. The methods of application of mechanical therapy using a simulator developed universal and local fatty clay as a means of physical therapy. It is proved that the method developed by the authors provided a mechanotherapy achieve the required level of mobility in the joints and improve range of body functions. Found that in the process of applying the developed program of rehabilitation basketball players with injuries of the lower extremities most effective in complex physical rehabilitation was value: therapeutic physical training with mechanotherapy + physical therapy with curative mud + therapeutic massage. Technique introduced to the work of medical and health-improving establishments and educational institutions of Ukraine Ministry of Education and Science of Ukraine.

Keywords: physical, rehabilitation, methodology, lower limbs, non-traditional means, mechanical therapy.

Introduction

Statistic data for several recent years confirm the process of constant increasing of traumatism among workable population [1]. The reasons of these phenomena increase and become more various; rather large portion of traumatized is students. In its turn among traumas distortions of supporting motor system (SMS) prevail [1]. From 60% to 72% of the traumatized are from groups of sports perfection in outdoor games. Most of students of Zhytomyr state technological university (ZhSTU) are not professional sportsmen, that is why they are restricted in the time and for mastering and improving of technical game techniques and it results in increasing of traumas' quantity in men basketball teams of ZhSTU. Regarding the problem in more detail way, we can affirm that any disorders of SMS and lower limbs in particular result in restriction of motion abilities for some period of time and cause sportsman's disability in educational and training processes. Rehabilitation of SMS functions without physical rehabilitation means (PR) is impossible. PR of patients with lower limbs abnormalities consists of [1,2,3]:

- Rising of muscles' tonus;
- Elimination of prevention form contractures in joints;
- Restoration of joints' motion activity.

Commonly used methods of treatment do not give always the desired results and that is why development of new efficient and simple methodic is of great urgency.

The research has been fulfilled as per plan of scientific & research works of physical education department of ZhSTU.

Purpose, tasks of the work, material and methods

The purpose of the work is development of efficient methodic of application of mechanic therapy for rehabilitation of sportsmen-basketball players after traumas of lower limbs.

The tasks of the research:

- Generalization of experience of application of mechanic therapy means for rehabilitation of sportsmen with traumas of lower limbs;
- Analysis of character of the above mentioned traumas;
- Development of methodic of application of author's simulator in complex with other mechanic therapy means.

Results of the research

Modern basketball is one of the most trauma-hazard kinds of sports. It is connected with the fact that basketball site is relatively small space for movement of ten players with maximal speed, considering that weight-height data of players are substantially higher than average values. With struggle for ball, spurts, passing under ring, defense play and quick attacks collisions are very frequent. In training process the scope and intensity of applied loads increase. Absence of individual approach to control of loads and training of techniques are the reason of overtiredness and overstrain that result in SMS traumas [1,2,10]. Games in competition period force sportsman to work at extreme of his physical and psychic abilities that also facilitate increasing of traumas' quantity. Besides the mentioned reasons, there are a lot of reasons, which have been studied insufficiently.

In the present researches basketball players, which were traumatized in the period from 2009 to 2011, took part. Statistic analysis of character, quantity and complexity of traumas of basketball players' of different roles lower limbs, which was fulfilled by the authors for this period, confirmed again the need in development of original PR methodic for the above mentioned contingent.

The character of the registered traumas, videlicet: close fracture of ankle joint, sprain of ligaments, shins', coccyx's and sacrum's fractures, traumas of meniscus, - implies intensive application of mechanic therapy means in PR program for the above enumerated cases.

Traumas of basketball players' supporting motor system are 70.09% of all pathologies. Among them traumas of meniscus, cross-like and side ligaments of knee joint and combined traumas of capsular-ligament apparatus are the most frequent.

54.93% of all pathologies are cute traumas of knee joints.

Analysis of the character of basketball players' traumas permitted to find out much bigger quantity of heavy traumas of supporting motor system. They are: fractures of long tubular bones and dislocations. Fractures, mainly, are located in zone of forearm, they appear with fallings down, which are caused, like in other kinds of sports, by using (often intentionally) of prohibited techniques. Dislocations usually are met in zone of hand fingers and are caused with ball's taking off in episodes of under backboard game. Traumas of м'язонозичного apparatus (4, 72% of all supporting motor system' pathologies) are found in zone of lower limbs. The most frequently Achilles tendon ruptures are diagnosed as well as hypodermic rupture of quadriceps muscle of thigh. Traumas of muscle are rather seldom and usually are found in zone of shin's muscle.

Analysis of basketball players' traumas permitted to find out comparatively bigger quantity of SMS heavy traumas. Fractures of long tubular bones and dislocations are among them. The most frequently Achilles tendon ruptures are diagnosed as well as ruptures of quadriceps muscle of thigh. Traumas of muscle are rather seldom and usually are found in zone of shin's muscle.

For PR of basketball players with lower limbs' traumas the authors developed complex program, in which significant place was taken by mechanic therapy. Mechanic therapy permits to direct and to dose movements. The purpose of exercises is restoration of joints' mobility, elimination of contractures, strengthening of muscles increasing of blood and lymph circulations' intensity, improvement of local influence on tissues, increasing of muscles' and ligaments' elasticity, restoration of joints' natural functions. Action of different types' mechanic therapy apparatuses, which are used for this purpose, is based on bio-mechanical peculiarities of joints' motions. Most of apparatuses are used from early post immobilizing period: apparatuses of pendulum type - for development of joint mobility, apparatuses of pulley type - for strengthening of muscles. Apparatuses, which use principle of lever, or simulators for strengthening of different muscles' groups and improvement of CVS are usually used on the stage of sanatorium rehabilitation. The developed by one of the authors universal mechanic-therapeutic simulator (MTTA), to which patent МПК А 61H23/00, number 86320, dated 10.04 2009 was issued, is suitable for application from the first days of physical rehabilitation. Experimental PR program for sportsmen after traumas of lower limbs envisaged practicing of below described form of trainings and physical exercises.

Individual PR trainings for the mentioned contingent were the main form of trainings during all process of treatment. Besides trainings on MTTA and other simulators, individual TPC trainings included gymnastic, general trainings and breathing exercises. Duration of such trainings depended on the state of a patient and hid physical level. Trainings were conducted by the authors or by hospital instructor twice a day and took 20-30 minutes at the beginning of course and increased their duration up to 60 minutes and more. Duration of trainings increased with improvement of patient's state and if positive dynamic of motion indicators was observed.

It is known that complex application of all kinds of physical exercises, based on bio-mechanical laws and observance of hygienic norms, improve several times specific influence of physical exercises on patient's organism. On the stage of sportsmen' recovering the authors used available at ZhSTU domestic serial simulators [4,6,7,8].

Exercises on simulators were divided into 3-4 series, which were trained 3-4 times a week. Collection of simulators was changed every week. For example in main group the first series of exercises was fulfilled on simulators

Grace", „Health ” and „Rhythm -2"; on Thursday – on „Disk of health ", „Pulley expander ” and MTTA.

Next week: on Monday exercises were fulfilled on simulators „Collibris ", „Caucasian ” and „Health "; on Wednesday – on „Grace ", MTTA and „Disk of health "; on Friday – on „Roller ", „Pulley expander ” and „Rhythm - 2".

The third week: on Monday - На третій тиждень: у понеділок – „Collibris ", „Grace "; on Tuesday - „Health ” and MTTA; on Thursday - „Pulley expander ” and „Caucasian "; on Friday - „Roller ” and „Collibris ”.

All trainings and procedures, which were applied by the authors of the present article, were carried out under strict medical control. Application of the developed methodic positively influenced on efficiency of physical rehabilitation of sportsmen that is witnessed by the results, obtained in main pedagogic experiment. The authors recommend the most optimal intensity of MT procedures during periods with observance of general regulations of procedures (see table 1).

Table 1

Methodic of mechanic therapy for complex treatment of basketball players after traumas of lower limbs

Period	Order of procedures	Duration of procedure	Load, g	Purpose of procedure	Joint	Number of repetitions, duration of procedure	Notes

First	1-a	4	1000	Improvement of joints' mobility	Any of injured	2 x 2	For patients with weakened cardiovascular system
	2-a	6	2000			3 x 2	
	3-a	9	2000			3 x 3	
	4-a	6	2000			2 x 3	
	5-a	8	2000			2 x 4	
Second	6-a	10	3000			2 x 5	For all patients
	7-a	15	3000			3 x 5	
	8-a	9	1000			3 x 3	
	9-a	10	1000			2 x 5	
	10-a	9	4000			3 x 3	
	11-a	10	4000	2 x 5			
	12-a	10	5000	2 x 5	For patient with strong muscles		
	13-a	15	5000	3 x 5			
	14-a	18	5000	2 x 6			

Procedure of mechanic therapy must be preceded by different methods of physical treatment (paraffin, ozokerite applications, therapeutic gymnastic, electrophoresis and so on). Depending on conditions of fulfillment at the end of procedure manual or vibration segmental massage shall be carried out [1,10]

The rate of forced oscillations of apparatus's load pendulum shall be in average 60 oscillations per minute (± 3 oscillations per 1 minute l xb.).

Summary

In connection with new interpretation of pathogenesis of different loco-motor apparatus's diseases and appearing of new methods of conservative and surgical treatment of orthopedic and traumatized patients there appeared a need in further development and specifying of appropriate treatment methodic with the help of physical exercises, including mechanic therapy, as a method of special influence in cases of supporting and motion organs' traumas.

Duration and methodic of mechanic therapy with different SMS traumas require scientific foundation in strict compliance with dynamics of reparative processes and considering secondary changes in joints and muscles, which limit motion function.

Exercises on apparatuses of mechanic therapy are used as supplementary influence on separate links of SMS for development of motion function and muscles' strength.

The program, developed by the authors, with mechanic therapy and bolus therapy (clay treatment) in its base, influenced positively on efficiency of physical rehabilitation of basketball players with traumatized low limbs. Application of the authors' methodic resulted in shortening of physical rehabilitation period by 1-3 weeks for all patients of main group.

Owing to implementation of experimental methodic of physical rehabilitation, with complex approach to treatment in its base, we obtained new results of sportsmen's with traumatized lower limbs physical rehabilitation, videlicet:

- One of peculiarities of the offered methodic was the fact that the authors carried out preliminary analysis of traumas of lower limbs and determined rehabilitation measures;

- The authors developed methodic of application of mechanic therapy with the help of newly designed simulator and local fat clay as a method of physio-therapy;

- The developed by the authors methodic of mechanic therapy ensured achievement of appropriate joints' mobility and improvement of a number of organism's functions. These recommendations were tested in rooms of therapeutic physical culture and at places of some patients' residence with individual using it by them.

In the process of developed PR program by basketball players with lower limbs traumas it was established that in the complex of physical rehabilitation the most effective was correlation: therapeutic physical culture with mechanic therapy + clay treatment + therapeutic massage. With such correlation 77.7% of the traumatized sportsmen reached complete restoration of lower limbs' functions.

Traumatized basketball players, who trained by the developed by the authors program, restored stereotype of correct walking quicker, lost demand in auxiliary supporting means, that shortened period of returning to domestic and sports activity. Efficiency of the methodic was tested in medical and rehabilitation establishments, where efficiency and rationality of rehabilitation were proved; besides, different variants of mechanic therapy procedures were offered in their possible combination with other physio-therapeutic procedures for the given category of traumatized. The developed by the authors program can be applied of PR of sportsmen with traumas of lower limbs, which practice other kinds of sports.

Further researches imply profound study of structures and principles of action of new mechanic therapeutic apparatuses, composing of exercises' complexes for their using in PR program for traumatized basketball player of different roles, different physical level and different qualification.

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FEATURES OF ORGANIZATION AND MAINTENANCE OF PHYSICAL EDUCATION OF STUDENTS OF HIGHER PEDAGOGICAL EDUCATIONAL ESTABLISHMENTS

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Annotation. A purpose of work is an analysis of data of modern scientific literature for organizations and maintenances of physical education of students of higher educational establishments. An analysis over of 273 publications of domestic and foreign scientists and researchers is brought. Estimation over of positions of conception of development of students' physical internals, co-ordination and co-ordinating capabilities are brought on employments on physical education. Data of modern scientific literature are considered on development and perfection of motive internals and co-ordinating capabilities of modern youth. The problems of health of modern young man level are shown. It is well-proven that the professional capabilities of modern teacher are straight related to good physical preparedness. The further ways of development of motive capabilities of young people are certain. Finding allows establishing that is now accumulated there is enough material which allows stepping over through the traditional aspects of pedagogical process of mastering the man of motive abilities and skills. Untraditional ways are shown to the process of physical education of students of pedagogical higher educational establishments.

Keywords: students, teachers, specialized, physical education, professionally, applied, preparation.

Introduction

For many years the problem of improvement of students' physical education has been attracting attention of specialists [2, 4, 15, 20]. Higher educational establishments are completed mainly with boys and girls, who have just left school. Experience shows that physical; level of most of applicants is still low, there is a trend to reduction of level of comprehensive physical training [3, 6, 11]. Analysis of literature sources witnesses about worsening of young generation's physical development [6, 8, 16], about progressing of motion deficit [7, 16, 22], that result in worsening of students' health [14, 20].

The task of rising generation's physical education efficiency's improvement has been being and is being the most important for recent decades. In theory and in practice the problems of differentiating, individualization and profiling of teaching, integration of education's content has been actively developed, idea of humanization is implemented [7]. Upgrading of educational system in our country has also touched students' physical education at HEEs.

In specialists' opinion it is necessary to reject rigid normative, mandatory and authoritarian character of trainings, adjusting to outside standard [2], it is necessary to form student's interest to a subject, to awake interest for building of healthy body, for formation of own health. For decades we have been seeing a gap between physical culture and human general culture, human spiritual principles. With formation of students' physical culture, its motion component was accentuated to the prejudice of intellectual and social-psychological aspects [14].

The subject of the present work complies with orientation of scientific program of physical education faculty of Chernigiv national pedagogical university, named after T.G. Shevchenko, and it is included in university subject "Didactic principles of formation of motion function of persons, who practice physical education and sports" (state registration No. 0108U000854, dt. February 19th, 2008). The work has been fulfilled as per orientation of state-financed subject "Methodic principles of professional preparation of future physical education instructors for formation of modern youth's healthy life style by them" (state registration No. 0110U000020, dt. January 29th, 2010).

Purpose, tasks of the work, material and methods

The purpose of the work is analysis of data of up-to-date scientific literature on organization and content of HEE students' physical education.

Results of the research

For the first time strategy of culturologic education was determined by V.K. Balsevich, M.Ya. Vilianskiy, A.P. Matveyev. In 1992 L.I. Lubyшева formulated the concept of physical education as specific process of formation of a person's physical culture.

L.I. Lubyшева [15] developed and gave scientific foundation to concept of students' physical education. The essence of this concept implies the following statements. The purpose of physical culture at HEE is formation of student's physical culture as systemic and integral quality of a personality, as integral component of general culture of future specialist. The content of physical culture is in harmonious unity of three components: world vision, intellect and body. As per this concept, formation of student's physical culture shall include the following directions: breeding of body culture, intellectual, and social-psychological education.

In legislation of Ukraine about physical culture and sports, physical culture is represented in higher educational establishments as an academic discipline and rather important component of integral development of a personality. To the largest extent, physical culture realizes its educational and developing functions in purposeful pedagogic process of physical education [22].

On the base of state standards of higher professional education, HEEs determine the forms of physical culture training independently, considering the content of basic academic program of physical education.

The purpose of students' physical education must be formation of personality's physical culture. In conditions of students' free choice of activity and independent strategy of general culture's education the material of Program includes two interconnected components: compulsory, or basic, which ensures formation of person's physical culture foundations, and variable, which is grounded on the basic one and supplements it, and which considers individuality of every student, his motives, interests, demands. On this foundation formation of different by orientation and content optional courses, including the author's, integrating and other, is provided.

One of main tasks of physical education at HEE is breeding of habits of independent motion activity.

Practical training is the basis of physical education at HEE. For most of students, physical training classes are the main and often the only form of physical culture. Professional activity of physical education instructor is the last opportunity to influence on inadequate physical development, on low physical level and motion-coordination abilities of students in the frames of state educational system [15].

Prevailing of female contingent is a specific feature of pedagogical HEE. That is why, searching of new means and methods of physical culture training, which would facilitate rising of physical level and health of female students, is an urgent task.

The process of female students' training by all parts of physical education program stipulates comprehensive physical preparedness, optimal level of motion abilities' complex development. Successful solution of these tasks can be realized only with detail consideration of students' typological features, their initial physical level (endurance, strength, quickness, flexibility), technical preparedness and their interconnections [2]. For boys and girls instructors shall apply different methodic of physical education trainings.

Professor V.S. Farfel [19] notes in his works, that owing to reduction of motion activity of student's age girls, to some extent functions of motion analyzer also reduce. As per data of numerous researches in this age significant increase of body weight, mainly owing to not active adipose tissue. Increase of weight and comparatively insufficient motion activity of student's age girls result in reduction of their general preparedness [11].

Unlike man's organism, woman's organism has less strong bone system, less general development of body muscles, wider pelvic girdle and stronger muscles of pelvic floor. The difference in constitution shall be reflected in orientation of physical action.

S.A. Yagunova, L.M. Startseva [23] note that women manifest exclusive flexibility when carrying out different motions: high flexibility of all backbone sections, owing to wider than man's inter-vertebral fissures and better stretching and elasticity of connecting tissue, cartilages and joints; large angle of pelvic girdle and its high mobility; large amplitude hip joints' mobility, which depends on both: position of hip head and significant stretching characteristic of connecting system; mobility of symphysis pubis, that can be preserved for long time due to presence of cartilage interlayer in this place.

Functioning of cardio-vascular, respiratory, nervous and other system also have a number of characteristic for woman's organism peculiarities. All these is reflected in longer period of organism's recreation after physical load and quicker losing of training state with stopping of physical trainings.

Functional capacities of blood circulation and respiratory systems of girls and women are much lower than of boys and men, that is why loads for girls and women shall be less by scope and increase during longer period of time.

V.I. Ilyinich [22] recommends to warm up girl students more carefully and for longer period of time; when carrying out power and quickness exercises "more gradually rise training load, more smoothly bring it to optimal level" than it is necessary at trainings of boy-students. For women's health development of prelum abdominale, back and pelvic floor muscles, is of great importance.

In the opinion of V.M. Mikhaleny [20] girl students' training shall be built in the following way: preparatory part includes specific elements of general development – execution of exercise, which are required for childbearing functions of woman, development of plastique and gracefulness; the main part includes exercises, which are common for all group, and independent execution of individual tasks during 15-20 minutes, considering both individual menstrual cycle and general regularities of organism and motion abilities of girl students as per phases of their ovulatory cycles.

Numerous researches, which were carried out in different regions of Ukraine, confirm that most of girls, who enter HEEs, have low physical and health levels as well as weak interest to physical culture and sports activity [1, 3, 6, 8, 16]. This, naturally, influences on girl students' attitude to discipline "Physical education". As per medical examinations' results, which were conducted in Kyiv university, named after Borys Grinchenko and in Chernigiv national pedagogical university, named after T.G. Shevchenko (2005-2008) 46% of students have different spine curvatures and posture cartilages abnormalities, with it 80% of them are girls.

Many diseases of adult age origin from mother's womb, that is why, the health of nation, to large extent, depends on the health of to-day's girls. As far as in 1891, on the pages of magazine "Bulletin of education", doctor Clement Dukes attracted attention to the fact that "parents and teachers shall understand the truth and, at the same time, accept as their task inspiration of every girl that she is morally obliged to desire to be physically sound and healthy, energetic and graceful and naturally (not artificially) slender and nice-looking". And it is absolutely clear that for such perfection of body undoubtedly physical exercises are required [8].

Every woman wishes to be healthy and beautiful. But health and beauty are not the gift of nature, they are usually result of long-term work on perfection of own organism. With it, strengthening of health is impossible without motions,

which shall be oriented on activation of internals' functioning and development of human supporting motor system [17, 18]. In the same way, beauty means not only perfect external form of woman's body, but it requires high coordination plasticity, and gracefulness of movements. In our opinion, the task of physical education instructor is to teach girls to freely and gracefully move their bodies and execute all movements as purposeful as possible, to help in formation of correct posture, beautiful step and expressive movements.

In all publications of the end of 19th century, which were devoted to physical education of women, there is a certain provision about the fact that physical exercises must be carried out not to the prejudice of femininity [8]. Traditionally, curriculums of girls' educational establishments included dances and at the beginning of 20th century they were supplemented by gymnastics. It was noted that physical education of women shall differ from physical education of men. Training girls, Rosalia Reber [9] put on the first place team competitive game as one of the best means of character's development, training of physical abilities and skills. Rhythmic exercises were offered as a supplement or correction means, as far as in them woman find a response to her instinctive desire of smoothness, beauty and grace.

Chempetiet de Ribe, senior instructor of gymnastics in Sweden gymnastic college, in his book "ABC of physical education of women" wrote that physical education of girls and women shall consist of natural movements, which, first of all, permit to "freely breathe", and compensatory movements, which correct abnormalities, caused by conditions of modern civilized life (including constitution abnormalities, especially of posture). Rhythmic movements shall be related to correcting and natural movements, with understanding of their aesthetic value.

In the works by V.V. Gorinevskiy, great attention is paid to women's gymnastics and especially motor functions. He says that "we have no foundations to change motor functions, intrinsic to women", and that "in carrying out physical culture exercises by women sufficient place shall be given to smooth and circular movements". V.V. Gorinevskiy wrote [21] that for most of women it is necessary to provide opportunity to manifest their temper and it is possible thorough dance; if women are not sufficiently prepared for this then elements of dances (dance steps, gymnastic dances) shall be trained even at the beginning stages of physical training.

