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## HYDRO AEROBICS AS MEANS FOR PHYSICAL STATE IMPROVEMENT OF FEMALE STUDENTS

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**Annotation.** The questions of organization and conducting studies were considered by using system of hydro aerobics exercises for improving physical training of female students. Sixty female students took part in the experiment. All the tested girls were divided into two groups, 30 persons each. The tested group of female students made aerobic exercises on the dry land according to a plan. The female students of experimental group made hydro aerobics exercises according to the programme. Several methods were used: anthropometry, control methods of the functional parameters of the body, testing of the physical training indicators, methods of mathematical statistics. The reliable positive improvements of cardiovascular and respiratory systems were in the experimental group of the girls. The effect of the reliable decrease of fat mass of the tested female students was exposed among anthropometrical characteristics.

**Key words:** female students, health, physical state, hydro aerobics.

### Introduction

Many researchers (4) in their works note that the health of graduates of humanitarian and technical higher educational institutions (future specialists and future parents) is worsening. Physical state of girls, which determines the health of future child by 80%, is of special concern.

We have to state that there is a problem, connected with the necessity to improve physical state and health of female students and with the difficulties of its solution within the frames of traditional physical education system, existing in higher educational institutions (1, 2). It is not easy for the teachers of higher educational institutions to involve female students in physical trainings, which, by its form and content, do not differ from traditional ones. Non traditional kinds of sports are now very popular among young people (8). An increased interest of female students to different trainings in water is now being noted (3, 5, 6, 7). They are: walking and jogging in water, power training in water, hydro aerobics, aqua fitness, aqua building etc.

Hydro aerobics should be understood as different exercises in water to the music with elements of gymnastics, athleticism, yoga, choreography and acrobatics. The main task of hydro aerobics is reaching of health improvement effect of the disciples, improvement of cardiac and respiratory systems, rising of physical level: endurance, flexibility, strength and co-ordination.

Simultaneously with this it is necessary to note the lack of scientifically grounded data about influence of water gymnastics exercises, as a complex of exercises, on physical state and health of girls-students. That is why we put forward a hypothesis about the possibility of hydro aerobics exercises complexes' efficient application as a mean of 17-20 years old female students' physical state and health improvement.

The research has been fulfilled as per plan of scientific & research works of National university "Law academy of Ukraine, named after Yaroslav Mudriy".

### Purpose, tasks of the work, material and methods

*The purpose of the research* – experimental foundation of female students' physical state improvement on the base of hydro aerobic means application.

*Organization of the research.* 60 female students of 1 – 3 years of study took part in experiment. All tested were divided into two groups: 30 persons in each. Control group was trained as per traditional aerobics' program out of water. Female students of experimental group took part in systematic hydro aerobics trainings, which were conducted by specially developed program.

*The methods of the researches:* anthropometry, control of organism's functional indicators, physical level testing, mathematical statistics methods.

### Results of the researches

On the stages of experiment all tested were medically examined and had no contra indications to health improving aerobics and hydro aerobics trainings. Both of the groups had two trainings a week with training duration one hour. The program included three complexes of exercises in water: introductory with weakened intensity of exercises, main with increased intensity and training complex with high intensity of exercises. On all stages the tempo of exercises was controlled by music accompaniment. On the first stage of the experiment, introductory part of training was 10-12% of all training time, with music tempo of 128-135 beats p. min. and the duration of the whole period of training – 1 month. The main part took 80% of training time, tempo -130-146 beats p. min., the duration of the whole period of training – 2 months. The training part of complex: 8-10%, tempo – 128- 135 beats p. min., the duration of the whole period of training – 3 months. On the second stage introductory complex was shortened up to 2 weeks, main complex – up to one month and the duration of training complex was consequently increased up to 4.5 months. Music accompaniment tempo remained the same as on the first stage.

On the third stage of the research we executed the second (main) stage of pedagogical experiment with application of increased physical loads parameters.

Hydro aerobics trainings were conducted as per curriculum schedule. Warming up exercises included smooth rhythmic movements with gradually increased amplitude. Main part was the so-called "cardio-training", which consisted of different active movements, engaging different muscles' groups, and "power" training oriented on load of mainly torso muscles. The final part of a training included rhythmic, smooth movements, relaxing muscles, followed by stretching. Exemplary schema of training main parts' distribution is shown in table 1.

Table 1

*Distribution of hydro aerobics training time by main parts*

Parts of training	Description of parts	Duration depending on training period	
		In relation to the time of the whole training, %	Absolute indicators, min.
Introductory	Warming up	15	5-7
Main	"Cardio - training"	45	13-20
	"Power" training	25	7-11
Final	Relaxation	15	5-7

Stage-by stage control of experiment participants' physical state was organized on the base of testing method with registration of anthropometric, power and functional indicators.

By anthropometric data (table 2) considerable results of both groups were obtained on the third stage of researches.

Table 2

*Dynamics of girls' anthropometric indicators*

Indicators	Stages	Experimental group		Control group	
		X	s	X	s
Mass of body, kg.	1	54,8	6,9	54,2	7,4
	2	54,2	6,1	53,1	7,2
	3	54,5	6,8	59,0	7,9
Hip circle, m.	1	92,4	6,3	92,9	4,7
	2	92,0	5,9	92,2	5,2
	3	93,3	6,1	97,2	6,1
Abdomen circle, m.	1	79,4	8,7	81,4	5,9
	2	75,4	6,7	79,2	5,6
	3	76,2	9,6	83,3	8,8
Waist circle, m.	1	69,6	5,3	69,6	5,3
	2	68,0	5,8	68,0	5,8
	3	68,6	6,2	72,4	4,9

The indicators of body mass, hip circle and waist of experimental group's girls statistically did not change, except "abdomen circle", which reduced already on the second stage and remained statistically unchanged on the third one. Concerning the control group, all indicators, without exception, authentically worsened after finishing of experimental trainings.

The results of physical preparedness indicators are given in table 3.

Table 3

*Dynamics of girls' physical preparedness*

Indicators	Stages	Experimental group		Control group	
		X	s	X	s
Squatting, q-ty,	1	67,9	27,9	64,7	20,1
	2	78,6	21,5	84,1	24,8

	3	79,6	16,0	63,6	12,0
Press ups, q-ty.	1	3,7	3,5	3,1	3,8
	2	12,6	3,8	13,4	3,8
	3	11,5	3,7	7,6	2,6
Standing jump upward, m.	1	0,30	0,04	0,30	0,04
	2	0,30	0,04	0,32	0,06
	3	0,30	0,04	0,235	0,03

From this table it is seen that positive changes are in both groups, however, the level of their levels maintaining up to the third stage was authentically higher in experimental group.

The dynamics of functional indicators of experimental and control groups' girls are presented in table 4.

Table 4

*Dynamics of functional indicators of experimental and control groups' girls*

Indicators	Stages	Experimental group		Control group	
		X	s	X	s
GSTI, conv. units	1	66,4	14,0	74,7	18,0
	2	80,7	15,2	84,9	16,5
	3	68,2	14,5	72,9	17,8
Shtange's test, s	1	54,5	17,0	47,7	11,2
	2	62,1	11,1	56,2	12,5
	3	61,6	8,5	44,8	11,7
VCL, ls.	1	2,4	0,45	2,5	0,26
	2	3,1	0,39	3,0	0,52
	3	3,0	0,39	2,9	0,44

Notes: GSTI – Garvard step test index, VCL – vital capacity of the lungs.

By the data of table 4 we can see, that for the female students of experimental group improvement of all studied indicators both by two and by three stages of the experiment are authentic. In control group such distinctions were registered on the third stage of researches, like significant worsening of Shtange's test, i.e. in several months after finishing of experimental trainings.

At the same time the test values of experimental group's girls maintained on the same level under the same conditions. By VCL indicator all average-group data are not authentic, while in experimental group a positive dynamics was registered.

Thus, we have all the grounds to affirm that hydro aerobic influences very positively on organism's functional state of the tested from experimental group in comparison with control group.

**Summary**

The conducted researches resulted in establishing of authentic positive average-group indicators' shifts of cardiac and respiratory systems of experimental group girls. In control group the same shifts turned out to be significantly weaker.

Among anthropometric indicators there was found effect of authentic reduction of fatty mass indicator of experimental group girl; in control group this effect was not established.

The results of specially organized comparative experiment demonstrated incomparably positive influence of just water medium on physical and psychic state of the tested during fulfilling of physical exercises by them. That is why it should be considered that systematic hydro aerobics trainings can be an effective mean of female students' health and physical state improvement.

*The prospects of further researches* presume studying of hydro aerobics training's influence on female students of special health groups.

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## FOOTBALL AS A PROFESSIONAL SPORT, AND THE PROSPECTS FOR ITS DEVELOPMENT IN UKRAINE

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**Annotation.** The aim of the study was to determine the features of the functioning of European football as a segment of the service industry, bringing economic, social and political effects. The features of professional sports in Ukraine by the example of football as an object of scientific analysis were considered. It is considered the features of the functioning of football. The study used methods of system analysis, analysis methods specific sources, methods comparison, and statistical methods. It is shown that a significant influence on the development of modern sport in particular football by processes of commercialization and professionalization. Found that football is the manufacturer of a wide range of services that bring significant economic, social and political impact of the subjects and has a high football information and entertainment value for the audience.

**Key words:** football, professional, sport, prospects, development.

### Introduction

Significance of club and combined teams international matches conditions, as a substantial factor of national prestige, progressing scientific interest to the analysis of management's general grounds, economics, law, personnel, maintenance, scientific methodological and medical provision. Due to this fact the development policy of high sports is directed to searching optimal management models for the country. It is important to consider that professionalization and commercialization of modern sports would promote not only its modification, system of management and training of sportsmen, but condition the change of general sports system professional component's specific gravity, orientating it at maximal effectiveness, technical skills manifestation, aesthetics and show character [1-8].

Besides, one of the main trends of modern society development is globalization, due to which the determining features of modern sports' functioning are: integration in the system of world market economy, migration of sportsmen and coaches, formation of powerful transnational sports equipment market, informational and ideological dimensions [9, 10]. Radical changes, which now are going in modern high sports, condition the necessity of development of its strategy on national level in compliance with international trends. Owing to it there appeared an acute demand in analyzing development trends of some professional kinds of sports, football in particular, as well as the possibility of European experience application for the development of national systems [11].

Reconstruction of social and political structure, formation of market relations in Ukraine, decreasing of high sports results' level witness about the demand in scientific foundation of sports organizational system's change and searching new efficient management methods, which would consider both: national social-economical, political and cultural environment and the processes in international sports.

### Purpose, tasks of the work, material and methods

*The purpose of the research* – determination of football functioning's peculiarities as a segment of European industry of services, effective in economic and social-political aspects.

*The methods of the researches:* systemic analysis; analysis of special sources; comparison; statistics.

### Results of the researches

On the modern stage of development, sports, as a social institution, function in different directions. American sociologists [12, 13], when defining term "sports" underline three components of sports: "easy" sports ("sports for everybody"); organized sports (high sports); professional sports.

As per the point of view of V. Platonov and S. Guskov [5, 8], the following kinds of sports, which are different by purpose and effectiveness criteria are marked out: mass (people's) sports; Olympic sports; professional sports. Regarding specificity of sport activity in professional sports, the authors single out a number of features, which distinguish professional sports from Olympic one: they are orientation at the kinds of sports, which can bring great income or cover all expenses by own income. In leading European championships football completely manages this task. Besides, it ensures creation and maintaining of atmosphere of severe competition in national championships; formation of elite clubs; availability of sufficiently efficient and constantly improving sportsmen's social protection system. Footballers' contracts become more perfect from jurisdictional point of view, footballers' trade unions are creating, insurance companies work more perfectly.

Analysis of scientific literature showed that commercialization and professionalization processes, solutions of whose problems are reflected in works of many authors [4, 5, 13] et al., significantly influence on development of modern sports. They are regarded in the following aspects: constant expansion of commercial competitions, conducted both by international and national federations, net; changes of competition rules; development of commercial attractiveness; perfection of show character. So, for example, for the last ten years, there has been changed format of "European champions" cup into league of "champions", UEFA cup has been transformed into league "Europe", that permitted to attract additional investments, sponsors, major TV and radio companies.

All these permitted to make the tournaments the most attractive from commercial and show point of view on the continent. So, clubs receive financial profit even at the stage of getting into these tournaments, which increases depending on the won matches.

One of the vectors of qualitative transformations in modern football is not only establishing of market self organization but also formation of services market. The market of services, as relative, open subsystem of sports economics, fulfills an important function: it ensures more efficient usage of resources for satisfying of society with special, immaterial goods – sports services.

The market of sports services functions side-by-side with markets of goods, capitals, labor market and is divided into private markets because the services are various and diverse. For evaluation of sports industry's place and role in economy a complex of indicators is used, such as: share of gross domestic product assigned for development of sports; provision of population with available sports facilities, goods and sports services; availability of financial sources for sports and health improving activity.

Modern football transformed into important segment of European sports industry. Its structures regard as paramount importance of their activity application of modern technologies and it substantially expanded connections with other branches of economy. High efficiency of modern football's functioning is based on interaction of two mutually complementary spheres: football itself and its infrastructure. Just community of interests of each sphere's representatives promotes formation of conditions, which are necessary for implementation of sports, health improving and educational measures by realizing technological, organizational-economical, industrial, jurisdictional and other links.

To-day professional football is an open system, which interacts with environment and has sports competition, in our case sports show, as a main component. Achievement of the mentioned result is promoted by both: the systems main components - participants, organizers, management bodies, mass media means, and by other components – footballers' training system, refereeing, marketing and ticket programs, interaction with official authorities (governmental and municipal), sponsors, fans (see fig. 1).

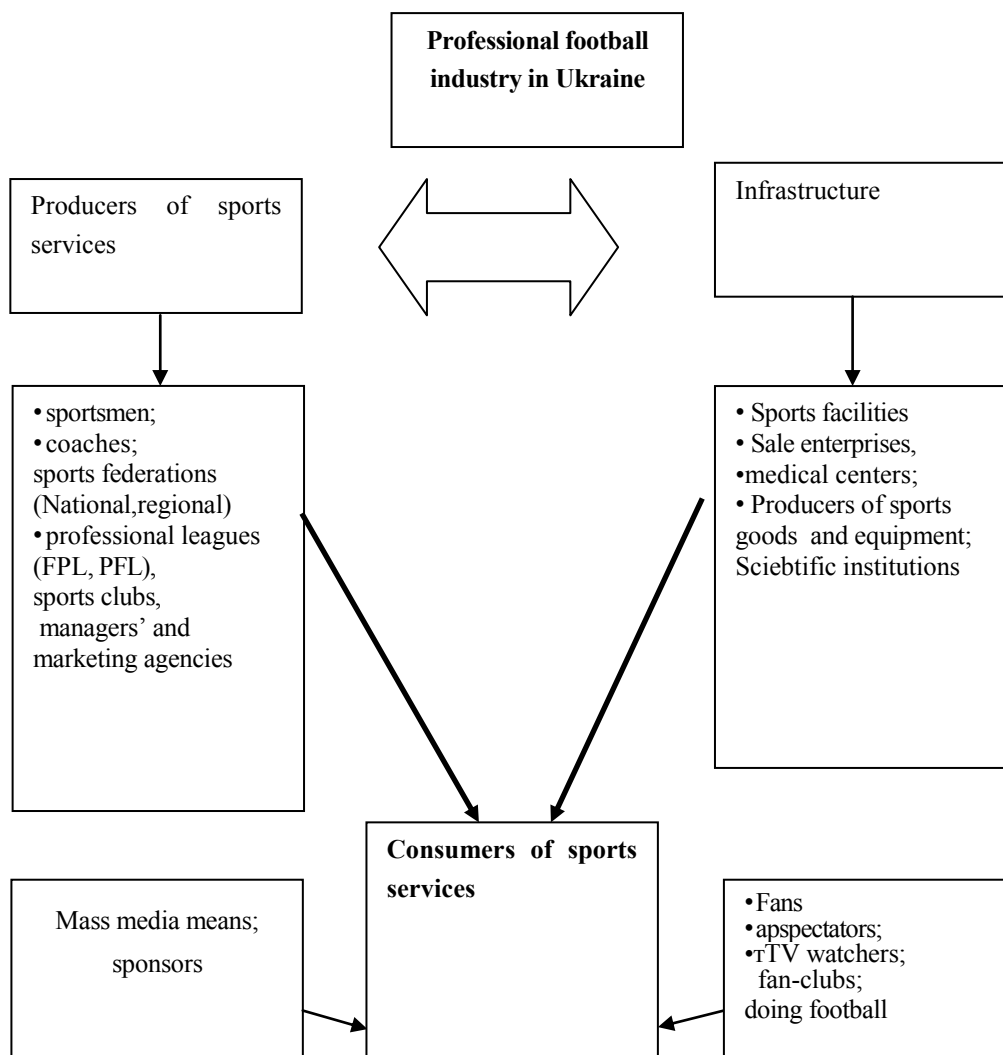


Fig.1 Main components of professional football industry

It should be noted that relates to the sphere of production of socially significant goods, which is manifested both in its external form – game (show) and internal – purpose orientation and social usefulness. These, to a large extent, condition football's popularity among the populations of many countries and preconditioned formation and development of its own segment at European market of sports services.