In the opinion of many scientists involving of women in physical activity and sports is much more difficult than in any other activity. Women prefer physical activity, considering its comprehensive influence on organism and way of life. Though, only certain kinds of physical activity are regarded by them as sex-identical and are compatible with their images of femininity, woman's body and figure [4].

Known Polish researcher of physical education and sports problems V. Starosta carried out questioning of students of two physical education colleges in Poland. Most of the tested thought that there are kinds of sports, which must not be practiced by women and more over by girls. Their idea they grounded by their care of women, thinking that practicing of men's kinds of sports can influence negatively on woman's and especially on girl's organism, result in losing of slenderness and femininity. Femininity is specially cared by women of age up to 25 years old (94.2%). Then, with years, women's care of femininity reduces [12].

Specialists in the field of physical education attract attention to complications in effective fulfillment of exercises for development of motion skills, which appear at training of girls and women. One of the reasons of it, is, as it is considered, the absence of emotional acceptance of loads owing to their monotony or durable repetitions [1].

T.A. Yurimiae with group of scientists offer to consider comprehensive training with accent on increasing of aerobic workability and normalization of body weight as leading aspect in girl students' physical training [13].

In the opinion of I.M. Okka [10], with planning of complexes it is necessary to consider quick response of woman's organism to physical load, especially responses of psychic and posture. He recommends application of complexes of gymnastic exercises under accompaniment of finished musical composition.

O.I. Panin [16] thinks that activation of girl students' physical education's process is possible only with the help of more effective and rational methods, coming from conditions of state program for HEE and available material base. He points at the necessity to completely use first of all methodic techniques in the frame of compulsory academic hours of HEE program, The main task in solution of the problem of HEE girl students' physical education' improvement is not the form (if they will specialize in a certain kind of sports or not) but it is more effective method.

As a results of analysis of materials' on the problem of students' physical level and physical preparedness determination scientists [6] worked out the following recommendations for improvement of girl-students' physical education process:

- pay special attention to senior girl-students;
- recommend the girls exercises for strength development and to less extent exercises for quickness and power quickness abilities. Considering specificity of power tests for girls, power exercises shall be mostly oriented on development of prelum abdominale muscles. In order to achieve simultaneous development of strength, quickness and power-quickness abilities, it seems to be optimal to use programs of fitness, aerobics and allied kinds of sports, which are popular among young women.

Aesthetic education is an integral component of comprehensive harmonious development of modern person, who is able to master cultural values, built life by the lows of beauty. That is why it must be a compulsory component of girl-students physical education. Aesthetic perception of surrounding phenomena is characterized by its reflection in emotional-feeling sphere. Physical culture provides large opportunities for aesthetics.

Taking care of aesthetic education at HEEs, some instructors use light, rhythmic, sometimes classic music, in warming up part and for fulfillment of training exercises.

Experience of instructors, who, in the course of physical exercises' fulfillment, characterize their aesthetic beauty, plasticity and harmony of body's beauty development in the process of physical training, is rather effective in the sense of including aesthetic education tasks into physical culture [18].

Age of 17-30 years old is a period of prosperity of a person's motor function that is witnessed by the results, which are showed by sportsmen in different kinds of sports. Good health and high engagement of people (including studying at higher educational establishments) is also characteristic for this age. It results in the fact that many of people of this age do not understand their demands in regular physical trainings for preservation and maintenance of their motion activity.

The main task of physical culture instructor is explanation, convincing of girl-student of the idea that motion activity is the best method of prevention from diseases. Motion activity is the main factor of such convincing [20].

With building of training process, selecting of means and methods it is necessary to consider girl-students' motivation for trainings.

Summary

Thus, analysis of special literature showed that in the process of girl-students' physical education, specialists recommend to apply differentiated approach. At training of girls it is necessary to use specific means and methods, which are different from those that are used at training of boys; it is necessary to consider physiological demands of women's organism. Physical training shall be oriented on development of strength and coordination abilities, increasing of aerobic workability and normalization of body weight; for this purpose it is recommended to apply, as one of the variants, complexes with current system of exercises' combination under accompaniment of musical composition. For emotional perception of loads, formation of motivation for independent trainings it is recommended to use most popular among youth modern health-improving programs in the process of girl-students' physical education. However, among scientific researches and works we did not find recommendations on purposeful development and improvement of coordination abilities of girl-students in the process of their academic physical education, as one of the most important directions of formation of body culture.

The prospects of further researches in this direction. It is stipulated that on the base of experimental data new ways of coordination's and coordination abilities development will be offered in the sphere of HEEs students' physical education.

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PHYSICAL IMPROVEMENT AND ITS IMPACT ON THE HEALTH OF STUDENTS

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Annotation. The directions of physical improvement in personal and individual approach and its impact on the health of students. The definitions of the concept of physical perfection and its main components: strength, speed, endurance, agility, flexibility. Special attention is paid to the importance of physical perfection as part of positive self-identity. Outlines the theory of the acquisition of physical improvement in the availability of a clear human motivation. It is noted that physical perfection is in need of motivation on the part of the student, the proper selection of a complex exercise and may be based only on a personal and individual approach based on the physical abilities of each student. Show the direction of their own physical fitness improvement during the self-study. It is shown that promoting the harmonious development of all-round, avoiding harmful habits, improve mental and physical performance and confidence in their own ability to significantly change the person's self esteem.

Keywords: physical, improvement, culture, strength, speed, agility, flexibility and endurance.

Introduction

Physical culture of students is an integral component of higher education. Questioning of students by Ministry of education gave deplorable results concerning their physical development and systematic character of practicing sports. Concerning first year students of higher educational establishments of Ukraine it appeared that 54% of respondents did not attend physical culture classes at school during last year. Only one half of them were on clinic books in connection with chronic diseases. With analysis of students questioning's results we received an interesting picture concerning students' attitude to own health. It was found that all respondents showed understanding of importance of healthy life style, but alongside with it 105 were tobacco smokers and only 9% practiced sports regularly. It should be also noted that 25% marked that their close relatives had cardio-vascular diseases. So, primary information about medical-social status of students witnesses about the absence of formed demand in physical perfection among most of respondents.

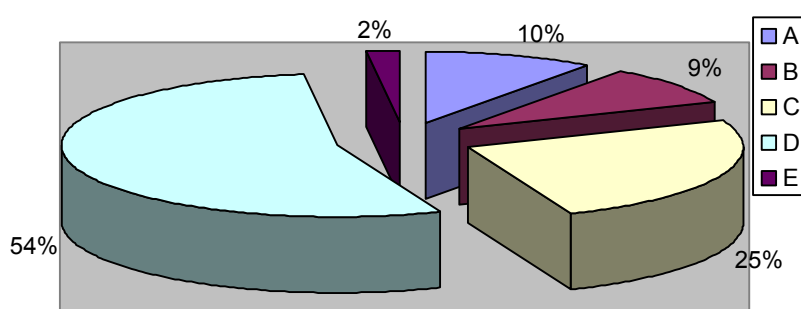


Fig. 1. Primary information about medical-social status of students

A=10% - tobacco smoking, B=9% - regularly practice sports, C=25% - diseases of cardio-vascular system of close relatives, D=54% - did not attend physical culture classes at school during last year of study, E=2% - did not answer question.

Recent years the problem of students' motion activity has become rather acute for specialists of Ukraine, as far as the quantity of diseases, resulted from hyperdynamia, has significantly increased. As per the data of specialists [2, 9-15] in different students' age periods their aims and motives for physical activity are different. In general, students' motives for training of health improving activity (HIA) differ from the motives of other age groups [3]. Physical perfection requires much strength, loads and endurance that is why most students chose simpler and unfortunately less effective for physical perfection exercises [8; c. 42-44].

The work has been fulfilled as per plan of scientific & research works of Kremenchug national university, named after Mykhaylo Ostrogradskiy.

Purpose, tasks of the work, material and methods

The purpose of the work is analysis of physical perfection in personal and individual approach and its influence on students' health.

The methods and organization of the research are study and analysis of literature sources.

Results of the research

Physical perfection is characterized by the state of health and comprehensive development of a person, to which we relate the state of physical abilities' development and formation of motion skills, general level of workability, functional changes of organism and its different systems and organs, mastering of special system of knowledge:

- Obtaining of required knowledge and skills by students in the field of physical culture in order to prevent from diseases;
- Increasing of organism's functional abilities with the help of physical culture means;
- Promotion of comprehensive harmonious development, giving up harmful habits, improvement of mental and physical workability with the help of physical self-perfection;
- Formation of physical self-perfection and healthy life style idea.

If a student has purposeful motivation for physical perfection and the sense of responsibility, it will make easier bearing of loads and permit to more effectively mobilize the resources of organism on its way to perfection.

For student's physical perfection it is important to understand the potential of his physical abilities. We call such separate motion bents as strength, quickness, patience, dexterity and flexibility physical abilities. Physical qualities of a person change in the process of growing and development of organism. These changes can be strengthened and accelerated by purposeful trainings and physical exercises, which are carried out at physical culture trainings at higher educational establishments of Ukraine. Only as a result of constant overcoming of training loads and student's wish for self-perfection a number of changes takes place in organism.

Physical perfection can be based only on personal and individual approach, with consideration of physical abilities of every student. At higher educational establishments students' physical perfection has the aim: development of such components as strength, quickness, patience, dexterity and flexibility. Means of strength training are exercises, for execution of which overcoming of different barriers, objects of different mass, such as weights, dumb bell shaped figures, rubber bunch and mass of own body (squatting, chin ups). For training of quickness the method of easy and difficult conditions is used (run downhill, throwing of light subjects). For example, they can be sawing of wood, swimming, heal-and-toe walk, long distance running.

Effective means of dexterity training are quick outdoor games, acrobatics. For training of flexibility active movements are executed, for example, body bending in different sides, different movements, legs' swings, side body bents. Physical abilities are not trained in isolated way, when improving one of them, we influence on other. This transferring of qualities can be both positive and negative.

There are several methods of physical perfection's education. Circular method is the method, whose name origins from the exercise, from which first exercise starts. Its essence is serial fulfillment of technically simple exercises, which are combined in complex as per certain schema. For every kind of exercises a place is assigned, which is called "station". Usually there are 8-10 of such stations. At every of stations one exercise is fulfilled – squatting, chin-ups, pressing ups, bends, jumps. They are fulfilled in several approaches. It should be remembered about such methods of physical strength perfection: quite little volitional effort is enough in order to have an owner of strong and handsome muscles for short period of time. In contrast to all other physical abilities strength quickly responses to training loads. Even short course of athletic gymnastics is sufficient for dressing body in strong and handsome muscular arms. Only one necessary condition: loads must increase gradually and every time it should be feasible. Strength is more than strength, it is also good health. But muscles require constant loads in order to preserve their tonus. Complexes of specially selected exercises will help to strengthen muscles as per abilities of trainees. There are also special exercises, which compensate flat-footedness, improve vestibular apparatus. Different multi axial movement in arms and legs joints maintain and develop anatomical structures in joints and, consequently, normal mobility. The state of joints and backbone influences on smoothness of movements.

For physical perfection and prevention from osteochondrosis it is necessary to insistently repeat movements, which are the most difficult, first with little amplitude and softly, then, increasing their scope and intensity. Individual experience shall be in the basis of dozing of exercises. It is very useful to fulfill several elementary exercises for restoration of joints' mobility in the morning, just after awakening, lying in bed. This first training improves mobility of joints and prevents from their premature aging. Students' training is possible with minimal efforts; for physical perfection it is easily possible to transform own flat in a kind of gym, in which there is everything that is required for gymnastic exercises. Instead of horizontal bar entresol or upper jump can be used.

An excellent exercise for development of arms, back and abdomen's muscles as well as for correcting of posture is chin ups. It is not good to quickly force loads: chin ups such straining of muscles, which first will seem to be excessive for organism, especially for cardio-vascular system. Only gradual fulfillment will be useful. Practically no equipment pressing up requires (from window bar, chair, floor). The lower the rest is located, the most difficult is execution of the exercise. Getting up an appetite for these exercises one will obligatory take care of improvement of equipment: acquire dumb bell shaped figures of different weight, hula hoop, chest expander, rubber or elastic bunch, skipping rope, rings, punching bag. Compulsory condition for home training is clean air.

However, physical perfection of students is possible only if enough leisure time is available. For youth, especially for students, leisure time is of the first priority; in the sphere of leisure a lot of social-cultural demands of personality is realized. Exactly in leisure person shows himself as free individual. However, in real practice opportunities of leisure are used not to full extent. Part of students, evaluating wrongly the role of physical culture knowledge as important factor of preservation and strengthening of health, prefer passive forms of leisure, because they have weak orientation on motion activity, connected with strengthening of health and under-evaluate the role of physical culture as a reason of mental development.

For solution of problem of formation of students' physical perfection in leisure conditions it has been found that sports leisure influences on improvement of educational, physical and physiological qualities of student youth. During academic year students can be trained by typical program: track and fields, outdoor games, rhythmic gymnastics. But for increasing of possibility of physical perfection it is necessary to additionally one time a week to fulfill yoga exercises, breathing exercises, shaping, dances, outdoor games under supervision of an instructor in free time. Physical education with accent on improvement in conditions of leisure increases humanistic and cultural values of students' physical culture.

The prospects of physical perfection are possible under the availability of theories of its motivation. By the data of V. Ztylkin [4], there are three theories of motivation of perfection: theory of necessity of perfection, theory of attribution and theory of achievement of target. Theory of necessity in achievement is a combined model, which considers both personal and situational factors as the most important indicators of human behavior. According to this theory people, who reach high achievements, strive to participate in competitions more often. An on the contrary, those, who do not reach high successes in sports, do not have desire to participate in competitions, in which evaluation of society is the main factor. The second theory points to the level, at which the person, who practice sports, understands his results, to what extent it influences on their further expectation and emotional responses that, in its turn, influences on motivation for achievement of perfection. So, prospects for physical perfection exist, if students have motivation for such type of trainings.

Summary

Having summarizing the above described it is worth to note that physical perfection requires, first of all, student's motivation and, secondly, correct selection of complex of exercises, which are oriented on comprehensive development of his physical qualities: strength, quickness, flexibility, endurance, dexterity. It is important to remember that physical perfection can be based only on personal and individual approach, with consideration of physical abilities of every student. Besides, physical abilities are not bred in isolated way; improving one of them, we influence on other and this transferring of qualities can be both negative and positive. That is why physical perfection can be practiced only up to certain indicators. To day, several methods of physical perfection's breeding are known, that is why correctly selected method will facilitate its efficiency. Every student shall independently take care of his physical form's perfection, because with its help promotion of comprehensive harmonious development progresses, denial of harmful habits, improvement of mental and physical workability and assurance in own abilities occur that, in its turn, substantially changes human self evaluation.

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THE EFFECTIVENESS OF THE PILOT PROGRAM OF DIFFERENTIATED CORRECTION OF PSYCHO-PHYSICAL CONDITION OF STUDENTS IN PHYSICAL EDUCATION

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Annotation. Defined and justified the designing an algorithm for the formation and operation of the content of physical education students. The algorithm is aimed at correcting the mental and physical condition of students in the relevant classes in high school. In the experiment involved a group of boys and girls of 20 people 17-18 years of age. The program provides theoretical and methodological, practical training, and certain types of control. The basis of the program is a differentiated approach to students with the features of display, speakers, self-determination, the relationship between the change in indicators of mental and physical state in the first year of study. Project operations are focused on meeting the requirements of the principles of physical education, the provisions of the public education on maintaining a physically active lifestyle. It is recommended for theoretical and methodological training of the use of modern information tools. Showing the direction of correction of psycho-physical condition of students.

Keywords: student, freshman, psychological and physical condition, physical education, differentiation, maintenance, somatotype.

Introduction

One of the most important tasks of physical education in higher education system is provision of appropriated level of students' psycho-physical state, as far as at the present stage its level is rather low or lower than middle (M.V. Dutchak, 2009; M.A. Negasheva 2005; O.D. Plakhtiy, 2012). In the first year of studying an additional, not less important task is reduction of negative influence and rational adapting of organism to stress-creating conditions, which occur in educational process, domestic and other kinds of students' cognitive activity [3; 8], (S.S. Izbash 2004; A.V. Lototenko, 2008). However, researches on solution of this problem on the base of differentiated approach to students in the process of physical education and using the signs, which, in complex, reflect individual features of every student, are absent.

Successful solution of the above mentioned tasks is possible only with improvement of existing and creation of new technologies of psychophysical state correction of higher educational establishments (HEE) students (F.Z. Meyerson, 1991; N.B. Pavliuk, 2006). To a certain extent it is connected with the fact that in addition to the marked out problems there exists one more, videlicet, the last requirement to HEE curricula, which stipulates reduction of compulsory physical trainings' period up to two years. Such reduction, considering the role of physical trainings in solution of the existing tasks, not only eliminates but on the contrary aggravates the present negative situation [7, 9-11], (O.A. Tomenko, 2012).

Considering the above mentioned, one of perspective branches of the mentioned problem's solution is differentiation of means and methods of physical education on the base of student individual's characteristics, which have biological foundation, which are integral and stable for long period [5]. One of characteristics, which meets these requirements and, comparatively with other, is used in physical education the most frequently, is somatic type (G.A. Yedynak, 2011). At the same time, researches in this direction are rather sparse [1; 2; 6], while researches, directed to correction of psychophysical state of different somatic students' types in the process of physical education, are absent.

The work has been fulfilled as per combined plan of scientific & research works in the sphere of physical culture and sports of Ministry of family, youth and sports of Ukraine for 2006-2010, by subject 3.1.1 "Theoretical methodic and program-normative principles of physical education of pupils and students" (state registration No. 0107U000771).

Purpose, tasks of the work, material and methods

The purpose of the work: to study on theoretical level, how the problem, connected with realization of differentiated approach to first year students, is being solved for improvement of students' psychophysical state in the process of physical education at higher educational establishments.

The methods and organization of the research. In the process of the research the following methods were used: general scientific (analysis, systemizing, generalization), pedagogical (testing, forming experiment), medical-biological (somatic metering and somatic scoping as per methodic by Shtefko-Ostrovskiy, modified by S.S. Darska, spirometry, sphygmomanometry, dynamometry, pulse metering, stepergometry, Martinet-Kushelebskiy's test – M-K), psycho-diagnostic (SAN methodic – methodic and diagnostic of self feeling, activity, mood by Spilberger-Khanin), methods of mathematical statistic.

During one academic year we used the created by us program of differentiated correction of students' psychophysical state (experimental groups (E) of boys and girls of thoracic (T) and muscular (M) somatic types; every group consisted of 20 persons of 17-18 years old age). This program was used in the process of students' physical education side by side with traditional approach to physical education at HEE [4], which did not stipulated consideration of somatically conditioned personalities' peculiarities and dynamic of their psychophysical state's indicators during the first year of study (control groups (K), every group consisting of 20 persons) as well as it did not

envisage the offered algorithm of formation and realization of the program. At the beginning of experiment, girls and boys from EG started studying at Crimea state medical university, named after S.I. Georgiyevskiy.

At the beginning and at the end of academic year we studied functional indicators, the main of which were: vital capacity of lungs (VCL), heart beat frequency (HBF) in relaxed state and after dozed physical load, systolic BP, index of Harvard step-test (IHST) and tests of Martinet-Kushelevskiy (M-K). At the same time we studied indicators of physical preparedness: quickness in tapping test, absolute muscular strength (backbone dynamometry), quickness (20 m run) explosive force of lower limbs (long jump from the spot) and the same of superior limbs (throwing of heavy ball from sitting position), mobility of lumbar backbone section (bending forward from sitting position), coordination in cyclic locomotion (shuttle run 4x9 m), general endurance (Cooper's test) and dynamic power endurance of different muscular groups (bending-unbending of arms in lying position, hand resting on floor, rising in sitting position from position lying on back). Besides, at the beginning of academic year and at the beginning of winter and summer examination periods we studied indicators of emotional processes (self feeling, activity, mood, personal anxiety) in two last periods we studied also indicator of cognitive processes, videlicet, results of every examination period' passing.

Conclusions about effectiveness of the offered program, were made after comparing of the data, which had been obtained from experimental and control groups and the following criteria were used for this purpose: quantity of the researched indicators, the meaning of which substantially changed (within the limits of from $p < 0,05$ to $p < 0,001$) in the course of experiment; quantity of studied indicators, which were the highest values of manifestation at the end of experiment.

Results of the researches

At the beginning of experiment indicators of all researched groups practically did not differ, that was pointed at by values t , which were at the level of $p > 0,05$. By coefficient of variation (V), discrepancies of individual results were within 0–20 %, with the exception of lumbar mobility, that also confirmed the conclusion about homogeneity of formed groups. In other words, the groups, formed for experiment, were homogeneous by sex, somatic type, indicators of psychophysical state and it increased objectivity of conclusions about effectiveness of programs, which were applied for influencing on students' state in the process of physical education.

Quite different data were obtained at the end of experiment. E.g., comparison of *thoracic somatic type girls'* (ET_d) functional indicators at the beginning and at the end of experiment did not witnessed about any negative change of any indicator (see table 1). This conclusion shall be specified, because during academic year systolic BP of girls reduced ($p < 0,05$). But this change was not regarded as negative one, because the value of this indicator of cardiovascular system's functioning remained within existing standards by the end of experiment (from 100 to 140 $ck \cdot min^{-1}$ [16]).

Table 1

Changes of functional and physical preparedness's indicators of thoracic somatic type girls during forming experiment

Indicators	Group	At the beginning		At the end		Change($\bar{x}_1 - \bar{x}_2$)			
		\bar{x}_1	m	\bar{x}_2	m	Absolute value	%	t during year	t at the end
<i>Functional indicators</i>									
VCL, ml	ET _d	2760	102,4	2970	92,3	210,0	7,6	1,52	1,57
	CT _d	2850,0	123,9	2733,0	119,6	-117,5	-4,1	0,68	
HBF in rest, $ck \cdot min^{-1}$	ET _d	76,1	1,3	69,2	1,5	-6,9	9,1	3,48**	2,23*
	CT _d	75,6	1,61	76,1	2,7	0,5	-0,7	0,16	
HBF after dozed load, $ck \cdot min^{-1}$	ET _d	111,7	2,1	100,4	2,2	-11,3	10,1	3,72**	3,93***
	CT _d	112,2	2,52	115,5	3,15	3,3	-2,9	0,82	
Systolic BP, mm. merc. Col.	ET _d	118,6	2,4	110,3	2,1	-8,3	7,0	2,60*	0,48
	CT _d	119,1	2,67	111,8	2,31	-7,3	6,1	2,07*	
IHST, Conc. units	ET _d	73,4	1,4	81,2	1,3	7,8	10,6	4,08***	3,12**
	CT _d	73,1	1,2	75,5	1,28	2,4	3,3	1,37	
Test M-K, % of Initial value	ET _d	48,1	3,01	34,2	2,7	-13,9	28,9	3,44**	4,02***
	CT _d	49,0	3,22	53,2	3,88	4,2	-8,6	0,83	
<i>Physical preparedness indicators</i>									
20 m run, sec.	ET _d	3,6	0,08	3,2	0,04	-0,4	11,1	4,47***	3,12**
	CT _d	3,6	0,06	3,4	0,05	-0,2	4,3	1,98	
Long jump from the spot, cm.	ET _d	163,1	3,2	182,3	3,3	19,3	11,8	4,18***	2,55*
	CT _d	162,0	4,17	169,0	4,05	7,0	4,3	1,2	
Shuttle run 4x9 m, sec.	ET _d	11,5	0,14	10,2	0,11	-1,3	11,3	7,3***	7,37***

	CT _d	11,5	0,12	11,4	0,12	-0,1	0,6	0,42	
Forward bending from sitting position, cm.	ET _d	11,5	1,4	17,2	1,2	5,7	49,6	3,09**	1,33
	CT _d	12,7	1,39	14,8	1,35	2,1	16,1	1,06	
Pressing ups, quantity	ET _d	10,8	0,43	19,8	0,31	8,9	82,4	17,0***	12,4***
	CT _d	11,6	0,51	12,1	0,54	0,5	4,3	0,67	
Rising in sitting position 1 min., quantity	ET _d	38,6	1,4	51,8	1,7	13,3	34,5	5,99***	0,50
	CT _d	39,4	1,73	50,4	2,23	11,0	27,8	3,87**	
Throwing of heavy ball in sitting position, m.	ET _d	5,2	0,17	6,2	0,12	1,0	19,2	4,81***	2,88*
	CT _d	5,3	0,19	5,6	0,17	0,3	3,9	0,81	
Cooper's test, m	ET _d	1895	41,2	2100	30,5	205,0	10,8	4,0***	3,50**
	CT _d	1940,0	49,07	1890,8	51,36	-49,2	-2,5	0,69	
Backbone dynamometry, kg	ET _d	63,1	1,9	74,1	1,85	10,9	17,3	4,15***	2,41**
	CT _d	62,4	2,40	68,0	1,73	5,6	8,9	1,88	
Tapping test, q-ty per 10 sec.	ET _d	63,7	0,2	66	0,06	2,3	3,6	11,02***	9,25***
	CT _d	64,0	0,11	65,0	0,09	1,4	2,2	0,98	

Notes. Here and below confidential difference of two means for connected and not connected samples at level: «*» - $p < 0,05$, «**» - $p < 0,01$, is marked.

«***» - $p < 0,001$

At the same time substantially positive changes were noticed at: HBF in rest, improvement of which was 9,1 %, HBF after dozed load (19,1 %), restoration of workability after such load by M-K test was (28,9 %) ($p < 0,01$) and general physical workability (10,6 %; $p < 0,001$).

Analysis of the same indicators, which were obtained in thoracic somatic type girls' control group (KT_d), showed the absence of substantial changes, that witnessed about manifestation of these indicators on the reached previously level, including systolic BP. The latter, though it increased during academic year by 6,1 % ($p < 0,05$), at the end of the year remained within existing standards (see table 1).

The applied variants of trainings influenced girls' physical preparedness in different ways. E.g., ET_d all researched physical qualities substantially improved, though with different increment: the highest was dynamic power endurance of superior limbs' and abdomen's muscles, increment of which was correspondingly 82,4 % and 34,5 % ($p < 0,001$), lumbar mobility (49,6 %; $p < 0,01$), explosive force of superior limbs' muscles (19,2 %; $p < 0,001$); to some extent less, but also confident – absolute muscular strength (17,3 %), explosive force of lower limbs (11,8 %), coordination in cyclic locomotion (11,3 %), power of quickness (11,1 %), general endurance (10,8 %), the least was quickness, increment of which was 3,6 % ($p < 0,001$).

The results, reached by CT_d were much worse than the above mentioned: with increment by 27,8 % only dynamic endurance of abdomen's muscles was ($p < 0,01$), the rest of indicators remained on previous level.

From the beginning of academic year and up to winter examination period ET_d girls' self feeling practically did not change as far as their evaluation of this emotion in both cases met standards, - it was correspondingly 5,38±0,12 and 5,41±0,1 points ($p > 0,05$), while normal value is 5,4 points (see table 2). KT_d girls decreased their evaluation for the same period by 12,7 % ($p < 0,01$), i.e. from normal value at the beginning to much less value, that witnessed about unsatisfactory self feeling of these girls by the beginning of winter examination period. From the beginning of winter exams and to the beginning of summer examination period evaluations of ET_d and KT_d practically did not change, that witnessed about normal and bad self feeling of the girls of both groups – the value of this indicators was practically 5,42±0,11 and 4,83±0,15 points ($p < 0,01$).

Table 2

Changes of functional and physical preparedness's indicators of muscular somatic type girls during forming experiment

Indicators	Group	At the beginning		At the end		Change ($\bar{x}_1 - \bar{x}_2$)			
		\bar{x}_1	<i>m</i>	\bar{x}_2	<i>m</i>	Absolute value	%	<i>t</i> during year	<i>t</i> at the end
<i>Functional indicators</i>									
VCL, ml	ET _d	2425,6	88,3	3110,3	86,3	684,7	28,2	5,55***	3,74**
	CT _d	2487,5	97,73	2587,5	110,14	100,0	4,0	0,68	
HBF in rest, $\text{ck} \cdot \text{min}^{-1}$	ET _d	74,1	2,06	66,2	1,3	-7,9	10,7	3,24**	3,23**
	CT _d	74,8	1,57	72,7	1,54	-2,1	2,8	0,95	
HBF after dozed load, $\text{ck} \cdot \text{min}^{-1}$	ET _d	107,4	1,9	92,2	1,7	-15,2	14,2	5,96***	4,98***
	CT _d	106,6	2,40	107,3	2,51	0,7	-0,7	0,20	
Systolic BP,	ET _d	117,6	2,2	116,8	3,7	-0,8	0,7	0,19	1,05

mm. merc. Col.	CT _d	116,3	2,36	112,4	1,99	-3,9	3,4	1,26	
IHST, Conc. units	ET _d	75,8	1,4	85,2	1,1	9,4	12,4	5,28***	4,77***
	CT _d	75,3	1,35	77,3	1,24	2,0	2,7	1,09	
Test M-K, % of Initial value	ET _d	44,1	2,6	31,7	1,9	-12,4	28,1	3,85***	4,87***
	CT _d	42,8	2,83	47,9	2,73	5,1	-11,9	1,30	
<i>Physical preparedness indicators</i>									
20 m run, sec.	ET _d	3,4	0,06	3,1	0,04	-0,3	8,8	4,16***	5,55***
	CT _d	3,4	0,05	3,5	0,06	0,1	-2,9	1,36	
Long jump from the spot, cm.	ET _d	161,3	2,1	179,4	1,8	18	11,2	6,54***	8,02***
	CT _d	160,0	2,24	158,0	1,97	-2,0	-1,3	0,67	
Shuttle run 4x9 m, sec.	ET _d	11,5	0,12	10,1	0,07	-1,4	12,2	10,1***	15,2***
	CT _d	11,5	0,11	11,5	0,06	0	0	0	
Forward bending from sitting position, cm.	ET _d	13,4	1,1	19,3	1,21	5,9	44	3,61**	1,94
	CT _d	14,8	1,16	16,0	1,20	1,2	8,1	0,72	
Pressing ups, quantity	ET _d	15,4	0,7	26,3	0,6	10,9	70,8	11,8***	11,2***
	CT _d	16,0	0,66	16,0	0,70	0	0	0	
Rising in sitting position 1 min., quantity	ET _d	41,2	1,8	50	1,3	8,8	21,4	3,96***	2,1*
	CT _d	43,3	1,79	45,0	1,99	1,7	3,9	0,64	
Throwing of heavy ball in sitting position, m.	ET _d	4,9	0,11	5,9	0,1	1,0	20,4	6,73***	4,48***
	CT _d	15,0	0,12	5,2	0,12	0,2	3,2	0,96	
Cooper's test, m	ET _d	1870	35,1	1980	24,2	110	5,9	2,58*	4,26***
	CT _d	1880,3	34,13	1828,3	26,10	-52,0	-2,8	1,21	
Backbone dynamometry, kg	ET _d	61,2	1,3	79,7	1,6	18,5	30,2	9,0***	4,49**
	CT _d	60,4	1,73	67,2	2,28	6,8	11,3	2,38*	
Tapping test, q-ty per 10 sec.	ET _d	65,0	0,17	67	0,11	2,0	3,1	9,88***	6,14***
	CT _d	65,0	0,14	66,0	0,12	0,5	0,8	0,27	

The same peculiarities of manifestation and changes were noticed at other indicator of emotional processes, videlicet, activity: during the first stage ET_d change of evaluation had trend to reduction (reduction by 3,5 %), i.e. from to some extent increased at the beginning to normal ($p>0,05$). CT_d change was also negative, but rather more expressive: from to some extent excessive at the beginning ($5,15\pm 0,1$ points) it decreased by 9,3 %, and by the beginning of winter exams it reached the value of $4,67\pm 0,11$ points that reflected unsatisfactory emotional activity of these girls, ($p<0,01$). During the following stage both at ET_d and CT_d the girls' self evaluation of their activity practically did not change, i.e., values were correspondingly within standards and lower than norm values.

Mood of the girls, as other form of emotional processes, was characterized by the following peculiarities: during the first stage the change of ET_d indicators had trend to reduction, i.e., from to some extent excessive evaluation at the beginning it reduced by 2,7 % ($p>0,05$) and at the beginning of winter exams it was closer to normal value; the change in CT_d was also negative but much more expressive – from to some extent excessive at the beginning ($5,32\pm 0,1$ points), evaluation reduced by 9,8 %, and reached the value of $4,8\pm 0,11$ points, that reflected, to some extent, decreased mood of these girls ($p<0,01$).

During next stage, i.e., between winter and summer exams, the value of this indicators practically did not change: evaluation of ET_d decreased by 0,4 %, and CT_d - by 0,8 % ($p>0,05$); the values at the end witnesses that the first had mood close to normal and the latter – decreased.

Personality's anxiety of girls of both groups was at low level at the beginning of academic year, as far as indicators were less than 30 points: ET_d 's evaluation was $29,4\pm 1,1$ points, CT_d 's - $29,1\pm 1,57$ ($p>0,05$). During first half of year ET_d 's evaluation decreased by 10,2 % ($p<0,05$), but CT_d 's on the contrary increased by 74,9 % ($p<0,001$), that witnessed, correspondingly, increase of personality's anxiety of the girls by the beginning of winter examination period. In the next period further reduction of this indicator was noticed at ET_d (reduction of evaluation by 8,7 %; $p<0,05$) and practically full absence of changes in CT_d (reduction by 2,9 %; $p>0,05$). In other words, at the beginning of summer examination period personality's anxiety of ET_d 's girls remained low as it was earlier, while it remained high, at CT_d .

Concerning data of cognitive processes they had the following peculiarities: average from all evaluations for all stipulated by winter examination period exams was for ET_s - $4,21\pm 0,07$, for CT_d - only $3,91\pm 0,12$ points that, with comparing, is much less ($t=2,16$; $p<0,05$). During summer examination period difference in results preserved, though it was less expressive, comparing with previous exams: in ET_d average result was $4,16\pm 0,09$, in CT_d - $3,95\pm 0,15$ ($t=1,2$; $p<0,03$).

Generalization of the mentioned above data witnessed that from all 22 studied indicators of psychophysical state (6-functional indicators, 10 - indicators of physical preparedness, 6 - indicators of psychic state, 4 of which reflected the forms of emotional processes, 2 - state of cognitive processes by the results of two examination periods)

ET_d girls manifested substantial improvement of 17 with the absence of worsening of other, because VCL, average results of both examination periods, activity and mood remained unchanged during academic year. In both latter cases initial values of indicators witnessed that activity and mood of the girls met standards. Then, absence of changes witnessed that during all period of research, the mood and activity of the girls remained normal and this permit to speak about positive result. In connection with it general quantity of indicators that became improved at ET_d can be considered to be equal to 19 instead of 17, the rest 3 became on initial level.

Concerning CT_d only 2 indicators improved (dynamic power endurance of abdomen's muscles and systolic BP) but they improved with simultaneous worsening of 4 indicators (all reflecting emotional processes) and the rest 16 being on initial level.

By other criteria, videlicet, by the quantity of studied indicators, which were the highest at the end, it was established the following: from all 6 functional indicators of ET_d the value of 4 were much better (on the level from $p < 0,05$ to $p < 0,001$) in comparison with CT_d 's indicators, while the latter were not characterized by advantages in any indicators; VCL and systolic BP indicators practically did not differ (see table 1). From 1- indicators of physical preparedness ET_d 's values of 8 were much better than the same at CT_d , only lumbar mobility and dynamic power endurance of abandon's muscles did not differ. Concerning indicators of emotional processes discrepancies were as follows: at the beginning of winter examination period 3 of 4 indicators (self feeling, activity, personality's anxiety) were better at ET_d than at CT_d , the value of mood indicators – practically were equal; at the beginning of summer exams 3 indicators (self-feeling, mood, personal anxiety) were much better at ET_d , activity did not differ substantially but had better trend, that was expressed by its indicators being closer to standards.

As per indicators of cognitive processes it was established that from 2 indicators in one of them ET_d girls had much better values than CT_d , girls, in the second indicators – achievements were practically equal. In general it should be noted that experimental program facilitated achievements of higher results in 16 from 22 indicators by the girls of thoracic somatic type in comparison with the girls of the same somatic type, who were trained by traditional program of physical education at HEE.

Generalization of data, which were obtained in other groups, participating in experiment, witnessed that in experimental group of thoracic somatic type boys (ET_x) from 6 functional indicators 5 improved, while in control group (CT_x) – no indicators improved; in experimental group of girls (EM_d) and group of boys (EM_x) of muscular somatic type – correspondingly 5 and 6, while in control groups (CM_d and CM_x) – no indicator (see table 2-4).

Table 3

Changes of functional and physical preparedness's indicators of thoracic somatic type boys during forming experiment

Indicators	Group	At the beginning		At the end		Change ($\bar{x}_1 - \bar{x}_2$)			
		\bar{x}_1	<i>m</i>	\bar{x}_2	<i>m</i>	Absolute value	%	<i>t</i> during year	<i>t</i> at the end
<i>Functional indicators</i>									
VCL, ml	ET_x	3490	89,4	3680	79,6	190,0	5,4	1,59	0,82
	CT_x	3565	129,0	3545	143,68	-20,0	-0,6	0,10	
HBF in rest, $ck \cdot min^{-1}$	ET_x	68,3	1,72	63,1	0,8	-5,2	7,6	2,74*	4,84***
	CT_x	67,8	1,69	71,5	1,54	3,7	-5,5	1,62	
HBF after dozed load, $ck \cdot min^{-1}$	ET_x	100,3	2,9	90,1	2,1	-10,2	10,2	2,85*	3,69**
	CT_x	98,2	3,32	107,2	4,13	9,0	-9,2	1,70	
Systolic BP, mm. merc. Col.	ET_x	125,1	1,7	114,2	1,9	-10,9	8,7	4,28***	2,32*
	CT_x	126,2	1,8	121,6	2,56	-4,6	3,6	1,47	
IHST, Conc. units	ET_x	75,6	1,8	89,6	1,44	14,0	18,5	6,07***	4,05***
	CT_x	76,5	1,78	80,1	1,85	3,6	4,7	1,40	
Test M-K, % of Initial value	ET_x	45,1	2,7	37,2	2,9	-7,9	17,5	2,04*	2,37*
	CT_x	44,7	3,04	49,9	4,5	5,2	-11,6	0,96	
<i>Indicators of physical preparedness</i>									
20 m run, sec.	ET_x	2,8	0,03	2,4	0,04	-0,4	14,3	8,0***	8,94***
	CT_x	2,8	0,02	2,8	0,02	0	0	0	
Long jump from the spot, cm.	ET_x	227,5	2,1	243,3	1,4	16,0	7,0	6,26***	3,40**
	CT_x	228,8	3,80	234,8	2,07	6,0	2,6	1,39	
Shuttle run 4x9 m, sec.	ET_x	9,7	0,07	9,1	0,06	-0,6	6,2	6,51***	4,79***
	CT_x	9,7	0,05	9,7	0,11	0	0	0	
Forward bending from sitting position, cm.	ET_x	8,1	1,2	14,1	1,1	6,0	74,1	3,69**	2,63*
	CT_x	8,6	1,11	9,8	1,21	1,2	14,6	0,76	

Pressing ups, quantity	ET _x	32,1	1,5	39,4	0,9	7,3	22,7	4,17***	3,13**
	CT _x	33,6	1,47	34,0	1,47	0,4	1,0	0,17	
Rising in sitting position 1 min., quantity	ET _x	52,1	0,8	65,4	1,4	13,3	25,5	8,25***	2,63*
	CT _x	51,2	1,36	58,5	2,22	7,3	14,3	2,81*	
Throwing of heavy ball in sitting position, m.	ET _x	6,7	0,18	7,9	0,14	1,2	17,9	5,26***	2,05*
	CT _x	6,9	0,22	7,4	0,20	0,5	7,1	1,67	
Cooper's test, m	ET _x	2350	41,4	2574	31,2	224,0	9,5	4,32***	4,09***
	CT _x	2384,0	55,46	2336,5	49,03	-47,5	-2,0	0,64	
Backbone dynamometry, kg	ET _x	110,3	2,4	124,2	1,9	13,9	12,6	4,54***	3,06***
	CT _x	111,6	3,73	115,5	2,12	3,9	3,5	0,92	
Tapping test, q-ty per 10 sec.	ET _x	68,0	0,08	69,0	0,07	1,0	1,5	9,41***	10,9***
	CT _x	69,0	0,06	68,0	0,06	-1,3	-1,9	11,8***	

Table 4

Changes of functional and physical preparedness's indicators of muscular somatic type boys during forming experiment

Indicators	Group	At the beginning		At the end		Change ($\bar{x}_1 - \bar{x}_2$)			
		\bar{x}_1	<i>m</i>	\bar{x}_2	<i>m</i>	Absolute value	%	<i>t</i> during year	<i>t</i> at the end
<i>Functional indicators</i>									
VCL, millilitre	EM _x	3597	86,9	3950	51,5	353,0	9,8	3,49**	2,88*
	CM _x	3682,5	82,66	3665	84,61	-17,5	-0,5	0,15	
HBF in rest, $\text{ck} \cdot \text{min}^{-1}$	EM _x	74,1	1,7	64,4	1,8	-9,7	13,1	3,92***	3,48**
	CM _x	73,2	1,87	74,7	2,35	1,5	-2,0	0,50	
HBF after dozed load, $\text{ck} \cdot \text{min}^{-1}$	EM _x	104,9	2,8	90,2	2,5	-14,7	14,0	3,92***	4,25***
	CM _x	103,6	3,17	108,1	3,39	4,5	-4,3	0,97	
Systolic BP, mm. merc. Col.	EM _x	126,3	2,1	120,2	1,4	-6,1	4,8	2,42*	3,58**
	CM _x	128,2	2,72	129,2	2,09	1,0	-0,8	0,29	
IHST, Conc. units	EM _x	78,2	1,8	88,8	1,5	10,6	13,6	4,52***	4,51***
	CM _x	79,6	1,7	78,9	1,6	-0,7	-0,9	0,30	
Test M-K, % of Initial value	EM _x	42,4	2,1	32,3	2,3	-10,1	23,8	3,24**	2,04*
	CM _x	41,6	2,53	47,6	7,29	6,0	-14,4	0,78	
<i>Indicators of physical preparedness</i>									
20 m run, sec.	EM _x	2,8	0,04	2,7	0,05	-0,1	3,6	1,56	3,71**
	CM _x	2,8	0,02	2,9	0,02	0,1	-3,9	3,8**	
Long jump from the spot, cm.	EM _x	225,4	2,4	234,3	1,7	9,0	4,0	3,04**	3,11**
	CM _x	226,8	2,91	225,3	2,36	-1,5	-0,7	0,40	
Shuttle run 4x9 m, sec.	EM _x	9,5	0,06	9,0	0,04	-0,5	5,3	6,93***	7,44***
	CM _x	9,6	0,04	9,6	0,07	0	0	0	
Forward bending from sitting position, cm.	EM _x	9,7	1,04	14,2	0,5	4,5	46,4	3,90***	3,33**
	CM _x	10,4	1,05	11,0	0,82	0,6	5,8	0,45	
Pressing ups, quantity	EM _x	34,6	1,42	46,5	1,9	11,9	34,4	5,02***	3,09**
	CM _x	35,8	1,60	38,8	1,61	3,0	8,5	1,35	
Rising in sitting position 1 min., quantity	EM _x	52,1	2,1	67,8	1,12	15,7	30,1	6,60***	2,41*
	CM _x	53,3	2,02	60,9	2,63	7,6	14,2	2,28*	
Throwing of heavy ball in sitting position, m.	EM _x	6,9	0,16	7,9	0,11	1,0	14,5	5,15***	2,04*
	CM _x	7,1	0,18	7,5	0,17	0,4	5,2	1,47	
Cooper's test, m	EM _x	2310,0	34,9	2480,0	28,3	170,0	7,4	3,78**	2,68*
	CM _x	2356,3	50,33	2367,5	31,08	11,2	0,5	0,19	
Backbone dynamometry, kg	EM _x	115,6	2,7	135,4	2,1	19,8	17,1	5,79***	6,61***
	CM _x	116,3	3,11	117,7	1,66	1,4	1,2	0,38	
Tapping test, q-ty per 10 sec.	EM _x	69,0	0,15	70,0	0,11	1,0	1,4	5,38***	2,74*
	CM _x	69,0	0,10	69,0	0,13	0	0	0	

From 10 indicators of physical preparedness of ET_d and ET_x all improved, while in CT_d and CT_x – only dynamic power endurance of abdomen's muscles improved with worsening quickness; in EM_d – all indicators, in EM_x – 9 indicators, in CM_d and CM_x – correspondingly absolute muscular strength and dynamic endurance of abdomen's muscles with worsening of quickness strength of the latter.