Football as high sports is a sphere of sport training and sport-show production sphere with purpose orientation at achieving and maintaining of sport form, creation of sport show, satisfaction of spectators' aesthetic demands and their demands in communication and active leisure. Football of a labor process is a sphere of application of not only professional sportsmen's physical, intellectual and other abilities, but also of coaches, referees, agents, organizers, sponsors, stock and equipment producers and other subjects of market. Formation and development of professional branch is founded on realization of both: sportsmen's strive to satisfy personal targets and efforts of people who ensure different sports measures' organization.

Football industry at market, and realization of services have a number of peculiarities. In opposite to material good, in football services are produced and consumed mainly simultaneously and are not liable to be maintained. That is why consumption of majority of services takes place in direct contact of their producers (sportsmen, coaches) with consumers (spectators, coaches) excluding brokerage.

Service realization in football closely interacts with the selling of tying products (sports stock, equipment and etc.) and progressively influence on it.

All kinds of football industry services are appropriate for wide involving into international economic turnover. First of all it concerns sports facilities services (conducting of tournaments, Euro 2012) and so on, sports activity directed to receiving of material profit; football to-day is characterized, first of all, by its entertaining value and economic efficiency, that is the reason of dramatic rise of competition and constant spectators' attention to long-term contest. Formation of social-economic relations in football has specific features, which are caused, first of all, by transformation of football subjects (by targets and character of activity) into economics subjects: professional teams, spectators, sports management bodies.

Modern football also functions under influence of social-political and economical processes, that mainly manifests in its subjects' administrative and economical links, involving of eminent political and social figures, which become the heads of sports federations, attend sports measures, matches.

#### Summary

Thus, basing on the above said it can be affirmed that modern football is a combination of social-economical relations of private and public character, which appear among the subjects in connection with their participation in professional sports activity. At the present stage, football in all its manifestations (mass, Olympic, professional) is the producer of wide range of services, to which there relate: physical culture-health improving and sports trainings sport shows, organization and conduct of educational-training process; presenting of sports facilities to population; informational, consulting, educational and other services. With this, consumption of football as a service brings significant economical and social-political effect and has high informational-entertaining value for spectators.

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## COMPUTER DIAGNOSTICS OF LEVEL OF PROFESSIONAL COMPETENCE FORMATION OF FUTURE PHYSICAL CULTURE TEACHERS IN THE BIOLOGICAL DISCIPLINES STUDY

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**Annotation.** The analysis of the level of professional competence formation of future physical culture teachers in the biological disciplines study was provided. The study involved 79 students. It is applied methods of teaching observation and experiment. The computer program of monitoring of professional competence of future teachers of physical education was described in the study of the biological sciences. Analyzed the results of 448 students questionnaire of the first and second year, studying at specialty "teacher of physical culture." Found that the results of the formative stages of the experiments show significant positive changes in the levels of formation of professional competence of students of the experimental group. Found that the increase in the number of students with high and medium level of formation of professional competence and reduced the number of students with low level of formation of professional competence.

**Keywords:** computer, diagnostics, professional, competence, physical culture.

### Introduction

In modern, quickly developing society, demand in professionally competent future teachers of physical culture is more and more growing. And that is why requirements to the quality of future physical culture teachers' training are increasing, that condition not only the necessity of constant training process perfection, application of its new forms, but also implementation of pedagogical diagnostics for checking, permanent control, evaluation, accumulation of statistics data and their analysis, for revelation of dynamics, trends, further progressing of students' knowledge and skills.

Theoretical foundation of pedagogical diagnostics' different aspects was reflected in the works both of domestic and foreign scientists, such as V.S. Avanesov [1], B.P. Bitinas and L.I. Katayeva [2], O.M. Demchenko [3], I.P. Pidlasnyy [6], A.V. Khutorskiy [10] et al.

Conception "professional competence" was studied by such foreign scientists as R. Boytsis [11], B. Spenser [12], Ye. Short [13]. Different aspects of future physical culture teachers' professional competence were studied also by Yu.V. Dragnyev [4], L.O. Konovalska [5], N.M. Samsutina [7], L.P. Suschenko [8], O.V. Timoshenko [9] et al.

The results of contemporary literature sources' analysis witness that there has not been paid sufficient attention to pedagogical diagnostics problems in higher educational institutions. That is why, in our opinion, in conditions of heightened attention to the quality of specialists' training at higher educational institutions, the problem of pedagogical diagnostics becomes very urgent.

The work has been fulfilled as per plan of scientific & research works of National pedagogical university, named after M.P. Dragomanov (Institute of physical education).

### Purpose, tasks of the work, material and methods

*The purpose of the research* was to analyze results of Ukrainian higher educational institutions students' questioning results; to describe computer software "VSD: monitoring of future physical culture teachers' professional competence in the process biological disciplines study", which was developed in co-authorship with L.P. Suschenko and V.A. Didenko; to carry out analysis of formation levels of future physical culture teachers professional competence in the process of studying of biological disciplines.

*The methods of the researches:* theoretical analysis and generalization of scientific literature, pedagogical observation, pedagogical experiment, methods of mathematical statistics.

### Organization of the research.

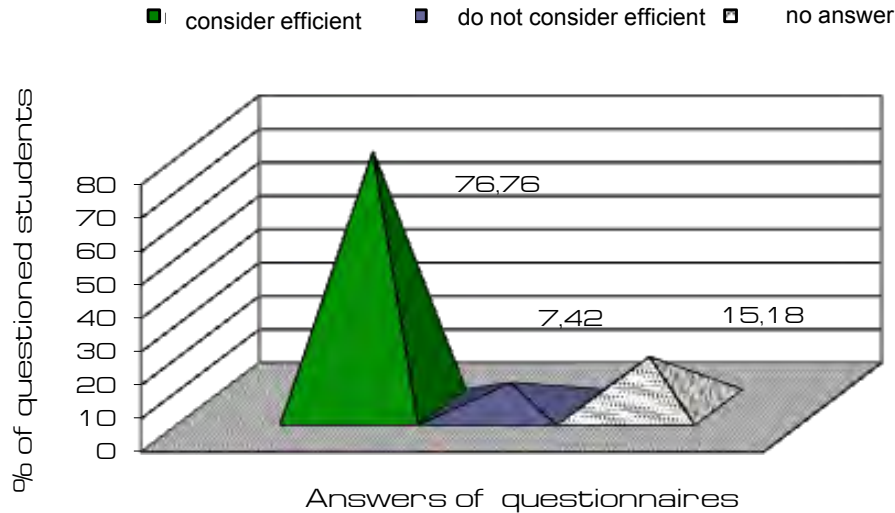
Pedagogical experiment, which consisted of stating and formational stages was being carried out during 2010 - 2012 academic years.

At stating stage of the pedagogical experiment documentary sources was studied, accumulation of actual materials and their preliminary systematization were fulfilled, the status of future physical culture teachers' professional competence formation levels was studied in the process of study of such biological disciplines as "Vital functioning safety and civil defense" (1<sup>st</sup> year); "Common hygiene and hygiene of physical exercises" (2<sup>nd</sup> year), "Physiology of physical education and sports" (2<sup>nd</sup> year). At formation stage, students of National pedagogical university, named after M.P. Dragomanov, took part in pedagogical experiment as the members of experimental group (n=79).

### Results of the research

In order to study contemporary status of future physical culture teachers' professional competence in the process of studying of biological disciplines, 448 students of higher educational institutions were questioned. In particular, they were: 86 students of Berdyansk state pedagogical university, 49 students of Volyn national university, named after Lesya Ukrainka, 63 students of Zaporozhskiy national university, 146 students of National pedagogical university, named after M.P. Dragomanov (Institute of physical education), 51 student of Lutsk University "Ukraine" (Institute of human being progress), 53 students of Cherkassk national university, named after Bogdan Khmelnytskyi.

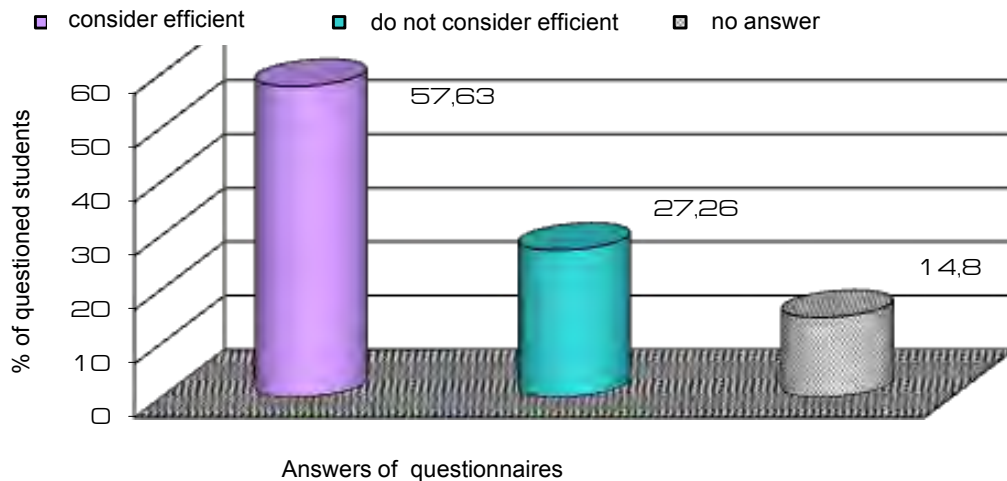
Analysis of the students' answers witnesses that among 448 students, 76.76% consider pedagogical diagnostics of future physical culture teachers' professional competence in the process of studying of biological disciplines to be an efficient method. 7.42% do not consider it to be efficient, for 15.18% it was difficult to answer (see fig. 1).



*Fig 1. Distribution of students' answers to the question if pedagogical diagnostics of future physical culture teachers' professional competence in the process of biological disciplines study is efficient or not*

So, majority of students consider pedagogical diagnostics of future physical culture teachers' professional competence in the process of biological disciplines study useful to be conducted.

The students' answers concerning efficiency of computer knowledge testing, which they received in the process of biological disciplines study distributed as follows: from 448 students, 57% consider computer knowledge testing, efficient, 27.26% do not consider it efficient, for 14.80% it was difficult to answer (see fig.2)



*Fig 2. Distribution of students' answers to the question if computer testing of knowledge, which they received in the process of biological disciplines study is efficient or not (%).*

In the process of students' training there were introduced the revealed organizational-methodological techniques of pedagogical diagnostics of future physical culture teachers' professional competence in the process of biological disciplines study.

We developed diagnostic tools for monitoring of future physical culture teachers' professional competence formation levels in the process of biological disciplines study, which included criteria, indicators and the levels (low, middle and high) of future physical culture teachers' professional competence formation in the process of biological disciplines study. The developed diagnostic tools become a basis of algorithm of computer software "VSD: monitoring

of future physical culture teachers' professional competence in the process biological disciplines study", which was developed in co-authorship with L.P. Suschenko and V.A. Didenko.

The program was designed for testing of students' group up to 100 persons each. To work with this program, start file "Testing. Exe", which is located in working folder. After starting of the program the window with program title appears. To start testing student should enter his name, surname and patronimic and select the stage of experiment. If any of the mentioned fields is not filled it becomes of red color after pressing "Start" button. If to enter data, which are not available in data base, there will appear window with message "User has not been found". If all fields are filled correctly, with pressing button "Start", user will see list of tests. He should select the test, which he wants to pass or tick "Pass all tests", to pass all the tests one-by one and press button "Next".

On screen he will see a dialogue with the name of test, question and list of answers. In order to pass to the next question, user must select only one answer.

After passing the test user will see the window with the name of the passed test, level and quantity of points, gained during testing. In order to pass testing again, it is necessary to press button "End", then press "Exit" or cross in the right upper corner of program window.

As a result of test's passing the program creates report, which is located in file "report" and contains: mark for answer, total quantity of points and total level of readiness, which are located in other documents: "Text1.xls". Test tasks for evaluation of students' level of biological disciplines' knowledge. "Test2.xls" is a card for evaluation of formation level of future physical culture teachers' procedural competence in the process of biological disciplines studying; "Test3.xls" – is experimental analysis of evaluation of future physical culture teachers' communicative skills formation level; "Test4.xls" is experimental analysis of evaluation of future physical culture teachers' organizational skills formation level. Report consists of three pages. The first and the second pages consist of students' P.I.B., the points, which were gained by them during testing and level, but the first page contains the points at the beginning of the experiment and the second page contains the points, gained at the end.

The third page contains statistics of students' testing. This statistics reflect total quantity of students, who passed testing and total indicator of readiness level, average value, quadratic mean and representation error.

With passing all tests, student's readiness is calculated; these data are registered in file "MainSheet.xls". Student's P.I.B., points for each test are entered into report; criterion t-student is calculated as well as the levels for all tests at the beginning and at the end of experiment and the difference between them. Besides, statistics is calculated: the quantity of tested students and quantity of gained levels, average value, quadratic mean and representation error.

At the beginning of pedagogical experiment with the students of NPU, named after M.P. Dragomanov 10.13% had high level of professional competence formation, at the end of pedagogical experiment – 18.99% of students had high level; concerning middle level 37.97% had this level at the beginning of pedagogical experiment and 58.23% of students – at the end of the experiment; low level was manifested by 51.90% of students at the beginning of pedagogical experiment and 22.70% - at the end. By knowledge criterion the quantity of high level students increased by 8.86%, middle level – by 20.25%. By knowledge criterion the quantity of students with low level in experimental group reduced by 29.11%.