From 4 indicators of emotional processes' forms in ET_d activity and mood increased, in ET_x personality's anxiety reduced, other indicators remained at normal level; in CT_d and CT_x all indicators worsened; in EM_d and EM_x – they remained at normal level, in CM_d and CM_x – self feeling, personality's anxiety worsened and additionally, mood and activity correspondingly. From 2 indicators of cognitive processes all students showed initial level of indicators, videlicet, from $3,36 \pm 0,11$ to $4,4 \pm 0,06$ points.

As per criteria of indicators' quantity (those, that at the end were the highest) it was established: from 6 functional indicators: in ET_x 5 indicators were better than in CT_x , only VCL did not differ; in EM_d 5 indicators and in EM_x – 6 indicators were better than in CM_d and CM_x .

From 10 indicators of physical preparedness in ET_x all were better than in CT_x ; in EM_d 9 indicators and in EM_x – 8 indicators were better than in CM_d and CM_x , in the first lumbar mobility did not differ and in the latter quickness and explosive force of superior limbs' muscles.

From 4 indicators of emotion processes' forms in ET_x all were better than in CT_x ; in EM_d 2 indicators and in EM_x – 3 indicators were better than in CM_d and CM_x , only indicators of activity and mood of the first did not differ.

From 2 indicators of cognitive processes in ET_x , EM_d , EM_x all were better than in CT_x , CM_d , CM_x .

Summary:

1. At the present stage most of first year students are characterized by unsatisfactory psychophysical state and approaches to realization of physical education, for its correction practically do not consider individual features of students and it does not promote successful solution of the specified problem and therefore requires appropriate researches.

2. The developed as per offered algorithm program of correction of students' psychophysical state, that envisages consideration of complex of their individual features on the base of somatic type, ensures substantial improvement of most of indicators in comparison with application of traditional approach to realization of existing physical education program.

3. Application of the offered program during one academic year permits to achieve much higher indicators of students' psychophysical state than application of traditional approach to physical education that also witnesses effectiveness of the first in solution of the mentioned above task.

The prospects of further researches imply development of system of individual evaluation of students' psychophysical state (i.e. students of different somatic types) as one of preconditions of their stimulation to systematic motion activity in cognitive time, in different forms of physical trainings.

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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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AEROBIC EXERCISE IN REHABILITATION OF WOMEN SECOND COMING OF AGE WITH DIABETES MELLITUS TYPE 2 AT A POLYCLINIC STAGE RESTORATIVE TREATMENT

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Annotation. The aim of the study was to prove the efficacy of therapeutic walk in the rehabilitation of women with type 2 diabetes at a polyclinic stage. We examined 28 women with diabetes in an easy manner (age 50-56 years). In the control group rehabilitation of women was carried out using therapeutic exercises on background diet. In the main - also used a dosage walking. Found that physical rehabilitation helped reduce blood glucose levels and hypercholesterolemia patients, normalization of body weight. The heart rate of patients at rest decreased due to economizing and efficiency of blood circulation. Marked increase in the index of physical condition by Pirogov improved emotional state (based on psychological testing). All patients found an increase in physical performance, according to a sample Master and increased resistance to hypoxia. In the group with the additional use of therapeutic walk, the results of rehabilitation were more pronounced.

Keywords: hypoxia, hyperglycemia, pre-obese, aerobic performance, step - test.

Introduction

Insular diabetes (ID) is one of the most frequent endocrine human diseases, with which all kinds of metabolism become abnormal. It is considered that one of main reasons of cardio-vascular diseases and diabetes' prevalence in modern world is motionless style of life. Disability and mortality of people with insular diabetes is conditioned, mainly, by complications after cardio-vascular diseases (apoplexy, cardiac infarction, affection of peripheral arteries) [1, 5, 12, 13].

For persons with insular diabetes, besides diet, the main method of prophylaxis and treatment is health-improving physical exercises. Muscular activity, changing all blood circulation process, rising metabolism level in cardiac muscle, stimulates coronary circulation [3]. Nevertheless positive influence of physical activity on diabetes has not been studied sufficiently yet. That is why recent years this problem has been attracting attention of both: scientists and doctors-practitioners.

It is known that correctly dosed physical loads positively influence on all kinds of metabolism that permits to reduce sugar level in blood, increase quantity of insular receptors and their sensitivity to insulin, to reduce doses of insulin. Alongside with it it has been established that significant loads can cause sharp increase of glucose in blood. Response of persons with diabetes to physical load to large extent is determined by the degree of compensation of diabetes and by the value of physical load [8].

The most difficult task of rehabilitation is determination of the level of admissible loads from the point of view of their safety. It is necessary to consider the degree of dis-adapting of a patient and influence of medication preparations, which influences on hemo-dynamics [11].

In literature there are data about influence of physical loads' character on metabolic processes in organism's tissues. With quick exercises or those, which are carried out for short time, anaerobic processes prevail in muscles, which results in ketoacidosis and very insignificantly influence on glucose level in blood. Exercises, which involve large muscular groups in actions at slow or moderate rate, with significant quantity of repetitions, cause increasing of oxidation processes in muscles, owing to which not only glycogen is consumed but glucose from blood as well. Such kind of muscular activity is more suitable for patients with insular diabetes, because increase glucose consumption by muscles and its burning result in reduction of hyperglycemia. I.B. Temkin offered and clinically tested differentiated method of therapeutic gymnastic for patients with insular diabetes, depending on their age, complexity of disease and accompanying ailments [7, 10].

Success in rehabilitation of patients with insular diabetes depends on complex of the applied means, among which different forms of therapeutic physical exercises prevail in combination with physio-therapeutic methods and massage.

The research was carried out as per plan of scientific & research works of Tavrisheskiy national university, named after V.V. Vernadskiy.

Purpose, tasks of the work, material and methods

The purpose of the research is studying of efficiency of different rehabilitation programs for patients with insular diabetes of 2nd type at outpatient stage.

The tasks of the work:

1. To study dynamics of anthropometric, functional, bio-chemical and psychological indicators of patients of 2 groups under influence of rehabilitation course.
2. To evaluate rehabilitation potential of women of main and control groups before rehabilitation course and after it.
3. To compare effectiveness of rehabilitation programs in 2 groups.

The methods of the research.

The research was carried out on the base of 3-rd polyclinic complex of Simferopol, during 1 month. 28 women of 50-56 years old, with insular diabetes of 2nd type without accompanying pathologies, took part in the research

All patients were divided into 2 groups: main group (No1) and control (No.2). The groups were characterized by homogeneity of the studied indicators. Both groups received the same food and were treated by the same procedures of therapeutic gymnastics (TG). In main group additionally rehabilitation measures, with using of dose walking, were conducted.

The patients were observed during 30 days. Observation implied diagnosing of functional indicators of cardio-respiratory system, its response to physical load, control of body mass index, bio-chemical indicators of blood and psychological testing. Evaluation of physical level (IPL) was carried out by Ye.A. Pirogova [9]. For evaluation of tolerance to physical loads we used two-step test (Master's test), the height of a step was standard – 23 cm. Besides, we conducted breathing tests – Shtange's Genche's tests [4]. Bio-chemical study of lipid and carbon hydrate metabolism implied determination of glucose and cholesterol level of patients with ID. For evaluation of emotional state, self feeling and activity we used psychological testing (questionnaire CAH). Mathematical processing of the obtained results was fulfilled with the help of Student's t-criterion and as per T. White.

Means of rehabilitation:

At the beginning of physical rehabilitation course TG procedure took 20-25 minutes, TG training were conducted every other day. TG complex included exercises for relaxing, balance, coordination of movements, training of vestibular apparatus, breathing exercises. Isotonic (dynamic) loads were preferred [10]. Duration of therapeutic gymnastics training in the second half of the course was 30-35 minutes. Besides TG, for patients of both groups everyday morning exercises were recommended.

Dosed walking fulfilled in main group every other day, (alternating with TG) in the second half of day [2]. The first week, the tested covered distance of 1-2 km at rate of walking of 60 steps per minutes. Quantity of trainings – 3 times a week. Duration of a training – 24-29 minutes. During second week patients with hyper tension covered distance of 2-3 km. The rate of walking was the same – 60 steps per minute. The quantity of trainings increased up to 4 times a week. Duration of one training was 40 minutes. At the 3rd week distance was 3-4 km. It was offered to increase the rate of walking up to 70-75 steps per minute. In the 4th week the quantity of training rose up to 4 times a week. In the whole, load was selected, considering workability and self-feeling of women.

Physical loads in both groups were applied in both groups together with diet therapy (diet No.9).

Results of the researches

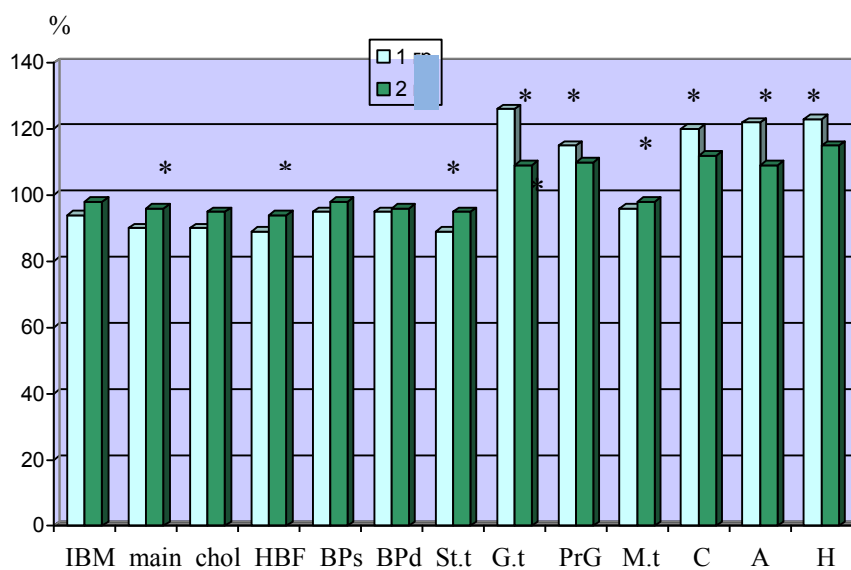
As thee conducted researches showed, the studied indicators of patients of both groups are comparable and confirm main diagnosis of patients –ID of light degree against the background of low health level, low physical workability and CAH level.

According to the obtained results, rehabilitation course facilitated reduction of initially excessive body mass in both groups, which was characterized as pre-obesity state. However, in main group it was expressed to the larger extent – by 3. 4% ($p < 0. 05$), (IBM) – by 3. 7% ($p > 0. 05$). Bio-chemical indicators of blood in both groups also improved: by level of glucose reduction in the main group was 10% (up to $6. 3 \pm 0, 2$ mmole p. l.), in control – 4%; by cholesterol level – in the 1st group change by 9. 8% (до $5. 5 \pm 0, 04$ mmole p.l.), in the 2nd – by 4. 9%.

As examination of cardio-vascular system showed, at the beginning of rehabilitation BP of patients was characterized by increased level – “increased normal”. The level of somatic health of ID patients, by IPL was “lower than middle”. Indicators of cardio-vascular system normalized in both groups as a result of applied rehabilitation course. However, in main group these results are more expressive: HBF decreased nearly by 6% more than in control group ($p < 0. 05$). After rehabilitation course IPL of patients approached to “middle”, and increasing of IPL of the 1st group's patients turned out to be confidently higher than of the 2nd group' patients by 5.6% 5, 6% ($p < 0, . 05$).

The tests with breathing pauses showed increasing of stability to hypoxia of all women. However, Stage's test results in main group increased more than in the 2nd by 17% ($p < 0. 001$), while Genche's test's results – by 5% ($p < 0. 05$). As it was seen from step-test, HBF of sum maximal load of 1st group women before rehabilitation course was $165, 2 \pm 0. 4$ b.p.m. After rehabilitation course this indicator reduced by 5. 5% ($p < 0. 001$). Improvement of results of load tests in control group was 2%. Thus, initially low workability of ID patients approached to satisfactory level as a result of rehabilitation course.

Psychological testing witnesses that psycho-emotional level of both groups increased. With it self feeling of main group patients rose by 7. 9%, in comparison with the 2nd group ($p < 0. 01$). Activity increased correspondingly by 10. 7%, mood – by 8. 8% ($p < 0, 001$) (see fig.1



1- group 1; 2 – group 2.

Fig.1. Dynamics of functional indicators of control and main groups' patients with insular diabetes in the course of rehabilitation. Differences are confident.

Thus, in main group as a result of additional application of aerobic exercises – dosed walking- rather expressed compensatory changes of metabolic processes and hemo dynamic indicators took place, most of which became normal. Dosed walking is an effective method of correction of state of patients with ID of second type.

Summary

1. Complex application of physical rehabilitation means (TG, diet therapy) facilitated improvement of metabolic processes, condition of cardio-vascular system and adapting abilities and psycho-emotional state of both groups' patients.
2. Additional application of dosed walking in main group significantly increased effectiveness of rehabilitation process.
3. Thus, application of dosed walking in rehabilitation of women with insular diabetes proved its efficiency and can be recommended for implementation in practice.

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EFFECT OF IMPROVING AEROBICS CLASSES AT THE LEVEL OF FLEXIBILITY OF FEMALE STUDENTS

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Annotation. The features of the influence of a set of special exercises with gymnastic stick and elements of stretching to develop flexibility while improving aerobics classes. In pedagogical experiment involved 20 girls 17 - 18 years old, first-year student. During the final part of the session used a set of special exercises aimed at increasing the range of motion when the torso and the mobility of the shoulder joints. The dynamics of indicators of flexibility. Determined that the selected set of special exercises in the classroom improving aerobics has a positive effect on the performance increase flexibility. Significant increase in the results can be seen in test 1 tilt body forward, which is characterized by increased mobility of the joints of the spine. It was determined that the transfer of gymnastic stick behind his back indicates an increase in the mobility of the shoulder joints.

Keywords: aerobic, flexibility, students, girls, movement.

Introduction

Aerobics trainings with health improving orientation are directed on maintaining of optimal level of physical abilities. Scientific researches of domestic and foreign authors witness that systemic attendance of aerobic trainings positively influences on students' health and physical levels. Efficiency of health improving aerobics' influence on students' physical development depends on correctness of exercises' fulfillment and systematic attendance of trainings [1, 10, 11].

An important mean of solution of tasks of students' physical education is development of physical qualities, flexibility including. In theory and methodic of physical education flexibility is regarded as morpho-functional peculiarity of human supporting motor system that determines the limits of body links' movement [9].

Interest to this physical quality is explained by the value of flexibility in fulfillment of any motion action. In researches of scientists [1, 11] it is stressed that it is necessary to develop flexibility for mastering sports and with fulfillment of any actions in the course of labor activity. Many domestic and foreign authors [2, 5, 12] wrote about influence of flexibility on improvement of motion possibilities and health improving of all organism. Insufficient flexibility can result in abnormalities of posture, appearance of osteochondrosis, deposition of salts, changes of gait and can become a reason of traumas [2].

The problems of flexibility's development are elucidated in scientific –methodic literature rather sufficiently. Great number of researches is devoted to methods and means of flexibility's development, to age aspects of its development [6, 7]. Flexibility as one of human motion qualities, have been researched from the point of view of anatomy, physiology and bio-mechanic [2, 4].

However, development of flexibility of students, who practice aerobics with health improving orientation, has been elucidated insufficiently. All these condition urgency of the chosen direction of our research.

The research has been carried out as per plan of scientific & research works of Kharkiv national economic university.

Purpose, tasks of the work, material and methods

The purpose of the work is to select a complex of special exercises with gymnastic stick and elements of stretching for development of flexibility during final part of health improving aerobics' training. Besides, it was necessary to carry out comparative analysis before and after pedagogical experiment, using testing results of girl students' group. Also we researched dynamics of flexibility indicators' of girl students, who practice health improving aerobics.

Organization of the research. The research covered 20 girls of 17-18 years old, the first year students, who systematically attended health improving aerobics' trainings during one year, twice a week.

Results of the research

Flexibility – is a motion quality that ensures execution of movements with big amplitude [2, 9]. The amplitude of movements is measured in linear units.

At aerobics trainings girl students fulfill elements of dances, which require significant amplitude of movements. I

The research covered 20 girls of 17-18 years old, the first year students, who systematically attended health improving aerobics' trainings during one year, twice a week. Duration of each training was two academic hours. For rising of flexibility indicators, at final part of every training special complex of special exercises with gymnastic stick and elements of stretching was fulfilled just after loading with aerobic exercises (see table 1).

Exercises with gymnastic stick and stretching elements at final part of training facilitate strengthening of arms' and shoulder girdle's muscles as well as increasing of movements' amplitude with bents and turns of torso, helps muscles to rehabilitate by turning them from contracted state to normal length.

Table 1

Complex of special exercises with gymnastic stick for flexibility

	Description of exercise	Dose	Methodic instructions
1	I.P.- Feet at the width of shoulders. Stick in horizontal position below, is held at the width wider than shoulders: 1) at count 1-2 – smoothly raise arms with stick upward; 2) at 3-4 – twist arms with stick backward; 3) at 5-6 – twist arms with stick upward; 4) at 7-8 – take I.P.	8-12 times	Gradually reduce the width of stick's hold
2	I.P.- Feet at the width of shoulders. Stick in horizontal position over the head, is held at the width wider than shoulders: 1) at count 1-8 – springing bents to the left, touching floor with stick; 2) at count 1-8 – springing bents to the right;	8-12 times	Maximal bents to the right and to the left
3	I.P.- Feet at the width of shoulders. Stick in horizontal position over the head, is held at the width wider than shoulders: 1) at count 1-8 – springing turns to the left, touching floor with stick; 2) at count 1-8 – springing turns to the right;	8-12 times	Maximal turns to the right and to the left
4	I.P.- Wide stand. Arms are twisted backward, stick in horizontal position, is held at width wider than shoulders: at count 1-8 – spring bents forward with twisting arms upward.	8-12 times	Gradually reduce the width of stick's hold
5	I.P.- Wide stand. Stick in horizontal position below, is held at width wider than shoulders: 1) at count 1- raise stick vertically to the right; 2) at 2 – twist arms backward (stick in horizontal position) 3) at 3 – with reverse movement raise stick vertically to the left) at 4 – take I.P.	8-12 times	Gradually reduce the width of stick's hold
6	I.P. - Wide stand. Stick in horizontal position behind back, is held from above: 1) at count 1 – forward bent; 2) at count – backward bent.	8-12 times	Maximal bent forward and backward
7	I.P.- bent forward with arching in wide stand, stick in horizontal position behind back, hold from above: 1) at 1-8 – springing turns to the left; 2) at count 1-8 – turns to the right.	8-12 times	Maximal turns to the right and to the left
8	I.P. Feet are close to each other, stick is in horizontal position in front of chest, hold from above: 1) bent forward and, stretching arms, touch tiptoes with stick, turn in I.P.; 2) bend forward, bring stick behind feet; 3) not changing position, maximally bend forward, touch knees with chin; 4) turn back to I.P.	8-12 times	Maximal bent forward
9	I.P. Sitting on floor, legs are parted. Take legs with both hands and try to touch floor with chest.	Keep position 10-12 seconds	Straight back

The complex of exercises shall be executed by method of static stretching. For this purpose it is first necessary to relax and then fulfill exercise, maintaining final position from 10-15 seconds to several minutes.

As far as in aerobics, in static positions, movements, demonstrating flexibility, are prohibited (i.e. maximal bent backward, arch, etc.) [3, 8], then, for determination of flexibility level we used the following tests- torso forward bent from position sitting on floor ¹ and bringing gymnastic stick behind back ².

Initial and final indicators of girl students' flexibility by the results of tests are given in table 2.

Table 2

Indicators of girl students' flexibility

Girl students	Indicators of flexibility, cm				Increment, %	
	Initial		Final		1	2
	1	2	1	2		
A.	10	86	12	84	20.	2. 33
B.	7	107	7	10	0. 00	0. 93
C.	20	85	21	83	5. 00	2. 35
D.	13	99	15	96	15.	3. 03
E.	12	98	13	95	8. 33	3. 06
F.	11	96	12	94	9. 09	2. 08
G.	4	88	6	88	50.	0

H.	20	80	20	78	0.00	2.5
I.	19	81	21	79	10.	2.47
J.	17	98	18	95	5.88	3.06
K.	12	94	14	91	16.	3.19
L.	11	92	12	90	9.09	2.17
M.	13	94	14	91	7.69	3.19
N.	5	107	7	10	40.	2.8
O.	8	97	9	95	12.	2.06
P.	11	92	12	91	9.09	1.09
Q.	7	99	9	96	28.	3.03
R.	13	84	14	82	7.69	2.38
S.	15	86	16	85	6.67	1.16
T.	18	79	19	77	5.56	2.53
Average indicator	12,	92,	13,	90	10.	2.28

- ¹ – torso forward bent from sitting position, cm
² – bringing of gymnastic stick behind back, cm

With fulfillment of test –forward torso bent from sitting on the floor position” girl students smoothly bend forward and, without bending leg, try to reach as far as possible. The position of maximal bent shall be kept for 2 seconds, fixing fingers on mark. Mark on perpendicular centimeters’ rule, which the tested touched by tips of fingers, is the result of test.

Bringing of gymnastic stick behind back is fulfilled from initial position – gymnastic stick is held by two hands from above below in front of body. With arches forward-upward stick is brought over head backward and then downward. Arms shall be straight in elbows. The exercise first is fulfilled with wide hold of hands, then, gradually, width of hold id reduced to minimally possible. The level of shoulder joints mobility is evaluated by distance in centimeters between thumbs of left and right hands in hold. The less is this distance, the higher is level of shoulder joints flexibility and vice versa. The dynamics of results’ increment is presented in fig.1.

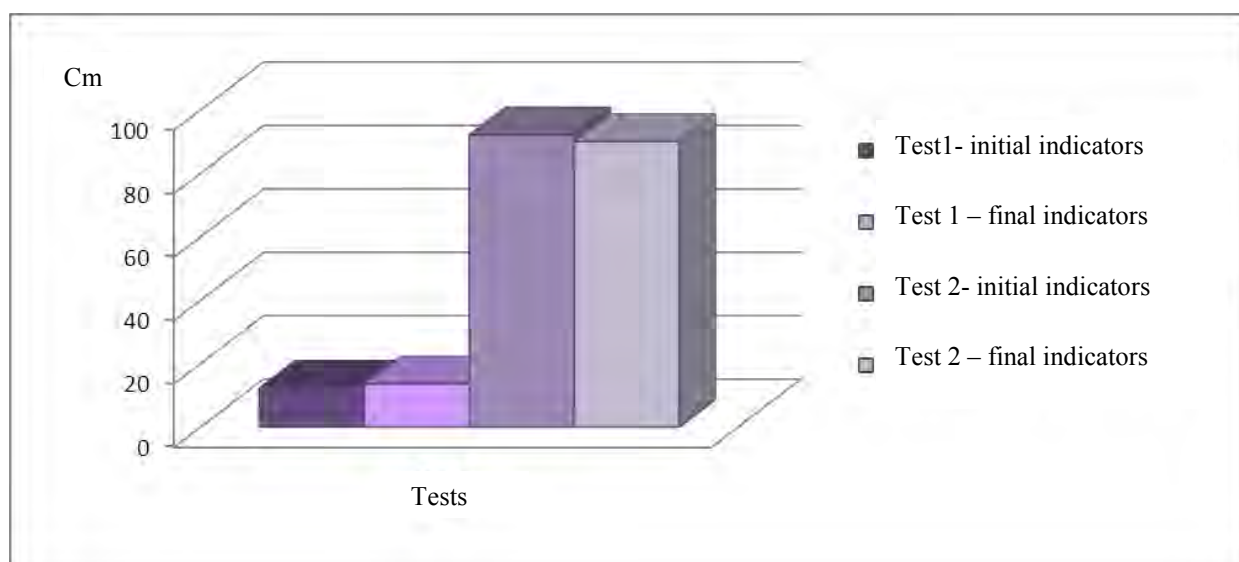


Fig.1. Dynamics of flexibility indicators

Average increment of indicators was 10. 16%, for torso bending from sitting position 2. 28% of bringing gymnastic stick behind back.

The selected complex of special exercises with gymnastic stick and stretching elements for development of flexibility at trainings of health improving aerobic positively influences on increasing of flexibility indicators.

Summary

Increasing of flexibility indicators under influence of the offered complex of exercises has been experimentally proved. Complex of exercises, used at final part of trainings, increases amplitude of movements with fulfilling of torso bents and raises shoulder joints’ mobility.

Confident increasing of results was in test No.1 – torso forward bent, which characterizes increase of backbone flexibility. Results, which were obtained in test No.2 – bringing of gymnastic stick behind back- witness about increasing of shoulder joints' mobility.

It is envisaged to carry out further researches in direction of determination of health improving aerobics' influence on development of power qualities of girl students of economic university.

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COMPARATIVE ANALYSIS OF THE LEVEL OF PHYSICAL HEALTH OF STUDENTS OF ECONOMICS SPECIALTIES

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Annotation. The results of the study of the level of physical health of students of economics specialties were conducted. The study involved 636 students. It was used the method of assessing the level of physical health G.L. Apanasenko. Defined by the functional state of the organism in terms of cardio-respiratory and muscular systems, which are formalized in quantitative terms (points) and are associated with the level of individual health. It was stated that the vast majority of students have low rates with the steady tendency to deterioration over the period of study. Found that physical education classes do not fulfill the full recreational function. Self-improvement gives little impact or affect the health of students. The necessity of developing the content of a sports-oriented technology of physical education students on the basis of volleyball and aimed at improving the professional-applied physical fitness.

Keywords: analysis, student, health, economic, specialty.

Introduction

Main preconditions of development of different human life activity sides are health and healthy life style. Exactly these criteria are responsible for the level of citizens' participation in social-civil measures, full-fledged fulfillment of their social targets, active participation in such forms of life activity as civil, social-domestic and so on. This problem is especially urgent for students. Observance of healthy life style plays important role in student's life, as far as it is a guarantee of future self realization and progressing in all spheres of life, starting from mental and up to physical.

World health protection organization (WHPO) determines that human health is not absence of diseases and physical defects, but it is a state of harmony of physical, psychological and social health. Doctor of medicine, professor G.L. Apanasenko, understands health as an organism's state, with which such level of energetic potential is ensured that it permits improvement of human self-feeling and efficient fulfillment of person's biological and social functions [1].

Physical development is in the base of physical preparation for future labor activity. It is the base for improvement of all vital functions of organism, necessary motion qualities, abilities and skills. Alongside with it, development of production, automation of production, creation of continuous technological processes, implementation of automatic control systems, electronics, cybernetics, increase of speed and efficiency of actions, change the character of productive labor. Portion of manual labor and physical load reduce, portion of mental activity increases in total balance of working hours. All these bring to further increasing of special requirements, which are set forward to human organism to specialist's physical level [2,7,8].

To-day successful obtaining of higher education is possible only under condition of availability of sufficiently high level of health that is why consideration of peculiarities of life style, in particular physical activity and positive attitude to physical culture and sports activity – is an important element of organization of students' physical education [3].

By the data of medical examinations and special questionings nine from ten students have health abnormalities, up to 50% of students are observed at clinics, every fifth student is a member of special health group or is free from attending physical culture classes. For example as per data of World health protection organization, only 5% of population of Ukraine practice health improving trainings, while in Japan – 80%, in USA – 70% [6,11,12].

Great number of authors registered increment of nervous-psyche disorders, diseases of cardio-vascular system of persons, who most time are in "sitting" position [5]. Their emotional resistance, attention functions, thinking and memory weaken.

Reduced motion activity, which is seen in limiting of space and strength characteristics of movements, negatively reflects both: in the state of functional systems and in organism's activity in general; it causes untrained state of organism and is harmful for functional and physical state. Such state is followed by changes in regional blood circulation [4, 9, 10].

The existing, at present, organization of physical education at HEEs is not sufficiently effective for increasing of health and physical levels and does not fulfill to full extent health improving function for most of students.

The research has been carried out as per plan of scientific complex work of physical culture' theory and methodic department of Sumy state pedagogical university, named after A.S. Makarenko, which was approved by Institute of scientific-technical and economic information of Ukraine, Kyiv, state registration number 0111U005736.

Purpose, tasks of the work, material and methods

The purpose of the research is to study and analyze somatic health level of girl students of economic specialties of HEE "Ukrainian academy of bank business of National bank of Ukraine" (UABB) and Sumy state university (Sum SU).

In order to research the level of somatic health of girl students of economic specialties of HEE "Ukrainian academy of bank business of National bank of Ukraine" (UABB) and Sumy state university (Sum SU) we used the

method of somatic health evaluation, developed by G.L. Apanasenko. Selection of this method was conditioned by the fact that it permits to evaluate organism's functional state in complex way, by indicators of cardio-respiratory and muscular systems, which are expressed in quantitative units (points) and are connected with level of individual health. Methodic of research was composed of determination of anthropometric and functional indicators and their indices.

Organization of the research. Girl students of 1st – 4th years of study on economic specialties at two HEE: UABB – 214 girl students and SumSU – 412 girl students took part in the research.

Results of the research

Results of comparative characteristics witness that absolute majority of both HEEs' girl students has low level of somatic health. As it can be seen in table 1, height of UABB girl students is within

1.68±0.07 m, and Sum SU – 1.68±0.07 m correspondingly. Mean weight of UABB girl students is 66.03±4.93 kg, of Sum SU girl students - 65.33±5.06 kg, correspondingly. Vital capacity of lungs of UABB girl students is 3478.31±400.44 ml, of SumSU - 3477.69±384.73 ml.

Table 1

Combined table of anthropometric and physio metric indicators of girl students of economic specialties of UABB and SumSU

Indicators	UABB (n=214)		SumSU (n=412)	
	Static indicators			
	X _{avr}	σ	X _{avr}	σ
Height (m)	1.68	0.07	1.68	0.07
Mass(kg)	66.03	4.93	65.33	5.06
VCL(ml)	3478.31	400.44	3477.69	384.73
Dynamometry of hand (kg)	33.18	8.78	32.62	8.85
HBF (b.p.m.)	74.10	3.49	74.01	3.25
BP _s (mm merc. col.)	120.55	2.93	120.55	3.00

The examined force of hand is in average for girl students of UABB 33.18±8.78 kg, for Sum SU – 32.62±8.85 kg correspondingly. HBF of UABB girl students is– 74.10±3.49b.p.m. of SumSU– 74.01±3.25 b.p.m. BP of UABB students is– 120.55±2.93 mm merc.col. and of SumSU students – 120.55±3.00 mm merc. col.

Thus, ISH of UABB students is 0.30 points and for girl students of SumSU it is– 0.42 points. It is possible to make conclusion that ISH (index of somatic health) of Sum SU girl students exceeds indicators of UABB girl students by 0.12 points. The calculated ISH values point, that the level of somatic health of both HEEs' girl students is low (ISH ≤ 3 points) (see table 2).

Table 2

Combined table of somatic health of girl students of economic specialties of UABB and SumSU

Indicators	UABB (n=214)		SumSU (n=412)	
	Static indicators			
	X _{avr.}	points	X _{avr.}	points
Mass index (kg p. m ² /)	23.59	-0.56	23.39	-0.60
Vital index (ml p.kg)	53.13	0.41	53.69	0.42
Power index (%)	50.58	-0.29	50.38	-0.28
Index of Robinson (conv.un.)	89.33	0.24	89.22	0.37
Martinet's test (sec)	155.78	0.50	153.42	0.51
ISH		0.30		0.42

The fulfilled research gives also information about level of somatic health of 1st – 4th years economic specialties' girl students of SumSU.

For example, from the tested quantity of SumSU girl students 14% (81) have low level of somatic health, 20.95% (22) girl students have level lower than middle, 1.9% (2) persons – middle level. Levels higher than middle and

high were not registered at all. With examining of 2nd year girl students of SumSU the following results were obtained: 89% (89) girl students have low level, 10% (10) girl students – level lower than middle and 1% (1) person – middle level. Among 3rd year girl students 88.68% (94) persons have low level, 11.32% (12) persons – have level lower than middle. With studying 4th year girl students of SumSU the following results were obtained: 89.11% (90) persons – low level 10.89% (11) girl students, who have level of somatic health lower than middle.

Thus, if to compare the obtained results of the research we can make conclusion that absence of higher than middle and high levels of somatic health is common for girl students of both HEEs. Concerning middle level, the quantity of UABB girl students with such level of somatic health is nearly two times higher than at SumSU. At the same time percentage of low level of somatic health of UABB is higher than it is at SumSU. By percentage correlation indicator of SumSU is higher than it is at UABB by 3.07% concerning level lower than middle (see fig.1).

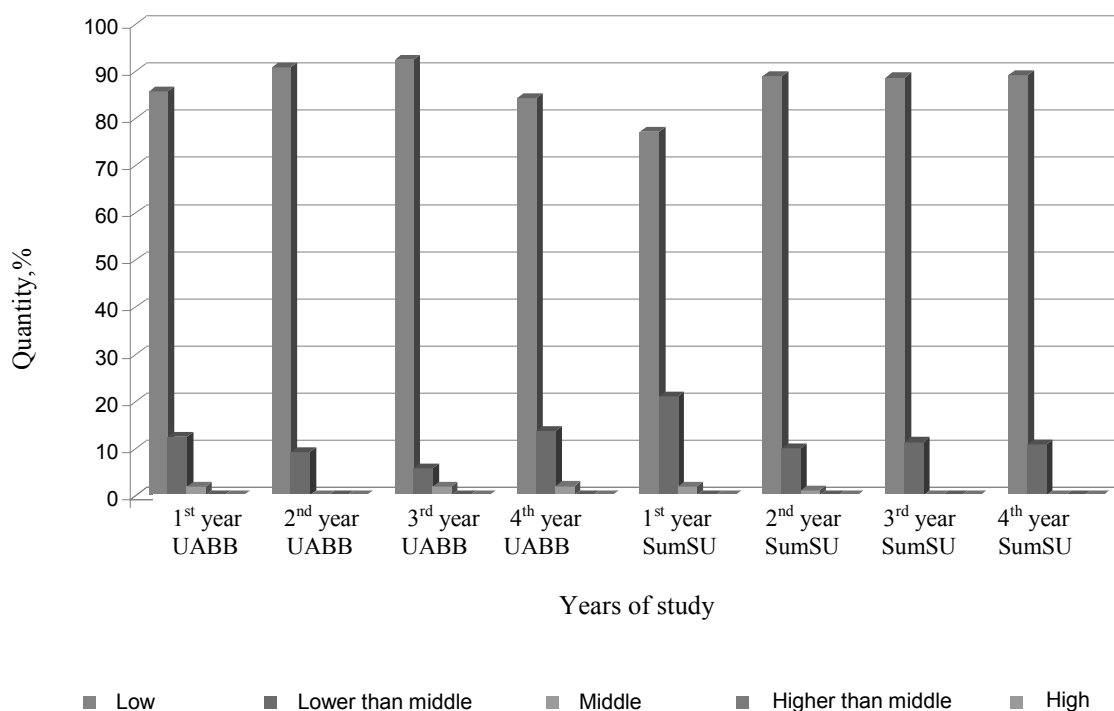


Fig.1. Comparative characteristics of somatic health levels of UABB and SumSU girl students

Summary

So, as results of our research show somatic health level of students is in general very low. 98.6% of UABB girl students have low and lower than middle levels and 99.27% of SumSU girl students. Only 3 girl students in every HEE have middle level of somatic health. Index of somatic health of UABB girl students is 0.3 points and the same of SumSU girl students is 0.42 points. It says that the tested contingent of girl students of economic specialties of UABB and SumSU is characterized by low level of somatic health.

Considering all above said a conclusion can be made that absolute majority of girl students have low indicators, which, in spite of certain percentage fluctuations, have steady trend to worsening during period of study. I.e. physical education classes and independent improvement of girl students' motion qualities give either insignificant results or absolutely do not influence on students' state of health.

The prospects of further researches: with the help of analysis and generalization of scientific-methodic literature, sociological methods and method of health state's determination by G.L. Apanasenko, physiological methods, testing, pedagogical experiment and methods of mathematical statistics to develop sports-oriented technology of physical education of girl students of economic specialties on the base of volley ball, which would be directed on improvement of professional-applied physical preparedness. Practical significance will be in implementing of the developed sports-oriented technology of girl students' physical education on the base of volley ball into practice of economic HEEs' functioning.

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MODELING OF COMPETITIVE DISTANCES QUALIFIED ROWING AND CANOEING (ILLUSTRATED MAN ROWING)

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Annotation. The aim of the study is to identify the best models of the race distance in rowing and canoeing. The study involved 12 highly skilled paddlers. Used heart rate monitors Polar RS800 G3, biochemical analyzer Dr. Lange LP-420. The possibility of individual simulations passage race distance. The factors that affect the distribution of forces on the distance. The optimal model of the passage of the 500 and 1000 meters. It was revealed that the distance of 200 meters has its own characteristics. The necessity of a separate simulation race distance in the non-Olympic rowing distances, length of more than 1000 meters. It is noted that in the competitive microcycle pay particular attention to the prelaunch workout consistent with the mobilization of the two leading mechanisms that ensure optimum energy supply at a distance. Recommended an increase in the volume of training loads in V (4b) intensity zone in the current control to monitor the index of hemoglobin, which should not significantly decrease.

Keywords: modeling, distance, padding, kayak, canoe.

Introduction

Coming from variety of competition courses in kayak and canoe rowing and considering the time of struggle (from 32 seconds at 200 m distance to 2.5 hours and more at marathon distances), the factors, which limit achieving of the highest sport results, will be different in this kind of sports. Also rowing tactic will be different, which, last time, is reduced to nearly exact simulating of competition activity, without right to change schema of course's passing in the process of passing. The last rule can be not spread to passing of preliminary cycle and to long (circular) courses of competitions, where participants can move out of "own water" or track.

It should be noted that recent years the level and scope of special knowledge concerning the problems of simulation of competition activity's structure (including rowing) have significantly increased [1-5]. First of all this period is characterized by scientific-research work in the field of physiology and bio-mechanics of kayak and canoe rowing [6-13]. Practically valuable knowledge was obtained with development of this problem relating to generalizing of results of testing and on the contrary – with revealing of individual peculiarities of simulation, which were connected with individual functional abilities of sportsmen. With it, systemizing of such information, its development up to the level of practical recommendations and implementation into training practice – directly facilitate improvement of training's quality of qualified rowers.

The work has been fulfilled as per scientific topic 2.25 "Monitoring of process of qualified sportsmen's adapting, considering their individual features" of combined plan of scientific & research works in the sphere of physical culture and sports for 2011-2015 (state registration NO. 0111U001732).

Purpose, tasks, material and methods

The purpose of the research is development of simulation methodic of competition course passing by qualified kayak and canoe rowers at "straight" (200, 500, 1000 meters) competition distances.

The methods and organization of the research. We used the methods of current and prompt control of rowers' individual functional state.. The following methods of research were applied: analysis of data of special literature, of competition reports and reports of stage-by-stage complex examinations; timing of testing distances and their separate segments with using of testing and training loads and with the help of stopwatches «Umbro Professional StopWatch»; radio-telemetric pulse metering and GPS-speed metering at separate trainings and during tests exercises with application of pulse meters Polar RS800 G3; bio-chemistry of blood with the help of bio-chemical analyzer Dr. Lange LP-420 (indicators of blood lactate level) – the level of blood lactate's concentration was determined with testing and during execution of series of training exercises on water; statistic methods of processing of the obtained data with determination of dependence between rowing speed an, blood lactate's concentration and heart beats frequency (HBF), corresponding to this speed; method of sport results' extrapolation on main starts of season with calculation of individual zones of loads' intensity.

Testing of rowers was fulfilled with consideration of differentiated approach concerning sex, age, period of sport life, sport specialization and qualification. Besides, we took in consideration the results of previous testing at stage complex examinations on the base of scientific-research institute. Main results are presented here on example of men's kayak rowing. In men's canoe and women's kayak rowing the results were similar.

The following training tests were used:

- Determination of alactate capacity: rowing гребля 4, 6, 8, 10, 12, 14, 16, 18, 20 seconds – maximally, after 5 minutes of rest with blood sampling in recreation period (1 and 3 minutes);
- Determination of technical result at distances of 1000, 500, 200 maximally, one control passing of every distance in meso cycle of preparation. By the dynamics of results from meso-cycle to meso-cycle in current and previous seasons we carried out sport results extrapolation to main competitions of the year.

Results of the researches

It is known that in rowing sport result depends on combined and successive using of aerobic and anaerobic recourses (ways of energy supply). With it, unlike arithmetic, where “with alternating of summands the sum is not changed” – with simulating of competition course passing it is important to consider exactly sequence of using of energy supply mechanisms. It is necessary to purposefully influence on kinetics of functional responses, because other processes, limiting achieving of high results, depend on them.

It has been established that sequence of using of energy supplying mechanisms shall be as follows:

200 meters: kreatine-phosphate + glycolytic mechanisms of energy supply (tactical variant of competition distance passing - “retaining”);

500 and 1000 meters: kreatine-phosphate + aerobic + glycolytic mechanisms of energy supply (tactical variant of competition distance passing – “even”).

With it, in rowing sport practice at the longest distances there happen situations, when at distances of 500 and 1000 meters sportsman or team lose passing after winning the first half of the course. This situation is typical if correct sequence of realizing of aerobic and lactate energy supply mechanisms was distorted.

In spite of the fact that at present general rules of simulation of mixed competition distances’ (middle length courses) passing are known, specifying of start acceleration, mean-stationary section of distance and peculiarities of finishing are in competence of coaches and scientists, who work with certain kinds of sports, with certain teams and sportsmen. At most inconsistent distances of 500 and 1000 meters (with high probability of involving of both aerobic and anaerobic energy supply mechanisms in competition exercise) all this, actually, is reduced to simulation of work and speed in zone V (4b, 100% from distance zone) of sportsman or team on the base of information about capacity of kreatine-phosphate energy supply mechanism.