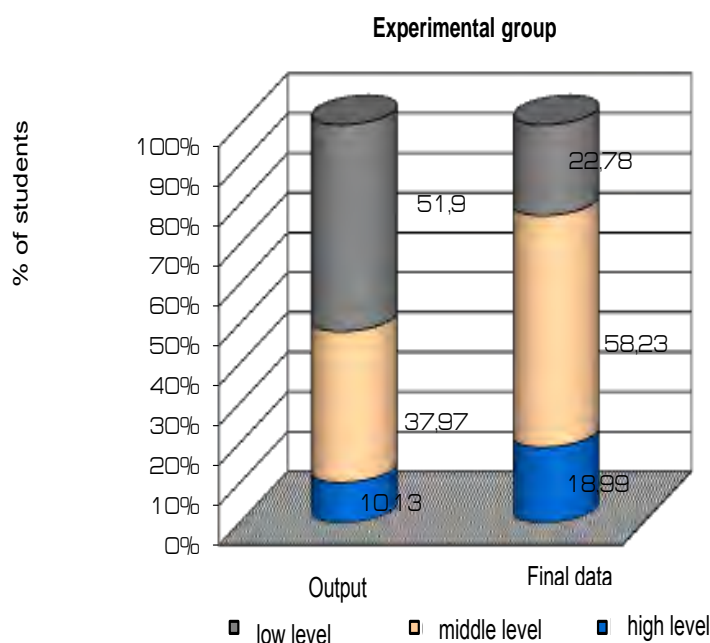
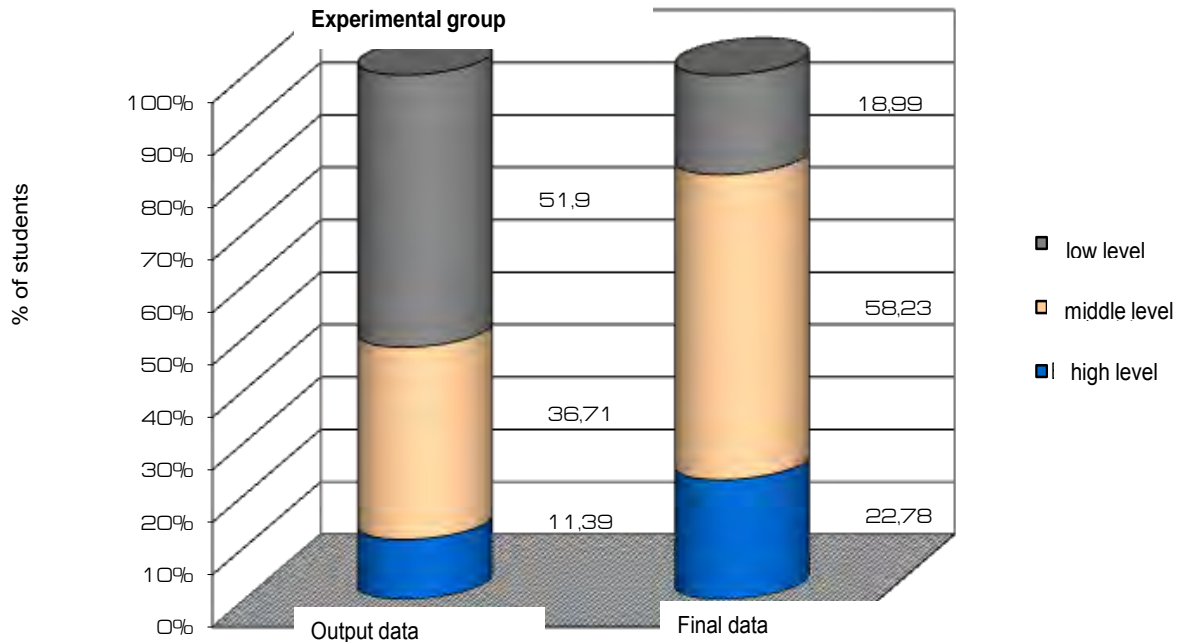


Fig.3 Dynamics of professional competence formation levels by knowledge criterion, manifested by students of NPU, named after M.P. Dragomanov (%)

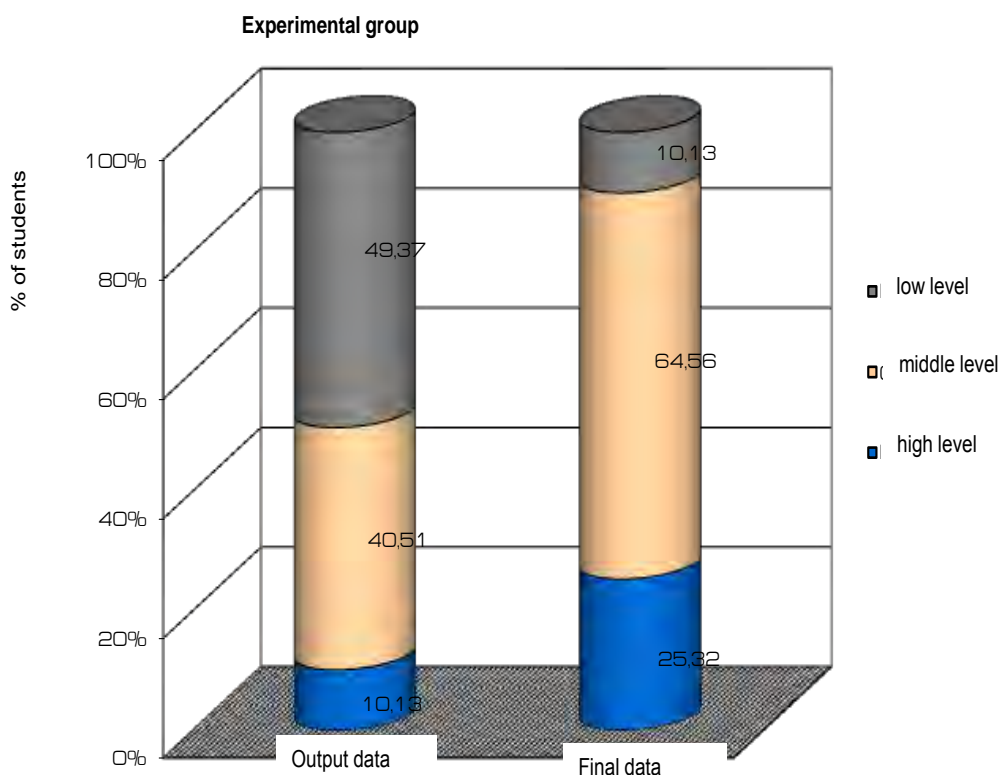
As per procedural criterion, at the beginning of pedagogical experiment high level of professional competence was manifested by 11.39% and at the end of the experiment – 23.78%; 36.71% of students had middle level at the beginning of the experiment and 58.23% - at the end. Low level was manifested by 51.90% at the beginning of pedagogical experiment and 18.99% - at the end (see fig.4).



*Fig.4 Dynamics of professional competence formation levels by procedural criterion, manifested by students of NPU, named after M.P. Dragomanov (%)*

By procedural criterion the quantity of high level students in experimental group increased by 11.39%. The quantity of students, who manifested middle level, increased by 21.52%. By procedural criterion the quantity of students with low level in experimental group reduced by 32.91%. So, as per the results of pedagogical experiment, analysis of professional competence formation levels by procedural criterion witnesses about positive changes in experimental group.

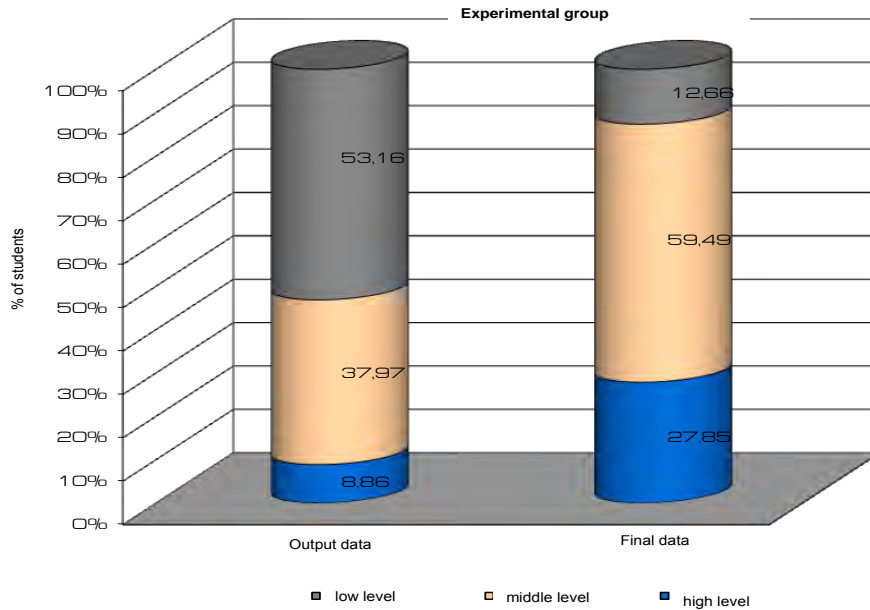
As per communicative criterion, at the beginning of pedagogical experiment high level of professional competence was manifested by 10.13% and at the end of the experiment – 25.32%; 40.51% of students had middle level at the beginning of the experiment and 64.56% - at the end. Low level was manifested by 37% at the beginning of pedagogical experiment and 10.13% - at the end (see fig.5).



*Fig.5 Dynamics of professional competence formation levels by communicative criterion, manifested by students of NPU, named after M.P. Dragomanov (%)*

By communicative criterion the quantity of high level students in experimental group increased by 15.19%. The quantity of students, who manifested middle level, increased by 24.05%. By communicative criterion the quantity of students with low level in experimental group reduced by 39.24%. So, as per the results of pedagogical experiment, analysis of professional competence formation levels by communicative criterion witnesses about positive changes in experimental group.

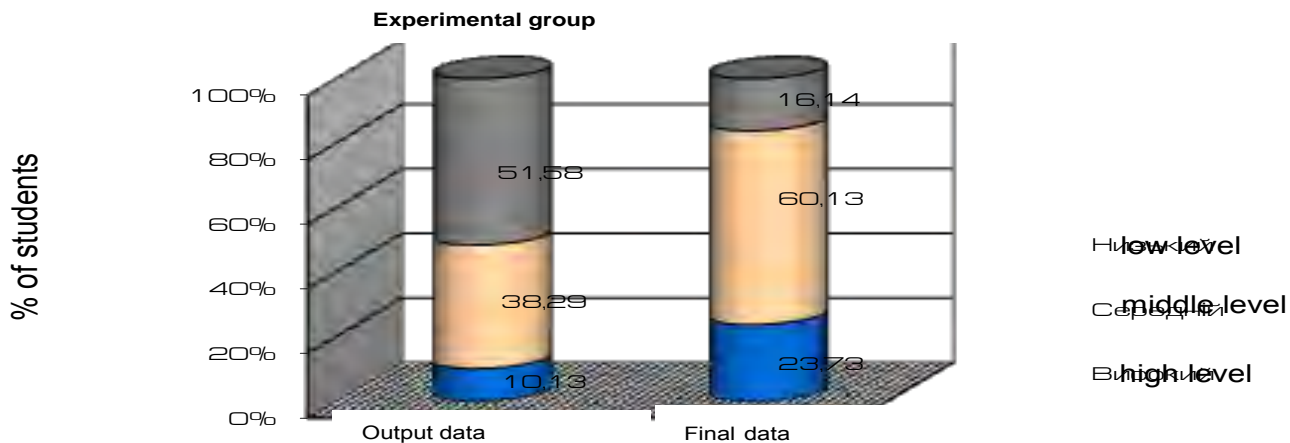
As per organizational criterion, at the beginning of pedagogical experiment high level of professional competence was manifested by 8.86% and at the end of the experiment – 27.85%; 37.97% of students had *middle level* at the beginning of the experiment and 59.49% - at the end. Low level was manifested by 53.16% at the beginning of pedagogical experiment and 12.66% - at the end (see fig.6).



*Fig.6 Dynamics of professional competence formation levels by organizational criterion, manifested by students of NPU, named after M.P. Dragomanov (%)*

By organizational criterion the quantity of high level students in experimental group increased by 18.99%. The quantity of students, who manifested middle level, increased by 21.52%. By communicative criterion the quantity of students with low level in experimental group reduced by 40.51%. So, we impressed that by the end of pedagogical experiment, we observe positive changes in experimental group as per organizational criterion.

At the beginning of pedagogical experiment high level of professional competence in the process of biological disciplines' studying was manifested by 10.13 % of future physical culture teachers and at the end of the experiment – 23.73%; 38.29% of students had middle level at the beginning of the experiment and 60.13% - at the end. Low level was manifested by 51.58% at the beginning of pedagogical experiment and 16.14% - at the end (see fig.7).



*Fig.7 Dynamics of professional competence formation levels, manifested by students of NPU, named after M.P. Dragomanov (%) in the process of biological disciplines' studying*

The quantity of high level students - future teachers of physical culture in experimental group, increased by 13.61% in the process of biological disciplines studying. The quantity of students, who manifested middle level, increased by 21.84%. The quantity of students with professional competence's low level of future physical culture teachers in experimental group reduced by 35.44% in the process of study of biological disciplines.

**Summary**

So, the efficiency of computer program “VSD: monitoring of future physical culture teachers’ professional competence in the process biological disciplines study”, which was developed in co authorship with L.P. Suschenko and

V.A. Didenko has been established. It has also been established that formation stage of pedagogical experiment' results witness about significant positive changes of professional competence formation levels of experimental group students.

*The prospects of future researches* lie in implementation of dissertation research materials into the practice of educational process at higher educational institutions of Ukraine.

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## THE ESSENTIAL CHARACTERISTIC OF HEALTH PRESERVING COMPETENCE OF PHYSICAL EDUCATION TEACHER

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Sumy state pedagogical university, named after A.S. Makarenko

**Annotation.** It is grounded theoretical component of the essence of health-physical education teacher competence. Determine the relevance and unquestionable practical importance of this problem. Presents the basic concepts that define the essence of the competence of health-physical education teacher. Preserving the health of a competent teacher is seen as a component of physical culture of personality and professional competence. Determined that the health-competence is a manifestation of the teaching culture of health, the basis of social and educational maturity acquired during training and operations. Substantiated that the competence of health physical education teacher is a complex integrated education in personality structure specialist. School health expertise integrates professional and personal aspects, namely, causes the formation of the physical education teacher positions.

**Key words:** professional, competence, health-preserving, competence, physical culture.

### Introduction

Modernization of physical culture education in modern school is carried out in direction of its priorities' re-orientation. The priorities change from sports-physical cultural to physical cultural-health improving targets and content, to general recreational function, humanistic, cultural-forming essence of physical culture-educational reality, which ensure conditions of healthy life style culture formation. It determines new content of physical culture teacher's professional activity on the base of his formed health improving competence. So, acute character of research of physical culture teacher's health improving competence's formation is determined by up-to-date trends of physical culture education development and by demand in preparation of highly qualified personnel, able to effectively solve the tasks of pupils' health formation, maintaining and strengthening.

In domestic and foreign literature theoretical foundations for solution of the mentioned problem has been developed. For example, theoretical and methodological foundations of competence approach in higher and comprehensive educational systems are elucidated in the works by N. Bibik, I. Zymnya, I. Yermakov, V. Lozova, Kh. Munkler, A. Khutorskiy et al. Different aspects physical culture teacher's formation is presented in a number of dissertations. However, with all variety of approaches to teachers' training, the problem of health improving competence's formation of a physical culture teacher has not been reflected yet sufficiently in researches. Only in several papers this problem is regarded in general aspect [2], [3]. In works [15] competence hierarchy of physical culture teacher is presented, which make basis for formation of future specialist's professional competence; in work [16] general approaches to solution of health improving competence of physical culture teacher are outlined.

Analysis of scientific literature permits to state that the problem of health improving competence of future physical culture teacher practically is not studied and, that is why, it requires certain scientific researches. In particular, there is no common recognized understanding of health improving competence of physical culture teacher as a social-pedagogical phenomenon, which has great potential for improvement of rising generation's health.

The research has been fulfilled as per the plan of scientific & research works "Methodological, contextual and methodical innovations in professional-pedagogical training of physical culture teachers in the context of credit-modular system's implementation" (0109U004948) of theory and methodology of physical culture department (Sumy state pedagogical university, named after A.S. Makarenko) and as per the tasks on formations of future teachers' health improvement competence.

### Purpose, tasks of the work, material and methods

*The purpose of the works* is to theoretically ground the essence of health improving competence of physical culture teacher. The urgency and unconditional practical importance of the mentioned problem were the preconditions of our researches.

### Results of the researches

On the base of theoretical analysis of the works of foreign scientists B. Oskarson, V. Hutmayer et al., russian researchers V. Krayevskiy, A. Khutorskoy, domestic scientists O. Ovcharuk, O. Pometun et al. it was established that in present conditions competence approach is studied by the majority of domestic and foreign scientists as one, having priority in professional education. It has been cleared up that conception "competence" is a subject of scientific discussion and is understood as a complex of attitudes, values, knowledge and skills [17, 23]; as integrative characteristics, containing purpose-formation, actions, evaluations, reflections [11, 14]. It has been established that personality's competence is manifested in independent activity, is wider than conceptions "knowledge, skills" and embraces not only cognitive and operational-technological spheres, but also motivational, ethic, social and behavioral spheres [18], [23].

Scientists I. Zymnya, O. Ovcharuk, O. Pometun point that the widest by content are "super subject" ("key") competences, which are synthetic, i.e. which combine certain scope of knowledge, skills and attitudes, obtained during

the whole period of education [7]; which are of poly functional, super subject, inter-discipline character and are directed to formation of critical thinking, reflection, determination of personal opinion [14]. Key competences include, to a large extent, general competences of general subjects, which are determined for each subject and are developed during the whole period of its mastering, and competences of special subjects, which are formed during certain period of studying, i.e. they are the stages, the levels of obtaining of general subjects' competences [14, [www.eidos.ru/news/compet/](http://www.eidos.ru/news/compet/)].