Having information about capacity of kreatine-phosphate energy supply mechanism of a certain sportsman, it is possible to prognosticate about from what second of maximal work lactate’s level starts to sharply increase, and it means it is possible to monitor this process (see fig.1).

Having information about speed in zone V (4б) – we can reach even passing of course at speed equal to speed of lactate accumulation meaning its maximal indicators (and refusal of work) just by the moment of finish’s passing (see fig.2).

With leaving start zone, short-term reduction of capacity with maintaining of inertia of previously accelerated boat (exhaustion of kreatine-phosphate mechanisms) has the aim to optimize involving of glycolytic processes in competition activity, when blood lactate’s concentration is on levels, which stimulate but not inhibit aerobic function (see table 1).

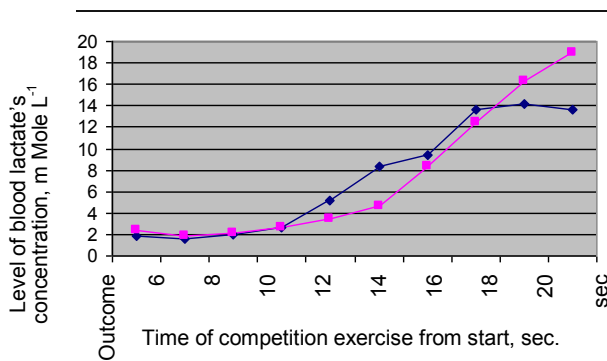


Fig.1 Dynamics of blood lactate's accumulation of two qualified kayak rowers with passing of start segment with maximal possible speed

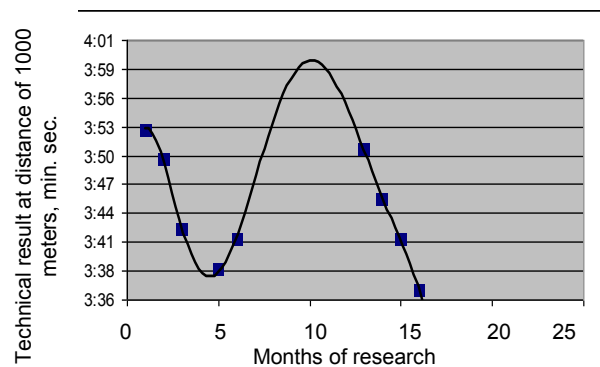


Fig.2. Dynamics of sport result of kayak rower in two annual cycles of training at distance of 1000 meter with extrapolation to future month.

For qualified kayak rowers we developed models of competition activity, which implied calculation of load capacity from start to finish for every separate sportsman or team (see table 2).

At courses of 500 and 1000 meters it resulted in insignificant reduction of speed at the first half of the distance in relation to significant improvement of technical result at the second half. It is known, that competition statistics on dynamics of passing of competition courses by 250 meters’ sections has no physiological foundation. For evaluation of competition activity’s simulation it is necessary to have evaluation of results at marks 50, 75, 250, 375, 500 meters (for distance of 500 meters) and 50, 100, 250, 500, 750, 1000 (for distance of 1000 meters). With it: in both cases, up to the first mark - the course is passed with maximally possible speed; up to the second mark – ability to maintain inertial speed with obligatory reducing of work-power is evaluated; up to the third mark – ability to gain speed in zone V (4b)m corresponding to average-stationary section of distance, is evaluated. Further, ability to maintain the desired speed is evaluated by its dynamics, without any fluctuations concerning model.

Table 1

The most frequent mistakes, which are made with simulation of passing of competition 500 and 1000 meters' distances by qualified kayak rowers.

Mechanism of energy supply in the order of its using at distances of 500 and 1000 meters	The most frequent mistakes
Kretine-phosphate	- Kreatine-phosphate mechanism is not use to full extent, when 50 meters' section is passed slower than control acceleration at 50 meters; - Start without information about available capacity of kreatine-phosphate mechanism of energy supply, i.e. about admissible time of maximal work from start.
Aerobic	- Absence of breathing cycles with straining on start, when deep breathing appears only as response to increasing of carbon dioxide's concentration in blood with leaving of start zone; - rhythm of breathing does not correspond to rowing locomotion (cycles), i.e. differs from the correct one: stroke from one side – inhale, from the other – exhale.
Glycolytic	- attempt to use glycolytic mechanism of energy supply with leaving start zone that results in significant losses at the second half of distance in comparison with insignificant improvement at the first one; - attempt to sharply finish, which witness about not optimal using of mixed (aerobic + glycolytic) energy supply at average-stationary section of distance.

Table 2

Example of simulation of 1000 meters' distance by qualified rower in single oar kayak

Section of distance	Intensity of work at distance	Zone of intensity	Prevailing energy supply
0-50m	Start section is passed with maximally possible speed	VII	ATP-KP
50-100m	Leaving of start zone. Reduction of power up to threshold of anaerobic exchange (TANE), speed of boat is maintained owing to inertia, gradually reducing to mean-course value in zone 5.	TANE	Aerobic
100-750m	Average-stationary section of distance	V	Aerobic and lactate with speed of lactate's utilization from working muscles during passing of distance being accentuated.
750-1000m	Maintaining of speed at average stationary section of distance with (it is possible but not obligatory) finish acceleration, if it can be preserved up to passing of finish line.	V-VI	Aerobic. Lactate – to less extent, with accent on ability to resist high concentrations of lactate.

Summary

Simulation of passing of competition courses by kayaks and canoes is directly connected with the level of functional abilities of a certain sportsman or team, with peculiarities of development of aerobic and anaerobic (lactate and alactate) mechanisms of energy supply.

Significant quantity qualified sportsmen's losses appears with simulation of 500 and 1000 meters' distances, at which work is fulfilled in mixed modes, when passing from start section to average stationary one and with finishing.

Preparation for simulated passing of competition course shall include in last meso-cycle of special- preparation stage of annual cycle's preparation period the following: general reduction of training loads, optimization of training loads' scope in mixed zone V 94b), with competition speed (100% from course speed). With such exercises speed of lactate accumulation must correspond to the speed of its accumulation at main competition course, with technical result of which being extrapolated to the time of main season competitions. The final level of lactate's concentration in training exercises will depend on duration of exercise (it will always be less than at competitions) and intervals of rest. With application of such training method one must not strive to accumulation of maximal individual levels of lactate owing to prolongation of exercise and reducing of rest intervals. Main mistake of training process is an attempt to carry out plan with decreasing speed lower than 100% from the planned course-speed. In this case speed of lactate's accumulation will be lower than at passing of main competition distance and its frequent using will result in creation of speed barrier.

Such mixed (aerobic-anaerobic) training shall be first of all oriented on improvement of sportsman's speed of lactate's utilization at distance, but not on approaching individual maximal and, in this connection, destructive concentrations of lactate. It is achieved at the cost of correctly selected rest interval and the length of a section (less than competition one).

With increasing of training loads' scope in V (4b) zone of intensity, in current control it is necessary to look after indicator of blood hemoglobin, which must not confidently reduce.

In competition micro-cycle special attention shall be paid to pre-start warming up with successive mobilizing of two leading mechanisms, which provide optimal energy supply at distance:

1. Mobilization of aerobic mechanism of energy supply: work at TANE 1 and technical work at TANE 2 several times (individually) during 1.5-3 minutes.
2. Mobilization of neurogenic stimuli of responses: up to 6 sec – maximal accelerations by the course of boat's movement with very high (more than 3 minutes) rest intervals with the last acceleration; not later than 5 minutes before start.

At distances of 200 meters and "circular" courses (5000 meters and more) simulation of competition activity will have own specific features, which will be connected with prevailing using of anaerobic (in the first case) and aerobic (in the second case) mechanisms of energy supply. These problems will be discussed in other publications.

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FEATURES OF CONSTRUCTION OF THE TRAINING PROCESS SKIERS AGED 17-18 YEARS TO COMPETE IN DIFFERENT STYLES OF SKIING

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Annotation. The work is devoted to the improvement of precompetitive preparation of skiers, taking into account the need to participate in competitions of different styles of skiing. The experiment included 20 athletes aged 17-18 years. Isolated model characteristics of athletes who successfully perform classic and skating style of movement. The range of indicators of physical fitness of athletes, which is the norm for this level of qualification. The technique of constructing precompetitive preparation of athletes on the basis of a combination of style of movement. It was established experimentally that the combination of training sessions during the day improves athletic performance in racing classic and skating style. In this case, primary and secondary occupation to carry out a different style of skiing with a change of their rotation on the next day.

Key words: ski races, classic technique, skating technique, racing, researches, methods, training.

Introduction

At congress FiS 1987 skiing styles were divided into two ones: classic (traditional) and free style, which stipulates using of skating techniques [5-7].

Competition programs of ski-racers, starting from regional championships and winter Olympic Games including, envisage 2 styles of racing. Besides, skiing of alternating style (skiatlon) is widely used; this method combines classic and skating styles in one racing [1-4,8,9]. It requires special attention to development of training process, with combining of two ski styles.

The problem of pre-competition trainings of classic style skiing is studied in a number of works, but there is no researches on pre-competition trainings of 17-18 years old ski racers, with combination of classic and skating styles.

Besides, recent years methodic of sportsmen's preparation, based on individual, morphological, physiological and psychological features of organism, has changed. That is why, scientific and practical grounding as well as development of system of pre-competition training with different skiing styles, considering biological peculiarities of young sportsmen, is rather urgent problem.

The work has been fulfilled as per plan of scientific & research works of Kharkiv state academy of physical culture.

Purpose, tasks of the work, material and

The purpose of the work: experimental foundation of methodic of 17-18 old skiers' training for participation in different skiing styles' competitions.

The tasks of the researches:

1. Analysis of existing methodic of pre-competition ski-racers' training.
2. Determination of optimal morphological-functional models of ski-racers for successful participation in competitions with classic and skating styles of skiing.
3. Development of the most rational methodic of sportsmen's pre-competition training for participation in competitions with different styles of skiing.

Organization of the research. Model characteristics of classic and skating styles' advanced ski-racers, which considered anthropometric characteristics and indicators of sportsmen's functional state, were developed.

The second stage of the research was conducted in conditions of training session (28 days). Sportsmen were divided into two groups: the first – control, in which traditional training methodic was used (alternating of ski styles each day), and the second – experimental, in which the developed by us methodic was applied. Every group consisted of 20 sportsmen.

Construction of trainings, both of control and experimental groups, considered up-to-date demands to training process: orientation of exercises, their intensity, duration of series and interval for rest after loads. In both groups trainings were carried out at the same time; after trainings results were registered. Difference between results of both groups was calculated then.

The methods of the research. We used methods of anthropo-scopy and anthropometry. Linear sizes of body were measured. Weight-height indices and scale index by Manuvriet were calculated. Besides, we used methods of functional examinations (heart beats frequency, vital capacity of lungs, PWC₁₇₀ and other), Skibinskiy's index was calculated; test by Rufiet-Dixon and Index of Harvard step-test (IHST) were used.

Results of the research

Anthropometric examinations of ski-racers showed confidently higher height indicators (by 2.2%), weight (by 2.5%), length of legs (by 3.0%), weight-height index (by 4.5%) ($p < 0,05$) of skiers, who were better in classic style of skiing. Differences in the length of arms and index of leg were not confident ($p > 0,05$) (see table 1).

Table 1

Comparative characteristics of optimal model's anthropometric indicators of different style qualified ski-racers (n=20)

Антропометричні показники	Classic style		Skating style		t	p
	$X_1 \pm m_1$	σ_1	$X_2 \pm m_2$	σ_2		
Length of body, cm	180,00±0,91	2,87	176,00±0,97	3,06	3,54	P<0,05
Body mass, kg	70,00±0,88	2,71	68,00±0,63	2,00	2,53	<0,05
Length of arms, cm	75,00±0,56	1,76	73,00±0,58	1,83	2,03	>0,05
Length of legs, cm	108,00±0,78	2,35	104,00±0,70	2,11	2,99	<0,05
Scale index, %	89,90±0,15	0,46	87,90±0,14	0,45	0,67	>0,05
Weight-height index, kg.p.m	21,66±0,79	0,69	20,02±0,61	0,42	4,54	<0,05

Analysis of anthropometric studies shows that model characteristics of ski-racers are within 2,2 – 7,6 % from average results of testing and are confidently different (p<0,05) by most of indicators.

Correlation analysis of anthropometric indicators' dependence of classic style (r₁) and skating (r₂) styles' ski racers showed close dependence between the length of body and indicators of length of leg (r₁=0,90; r₂=0,95), length of leg (r₁=0,90; r₂=0,91), length of arms (r₂=0,92), length of leg and index of leg (r₁=0,70; r₂=0,89), weight-height index and weight (r₁=0,52; r₂=0,75), length of arms and indicators of length of legs (r₂=0,87) and index of leg (r₂=0,86).

Analysis of testing of organism's functions and systems permitted to determine the range of physical preparedness indicators, which corresponds to middle level and is a normative for the given qualification level. High level is the highest target for general and special physical preparation.

Difference between indicators, which reflect classic and skating styles races/ influence on cardio-vascular system, is: test by Ruffet-Dixon – 12%, frequency of breathing under load – 7.7%, heart beats frequency after loads – 4.3%, coefficient of endurance – 3.75% and Harvard step-test – 2.6% (p<0,05).

The obtained results permitted to work out model characteristics of optimal physical parameters for successful classic and skating styles skiing at competitions.

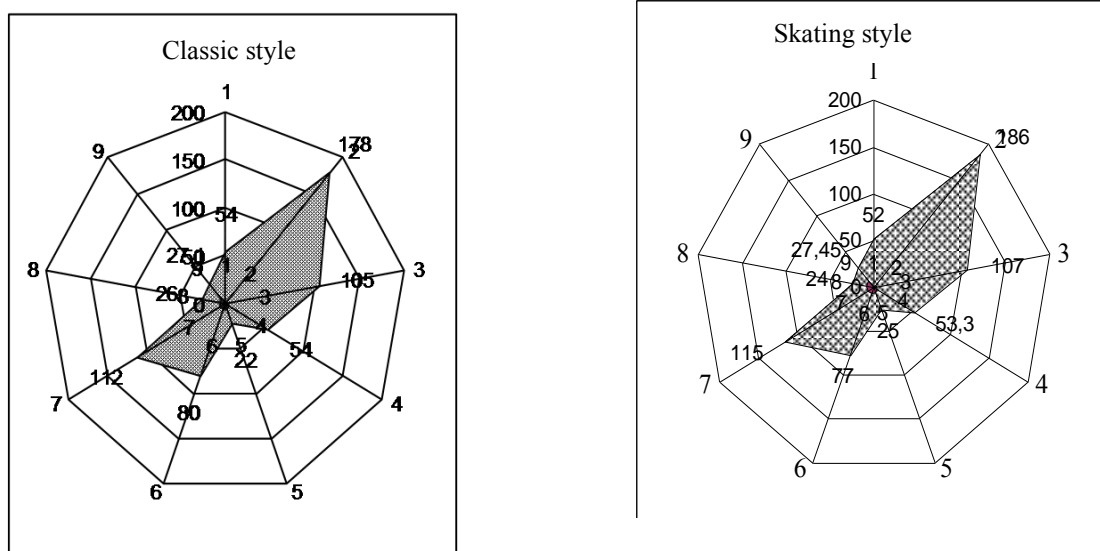


Fig.1. Model characteristics of indicators of qualified ski-racers, who successfully participate in competitions in classic and skating styles, organism's functional state.

Legend: 1- heart beats frequency (HBF) in rest, beats per minute (bts.p.min⁻¹); 2 – heart beats frequency (HBF) after loads, beats per minute (b.p.min⁻¹); 3 – PWC₁₇₀, conventional units (cov.un.); 4 – vital capacity of lungs (VCL), liters (l); 5- test by Ruffet-Dixon, conventional units (conv.un.); 6 – coefficient of endurance, conventional units (conv.un.); 7 – IHST, conventional units (conv.un.); 8 – quantity of breathing per minute; 9 – Skibinskiy's index, milliliter per kilogram (ml.p.kg).

Thus, different styles of skiing put forward special demands for sportsmen's organisms. These demands require reconstruction of movements' structure in compliance with technique of skiing as well as further training of sportsman organism's functional systems.

This statement determined searching of optimal approaches to planning of training process, considering both skiing styles, especially in the period of preparation for main competitions of season.

In pre-competition period in control group traditional skiers' training methodic was used, in which styles alternated every other day (see fig.2).

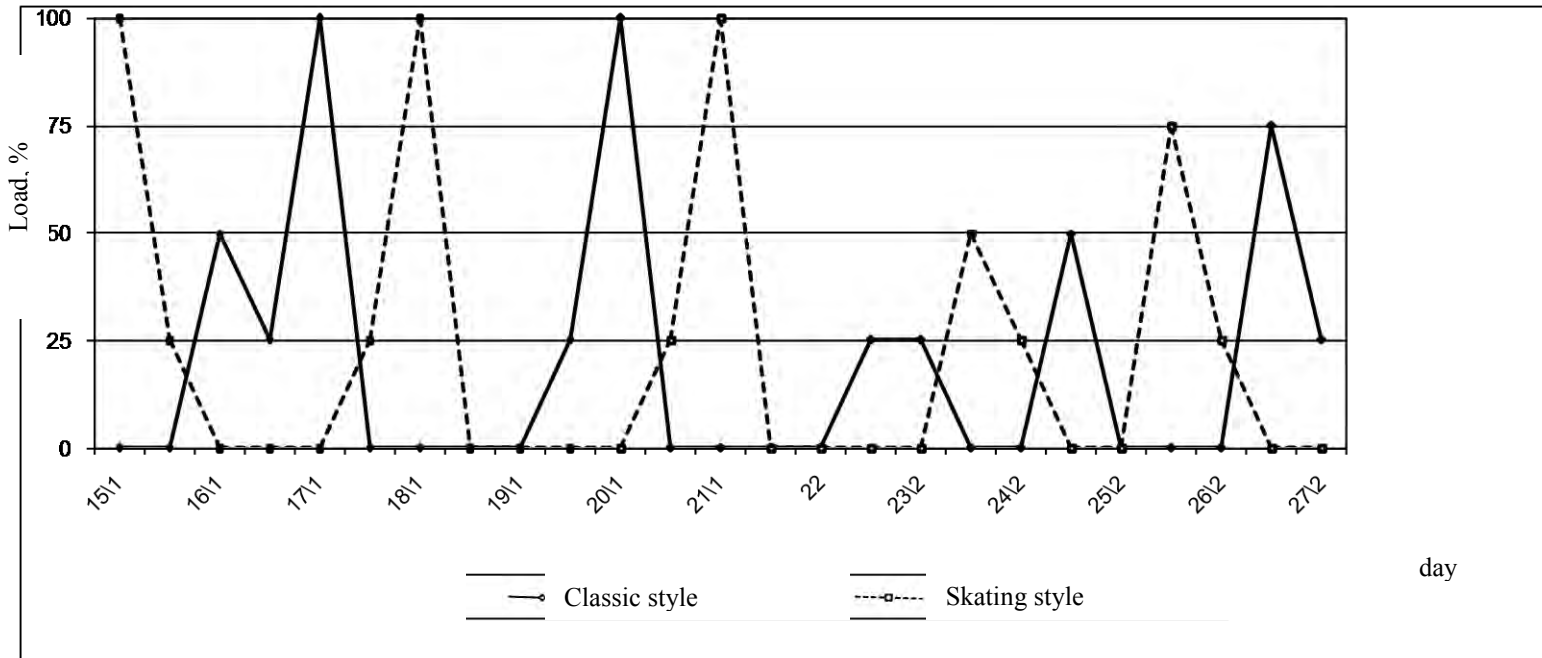


Fig.2. Combination of skiing styles at the stage of direct preparation for competition of 17-18 years old skiers (control group).

On the base of conducted pedagogical studies, we developed methodic of training process construction, which was used in experimental group. The given methodic stipulated the training of both styles in one training day. So, the first, main, classic style training envisaged development of special skiers' abilities, the second – was free style training, considering preparation for next day training. Next day, sequence of skiing styles changed (see fig.3).

Orientation of trainings, load's scope and intensity were similar in both groups.

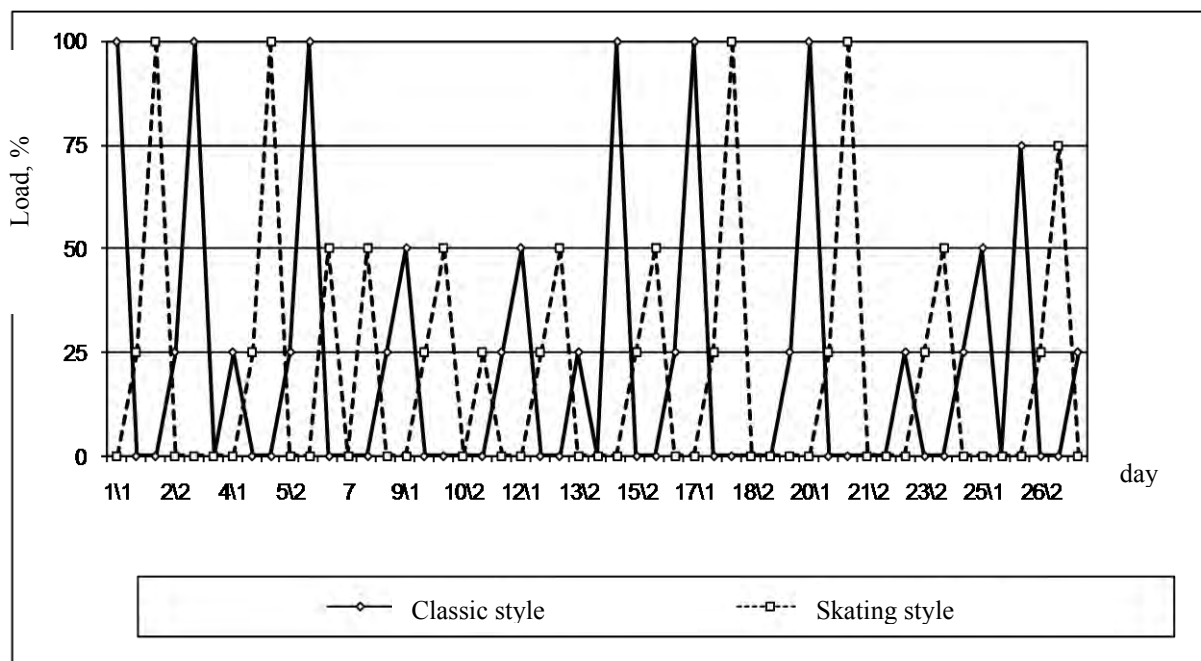


Fig.3. Combination of skiing styles at the stage of direct preparation for competition of 17-18 years old skiers (experimental group).