Generalization of approaches of known scientists O.Yevsiukov, V. Krayevskiy, N. Kuzmina, A. Markova, V. Lozova, T. Suschenko et al. to determination of content and conditions of teacher's professional competence permits to interpret future physical culture teacher's health improving competence as certain personal new formation, which is created in the process of educational and training systems combination's realization in the process of professional education, as well as a component of teacher's professionalism and professional competence. Professional competence of physical culture teacher is connected with solution of wide circle of social, culturological, psychological, physiological and other problems and, in broad aspect, it is a combination of theoretical knowledge, practical skills, experience, teacher's personal capabilities, dialectical inter-relations of which ensure efficiency and effectiveness of pedagogical activity [22].

Combination of culturological and competence's approaches (L. Vovk, M. Kagan et al.) to professional education permitted to determine the connection of physical culture teacher's health improving competence with other personal formations. It has been established that it is one of key competences, which more widely ensures human's abilities to fulfill culturally purposeful, poly functional, poly subject kinds of activity [1], to solve efficiently the tasks of professional and socio-cultural spectrum [10].

As the base of health improving competence's essence of physical culture teacher we took theoretical ideas of scientists about phenomenon of personal physical culture, health culture and teacher's professional competence.

As per the opinion of Yu. Yevseyev "physical culture is a part (sub system) of mankind general culture, which is a creative activity on mastering of the past and creating of new values, mainly in the sphere of development, health improvement and education" [6]. B. Shiyan defines physical culture as "combination of society achievements in rational utilization of special means, methods and conditions of purposeful physical and spiritual perfection of a person" [22]. Regarding physical culture in more narrow meaning, B. Shiyan defines "personal physical culture" as "combination of a person's features, which are obtained in the process of physical education and are expressed in person's activity, directed to comprehensive perfection of his physical nature and practicing of healthy life style [22]. In the opinion of V. Goraschuk [5] et al., culture of person's health is an important component of his general culture, conditioned by material and spiritual environment of society's vital activity, that is expressed in system of values, knowledge, demands and skills concerning formation, maintaining and strengthening of health.

So, it is necessary to base on the fact, that one of the targets of modern physical culture education (education and training) is facilitating the development of health creating, health creative foundation of person's general culture through formation of the following:

- Personality's physical culture (movements' culture: development of physical abilities, morpho functional abilities of organism by formation of motion skills; formation of physical culture knowledge, appropriate professional pedagogical skills, interests, demands, motivations, world outlook and etc.);

- humanitarian culture of personality (cognitive, communicational, informational and so on);

culture of health and safety of vital activity (in the process of realization of health improving, recreational, rehabilitation, everyday and professional activity (V. Goraschuk [5], A. Matveyev [13], B. Shiyan [22] et al.). It should be noted that the idea of professional or other kinds of competence combination with the development of professional or pedagogical culture is divided by many researches, in particular I. Zyazyun, V. Slaktionin et al. They are unanimous in their conclusions: professional culture characterizes a teacher from professional-personal side and is a combination of integrative characteristics – humanistic orientation of personality, social responsibility, creative pedagogical thinking, etc. [8, 19].

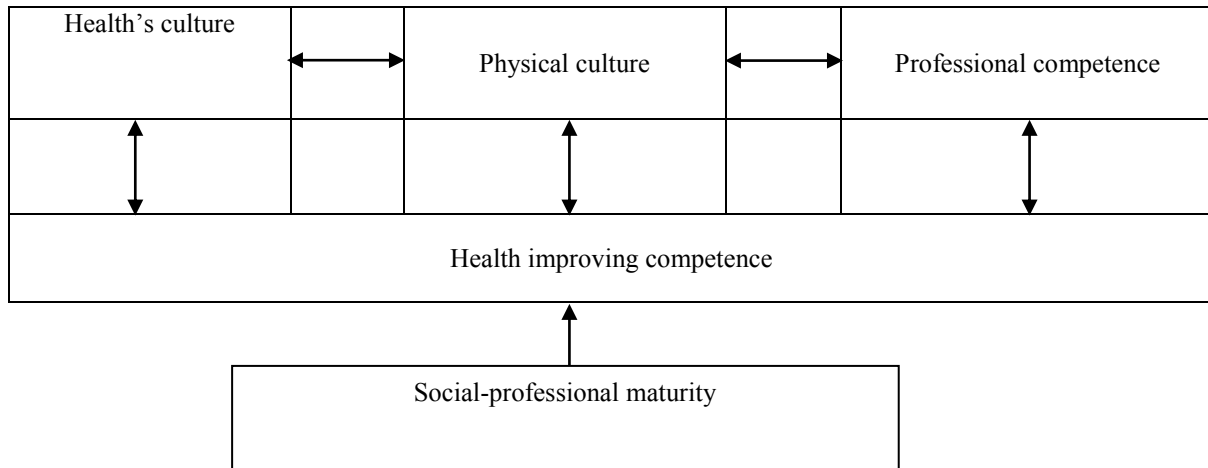
As far as for physical culture teacher the leading kind of social cultural activity and the main field of health improving competence's realization is professional pedagogical activity, we regard health improving competence as an important component of teacher's professional-pedagogical culture and it is understood by scientists as generalized indicator of professional competence and a mean of professional self perfection [21].

It is commonly recognized that one of the criteria of professional-pedagogical formation (physical culture, person's health culture) is personal maturity of a man (one of the brightest examples of creation of motivation's formation and professional culture perfection is theory of demands by A. Maslow [12]). Pedagogical literature regards personal maturity as a component of more broad conception – social or social-pedagogical maturity [1, 21]. From the point of view of pedagogical acmeology (B. Oskarsen, V. Slaktionin) social-pedagogical maturity of a personality is the most large-scale category, which characterize certain level of personality's development, promoting creative mastering of different kinds of culture, connected with significant professional, personal and social achievements [17, 21].

So, considering the subject of our research, let us regard social-pedagogical maturity as a definite target and important indicator of formation of physical culture teacher's professional competence, and the same social-pedagogical maturity we regard as more broad formation. Such understanding permits for us to regard the process of education,

training and socialization of future physical culture teachers in socio cultural environment of higher educational institutions [9] as leading means of his health improving competence's formation.

Generalization of the mentioned statements permits to affirm that health improving competence of physical culture teacher is a complex integrated formation in specialist personality's structure and can be regarded as a component of his physical culture and professional competence; it is a manifestation of his health's culture, the basis of his social-pedagogical maturity. It gives possibility to trace the connection of physical culture teacher's health improving competence's connection with other basic conceptions (diagram 1).



*Diagram 1. Connection of health improving competence with basic conceptions*

Analysis of scientific researches of professional competence problems permits to affirm that the structure of health improving competence of physical culture teacher is based on the unity of consciousness and activity, on the properties of professional activity and its components. That is why health improving competence should be regarded in procedural-dynamic aspect, as one, which is manifested through activity, which has dialectical character and embraces all spheres of personality.

The specificity of physical culture teacher's professional activity demands special approach to the organization of future specialists' professional training in conditions of higher educational institutions. It shall result in the unity of inner, motivated, personal readiness to physical culture and health improving activity and practical, theoretical-methodological preparedness for it. With it, simultaneous progressing from personality to profession and from profession to personality is a leading idea, conceptual basis both: of analysis and solution of health improving competence's formation of physical culture teacher.

Having generalized the above mentioned theoretical approaches, we came to conclusion that health improving competence of physical culture teacher is a complex, integrated formation in integral structure of a specialist's personality, the component of his physical and health culture, professional competence; it is the result of mastering of pedagogical profession; it is a general category, which embodies the development of social-professional maturity as a property, connected with professional, personal and social achievements and determines life position and socially useful personality's activity and his readiness to efficiently solve the tasks of health formation, maintaining and strengthening and healthy life style organization in the process of professional activity on the base of already formed knowledge, skills, value orientations, professionally important features and abilities.

**Summary**

The conducted analysis of theoretical researches on the problem of determination of health improving competence of a physical culture teacher permits to make the following conclusions:

1. By majority of domestic and foreign scientists' opinion in modern conditions competence approach is regarded as one of the first priority in professional education, Implementation of this approach stipulates that health improving competence shall be determined as one of the most important educational results of physical culture teachers' training.
2. Health improving competence of a physical culture teacher shall be regarded as a key, super subject competence, as an ability to fulfill complex, poly functional, poly subject, cultural-research kinds of activity, efficiently solve wide spectrum of problems of health formation, maintaining and strengthening and healthy life style organization, connected both: with professional and social activity.
3. Health improving activity is a complex new formation, which unites professional and personal aspects, connected functionally and by content with other personal basic formations, properties and features, first of all with professionalism, health and physical culture, professional competence; it conditions formation of personal and social-professional maturity and positions of a physical culture teacher.

*The prospects of further research* lie in determination of structure and content of health improving competence of a physical culture teacher, in foundation of its formation's organization-pedagogical conditions in the process of professional training.

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## THE FUNCTIONAL MODEL OF OPTIMIZATION OF THE SPECIAL PHYSICAL PREPARATION OF STUDENTS IN THE PERIOD OF FLYING PRACTICE

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**Annotation.** It is considered approaches to optimization special physical preparation of students during the period of flying practice. For the construction of functional model of such system new information IDEF technology is utilized (ICAM Definition). The feature of technology is gradual introduction all large levels of working out in detail (decouplings). It is marked that it is expedient to carry out a decoupling before functions which will realize leaders of physical preparation and instructor of flying preparation. It is well-proven that on the stage of research of function a fundamental place is occupied by a functional design. The result of optimization of maintenance of teaching is systematization of knowledge, abilities, facilities of development and support professionally of meaningful qualities of students. The hierarchical levels of process of systematization of maintenance of teaching are recommended. It is offered directions of realization of functional model through conditioning optimization of pedagogical activity of teacher.

**Keywords:** optimizations, student, flying preparation, special physical preparation, functional model.

### Introduction

Reorganization of Air Forces of Ukrainian Armed Forces put especially keenly the question about improvement of military specialists training's quality. First of all it concerns the most complicated kinds of professional activity, to which the profession of military pilot relates in full. Review of scientific papers, reports, monographs [2, 3, 5, 8], devoted to training of flight personnel, permits to regard training process as consisting of theoretical, simulating training, psychological, psycho physiological, physical and directly flight training components. Focusing of pedagogical influence's results of all six training kinds determines professional preparedness.

Professional training of pilots relates to those components of aviation system, in which great number of dangerous factors are hidden and revelation of these factors in due time is the essence of flights' safety control through improvement of educational process [5].

That's why searching of ways of pilots psycho physiological and physical abilities', which are the ground of professional activity, maintenance by means of special physical training (SPT) is an urgent task of cadets flight training's modern organization.

As our research has showed, the problem of flight personnel's physical training on different stages of professional formation and improvement at military higher educational institution is not a new or insufficiently studied one (A.A. Gorelov, O.M. Kernitskiy, M.S. Korolchuk, R.N. Makarov). Nevertheless, reformation of education requires regarding this problem from the position of modern technologies of education quality improvement in compliance with new governmental educational standards.

The researches, which have been being carried out since the day of Ukrainian Air Forces creation, practically did not touch the question of pedagogical process optimization in the field of pilots' physical training in the period of flight training.

Analysis of scientific pedagogical literature on the researched problem [1, 7] points, that pedagogical process optimization remains to be the factor, which intensifies pedagogical process, raises its effectiveness per every unit of time. That is, there has appeared a necessity to research SPT system from the position of idea of optimization.

At research stage of SPT system and its functioning efficiency's analysis the author offers functional modeling.

At present, for building of functional models of big systems new information technologies are used, which base on powerful computational means. Such technologies as IDFF (ICAM Definition) relate to them [6, 9, 10].

Diagram of the highest level is called a context one. On it the system's main function in the whole (target of function) is presented as well as arcs, which are a complete set of external interfaces. Besides, the purpose of model's creation and a person or organization, whose approach is reflected by this model, are obligatory depicted on the diagram. One of the most important peculiarities of IDFF technology is gradual introduction of progressively higher levels of detailing (decomposition) as the diagrams, reflecting model, are being created.

Functional block of context diagram, which presents system as a single module, is detailed on other diagram with the help of several blocks, connected by interface arcs. They are main sub modules (sub functions) of single output module. Each of sub modules can also be decomposed for the further presentation.

The work has been fulfilled as per plan of scientific & research works of Air Forces of Ukrainian Armed Forces, SR subject "Theoretical- methodological foundations of servicemen physical training system's functioning at Air Forces of Ukrainian Armed Forces", code "Administration -PT", state registration No. 0101U001112.

### Purpose, tasks of the work, material and methods

*The purpose of the research:* construction of functional model of cadets' special physical training's organization in the flight practice period on the base of optimization conception.

*The methods and organization of the research.* For solution of the posed problem theoretical analysis and generalization of literature sources, systemic approach and technology of complex systems' (IDFF-technology) functional models' creation were used.

### Results of the research

Construction of functional models by IDFF technology (models, which reflect actual status of the tested object, i.e. SPT) requires: first of all large resources, time, qualified specialists; secondly, availability of special software, supporting systemic principles of model creation.

Creation of functional model makes it possible to estimate available functions of sub systems and elements, compare them with standard functions, to make conclusion about efficiency of system's functioning, to solve a number of practical tasks, connected with its optimization's possible directions.

Functional hierarchic IDFF-diagrams permit also to divide authority for system's components, to organize their interconnections.

Figures 1-4 illustrate a variant of construction of CPT optimization's functional model fragment.

In this very case decomposition process has been realized for blocks A0, A1, A2 and A3 up to corresponding hierarchic level. The quantity of decomposition levels is determined by the head of development process. It is purposeful to carry out decomposition before functions, realized by physical training coaches and flight training instructors.

The purpose of model's creation is to analyze what functions shall ensure the process of social physical training optimization in the period of flight practice and how these functions shall be interconnected in order to develop recommendations concerning improvement of flight training system's efficiency.

In fig.1 there is presented context IDFF diagram (first level of decomposition) of PHT process's optimization, in which components are depicted as rectangles.

The target of special physical optimization (fig.1, arrow- exit) is reaching of cadets' readiness for the conditions of flight activity for the assigned time, reasonable efforts, cadets' and teachers' time.

Activities on solution of mentioned above optimization problems and reaching its targets (fig.1, arrows above) are regulated by the following documents:

- "Course of initial flight training of sports aviation clubs";
- "Service regulations of Armed Forces of Ukraine";
- Order of Ministry of Defense of Ukraine, No.202, dt. 26.04.2007 "On perfection of planning and organization of physical training at military higher educational institutions of Ukrainian Armed Forces and at military educational units of higher educational institutions";
- "Manual of physical training";
- "Instructors' manual on organization and fulfillment of cadets' flight training";
- "Procedure of ground and flight training on aircraft Л-39";

At input (arrows on the left): academic plan of flight specialties cadets' training; resources (material, financial, time); initial level of cadets' physical preparedness; physical culture-health improving and sports technologies.

The function of special physical training's optimization is to be carried out by the head of military higher educational institution.

Regarding pedagogical process as specially organized interactivity of pedagogues and cadets, which is directed to solution of developing and educational tasks, it is purposeful to underline optimal components quantity as per principle of sufficiency from the point of view of their practical application.

Main general components, without which efficient functioning of PST is impossible, include: content of training;

- activity of the head of military higher educational institution;
- activity of cadets' and SPT trainings supervisor;

The result of training content (block "Optimize SPT content") is systematization of knowledge and skills, means of cadets' professionally significant abilities development and support. The given documents (academic and working training programs) are the basis of realization of block's «Optimize activity of military higher educational institution» function. At the block's output there must be planning documents, which regulate SPT process, which are required for block "Activity of cadets' and SPT trainings supervisor". In the process of the block's realization, resource-organizational restrictions, offers concerning training content, which shall be considered during planning, are established. SPT process optimization is carried out under the guidance of head of military higher educational institution with active participation of the head of physical training and PST department, heads of services and sub units.

The basis of training content's optimization is curriculum (model of specialist's training), developed on the basis of specialist's activity model.

The most efficient mean of discipline optimization is systematization of academic materials.

The process of systematization of training content is an hierarchic one ( see fig.2) and includes several levels:

- formation of military specialist's ability to solve problems and tasks in the process of his flight activity by SPT means;
- formation of skills, ensuring military specialist's ability to solve problems and tasks in the process of his flight activity by SPT means;
- formation of content modules (subjects);
- formation of training elements (training questions);
- construction of pedagogical tasks' set.