The carried out experiments showed that the applied methodic of pre-competition ski-racers' training from experimental group, significantly improves results of classic and skating styles' racings (see table 2).

E.g., classic style's results are better at experimental group by 42 sec. ($p < 0,05$), while at the beginning of experiment there was no confident difference.

Like this, skating style's results of experimental group skiers were better and difference from control group results was 21 sec. ($p < 0,05$).

Besides, time results of control group classic style skiers improved by 2,24% ($p < 0,01$), and mean speed increased by 0,12 m.p.sec. However in comparison with initial indicators there was not found any confident difference ($p > 0,05$). While, time results of experimental group improved by 4% ($p < 0,01$), and mean speed increased by 0,2 mp.sec. ($p < 0,05$).

Table 2
Comparative characteristics of indicators of average speed and time results in control and experimental groups before and after experiment (n=10)

INDICATORS			Before experiment		After experiment		t	p
			$X_1 + m_1$	σ_1	$X_2 + m_2$	σ_2		
Classic style	Control group	Time result, sec.	2010±6,39	20,20	1965±3,98	12,58	5,98	<0,01
		Average speed m.p.sec	4,97±0,05	0,15	5,09±0,03	0,10	2,07	>0,05
	Experimental group	Time result, sec.	2003±6,52	20,59	1923±5,02	15,86	9,72	<0,01
		Average speed m.p.sec	5,00±0,05	0,16	5,20±0,04	0,14	3,13	<0,05
Ковзанярський стиль	Control group	Time result, sec.	1910±5,26	16,62	1790±5,18	16,38	16,3	<0,01
		Average speed m.p.sec	5,24±0,05	0,15	5,59±0,05	0,16	4,93	<0,05
	Experimental group	Time result, sec.	1915±6,05	19,12	1769±2,29	7,24	22,6	<0,01

		Average speed m.p.sec	5,23±0,06	0,17	5,65±0,02	0,07	6,67	<0,05
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Owing to experiment, time result of skating style racing shortened by 6,28% ($p < 0,01$), average speed increased by 0,35 m.p.sec., in control group and in experimental group by 7,62% ($p < 0,01$) and 0,42 m.p.sec. ($p < 0,05$).

The conducted parallel experiment showed that combination of skiing styles at trainings at the stage of direct preparation for competitions, influenced positively on preparedness of both group skiers, in experimental group, with alternating of skiing styles at every training, results were better, that witness about effectiveness of developed by us methodic of pre-competition training.

The obtained results of the researches confirmed our assumption concerning advantages of method of styles' dividing and training loads for 17-18 years old ski racers at the stage of direct preparation for competition in different skiing styles.

We have found out that application of alternating styles in one training day by ski-racers positively influences on improvement of sports results both of classic style ski racings and of skating style ones.

Summary

1. Anthropometric testing of qualified ski-racers showed that difference of model characteristics of posture is within 2,2% - 7,6% and they are confidently different ($p < 0,05$) by most of indicators.

2. The most significant model characteristics of 17-18 years old ski-racers' functional preparedness for classic style skiing are the following indicators: heart beats frequency in rest – 54 b.p.min, heart beats frequency after loads – 178 beats per minute (b.p.min.), PWC_{170} – 105 conventional units (conv. un.), vital capacity of lungs (VCL) – 54 liters (l.), Rufiet-Dixon's test -22 conventional units (conv.un.), coefficient of endurance – 80 conventional units (conv.un.), Index of Harvard step-test (IHST) – 112 conventional units (conv.un.), frequency of breathing - 26,8 times per minute, Skybinskiy's index - 27,1 milliliters per kilogram (ml.p.kg.).

For skating style skiing the following indicators are optimal: heart beats frequency in rest – 52 b.p.min., heart beats frequency after loads – 186 beats per minute (b.p.min.), PWC_{170} – 107 conventional units (conv. un.), vital capacity of lungs (VCL) – 53,3 liters (l.), Rufiet-Dixon's test -25 conventional units (conv.un.), coefficient of endurance – 77 conventional units (conv.un.), Index of Harvard step-test (IHST) – 115 conventional units (conv.un.), frequency of breathing - 24,8 times per minute, Skybinskiy's index - 27,45 milliliters per kilogram (ml.p.kg.).

3. Application of methodic of pre-competition meso-cycle construction, which was based on combination of skiing styles within one training day, in which main and additional trainings were carried out in different styles, with their alternating the next day, is the most optimal and permits to achieve high sports results in ski racings of classic and skating styles.

4. The developed by us methodic of pre-competition preparation of 17-18 years old ski-racers permitted to increase sports results of classic style skiers by ($p < 0,01$), and of skating style skiers – by 7,6% ($p < 0,01$).

The methodic of pre-competition training of ski-racers with combination of different skiing styles can be used not only at the stage of direct preparation for competitions but also in other meso-cycles of annual macro-cycle.

Further researches can be oriented on searching of effective methods and means of ski-racers' training, considering individual morphological and functional features of sportsmen.

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**SPORTS AND PEDAGOGICAL IMPROVEMENT IN THE TRAINING OF FUTURE TEACHERS OF
PHYSICAL EDUCATION**

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Annotation. Revealed the structure and content of the sport and improve teaching students of physical education in their chosen sport. The place of discipline and the value of "Sports and teacher improvement" in the preparation of future teachers of physical education. It is shown that the purpose of discipline is to familiarize students with the theoretical foundations and experience teaching and training work in their chosen sport, the methodology of this work with children of different ages. The main forms of teaching attributed lectures, seminars, practical, methodical surveillance, individual, self-study and educational practice. It is noted that discipline is allocated 522 hours. Of these 64 hours - at a lecture, 262 - on practical training, 86 hours - for individual classes, 174 hours - to work independently. A 4th year student provides the implementation of the course work.

Key words: teacher, physical education, sports, teaching, improving, students.

Introduction

Constant rising of demands to preparation of future physical education instructors require urgent actions on perfection of content, forms and methods of preparation of specialists in the field of physical culture and sports from higher educational establishments. Besides, introduction of physical culture new academic programs, which envisage training of variable modules in different kinds of sports, for pupils of comprehensive schools, put forward high requirements to sports-pedagogic preparation of students of physical education faculties. Increasing of efficiency "Sports-pedagogic perfection" discipline's teaching in the chosen kinds of sports shall satisfy these requirements, because this discipline takes one of the most important places in professional preparation of future physical education instructors.

The works by A.G. Gonezhuk (2004) [1], V.M. Prystynskiy (1991) [10], I.D. Svyshev (1994), L.P. Sushenko (2003) [11], B.V. Shyan, V.G. Papusha (2005) [16] et al. were devoted to some aspects of organization and sports-pedagogic preparation of future physical education teachers. The scientists grounded the system of theoretical and methodic knowledge and skills, which are components of physical education instructors' preparation at higher educational pedagogic establishments and proved that content of theoretical-methodic preparation at physical education faculties shall facilitate formation of a teacher, who should be bent to innovations and creativity, who should be able to at professional level a specialist indifferent means, forms and methods of work with pupils, who should be oriented on systematic replenishment of professional knowledge, its evaluation and self evaluation and to apply achievements of other sciences in his pedagogic activity.

But sports-pedagogic perfection of future physical education teacher has not been studied yet as a separate scientific-pedagogic problem and it conditions the urgency of the research. The work has been fulfilled as per plan of scientific & research works of Kharkiv institute of finances of Ukrainian state university of finances and international trade.

Purpose, tasks of the work, material and methods

The purpose of the research is to determine the structure and content of sports-pedagogic perfection of HEE students of physical education faculties.

The tasks of the researches is to study the place and purpose of discipline "Sports-pedagogic perfection" in preparation of future physical education instructors and determine its content and structure. For solution of the set tasks we used the *methods* of comparative and structural-systemic analysis, with the help of which we determined available in pedagogic and special literature approaches to sports perfection of future physical education teachers, and analyzed academic documentation on teaching of physical education faculties' students at Ukrainian and Russian HEEs.

Results of the researches

Analysis of curriculums and academic programs of physical education faculties of Ukrainian higher educational establishments witnesses that discipline "Sports-pedagogic perfection" (SPP) has taken of the first places in training of future physical education instructors for already many decades. For example, starting since 80-s this discipline was introduced as an optional subject. Analysis of curriculums of higher educational establishments' physical education faculties for 1989 and 1992 witnesses that SPP was studied by future physical education instructors in the scope of 480 – 580 hours correspondingly. At SPP classes, under the guidance of experienced coaches-instructors, future instructors improved knowledge and skill in the chosen kinds of sports. Before graduating from pedagogic establishment student must have receive sports grade not lower than second and a category of referee in certain kind of sports.

To day as well SPP course takes important place in preparation of future physical education teachers. It is witnesses by the fact that SPP program takes 4 and in some HEE 5 years, i.e. nearly all period of future specialist's preparation.

Analysis of some SPP programs shows that the purpose of this discipline is profound sports-pedagogic preparation of future physical culture instructors in the chosen kind of sports. For example, O.M. Khudoliy (2008) [15]

writes, that program of discipline “Sports-pedagogic perfection” stipulates formation of professional knowledge and skills, which will be required for independent work in different establishments of physical education and sports’ system as well as for rising of sportsmanship in the chosen kind of sports (CKS).

According to curriculum, 522 hours are assigned for discipline “Sports-pedagogic perfection”, from which 64 –lecture hours, 262 – practical classes (seminars, methodic, practical trainings and teaching practice; 48 hours – laboratory studies SSRW (students’ scientific research work), 86 hours – individual studies and 174 hours for independent work. At 4th year of study yearly work is envisaged.

At 1st year students study general problems of SPP theory, history in particular, modern state and prospects of SPP’s development, structure, classification and terminology of exercises in SPP, safety measures, rules of competitions and methodic of refereeing. At the 2nd year – principles of technique of SPP exercises, of motion abilities’ development, theory of motion skills’ training; at 3rd and 4th years physical education faculties’ students master knowledge in theory and methodic of training in SPP. Distribution of hours into different kinds of classes see in table 1.

Table 1

*Approximate distribution of SPP hours by years of study
(as per program by O.M. Khudoliy)*

Year of study	Forms of classes							Total hours (522)
	Lectures	Familiarizing-methodic	Practical & seminars	Laboratory works	Teaching practice	Independent	Individual	
I	16	6	22	12	6	43	21	126
II	16	8	24	12	8	44	22	134
III	16	6	24	12	6	43	21	128
IV	16	8	24	12	8	44	22	1 34

Pedagogically purposeful distribution of SPP course material is offered by S.V. Synytsya (2008) [13]. The developed by him program is designed for 4 years of study (1-4 years) and includes 3 stages, on every of which certain tasks are successively solved. The 1st stage (adapting) is preliminary basis preparation. It was designed to make perception of further professional training, easier; in it the following problems are solved: rising of general culture of specialists; widening of general, educational and professional world vision of specialists, etc.

The 2nd stage is the main stage of professional training. It includes: target familiarizing of specialists with up-to-date technologies; training and widening of future specialist’s knowledge in the chosen kind of activity. The 3rd stage (creative) – is the final stage of professional training. It includes: study of advanced practical experience in the chosen kind of activity; determination of creative potential’s development; integration of modern knowledge and achievements in professional activity.

Educational program, developed by S.V. Synytsya, is divided into 4 levels of training by its complexity. Complexity is determined in students’ mastering different motion tasks and different methodic techniques.

Table 2

*Approximate distribution of SPP hours by years of study
(as per program by S.V. Synytsya)*

Year of study	Forms of classes							Total hours(864)
	Theoretical	Methodic-practical	Practical	Control tests (INHT)*	Teaching practice	Independent	Individual	
I	8	10	84	6	--	24	24	156
II	8	42	48	8	--	28	28	162
III	4	36	24	4	--	20	20	108
IV	--	18	16	6	26	186	186	438

It should be noted that at Ukrainian HEEs SPP is taught separately by different kinds of sports, mainly by those, which are stipulated by school academic program; in particular: gymnastics, track and fields, swimming, outdoor

games and so on. At the beginning of classes first year students chose sport specialization, which they will study during 4 years, and are distributed into groups, 8-15 person each of them.

In contrast to physical education faculties of Ukrainian higher educational establishments, in the same Russian educational establishments the same discipline is called “Pedagogic physical culture-sports perfection (PPSP). Analysis of PPSP educational programs [6, 7, 17, 18] showed that this discipline is studied by physical education faculties’ students in compliance with the requirements of State educational standard of higher professional education in physical culture. Its aim is increasing of students’ professional and sports level on the base of one basic or some new kinds of physical culture and sports activity.

The content of PPSP is interconnected with theory and methodic of physical culture and sports (TMPCS) on the basis of realization of its main principles through specificity of a certain kind of sports. It means that by content all forms of classes reflect peculiarities of the chosen kind of sports, developing and specifying TMPCS principles on its base.

It is interesting to note that PPSP lectures are read for every year of study ion stream way and their content includes general for every kind of sports principles and information about main problems of sports and professionally-pedagogical perfection. For example, at lectures are familiarized with kinds and functions of sports in system of physical culture education; with competition and training activity in sports; with principles of technique and tactics, physical preparation in sports; with system of many-years preparation of sportsmen and specificities of scientific activity in sports. Lecture courses are read, as a rule, by highly qualified lecturers (candidates of sciences of masters of sports of Russia) [7].

At practical classes students are distributed into groups, depending on the chosen kind of sports, which are considered by faculty’s curriculum. Practical classes are, mainly, carried out on the base of university as well as on the base of CJSS**, JSS*** and other sport organizations and clubs, where trainings are conducted by personal coach of a student. The task of instructor, who is responsible for PPSP groups, is to control attendance of practical classes and students’ mastering of educational material, which permits to integrate knowledge, obtained in the process of studying at HEE.

At PPSP practical classes students must master techniques and tactics of the chosen kind of sports, as well as raise the level of condition and coordination preparation. It is compulsory to take part in competitions of different scale, where future instructors have to realize to the fullest extent their abilities in order to receive sports grade or the rank as per Single all Russian sports classification.

At senior years of study some students are permitted to change PPSP classes by conducting trainings of CJSS or comprehensive schools’ pupils in chosen kind of sports. Approximate distribution of PPSP hours is presented in table 3.

Table 3

Approximate distribution of PPSP academic hours

Year of study	Forms of classes			Total hours
	Theoretical	Seminars (practical)	Independent	
I	16	110	45	171
II	16	40	50	106
III	16	50	60	126
IV	10	48	45	103
Total	58	248	200	506

Analysis of academic documentation and special literature witnesses about similar attitude of Russian and Ukrainian specialists to forms of educational PPSP work. For example, G. Fiodorov (2006) [14] considered to be necessary carrying out of lecture course in the scope of 15% from all academic hours and practical classes in the following possible variants, which do not exclude their complex application: 1) subjective training classes; 2) educational methodic classes with students of junior years of study; 3) laboratory classes on development of planning and registration documentation.

Besides, the author stressed compulsory consideration of inter-subject connections with studying of PPSP. He noted, that successiveness of special knowledge and gradual character of motion qualities’ development, skills’ and organizational-methodic abilities’ formation in the process of learning of basic disciplines and their progress in the course of PPSP studying to certain extent facilitate solution of one of the key problems, which is characterized by duplicating of informational stream of knowledge with studying of one-profile disciplines. Realization mechanism of principle shall be carried out on the base of didactic deepening and widening of special knowledge, stimulating activity of students.

Other Russian specialist V. Kuzmin (1998) [3] regarded PPSP discipline as a mean of professional-creative preparation of future physical culture instructor. He offered formation of orientation on creativity and stimulation of students' creative abilities to include students, on the base of saturation with primary classes with creative situations, into active search of new methods of solution of different pedagogic tasks, which develop desire for learning, cognitive-creative interest to their profession and require from future instructors their ability to mobilize their potentials, to manifest fantasy, imagination, pedagogical improvising and etc.

The specialist advised to build most of PPSP practical classes by principle of teaching practice with further analyzing of them. Every student played both: role of a teacher and role of a disciple, applying with it the following methodic techniques: "one teaches all", "all teach one", "one teaches another one", "one teaches oneself".

For analyzing of all his activity in the role of pedagogue, at the beginning of student's life every student had to start diary of student-sportsman and diarize his pedagogic observations and ideas, analysis of his sports activity, self-control and read literature. The content of diary shall serve as a basis for writing of reviews, thesis, yearly works and diploma, making plans, comments, etc.

Summary

Thus, sport-pedagogic perfection of future physical culture instructors in Ukrainian HEEs is carried out in the process of SPP course in the chosen kind of sports. The target of SPP is familiarizing of students with theoretical basis and experience of training work in the chosen kind of sports as well as with methodic of carrying out of this work with children of different school age. The main forms of SPP teaching are: lectures, seminars, practical, familiarizing-methodic, individual and independent classes and teaching practice, during which future physical education instructors master knowledge of main CKS theoretical problems; master the basics of exercises' execution and methodic of CKS trainings at different stages of sports preparation; obtain knowledge, abilities and skills on organization and conducting of CKS competitions.

Further researches can be fulfilled on studying the problems of organization of educational process and evaluation of students' educational-sports and scientific achievements in SPP discipline.

- * INHT- Individual home tasks (*note of translator*)
- ** CJSS- Children-junior sport school (*note of translator*)
- *** JSS – junior sport school (*note of translator*)

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SUBMISSIONS AND FUTURE TEACHERS' ASSOCIATION REGARDING THE BASIC CONCEPTS OF THE SPHERE OF PHYSICAL CULTURE AND SPORTS

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Annotation. The aim of the work is to determine the characteristics of concepts and associations in relation to the basic concepts of the sphere of physical culture and sports in the future teachers of physical culture. In a questionnaire survey was conducted among 323 students (203 girls and 120 boys aged 17 to 23 years). The possibilities of the formation of students' motives for self-improvement and professional sports and recreational activities. Shows the structure of the students' ideas about the main sphere of physical culture and sports. It was determined that the structure of the students' characterized by a broad spectrum. Found that 14 - 22% of the students physical education is associated with the learning object. Indicator definitions of physical exercise as a form of organization of movements in students of all courses is increasing from 24.4% in the first year to 27.1% in the fourth. Almost half of the respondents believe that training - this kind of activity. Found that a significant number of students do not have a clear understanding of the basic concepts of the theory of physical education.

Keywords: students, physical education, theoretical knowledge, imagination, a teacher.

Introduction

Mastering of theoretical and methodic knowledge are rather important factors of formation of professional skillfulness of future physical culture teacher-instructor. It is confirmed by results of researches of T.Yu. Krutsevych [3], K.Hardman [7, 8] and by a number of foreign authors [6, 9, 10]. Efficiency of training specialists in physical education to large extent depends on formation of their specific world vision and physical culture thesaurus (from Greek thesauros – “storage”), that would be based on information-knowledge paradigm, where conceptual apparatus is the base (forms basic relations) of educational activity. In researches of A.A. Nikitina [5] thesaurus is regarded as a mean of orientation of students in learning-educational process of physical culture; as a result of mastering of educational material by them and as an instrument of physical culture-educational environment's designing. But, alongside with it, the problem of higher educational establishments' students awareness of physical culture and sports sphere has been weakly elucidated in literature, though concerning senior school pupils, it was studied in some works by N.G. Dolbysheva [2].

Nowadays study of world vision and sense sphere of personality are recognized as the most promising directions in psychology [4]. With it world vision is regarded as the component of mode of life, which is composed of ideas about most general connections and laws, which are characteristic for objects and phenomena of reality and human activity. In connection with it the problem of research of integral world vision complex's formation, which would be based on axiological and thesaurus approaches to physical culture trainings, becomes especially important.

Considering the above said, determination of ideas and associations concerning main concepts of physical culture and sports' sphere, as main factors of world vision formation of future physical culture instructors, is rather urgent.

The present studies has been fulfilled in compliance with plan of scientific & research work of SumSPU, named after A.S. Makarenko, Ministry of education and science of Ukraine for 2007-2011 as per subject “Optimizing of teaching and education process of different population's groups by means of physical culture”, approved by department of state registration of Ukraine institute of scientific & technical information in Kyiv (state registration number 0107U002255).

Purpose, tasks of the work, material and methods

The purpose of the research is to determine peculiarities of associations and ideas of future physical culture instructors concerning main concepts of physical culture and sports sphere.

The methods of the research:

1. Analysis of scientific-methodic literature.
2. Questioning (method of unfinished sentences).

Organization of the research

The researches were carried out on the base: Sumy state pedagogical university, named after A.S. Makarenko and Glukhov national pedagogic university, named after Oleksandr Dovzhenko. In order to find out associations and ideas of future physical culture instructors concerning main concepts of physical culture and sports sphere, we questioned 383 respondents of HEEs of Sumskaya region: of Sumy state pedagogical university, named after A.S. Makarenko (n = 232), of Glukhov national pedagogic university, named after Oleksandr Dovzhenko (n = 151). Questioning was conducted among the students of institutes and faculties of physical culture.