Block "Optimize activity of the head of military higher educational institution" ( see fig.3)

Government control the process of physical education, authorizing central body of executive branch which deals with problems of physical culture and sports and other executive central bodies in the sphere of physical culture

and sports. General organization of educational-training process of physical education and mass sports at military educational institution is carried out by its head, who ensures:

- making decisions concerning creation of necessary conditions for practicing physical education and mass sports;
- including compulsory physical training (4 hour weekly) in curriculums of all specialties for the whole period of study, excluding the last graduation semester;
- creation of structural sub units on physical education and mass sports and their provision with the required staff, material & technical base, equipment and stock;
- control over the cadets' state of health and physical education;
- execution of other authorities, envisaged by current legislation, concerning development of physical education and mass sports at higher educational institutions;

Decision of the head of university about organization of physical training is the basis for planning.

In the course of physical training planning it shall be formed the following:

- list of main tasks, final (expected) status of readiness for practical implementation as per the purpose of sub unit;
- analysis of physical training possibilities at the university;
- development of physical training measure for servicemen for the planned period.

Decision and order to organize physical training, approval of planning documents, regulating the process of physical training's organization are the results of physical training planning.

After making administrative decision, the process of controlling over physical training does not stop but transfers to realization phase, i.e. in the stage of its direct implementation into practice. The realization of the decision requires activating of its motivational, organizational, executive and control functions. Realization process of administrative decisions consists of:

- information of executors about the decision;
- coordination of the executors' activity;
- analysis of the results of the posed tasks and control over executors' activity;
- summarizing.

Fig. 4 illustrates the essence of the activity of coach and cadets, regarded as per principle of optimality. Creation of optimization conditions of physical training coach's pedagogical activity is connected by us with development and realization of coach's activity functional model. The principles of implementation of this model base on coaches' individual features and organizational-pedagogical peculiarities of academic process. In other words, realization of functional model of physical training teacher is the main but not the only condition of pedagogical activity optimization. With this, it should be noted that every model's component includes own conditions of optimization. Besides, model includes realization conditions and factors, ensuring its maximal optimization.

The offered by us functional model of physical training teacher's activity is a spread basic diagram and detail description of its components. Thus, functional model is an arranged, interconnected diagram and description of components of physical training teaches activity system: subjects of activity, kinds of activities, pedagogical activity technologies, conditions and factors of its optimization.

Within the frames of academic process in physical training at military higher educational institutions, cadets, SPT and teachers are the subjects of activity. The main kind of integral activity of higher educational institution's teacher are teaching, educational, scientific, methodological work and the work on his advanced training. These kinds are universal and relate to all kinds of higher educational institutions. Their universality expands to all disciplines of higher educational institutions, including physical training in military higher educational institution. Speaking about pedagogical conditions and optimization factors of physical training teacher's activity optimization we cannot but stress cadet's interest in receiving knowledge and skills. Purposeful, motivated training of a cadet is one of decisive pedagogical conditions, which optimize the activity of a physical training teacher. Only such training can bring positive results, positive shifts in knowledge levels and its organization, which would permit to speak about quality of physical training teacher's work, its efficiency. Cadets represent a contingent, which create environment for realization of conditions for physical training teacher's activity optimization.

#### **Summary**

It has been proved that on research stage fundamental place is taken by functional modeling. Functions shall ensure the process of optimization of special physical training in the period of flight practice. These functions shall be interconnected. It will permit to develop recommendations directed to perfection of flight training system's efficiency.

For construction of functional model of such system, new informational IDFF technology was used. An important peculiarity of the technology is a gradual (coinciding with creation of functional diagrams, reflecting the model) introduction of higher and higher detailing (decomposition) levels. Functional model of SPT system's optimization has also been developed.

*The prospects of our research* envisage designing of technology of cadets' physical training on the base of activity approach.

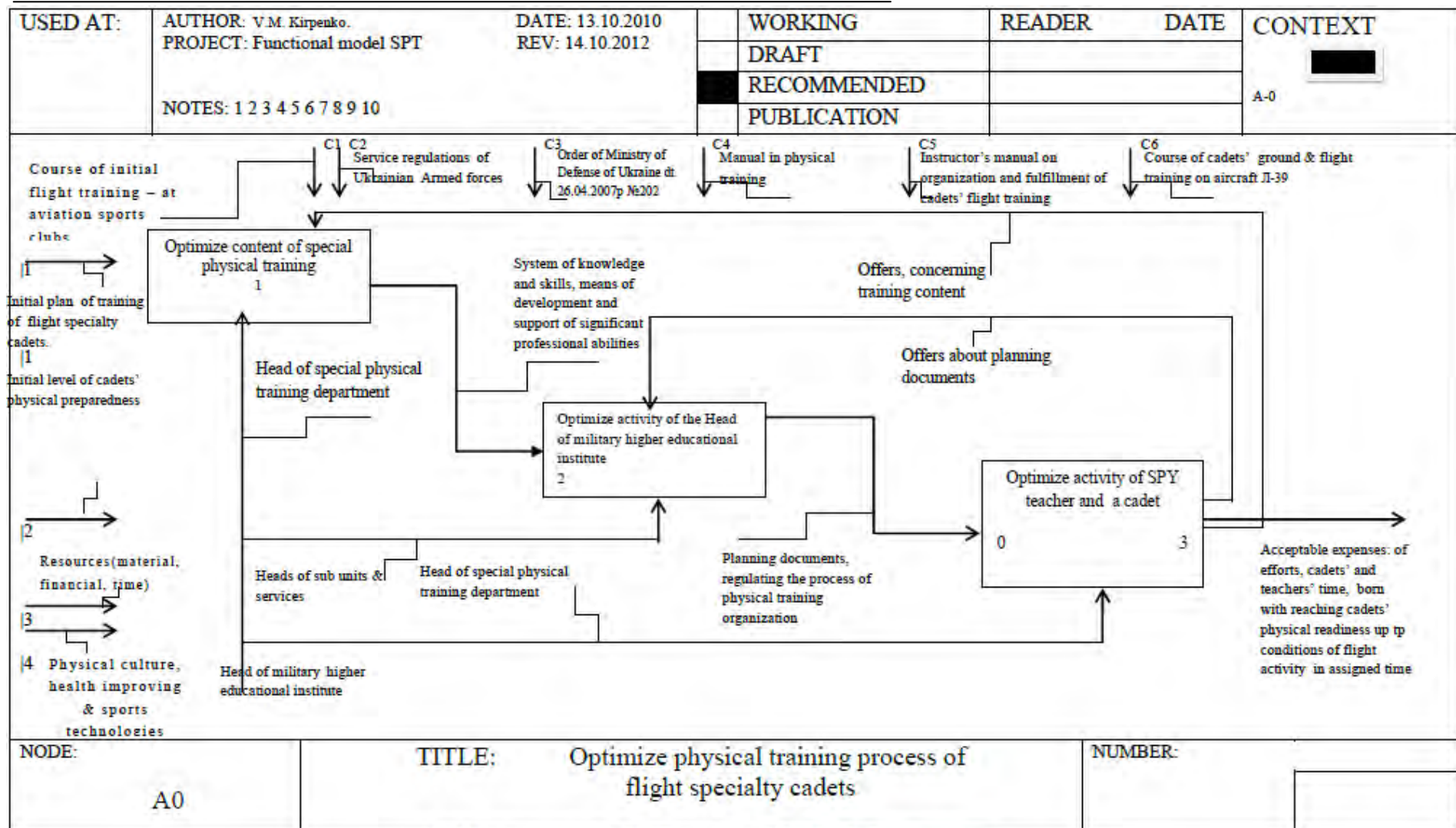


Fig.1 Functional model of SPT optimization. First level of decomposition

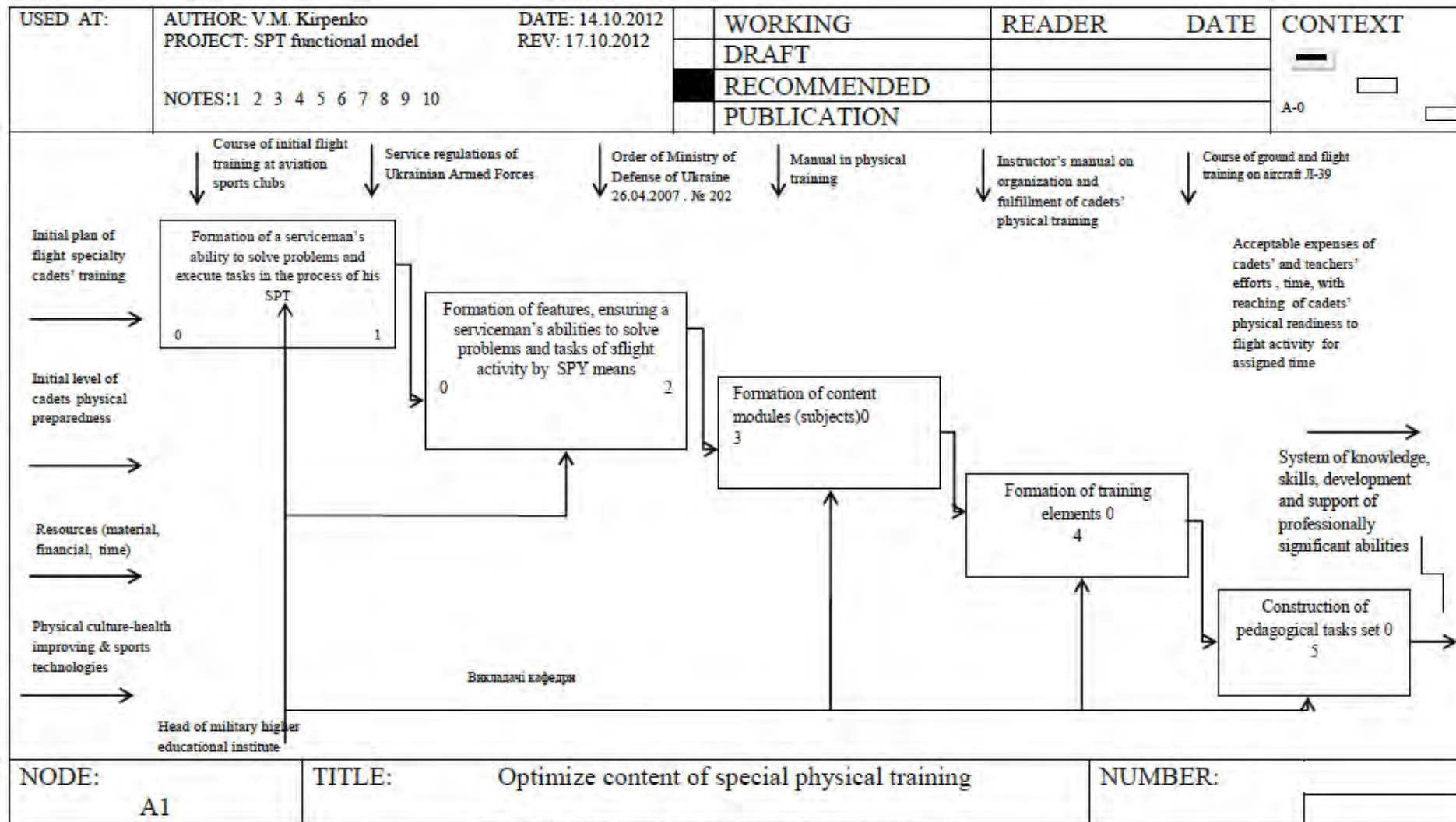


Fig. 2 Block "Process of training content systematization"

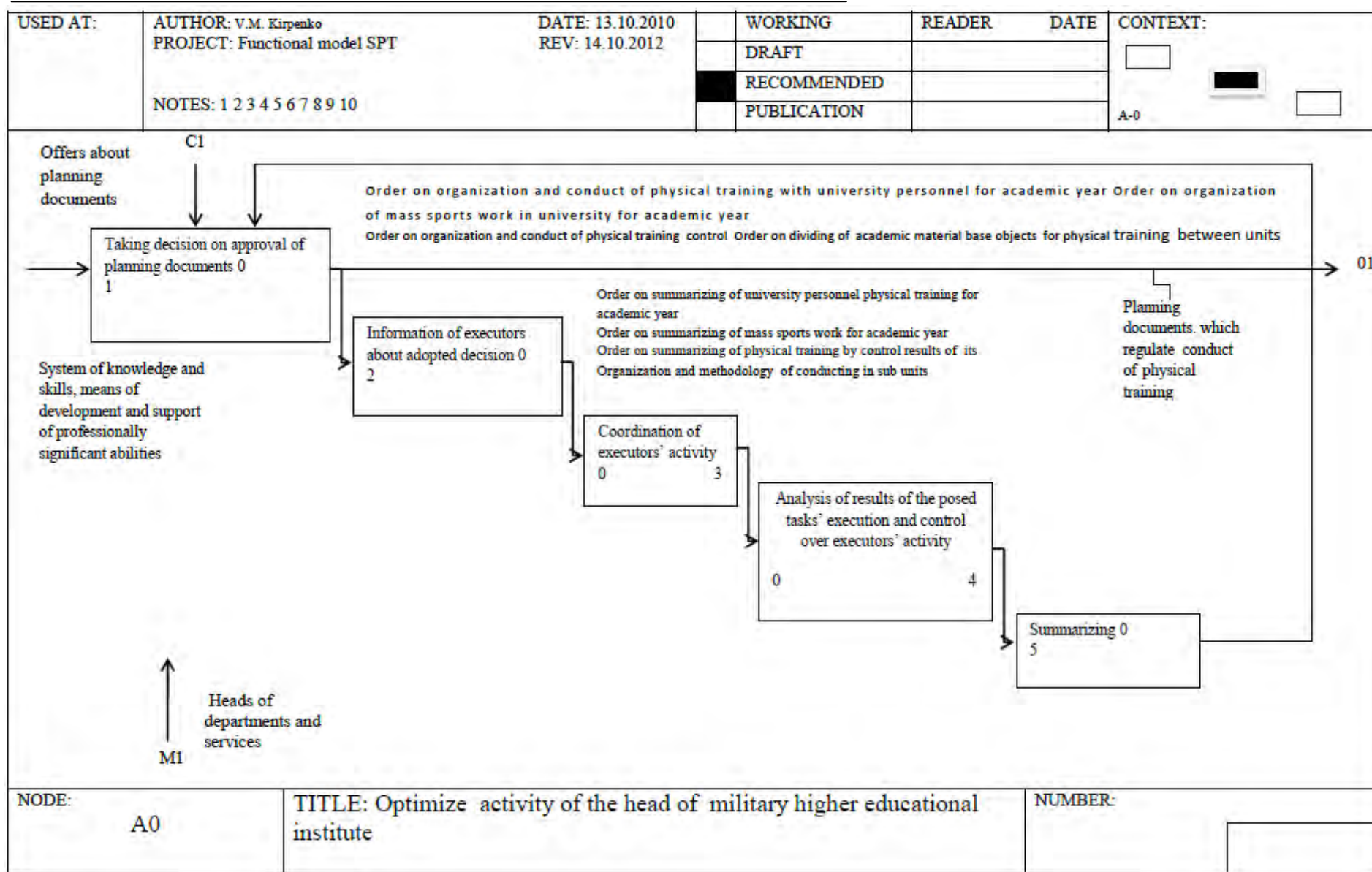


Fig. 3 Block “Optimize activity of the head of military higher educational institution”. The second level of decomposition.

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	NOTES: 1 2 3 4 5 6 7 8 9 10					
<p>Technology of discipline's teaching</p> <pre> graph TD     A[Optimize teaching activity of teacher and cadets 0 1] --&gt; B[Optimize teachers methodological activity 0 2]     A --&gt; C[Optimize educational activity of teacher 0 3]     A --&gt; D[Optimize scientific activity of teacher 0 4]     A --&gt; E[Optimize teacher's activity in his own advanced training 0 5]     A --&gt; F[Optimize teaching forms and methods, contacts with colleagues, systemic generalization of practical experience 0 6]          B --- B1[Technology of development of methodological recommendations concerning software &amp; methodological provision of cadets' training process]     C --- C1[Organization of mass sports work as per the following principles: - Organization of mass sports work as per the following principles: - Organic unity of mass sports with the process of military professional activity]     D --- D1[Development of physical, psycho-physiological and psychological optimal levels in compliance with requirements of military-professional training and activity]     E --- E1[Acceptable expens of efforts, teachers' and cadets' time for tracking of cadets' physical readiness to conditions of flight activity for assigned time]     F --- F1[Improvement of teaching forms and methods, contacts with colleagues, systemic generalization of practical experience]          B1 --&gt; B2[Scientific support of physical training process]     C1 --&gt; C2[Organization of mass sports work as per the following principles:]     D1 --&gt; D2[Development of physical, psycho-physiological and psychological optimal levels in compliance with requirements of military-professional training and activity]     E1 --&gt; E2[Acceptable expens of efforts, teachers' and cadets' time for tracking of cadets' physical readiness to conditions of flight activity for assigned time]     F1 --&gt; F2[Improvement of teaching forms and methods, contacts with colleagues, systemic generalization of practical experience]     </pre>						
NODE: A3	TITLE: Optimize SPT teacher's and cadet's activity				NUMBER:	<input type="text"/>

Fig. 4 Essence of pedagogical activity of physical training teacher and cadet

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**FORMING A MOTIVATION TO THE STUDIES BY THE MILITARY-APPLIED EXERCISES FOR THE  
CADETS OF FEW SPECIALTIES OF UNIVERSITY OF CIVIL DEFENCE OF MINISTRY OF  
EMERGENCY MEASURES OF UKRAINE**

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Kharkiv university of Air Forces, named after Ivan Kozhedub

**Annotation.** The directions of diverse characteristics determine the motivation of students to study military-applied exercises in special training. Questionnaire survey of students of different courses. Found significant differences in the motivation of the students. Proved that the motivation of students during their learning experiences significant changes. The directions of psychological and pedagogical methods to develop positive attitudes of students motivated to learn. Found that first-year students marked inconsistency and instability motivated attitude. Virtually all of the students as the main and most important point to high socially relevant reasons (protection of the homeland, preparing for performance of official duties). However, data from the correlation analysis, we can conclude that these motives are not for real students. Significant impact on the attitude of students to physical perfection is the following factors: ridicule colleagues, they lag behind in physical development. The essential condition is the presence of occupation of free time and comfort.

**Keywords:** motivation, student, military, applied, exercises, special, physical training.

### **Introduction**

The complexity and ambiguity of motivation problems' and its conceptual content's interpretation brought to great variety of their understanding by different authors. However, last years, majority of scientists, basing on motivation theory's conceptions – theory of activity origin of person's motivation sphere (A.N. Leontyev; 1966, 1972)- have come to certain unity concerning this phenomenon, in particular:

- Approach to motivation as to unity and dialectical interconnection of objective and subjective, social environment and personality of a man;
- understanding of demand character of motives, i.e. regarding motivation as a phenomenon, connected, first of all, with reflection and manifestation of demands;
- understanding of motivation not only as a combination of motives but as a process, changeability and discrepancy of which complicate objective and prompt evaluation of motives' for certain activity formation levels.

In spite of the fact that the problem of absence of systemic methodologies and specially organized work on motivation's for military-applied exercises mastering formation by the personnel of Ukrainian ministry of emergency situations (MES) units becomes one of the most important problems of special physical training, special motivation's researches have not been conducted yet in sufficient scope.

In MES educational establishments, in National university of civil defense of Ukraine in particular, special personnel of command staff and units is prepared, who should be dog experts, rescuers, who should directly participate in fire extinguishing, liquidation of emergency situations' consequences, carry out saving works in water. That is why special physical training consists of obstacle negotiations, fire-fighting applied sports, exercises in quick unfolding of special equipment, swimming by applied techniques, long and deep diving in cloth, swimming transportation of victim, submerged swimming and orientation with different diving equipment, overcoming of dog's obstacle course, exercises on conventional victim's transportation on slopes and different relief, different kinds of terrain and cave orientations, climbing at different heights of various steepness and level of complexity and descending from them with the help of Alpinist equipment and artificial supports, negotiating of different obstacles, including water, which are characteristic for mountains and caves [Order of MES of Ukraine No.10, dt. 05.08.2004, "On approval of manual of physical training in MES of Ukraine"].

High complexity of these exercises' mastering requires purposeful formation of motives for servicemen's training of military-applied exercises and kinds of sports.

The problem of motivation's formation as a pedagogical process with the following below elements and sequence is of interest and requires special consideration:

- a) accumulation, understanding and internalizing of knowledge;
- b) working out and strengthening of views as the base of motives for actions;
- b) development of definite behavior habits (in the light of the worked out views-motives).

With studying of motivation for trainings in physical preparation and sports system, the problem of revelation of corresponding feedback mechanisms is of great importance. It is necessary to consider that for the last decade there occurred significant shifts in value orientations of servicemen, that is why, basing on earlier important socially valuable motives (readiness to defend Motherland, mastering of military profession) and moral stimulating, when conducting educational work on cadets motivation's formation to physical perfection, seems now to be inefficient. Complete

satisfaction of servicemen's demands in the process of their physical self perfection is considered the main condition of harmonious development of servicemen's motion abilities' development. As the main factors, which facilitate the cadets' motivation-valuable attitude to physical training and sports, S.V. Romanchuk (2004) specifies: effective and material stimulation, conducting of theoretical classes in physical training, individual approach to every cadet, assigning of time for the chosen kind of sports training, in the mass sports hour [5].

Ye.M. Anokhin (2003), in his turn, thinks, that one of servicemen's motivation development ways is combination of procedural and effective motivations up to using of financial stimulation for achievement of high physical level [1].

So, we can make conclusion, that the problem of servicemen's motivation for physical training's formation and especially for mastering of military applied exercises on the present stage is one of the main problems of military education. Without its solution it is impossible to significantly raise efficiency and quality of teaching process. That is why the problem of wider and more profound study of servicemen's motivation for physical perfection, development of rational criteria and methodologies of formation and its dynamic objective evaluation is rather urgent. The search and grounding of complex of psychological-pedagogical techniques directed to formation of servicemen's steady motivation for military-applied exercises mastering is necessary [2, 3, 4, 6-10]. To achieve this purpose we conducted experimental researches of cadets of Ukrainian National university of civil defense.

The work has been fulfilled as per plan of scientific & research works of National University of civil defense of Ukraine physical training department on subject "Optimization of knowledge and development of recommendations for general physical training classes as the base of special training (fire-fighting applied sports and special training of scanty specialties of MES of Ukraine)".

#### Purpose, tasks of the work, material and methods

*The purpose of the research:* determination of all-round motivation of cadets for mastering of military-applied exercises in the process of special physical training.

*The methods and organization of researches.* In researching of problem cadets' motivation for mastering of military-applied exercises the authors used the following methods: theoretical analysis and generalization of scientific literature in order to determine the status of the researched problem; studying of instructions, documents which regulate the process of organization and conducting of special physical training in MES of Ukraine, questioning, statistical analysis.

#### Results of the research

For determination of cadets' of different years of study attitude to physical training and for evaluation different motives', which are the components of this attitude, significance levels questioning was carried out and it permitted to find out substantial distinctions in cadets' of different years of study motivations (table 1).

Table 1

*Details of cadets' of different years of study motives for military-applied exercises mastering*

Motives of achievement	Evaluation by 9-point scale		
	1 year	2 year	4 year
Execute norms of I, II grades	6,02±0,16	4,95±0,11	4,06±0,20***
Execute norms of CMS, MS	5,53±0,16	4,01±0,12**	4,58±0,16***
To become competition winner	4,12±0,17	3,59±0,12**	3,05±0,17***
Personal motives			
To have good body, appearance	7,75±0,12	6,46±0,08	6,49±0,13
To have general high physical level	7,68±0,08	7,57±0,07	6,41±0,13
To have high level of psychomotor response, coordination	6,13±0,10	6,22±0,09	6,07±0,15
To harden oneself, not to fall ill	7,67±0,08	6,47±0,08	6,31±0,13
To strengthen cardiac system	6,54±0,12	6,25±0,09	6,19±0,15
Inner demand for sports training	5,95±0,17	4,77±0,09	5,99±0,18
Social motives			
To have privileges in academic process due to doing sports	4,20±0,20	4,22±0,13	4,89±0,19
To obtain encouragement for sports results	4,12±0,20	3,90±0,12	4,63±0,20
To take reputable place in collective	5,89±0,14	5,95±0,09	5,89±0,19
Socially valuable motives			
Be ready for defense of Motherland	6,14±0,13	6,03±0,09	5,68±0,17*
To master profession	6,31±0,10	6,23±0,09	5,80±0,17*
To be an example for subordinates	6,44±0,08	7,41±0,08	6,16±0,13
To form moral features	6,09±0,17	5,87±0,10	4,42±0,19
To raise general cultural level	6,01±0,15	5,99±0,09	5,80±0,19
To endure high loads on service	7,50±0,12	6,32±0,08	6,24±0,13
Professional motives			
To release emotional stress	5,90±0,15	5,81±0,11	5,96±0,20

To adjust for future work	4,34±0,17	4,39±0,12	4,16±0,18
To enjoy with movements	5,88±0,14	5,79±0,10	5,99±0,17
Availability of spare time	5,81±0,18	5,84±0,12	3,58±0,17
Availability of comfortable conditions	3,20±0,21	3,39±0,13	2,93±0,15
Applied motives			
To be able to use martial arts techniques	6,47±0,09	6,35±0,09**	5,92±0,17***
To be able to run well, to negotiate obstacles	7,65±0,15	6,37±0,08	5,92±0,13***
To be able to execute gymnastics exercises	6,17±0,14	6,14±0,09	4,45±0,17**
Motives of avoiding punishments			
Purpose: - only passing physical training test	3,80±0,18	3,71±0,13	3,29±0,20
Not to receive «bad» and go on leave	3,89±0,20	3,74±0,14	3,33±0,20
*) level of statistical significance of means' distinctions $p < 0,05$			
**) level of statistical significance of means' distinctions $p < 0,01$			
***) level of statistical significance of means' distinctions $p < 0,001$			

So, on the first year of study discrepancy and unsteadiness of cadets motivation were noted (in particular, there were positive answers to questions, which contradicted each other, namely: mastering of physical exercises only to pass test, not to receive “bad” at the next training, and, at the same time, express desire to become competitions winners, execute CMS or MS norms).

Practically all cadets mark as main and the most significant “high”, socially valuable motives (defense of Motherland, readiness to service etc.) while from the data of correlation analysis it is possible to make conclusion, that these motives are for the cadets only those, “which are understood” but not “are actually acting”.

Such factors as mocking of colleagues, lagging in physical level influence greatly on cadets attitude to physical perfection.

Availability of spare time and comfortable conditions are also a substantial condition of training.

Practically all cadets want to execute mass sports norms. At this stage, for them factors of health improvement and relaxation in the process of physical exercises training as well as procedural motives are not especially important.

On the second year of studying:

- the motivation of cadets is more steady, different situational determinates influence to a less extent on it, much less quantity of contradictory answers in comparison with the first year cadets;
- Increase of health improvement factors' importance in the process of physical exercises training;
- significant differentiation of thought and relations of cadets, greater quantity of distinctions in cadets' of different specialties motivations then on the first year of study;
- factor of spare time for trainings is still important;
- cadets evaluate their own capabilities more realistically, that is why the quantity of those, who want to execute norms of CMS and MS becomes much less;
- such factor as opportunity to take reputable place in collective due to success in physical training gains great importance;
- cadets consider opportunity to gain mass sports grades in the process of physical training to be of great importance;
- socially valuable motives in physical training a little lose their importance. On the fourth year of studying:
- motivation has been established and relations more steady, that gives possibility to better prognosticate the level of cadets' physical readiness by the answers to questionnaire questions;
- low significance of socially valuable motives (defense of Motherland, mastering of profession) for cadets;
- practically nobody (except the members of university's combined teams) manifests desire to execute CMS or MS norms, to become a winner of large scale competitions, may be, because the cadets realized not only their demands but also their opportunities, correlated them and worked out rather steady motivations;
- practically nobody shows availability of spare time and comfortable conditions as objective factor for training, because this problem is not so acute for senior cadets as for the younger ones;
- relations in cadet collectives are established and that is why nobody shows desire to avoid mocking as a factor stimulating for physical perfection, but many cadets underline the influence of excellent cadets on development of interest to physical training and sports, with minimal affect of commanders and chiefs;
- as motives to physical perfection, forefront is taken by motives, which are connected with health improvement, with achieving of high level of physical abilities, their applied character, as well as procedural motives and hope to improve appearance, to have handsome body as a result of physical training;
- on the one hand we observe reduction of physical training significance, but on the other hand, inner demand to systematically do physical training does not change greatly, as a rule, it is in direct connection with physical preparedness of cadets and their general attitude to physical training;
- such motive of physical training as desire to be an example for subordinates in the future is very important both for senior and young cadets;
- significance of physical training as a part of general culture of a person is a little increased.

### Summary

It has been proved that cadets' motivations are changed in the period of their study at higher educational institutions, that, in its turn points at possibility to efficiently apply psychological-pedagogical methods for formation of cadets' positively motivated attitude to mastering of military-applied exercises in the process of special physical training.

*The prospects of our researches* stipulate development and experimental testing of efficiency of practical recommendations for controlling the process of cadets' motivations to master military-applied exercises, in the process of physical training, formation.

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## METHODOLOGICAL FOUNDATIONS OF HEALTHY LIFESTYLE

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**Annotation.** The phenomenon of a healthy lifestyle is analyzed in terms of such methodological approaches as systemic, synergetic, personality-centered, hermeneutic and holistic ones. The pedagogical principles of harmony with nature, humanization and democratization, complexity and interdisciplinary integration, succession and continuity are defined. A conceptual idea of a healthy lifestyle is formulated including formation of cultural, social and economic reasons to preserve and strengthen the health of Ukrainians, consolidation of the efforts of teachers to develop a long-term educational technology for forming a healthy lifestyle, which will unite all periods of human life (pre-school, school, student, mature age), improvement of the health of people in the Ukrainian society, maintenance of optimum ability to work, improvement of the quality of life for healthy living and educating healthy children. The basic mechanisms of implementation of the conceptual idea are proposed.

**Keywords:** health, life, personality, methodology, principles.

**Introduction**

In the present conditions, when there are many various paradigms, scientific theories, conceptions, conceptual ideas, it is necessary not only to choose and form the methodology of scientific pedagogical research, which would reflect and reveal the essence of the object of the research (healthy life style), but also to ground conceptual idea for efficient implementation of practical methods.

Formation of healthy life style is, out of the question, a difficult pedagogical task. Researches of O. Vakulenko, A. Dubogay, S. Lapayenko, L. Suschenko, V. Shkurkina et al. concerning formation of the rising generation's healthy life style help to fancy complex approach to the problem of health life [4, 5, 14, 17]. However, formation of students' healthy life style is an urgent problem of higher educational institutions and requires separate, more detail research for determination of methodological grounds.

The research has been fulfilled as per the plan of scientific & research works of Crimea engineering-pedagogical university within the frames of subject "Theoretical foundations and methodological conditions of development of students' physical and psychological potential" (approved by academic council PBH3 CIPU, minutes No.6, dt. January 28<sup>th</sup>, 2013).

**Purpose, tasks of the work, material and methods**

*The purpose of the research* - to analyze the phenomenon of healthy life style formation from the point of view of methodological approaches, to determine pedagogical principles, to formulate conceptual idea of personality's healthy life style formation.

**Results of the research**

Methodological foundation of the research is a philosophical doctrine about human being. We started theoretical cognition of research object basing on general methodological problems: cognition of contradictions; correlation of general and specific; categorical structure with studying of definitions "health", "health life style".

The necessary condition of health formation is systemic approach, which presumes studying of integral, hierarchic, interdependent, open process in its constant development and self-development. System is "infinity of interconnected elements, arranged in definite order, which create certain integral unity" [6, 33]. M. Amosov regarded conception "health" in a schema of interconnected factors of system's "mankind" components [1]. Systemic approach makes it possible to research an object as a part of the whole [13]. That is why the process of health formation is regarded by us as a part of overall process of healthy life style's formation.

From the point of synergetic approach, the health of an individual is a system, able for self development [7, 9]. Permanent self organization gives opportunity for a person to improve his health level in different situations of everyday life. Having determined synergetic quality of health, i.e. the possibility of self-development for self-organization, we realize our responsibility concerning development and implementation of children's and youth's health formation technologies as a single pedagogical process, because organization of children's health self development influences on their future development in this direction during all life.