Results of the researches

In order to determine students' ideas about mentioned problems we composed questionnaire by method of unfinished sentences [1], which contained 57 questions, divided by their sense in to four blocks of questions: theoretical (“Physical education is ...”, “Physical exercise is ...”, “training is ...”, and etc.), questions of methodic character (“For

development of strength it is necessary ...”, “For development of endurance it is necessary ...”, “For restoration after physical loads I ...”, and so on), questions of axiological orientation and questions about healthy mode of life.

The structure of students’ ideas about terms, which are connected with physical culture, is shown in table 1: 17,0 % of first year students, 24,6 % - of second year 29,3 % - of third year and 32,3 % of fourth year students regard physical education as educational process that undoubtedly is correct. Within 13-16% there is quantity of respondents’ answers, which imply that physical education is associated with academic subject or discipline, excluding only second year students (see table 1).

Physical education is understood as physical development by 10,7 % of the questioned first year students, by 6,3 % - of second year students, by 5,2 % - of third year and by 5,3 % of fourth year students. Physical education as educational process is associated by ten-eleven percents of first and second year students. About 16% of third and fourth year students also regard physical education as educational process. Category “Complex of physical exercises and measures” was chosen by 15.7% of first year students, 10.9% of second year, 13,8 % - of third and 14,2 % of fourth year students. In our opinion rather significant percentage of students regard physical education in such narrow aspect.

Table 1

Students’ ideas about physical education

Associations and ideas	Physical education			
	Years of study			
	I	II	III	IV
“Educational process”	17,0%	24,6 %	29,3 %	32,3 %
“Academic subject, discipline”	14,8 %	21,7 %	13,8 %	15,3 %
“Physical development”	10,7 %	6,3 %	5,2 %	5,3 %
“Education”	9,3 %	10,9 %	16,1 %	16,2 %
“Complex of physical exercises, measures”	15 %	10,9 %	13,8 %	14,2 %
Other	15,7 %	9,1 %	13,8 %	13,4 %
It was difficult to answer	17,5 %	16,5 %	8 %	3,3 %

It should also be noted that for nearly seventeen percents of questioned first and second year students it was difficult to answer that is a negative factor. For the fourth year students this indicator is approximately five times lower – up to 3.3%.

Information, presented in table 2, witnesses that 14,7 – 16,9% of all questioned students have general ideas about development of human power qualities. This indicators is rather steady with analysis of answers both of first year students and of second, third and fourth year students, excluding discrepancies within 2,1 %.

Table 2

Students’ ideas about development of power qualities

Associations and ideas	Development of power			
	Years of study			
	I	II	III	IV
“General ideas about development”	14,7 %	15,4 %	16,1 %	16,9 %
“Means of development”	9,3%	12,6 %	18,8 %	21,7 %
“Methodic knowledge”	27,5 %	30,9 %	35,1%	42,4 %
“Specificities of studying”	3,9 %	2,9 %	4,6 %	4,1 %
“Psychological peculiarities”	19,6%	16,1 %	9,2 %	6 %
Other	11,2 %	9,1 %	11,5 %	7,1 %
It was difficult to answer	13,8 %	13 %	4,7 %	3,8 %

It was difficult to answer for 14,8 % of first year questioned students, 12 % - of second year students 9,7 % - of third year and 8,8 % - of fourth year students. Besides, 27,5 % of first year students think that the basis of strength’s development is methodic knowledge and the quantity of students, who think so, increases at fourth year of study up to 42,4 %.

It should be noted that 19,6 % of first year students think that exactly psychological peculiarities are main conditions of development of strength, among second year students 16,1 %, among third year students - 9,2 %, and 6 %

of fourth year students divide this opinion. The quantity of students, who think that for development of strength it is necessary to have appropriate means and conditions, also increases. At first year of study 9,3 % think so, 12,6 % - at second 13,8 % - at third and 16,7 % -at fourth year of study. As we can see in table 2 the quantity of students, who think that specificities of studying influence on development of human power qualities, varies within 3–5 percents. The same trend was also observed concerning ideas about development of other human motion abilities, in particular, endurance, coordination and quickness.

Summary

1. The structure of students' ideas about terms, connected with physical culture, has rather wide spectrum. 14 – 22 % of the questioned associate physical education with academic subject. Indicator, that determines physical exercise as a form of motion's organization increases from 24.4% at first year of study to 27.1% at fourth year of study for all students. Nearly half of respondents consider that training is a kind of activity. Also the fact, that significant quantity of students has no clear idea about main concepts of physical education theory, attracts attention.

2. About 13–16 % of all questioned students have only general ideas about development of human power qualities, endurance and flexibility. The quantity of questioned students' who think that for development of physical qualities it is necessary to have "methodic knowledge", varies within 20–40%. Percentage of students, for whom it was difficult to answer the questions, varies within 18–20%. Only third year students faced no difficulties in answering questions about development of endurance and other motion qualities, while all second year students answered only question "For development of flexibility it is necessary ...", that is explained by the fact that they only started mastering of special theoretic disciplines.

The prospects of further researches imply development and implementation in the process of future physical culture instructors' preparation innovative technologies of mastering of theoretical knowledge, which are based on profound studying of essence of basic concepts of physical culture and development of students' associative thinking.

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PERFORMANCE OF TRANSMISSION GOALS IN ONE AND TWO-TOUCH COMBINED TEAM OF UKRAINE ON FOOTBALL IN A FRIENDLY MATCH IN 2011 AND THE MATCHES OF THE EUROPEAN CHAMPIONSHIP IN 2012.

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Annotation. The aim of the study is to determine the performance of the transmission ball in one and two-touch athletes Ukrainian National Team. The material for the study included a video of friendly and official matches of the Ukrainian team at the European Championships in 2012. It is established that the team performed for the match 78 - 63 goals with one touch (replication error - 20.51% - 34.72%) and 124 - 107 goals in two touches (replication error - 10.28% - 17.79%). It is noted that the lower estimate corresponds to the transmission rate of less than 100 goals in one touch of the match. Team deserves high marks, performing over 130 such programs ball per game. Ukrainian national team in 2011, served an average of 125 per game gear ball in two touches. More gear ball with one touch in 2012 Ukrainian performed in the game against England - 78 assists. It is noted that the figures obtained passes of ball team of Ukraine are the basis for the preparation of the appropriate correction for the next match.

Keywords: football, team, transfer, touch, replication, error.

Introduction

Indicators of ball passes studied by many scientists (S. Golomazov, B. Chyrva, 1999, V.N. Shamardin, 2002, G.A. Lysenchyk, 2004, M. Garas, Y. Fales, I. Chornobay, 2006, S.M. Zhuryd, 2007, Salem Mokhammed, 2007, P.Ye. Perepelytsa, S.E. Demkovich, 2007, O. Solomonko, I. Karpa, 2010, I.M. Chornobay, O.V. Bayrachniy, 2012, Ihor Chornobay, Olha Matviyas, 2012 et al.)

In particular, Golomazov, B. Chyrva, 1999, determined mean indicators of quantity and effectiveness of one-touch ball passes by combined teams in world final tournament 1998 [1]. Combined teams of France, Brazil, Croatia, the Netherlands fulfilled in average 75-95 one leg-touch ball passes at matches of World Cup 1998 [1, 2].

G.A. Lysenchuk, 2004, in his works made conclusion that team, which fulfills less than 100 one touch ball passes, deserves low mark of this indicator. Team, that fulfills more than 130 such passes, deserves high marks [3].

In works [4,5] quantitative and qualitative indicators of ball passes, which were fulfilled by world football champions in the period 1930-2010, were determined.

S.M. Zhuryd, 2007, described fulfillment of ball passes by highly qualified football players at European championship 2004 [6]. Salem Mukhammed, 2007, determined indicators of quality and effectiveness of one and two touches ball passes by club European teams of high qualification [7, 11].

P.Ye. Perepelytsa, S. E. Demkovich, 2007, determined the levels of ball control by the best combined teams at world championship 2006 in Germany, where the highest indicator was demonstrated by Spain combined team, which, unfortunately, lost 1/8 of final in match with combined team from France [8]. Though, in the future, combined team from Spain, fulfilling great number of passes, became champions of Europe 2008, 2012 and world champion 2010.

Indicators of ball passes' fulfillment by team of FC "Karpaty" (Lviv) in national championship of Ukraine were studied by O. Solomonko and I. Karpa, 2010 [9,12].

I.M. Chornobay and O.V. Bayrachniy determined indicators of one and two touches ball passes by football players of combined team of Ukraine and their adversaries in unofficial matches 2011 [10]. Combined football team of Ukraine did not take part in qualification tournament for European championship 2012. The team prepared for final tournament through a number of unofficial matches, each of them was regarded as control one [10].

Among special literature sources we did not find scientific works, in which quantitative and qualitative indicators of one and two touches ball passes' fulfillment by football players of combined team of Ukraine at unofficial matches (UM) and matches of European championship (EC) 2012, would be compared.

The research has been carried out as per the subject of scientific & research work of football department of Lviv state university of physical culture for 2011-2015 "Scientific-methodic principles of perfection of sportsmen's preparation in football, considering specificities of competition activity" of combined plan of scientific & research work in the sphere of physical culture and sports of Ministry of family, youth and sports of Ukraine.

Purpose, tasks of the work, material and methods

The purpose of the research is to determine peculiarities of indicators of one-two touches ball passes' fulfillment by combined team of Ukraine in UM 2011 and EC 2012.

The object of the research is competition activity of combined football team of Ukraine.

The subject of the research is distinctive features of indicators of one and two touches ball passes' fulfillment in the matches of football combined team of Ukraine.

The tasks of the research:

1. Determine quantitative and qualitative indicators of one and two touches ball passes' fulfillment by combined football team of Ukraine in UM 2011 and EC 2012.

2. Determine distinctive features of indicators of one and two touches ball passes' fulfillment by combined football team of Ukraine in the mentioned above matches.

The methods and organization of the research:

1. Analysis of literature sources.
2. Pedagogical observations of tactic and technical actions (of one and two touches ball passes' fulfillment).
3. Methods of mathematical statistics.
4. Theoretical analysis and generalization of results of the research.

The research was conducted with using of video records of six UM of combined team of Ukraine 2011 with national combined team of France, which took place in Sweden (06.06.2011), Czech (07.09.2011), Estonia (12.10.2011), Germany (11.11.2011), Austria (15.11.2011) and video records of matches of combined team of Ukraine at EC 2012. Analysis of one and two touches ball passes' fulfillment was carried out with the help of program "VLK media player".

Results of the researches

Analysis of video records showed that the highest quantity of one touch ball passes (except head passes) was fulfilled in UM with combined team from Estonia– 128 passes (see fig.1), and the least quantity of one-touch ball passes – in control UM with strong (as per rating of FIFA, UEFA) combined team from Germany – 56 passes. In UM 2011 combined team of Ukraine fulfilled in average 92 one touch passes per one match

In match EC 2012 with Sweden combined team Ukrainians fulfilled much less one touch passes (63) than in UM 2-11 with the same team (109 passes). In match with France combined team at EC 2012, Ukrainians fulfilled nearly the same quantity of one touch passes as in UM the last year (72 and 69 passes correspondingly). The biggest quantity of one touch passes at EC 2012, was fulfilled by Ukrainian team in match with combined team from England – 78 passes.

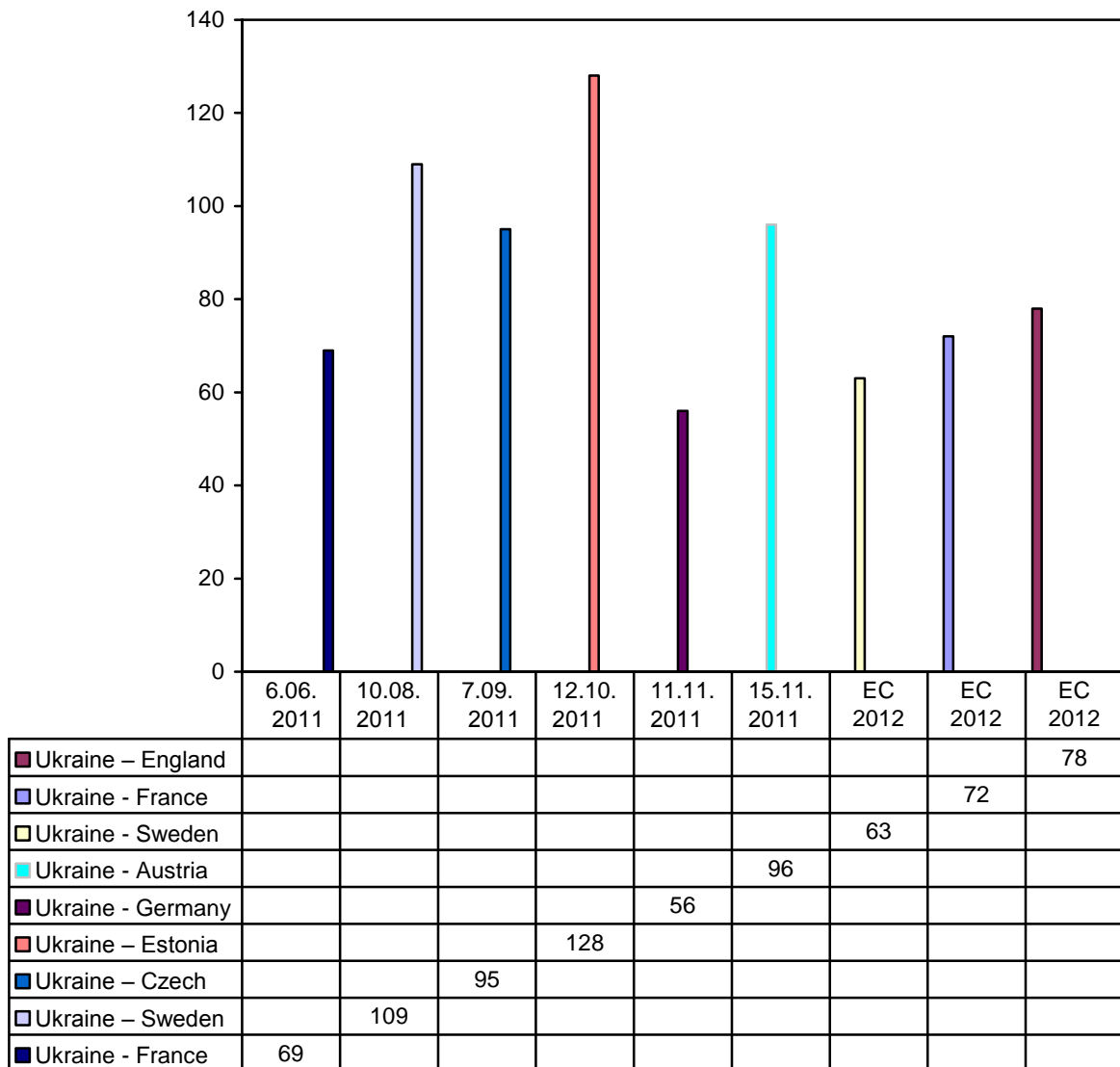


Fig.1. Quantity of one touch ball passes' fulfillment (except head passes) by combined team of Ukraine in UM 2011 and EC 2012 matches.

In UM 2011 the biggest quantity of two touches ball passes was fulfilled by combined team of Ukraine in match with combined teams from Estonia – 181 passes and Sweden – 172 passes and the least quantity of passes was fulfilled in UM with combined teams from Austria – 68 passes and Germany – 81 passes (see fig.2).

In UM 2011, combined team from Ukraine in average fulfilled 125 two touches ball passé per one match.

At EC 2012 combine Team from Ukraine fulfilled 124 two touches ball passé in match with combined team from Sweden; this is much less than in UM 2011 in the match with the same team (172 passes). In EC 2012 match with combined team of France Ukrainians fulfilled nearly the same quantity of two touch passes as in IM with the same team (118 and 110 correspondingly).

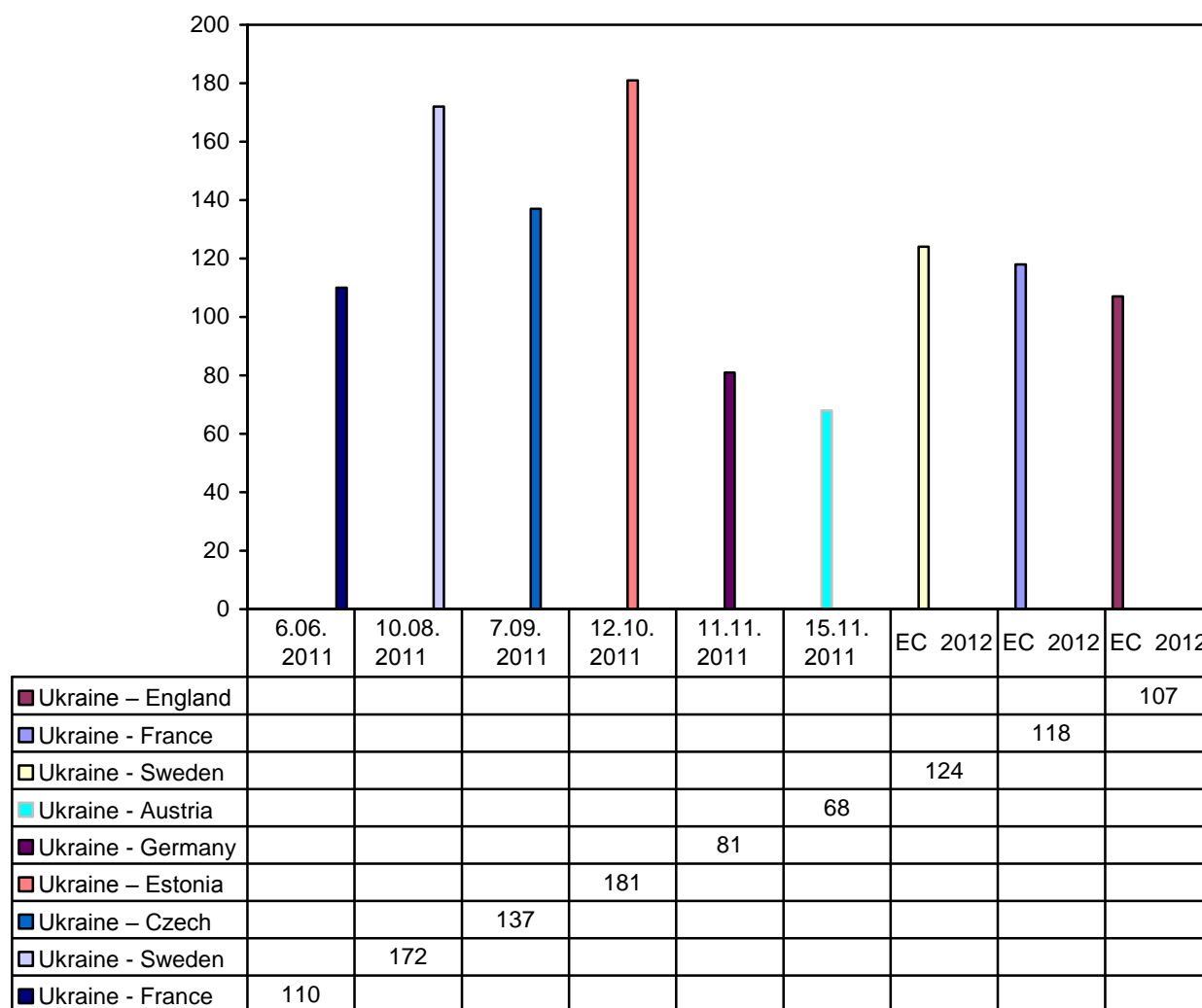


Fig.2. Quantity of two touch ball passes' fulfillment by combined team of Ukraine in UM 2011 and EC 2012 matches.

The least percentage of one touch ball passes' deficit was, when at UM combined team of Ukraine played match with Czech combined team – 12.63 %. Among the mentioned UM of 2011 the highest percentage of one touch ball passes' deficit was in matches of combined team of Ukraine and combined teams of Sweden (26.6%) and Austria (26.4%). The same deficit in UM with combined team of France was 17.39%, with combined team of Germany— 21.42%, with combined team of Estonia – 24.21%.

In average the deficit of one touch ball passes' fulfillment by combined team of Ukraine in UM 2011 was 17.87 % per one match.

In EC 2012 matches the least percentage of one touch ball passes' deficit was in match with combined team of England – 20.51%. In EC 2012 match with Sweden team percentage of one touch ball passes' deficit was 23.8%, and with combined team of France – 34.72%.

Among all studied by us matches the least percentage of two touches ball passes' deficit was at match of combined team of Ukraine with combined team of England - 10.28%.

Among UM 2011 the least percentages of two touches ball passes' deficit were in matches of Ukrainians with Sweden – 11.04% and Estonians– 12.15%. Percentage of two touches ball passes' deficit in UM with combined team of Germany was 13.58%, with combined team of Austria – 14.7%, with Czech combined team 15.32%.

At EC 2012 match with combined team of Sweden the percentage of two touches ball passes' deficit was 16.12%. The highest percentage of two touches ball passes' deficit was in matches with combined teams of France in 2011 and at EC 2012 (correspondingly: 20.9 % and 17.79%).

Summary

1. At European championship football players of combined team of Ukraine fulfilled 78-63 one touch passes and 124-107 two touch passes per one match. At unofficial matches 2011, combined team of Ukraine fulfilled more one and two touches ball passes, excluding the matches with combined teams of Germany, France and Austria.

2. In matches of combined team of Ukraine there were found high indicators of one and two touches ball passes' deficit, except unofficial control match with combined team of Czech. Two touches ball passes' deficit indicators were also high (except matches with combined team of England and unofficial matches with Sweden team).

The prospects of further researches are determination of qualitative and quantitative indicators of ball passes at world, continental, countries championships and among junior teams.

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