From axiological point of view it is necessary to ground on the values, which comply with humanness criterion, base on the positions of humanism as world outlook and way of life (existential, social, political, jurisdictional and moral values). With formation of an individual's health axiological and personality-orientated approaches become of special importance. These approaches mean setting interests of a person, his demand and abilities, rights as a member of society, his sovereignty in the center of educational process [8, 7, 15]. Only through such hierarchy of value approaches like person (personality) – people (culture, history, education) – state (society) it is possible to implement perspective and democratic model of healthy life style formation [16, 20]. With this, correlation of personality's and situational factors should be regarded as correlation of personality's qualities and objective demands of activity.

Let's analyze general conception "health" from hermeneutical position in order to determine components of the existing interpretations of this conception. English "health" derives from Anglo Saxon "hal"- whole. Greek "hugies" –

means health, reasonableness and wholeness. That is why health should not be reduced to physical state, but presumes psycho emotional balance, spiritual and social health. Statements of K.G. Yung, mentioning such conceptions as “whole”, “heal”, “health” [18] are of common knowledge. F. Perls and E. Fromm regarded as healthy such individual who is able to remain integral with the help of recreation of body, soul and spirit balance [12, 19]. Scientific work of B. Ananyev, in practice, is an example of studying an individual as an integral phenomenon. He stresses that development of a personality takes place through interaction in social situations [2, 202]. In our research we study health in detail from positions of holistic approach as a “part of whole”, meaning “healthy life style” on the one hand and as multi component integrity, required for creation of healthy personality’s wholeness on the other hand.

The used approaches become of special importance in their complex integration with conducting of pedagogical research of students’ healthy life style formation.

Principles are methodological reflection of used approaches. Among the principles, following which is the most important for formation of health life style, are the mentioned below:

- Principles of compliance with nature, humanization and democratization of pedagogical process, which influence on all natural peculiarities of the youth’s development;
- Principles of complex character and inter discipline integration, which assume combination of academic and educational processes and efforts of different organizations, affecting the process of education and self education in healthy life style formation;
- Principles of successiveness and continuity: starting from child’s first years of life health formation process goes through several stages, during which the content and directions of components of integral system of healthy personality’s establishment gradually become more complicated and various. This process is continuous, infinite and is going during all conscious life of a person.

Now, let us formulate conceptual idea of the given research, which consists of directions of personality’ healthy life style formation:

- formation of cultural, social and economical motives to protection and improvement of Ukrainian people’s health.
- consolidation of pedagogues’ efforts for development of long term pedagogical technology, which would unite all periods of a person’s life (pre-school, school, student’s years, mature period) in order to form healthy life style;
- rising of people’s health level in Ukrainian society, supporting of optimal working ability, quality of population’s life for ensuring of healthy life style and education of healthy children;

Mechanisms of realization of conceptual idea.

Realization of conceptual idea of a person’s healthy life style formation is possible on the base of pedagogical health centers organization in educational establishments: preschool, schools, higher educational institutions.

The tasks of such pedagogical health center can be the following: 3

- creation of ideological base for existing of sound and safe environment, methodology of formation of population’s set for healthy life style as the highest value;
- mastering of methods of psycho physiological and intellectual person’s abilities’ determination for efficient self regulation of own health state;
- development of educational standard and training of pedagogues for healthy life style formation.

#### Summary

From methodological position healthy life style has been regarded as an open and dynamic phenomenon, which does not exist in balance and has its own great potentials for self-development with the help of interaction with environment. Determination of methodological approaches, principles, conceptual idea of healthy life style formation permits to create theoretical basis for practical activity in this direction.

*The prospects of the research.* The offered mechanisms of the given conceptual idea’s realization require further elaboration, basing on consolidation of pedagogues’ efforts in healthy life style formation’s methods development.

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## FORMATION OF HEALTHY LIFESTYLE AMONG SCHOOLCHILDREN WITH OVERWEIGHT AND OBESITY

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**Annotation.** The problem of overweight and obesity in school children is considered. It is shown that the problem of child obesity underlie the development of many serious medical illness. It is introduced the analysis of publications on the problem of overweight and obesity in schoolchildren. It is defined methods for detection and possible non-pharmacological correction of the condition. The necessity of creating and putting into practice of long-term training programs to promote healthy lifestyle among schoolchildren are overweight or obese, to prevent the development of cardiovascular disease and other metabolic complications. Conceptually, it is determined the main directions of teaching and physical education students who are overweight and obese. It is shown that it is advisable to inform children and parents about the need to combine a balanced diet with exercise stress.

**Keywords:** obesity, overweight, healthy, lifestyle.

### Introduction.

One of the most widespread diseases in the world is obesity. At present time, there are about 1 billion people with excessive weight and more than 300 million of people, suffering form obesity. By forecasts of World Health Protection Organization the number of suffering from obesity will steadily grow [9]. So, in the USA, over 16% of children have excessive body mass and the quantity of children and teenagers with obesity has been redoubled for the last 20 years in developed countries [10]. At the same time, too late revelation of child obesity takes place. So, not more than 5.5% of children with obesity of the 1<sup>st</sup> grade pass medical examination, though their quantity is 65% of all children with excessive body mass. About 60% of adult obesity origins from childhood and adolescence age and show clear trend to further progressing [20].

The urgency of child obesity problem is also connected with the fact that it is the base of development of many heavy somatic diseases, first of all insular diabetes of the 2<sup>nd</sup> type, athero hypertension, atherosclerosis of vessels and other [12]. At present time, such diseases are the main reason of mortality of industrially developed countries' population and kill annually 2.5 million of people. Epidemic character of excessive body mass and obesity spreading throughout the world acquire not only medical but also socially significant character and require great attention of the widest circle of specialists [19].

The research has been fulfilled as per the plan of scientific & research works of sports medicine department of National University of physical education of Ukraine.

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

*The purpose of the work:* to study influence of healthy life style on pupils with excessive body mass and obesity weight correction for grounding of demand in creation long-term training programs for decreasing of weight.

*The methods of the research:* comparative analysis of domestic and foreign literature.

### Results of the research.

Numerous researches show that obesity is a poly etiological disease, which is realized in childhood under complex interaction of genetic and environmental factors [8]. Unfortunately, in our country there is no purposeful revelation of children with not only excessive body mass, but also with obesity that lead to late diagnosis and treatment of such state. Up to 70% of sick people come in sight of specialists only after 5-10 years since appearing of excessive fat mass. Most frequently, parents visit medical workers not in connection with excessive body mass of a child, but in connection with complaints, accompanying such state, which witness about complications of obesity, such as thirst, ache in legs, headache, unpleasant feeling in heart area, abnormalities of pubescence and etc. [1, 6].

Main diagnostic criterion of obesity is the presence of excessive fat mass. However, up to present time there have not been any simple and reliable method of fat mass's determination for children (for adult people bio impedance is such method) as well as there have not been any critical value of children's fat mass [13]. For revelation of children with excessive body and obesity body mass index mass (Kettle's index) is used, which is calculated by formula:

$$\text{BMI} = \text{body mass (kg)} / \text{height (m}^2\text{)}.$$

BMI, within the limits from 25 to 29.9, witnesses about excessive body mass and BMI higher than 30 means obesity. It should be noted that BMI gives idea only about general quantity of fat tissue, but does not permit to differentiate the quantity of subcutaneous and abdominal fat. Just abdominal type of obesity is the most dangerous for the development of metabolic syndrome, insular diabetes of the 2<sup>nd</sup> grade and arteriosclerosis [16].

As per the Agreed criteria, which were offered in 2007 by International diabetes federation (IDF), it is a rule now to estimate children's abdominal obesity by centile tables of waist circumference [5]. For determination of fat distribution's character indicator of waist circumference relation to hip circumference (WC to HC) is also used. With

girls' abdominal obesity this relation is more than 0.85, for boys it is more than 0.9. Both WC and BMI are quite authentic criteria of diagnostics of fat mass quantity [18].

Standard approach to treatment of obesity includes diet and physical loads that gives positive result in 50% of cases, but for majority of patients it has only a short term effect. As per "Global strategies on diets, physical activity and health", which were published World organization of health protection (WOHP) in 2004, with consideration of recommendations of Expert committee on obesity diagnostics and treatment, it is necessary to create clinical training programs, directed to steady reduction of weight. These programs shall include both: individual consultations and group trainings of correct eating behavior, healthy life style, which should involve the members of family. The main tasks of such training shall be: formation of steady motivation for gradual reduction of weight with further maintaining of the gained weight, for change of habits, way of life, increasing of personal responsibility for own treatment [7, 9].

The correction of pupils' excessive body mass shall be started from the complex of prophylactic measures, which must be directed to liquidation of harmful eating habits and formation of sound ones, to optimization of motion routine and order of day, stimulating of child's own motivation for healthy life style [3].

Unfortunately, in our country there is no service, which would deal with weight correction and formation of healthy life style of children, having excessive body mass and their parents. In children's polyclinics there are no specialists in diets, while district pediatricians must deal with a lot of other problems, requiring urgent solution. Children come to a specialist with already available obesity and even with its complications. Early excessive body mass's correction in childhood is a condition of health in adult age [2, 4].

For solution of this problem it will be effective to create Schools of correct eating or Schools of healthy life style, opening of which would be purposeful at children's polyclinics or at schools. Within the frames of Schools of correct eating it would be purposeful to deliver lectures for parents about health eating, to conduct role games with children, to organize meetings, at which children and their parents would exchange their experience, their own means for easing of passing to other diet. Competition ardour is also very important in the process of weight reducing as well as the possibility to see positive results of other children.

It is very important that not only children with excessive body mass but their parents as well would be professionally assisted [14]. Because, just in family incorrect life style of a child is embedded, e.g., just parents give example to eat after stress. Consoling the upset children, some parents give them something —tasty", without thinking that it can become a habit for all life and lead their child to obesity. The other harmful habit, which is formed in family, is eating while watching TV. With this conditional reflex "eating —watching TV" is formed. Besides while watching TV, child does not think about the quantity of the eaten. One more negative moment is the fact that TV commercials are rich with attractive for a child —harmful" food products. Very often the habit to eat watching TV is formed by his parents and if not to convince parents to get rid of such practice, it would be hardly possible to convince their child in it. One more important aspect of child's excessive body mass formation is monotonous hyper calorific family nutrition. Family nutrition and, consequently the nutrition of a child, are over satiated with easily digestible carbohydrates and satiated fats (confectionaries and sausage goods, sweet beverage, mayonnaise). It is necessary to convince parents to replace such food by fish, lentin meat, cultured milk foods, increase the quantity of vegetables and fruits in family nutrition.. Very often parents try to satisfy all caprices of their children and offer to them —harmful" products for him not to be hungry, if he refuses —useful" ones. The task of parents is to find such dish which would be simultaneously tasty and useful for their child, remembering that it affects the health of their child for many years in the future. Parents shall be familiarized with main conceptions about reasonable eating, about what proteins, fats, vitamins, carbohydrates and minerals are, in which products they are available and how many of the child's diet should contain depending on his age, self feeling and physical activity. Parents shall be able to attentively read information on labels of food products (life period, quantity of calories, proteins, carbohydrates, fats, presence of coloring agents, stabilizers and intensifiers of taste). So, for example, parents shall be informed that taste intensifier MSG can cause sight abnormalities of children [17]. Parents shall be able to estimate calorific value of different dishes, for example to understand that 200 kilo calories correspond to, approximately, half of cheeseburger or to 200 grams of milk porridge or 2 oranges or to 100 grams of boiled turkey. Parents shall be taught to calculate day norm of kilo calories' consumption for their child by formula:

$$1000+(100 \times \text{child's age in years})$$

If a child has excessive body mass then day consumption of calories shall be reduced by 10-15%. With this, fat content shall be not more than 25-30% of day calories content [15].

The parents with excessive body mass are recommended to diarize child's eating, with registration of the data about quantity and content of eaten dishes.. Parents shall plan the child's diet beforehand and compose his menu for every following day. For this purpose, approximate variants of breakfast, lunch, dinner, afternoon snack and supper, recipes of low calories dishes can be offered to parents. With keeping food diary it is necessary to clearly fix what was planned to be eaten in a certain day and what was eaten actually. In food diary it is necessary to honestly enter the eaten, between meals, candy or a handful of sunflower seeds. Keeping of such diary can be an amusing game for a child, for example with fulfilling of the accepted plan at the end of the day a child stick a sticker into diary and by the quantity of such stickers he can visually estimate his eating behavior during a week or a month. Special attention should be paid to behavior at somebody's place or at children's festivals with refreshments. Just at such measures frustrations are most likely.

Within the frames of Schools of correct eating and healthy life style it is purposeful to give to children and parents information about how to combine rational eating with dosed physical loads. Very often, children with excessive body mass are mocked by their classmates just at physical culture classes and it leads to the absence of their desire to attend such classes at all. As a result the schoolboy's existing hypodynamia still more aggravates and personal complexes start to form. Such children restrict their communication with the peers, all free from lessons time he spends at TV or computer that minimizes their motion activity. A kind of circulus vitiosus is created: for such children it is indicated to attend swimming pool, children sports clubs, take part in outdoor games in the air, besides academic physical culture classes, but under the criticism of physical culture teachers, coaches and their peers they still more shrink into themselves. In Schools of healthy life style such children could do therapeutic physical training with similar children and it would not cause any negative feelings concerning their appearance and physical abilities. Therapeutic physical training shall be carried out in a calm, friendly atmosphere, considering physical capabilities of such children and with gradual increasing of trainings intensity and duration. And only if diet therapy in combination with specially selected physical loads during 2,5-3 months turns out to be inefficient, for children with obesity medication can be prescribed [11].

#### Summary.

1. On the base of the conducted analysis of literature and other sources of information we offered conceptions of formation of healthy life style for pupils with excessive body mass and obesity.

2. We also have shown the need in creating of long-term programs on teaching healthy life style of pupils with excessive body mass and obesity for prevention from cardiac vascular and other metabolic complications and for raising of able-bodied population's lifetime.

*In further researches* it is planned to develop the program on formation of healthy life style for pupils with excessive body mass and obesity, considering age groups and with studying of weight reduction indicators in dynamics.

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## THE PROBLEM OF THE QUALITY OF JUDGING IN RHYTHMIC GYMNASTICS

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**Annotation.** The aim of the study is to develop a classification of factors influencing the quality of judging in rhythmic gymnastics. As a result of consolidation of theoretical information and practical experience was a list of the factors that negatively affect the behavior of judges in gymnastics, which were divided into two groups: the objective and non-objective (subjective). Objective factors include intense competition schedule, fatigue, especially memory, attention, competition rules, to the subjective: the ratio of judges to their gymnast (team) or to the opposing team, the lack of interest in the performance, composition of the judging panel, the influence of authority and popularity sportswomen dependence on its management. Respondents were unanimous in that independent professional judges are needed in a rhythmic gymnastics. It is set that 64% respondent mark the presence of pressure on judges from the side of competitors.

**Keywords:** judging, gymnastics, objectivity, factors.

### Introduction

The quality and objectivity of refereeing in kinds of sports with subjective determination of competition results is rather complicated problem. For its solution it is necessary to improve the rules of competitions, preparation of referees, principles of referees' teams completing, control over referees' work and using of technical equipment [2]. Alongside with it, most of researchers think that the system of rational preparation of referee personnel and improvement of rules are the main conditions of solution of refereeing problem in calisthenics [3]. However, referees' work efficiency depends on their psychological status, activity, anxiety, attention. Mental activity plays important role, which is connected with solution of different perceptual and mental tasks. These factors facilitate "loosening" of mark from its increasing to reduction that underlines dependence of referees on the state of their central nervous system [9]. Such problems can also be connected with peculiarities of memory. By the data of Yu.Ye. Titov [9], L.I. Turischeva [10] the capacity of human memory is lower than requirements of modern rules of competitions, according to which in one composition female gymnast carry out more than 20 elements by body, not considering the load of equipment, which is more than 1000 bits of memory. Referee must see and evaluate all this. Thus, formation of integral idea about factors of influence on referees' work as one of main problems not objective and unqualified refereeing, determination of total result and progressive development of calisthenics in Olympic sports system, conditions the urgency of the research.

In competition rules of many kinds of sports (calisthenics and gymnastics, high board diving, ski jumping, figure skating) there is no clearly differentiated criteria of evaluation of such indicators as show character, artistry of a sportsman, originality of techniques, complexity and sequence of exercises' execution and other, having great importance for determination of a winner [7]. In the process of this problem's study specialists marked out a number of factors, influencing on the quality of refereeing.

For example, the problems of gymnastics referees' attention and memory peculiarities were studied by Yu.Ye. Titov [9], criteria of control over referees' work were described in the works by Ye.P. Overkovich [1] and Yu.A. Popov [7], influence of social factor (sportsman's authority and popularity) on referees was researched by L.I. Turischeva [10]; R.M. Teriokhina [8] marked out the significance of inner referees' activity, connected with solution of different perceptual and mental tasks.

Subjective change of mark, connected with executive skill of female gymnasts is additional activity, i.e. solution of other tasks in the process of main information memorizing [8, 11, 12]. For example, evaluating an exercise, referees have not only to memorized the made by sportswomen mistakes, but also to solve tasks, connected with determination of additional markups.

The next factor, which influences on refereeing quality, is referees' tiredness. Tiredness causes both memory and attention weakening. Attention weakening is very important factor, which can bring to substantial mistakes in refereeing.

Referee's activity is characterized mostly by visual memory. Often visual memory requires volitional efforts. Special scientific works were devoted to: concentration of attention [4], referee's work efficiency [8], components, determining final psychic status of referees [4]. Each of these factors influences on referee's work efficiency.

Thus, referees' mistakes may be the results of the following factors: complexity of perception and processing of all information, attention and memory weakening, adjustment for certain standards of executive skillfulness, uncertainty of competition rules, absence of clear criteria of exercises' originality and show character.

The research has been fulfilled as per the plan of scientific & research works of Kyiv university, named after Boris Grinchenko for 2011-2015 on subject "Philosophical, educational and methodological foundations of competence, personal-professional, multi-profile university education".

### Purpose, tasks of the work, material and methods

*The purpose of the research:* classification of factors, which influence on refereeing quality in calisthenics.

*The tasks of the research:*

- To find out the factors of influence on refereeing quality in calisthenics;
- to classify and ground the factors of influence on refereeing quality in calisthenics;

*The methods and organization of the research.* The research was being conducted in the period from September 2010 to July 2012 and consisted of analysis of scientific-methodological literature, questioning, processing of data by the methods of mathematical statistics. Questioning covered 22 specialists in calisthenics, among them: 4 referees of the 2<sup>nd</sup> category, 2 referees of the 1<sup>st</sup> category, 6 referees of national category and 10 referees of international category.

### **Results of the research**

In the process of research we revealed main factors, which influence on the work of referees in calisthenics. These factors are the reasons of referees' mistakes, which appear in the process of competition refereeing. The mistakes were the results of subjective and objective factors. In their turn objective factors do not depend on conscious, will, desire or taste of a man and subjective factors do not reflect actual situation.

In the process of questioning, respondents were given the list of possible factors, influencing the referees' work. Among them there were objective factors such as noise in hall, absence of rest intervals, inconvenient location of working place, schedule density of female gymnasts' performances, tiredness, continuous refereeing for more than 6 hours, combination of referee and coach functions, unfavorable time of day, hunger [5].

Besides, subjective factors: referee's attitude to his female gymnast, to team or to adversary team, absence of interest to performance or to team, personnel of referees' team, influence of authority and popularity of sportswoman, dependence on his management.

Tiredness and dense performance schedule ( $W = 0,61$ ) were marked out by respondents as the factors which influence on their work to the largest extent. Referees' individual features, their qualification, record of service, level of competition are also of great importance (see fig. 1).

Except revelation of the most influencing on referees' work factors, respondents were questioned about refereeing peculiarities and problems in calisthenics. 64% of respondents agreed with pressure from the rivals. 68% of respondents gave positive mark to Ukrainian Federation of gymnastics' measures, directed to improvement of objectiveness, the rest were of other opinion.

The pressure from coaches or other referees was confirmed by 32 % of respondents, the same quantity of respondents did not agree with it, other insisted on partial pressure. All respondents were unanimous in opinion that calisthenics require independent professional referees.

Thus, the factors, marked out by us, stress the main refereeing problems in calisthenics. Their analysis and solution will permit to increase the level of refereeing quality and objectiveness in determination of winners. In further researches it is planned to formulate recommendations about elimination of negative influence of objective and subjective factors on refereeing in calisthenics and to develop the program of correction and recreation of referees' state in working process.

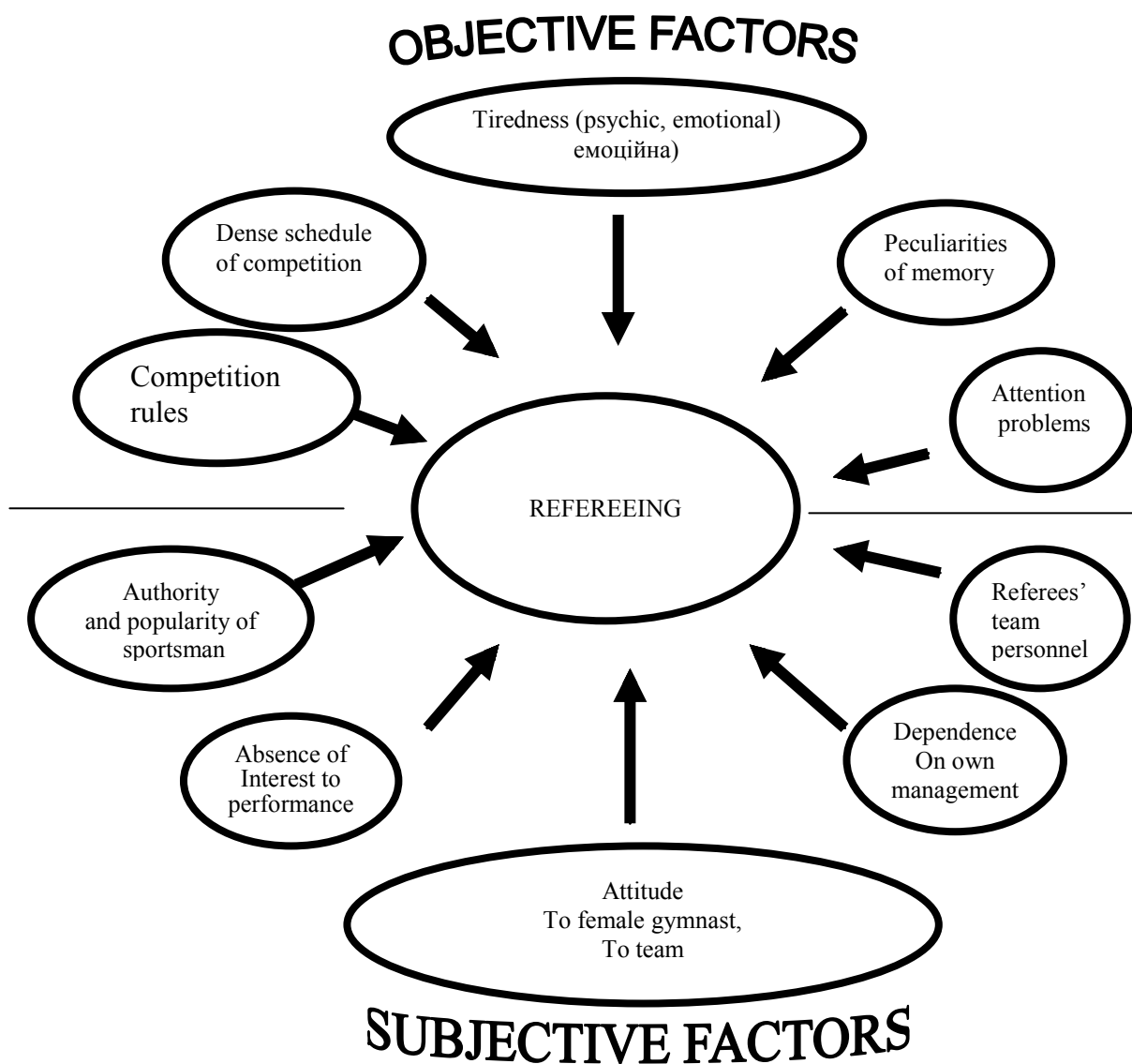


Fig.1 Classification of factors, influencing on referees' work in calisthenics

#### Summary

1. Analysis of calisthenics competition referees' practical experience witnesses that the problems of objective refereeing exist. The found factors, influencing on the refereeing quality, are divided into two groups: objective and not objective (subjective) factors. It permits to raise the quality of refereeing by avoiding the most important of them, and improve the objectiveness of competition refereeing.

2. Improvement of refereeing objectiveness is a complicated problem, which includes: perfection of competition rules, development of objective criteria of control over referees' work, using of modern technologies in refereeing, registration of referees' abilities to percept and process information in the process of competition with good quality, perfection system of referees' training.

3. The conducted researches expanded knowledge about problem of refereeing objectiveness in calisthenics. On the base of analysis of scientific-methodological literature it was established that efficiency of referees' activity is affected by their psychological state, peculiarities of their memories' operation, tiredness, level of attention and etc.

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## CHARACTERISTICS OF THE PHYSICAL HEART TRAINED AND UNTRAINED STUDENTS DEPENDING ON THE LEVEL OF BIOELEMENTS IN THE BODY

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**Annotation.** The functional inspection of cardiac activity is conducted at 80 physically trained and untrained students, who have been surveyed about the maintenance of cadmium, potassium and calcium in an organism. The research of the element balance of students revealed that study of chemical elements in the organism of sportsmen was more satisfactory, than for the physically untrained students which showed the deficit of essential elements. The research of features of reaction of the cardiovascular system on the physical loading showed that physiological role of toxic cadmium for the state of the cardiovascular system was more expressed for sportsmen, than for the physically untrained students, though its content in an organism was within the limits of the existing norm. The physiological role toxic and essential elements for an action of the heart of sportsmen and the persons who are not going in for sports is revealed.

**Keywords:** cardiovascular system, sportsmen, chemical, elements, students.

### Introduction

It is known that systematical physical trainings lead to substantial optimization of functional state of cardiac vascular system of organism, to raising of functional reserves of this system that require appropriate provision with microelements.. Besides, systematical physical loads are favorable factor, facilitating excretion of toxic elements from organism [3, 7]. In connection with it, studying of element balance status in organism in conditions of polluted environment, especially with systematical physical loads, is an urgent direction of physical culture and sports. The group of important for sportsman's organism elements includes ( $\text{Ca}^{++}$ ) calcium and ( $\text{K}^+$ ) potassium, with deficit or excess of which the abnormalities of muscles tissues' functioning is observed. At the same time some of the most spread pollutants, for example cadmium ( $\text{Cd}^{++}$ ), can be physiological antagonists of for these elements [6].

At present time there is rather limited quantity of works about interconnections between microelements' content and heat activity's indicators of sportsmen, which do not give full picture about how interaction of elements is realized in organism, how this interaction reflects on blood circulation system' functioning and affects on training and competition activity [9].

The researches have been conducted as per the plan of scientific & research works of Tavrisheskiy national university, named after V.I. Vernadskiy "Medical and biological grounding of physical education system. Development and improvement of medical-pedagogical observations' methods in training process" (State registration No. 0101U005752) and of Crimea state medical university, named after S.I. Georgiyevskiy by program "Physiological approaches to estimation of ecological risk for health" (State registration No.0102U006172).

### Purpose, tasks of the work, material and methods

*The purpose of the work:* to study peculiarities of cardiac vascular system's functional state of physically trained and not trained students, depending on cadmium, calcium and potassium content in organism in the state of physiological rest, under physical load and in the period of recreation.

*The methods of the research:* X-ray-fluorescence method, ECG method, statistical data processing by means of density-free correlation analysis by Spirman, statistical comparison by Manna Witny's method.

*The organization of the research.* The research covered 80 students (male) of 18-22 years old, from whom: 40 are students-sportsmen, professionally doing football (1<sup>st</sup> group) and 40 students, attending only academic classes in physical culture – (2<sup>nd</sup> group). The tested were examined for the content of  $\text{Cd}^{++}$ ,  $\text{Ca}^{++}$  и  $\text{K}^+$  in biologically constant tissues (hairs) with the help of X-ray-fluorescence method in laboratory of scientific & research center "VIRIA", Kiyev.

Heart activity was estimated by registration of indicators with the help of ECG on apparatus "Ergocard" (Italy). During research, identification of such ECG indicators as: intervals  $\text{PQ}^{\odot}$  and  $\text{QPST}^{\odot}$ , segment ST (S), complex QPS  $\odot$  and interval R-R (c) was carried out.

ECG was registered in physiological rest state, with combined step-by-step physical load on bicycle ergometer, which consisted of 8 stages (3 minutes each) and in recreational period (during 5 minutes).

Statistical processing of data was fulfilled by Spirman's density-free correlation analysis and statistical comparison by Manna-Witny's method.

### Results of the researches

First of all it should be noted that average content of the studied chemical elements in organisms of the tested sportsmen was within conventional, accepted as on to day, norm [4, 8, 10], while not trained students had deficit of  $\text{Ca}^{++}$  and, especially  $\text{K}^+$  in hairs (table 1).

Table 1

*Concentration of chemical elements in hairs of the tested students (mkg/g)*

Chemical element	Minimal	Maximal	X±Sx	Conventional norm
Cd <sup>++</sup> (cadmium)				
1 <sup>st</sup> group	0,00	0,28	0,08±0,01	0-1
2 <sup>nd</sup> group	0,00	0,17	0,05±0,01**	
Ca <sup>++</sup> (potassium)				
1 <sup>st</sup> group	183,67	929,69	353,31±28,40***	300-700
2 <sup>nd</sup> group	145,62	718,19	179,50±25,38	
K <sup>+</sup> (calium)				
1 <sup>st</sup> group	0,00	185,34	84,90±10,26	70-170
2 <sup>nd</sup> group	0,00	301,21	40,49±8,87***	

Note: Differences between groups are authentic \*\* with p<0,01; \*\*\* with p<0,001.

The obtained data are in compliance with the data about differences in the content of professional sportsmen's hairs, mainly it is increase of most chemical elements concentration (Ca, Mg, Na, P, K) in comparison with healthy, but not doing sports, male students' indicators [5].

So, it is considered that increased concentration of Ca<sup>++</sup> in sportsmen's hairs can rather show its intensive turnover and excretion under systematic physical loads (cumulative effect of physical loads) than reflect its high content in organism. On the other hand it can point to "hidden" risk of its deficit appearing. The increased Ca<sup>++</sup> metabolism also can reflect affect of training and competition processes and may be using of pharmacological remedies by sportsmen. It can also be illustrated by increased content of Cd<sup>++</sup> in sportsmen's organisms, assimilation of which worsens Ca<sup>++</sup> [6].

IAE, higher content of the researched elements can say about both: better elements' status of sportsmen's organisms and eliminating affect of muscular loads, which influence not only on dynamics of toxic elements but on the content of indispensable to life chemical elements.

The reduced calcium content in students' not doing sports organisms can be, in its turn, conditioned by a number of reasons. First of all Ca<sup>++</sup> deficit is connected with its low content in food, and in this respect Ca<sup>++</sup> deficit is rather spread phenomenon for modern young generation [2, 6]. Its reduction can also be observed in connection with its increased consumption resulting from stresses, excessive consuming of caffeine containing products, smoking. The latter also results in K<sup>+</sup> deficit in the hairs of students, who are not go in for sports, and is noticeable usually with psychic overstrain, weakening of adaptive mechanisms.

Average values of the studied indicators of heart activity in physiological rest state of students-sportsmen and students not doing sports did not sufficiently differ and, in general, complied with normative values, i.e. they were either within the limits of accepted physiological norm or differed from it insignificantly for some of the tested [1], (table 2).

Table 2

*Heart activity's indicators of the tested students in the state of physiological rest*

Indicators	Average± standard deviation		Norm
	sportsmen (n=40)	Not sportsmen (n=40)	
Interval PQ (c)	0,128±0,001***	0,131±0,002	0,12–0,20
Complex QRS (c)	0,090±0,002	0,093±0,003	0,06–0,09
Segment ST (c)	0,057±0,001***	0,065±0,001	0,02–0,12
Interval QRST (c)	0,148±0,001***	0,158±0,001	0,35–0,42
Interval R-R (c)	0,825±0,101	0,833±0,129	0,75–1,0

Note: Differences between groups are authentic \*\* with p<0,05; \*\*\*with p<0,001.

The results of comparative analysis of students sportsmen's ECG indicators and the students, not doing sports, witness that the found authentic differences of intervals PQ and QRST, as well as segment ST (see table 2) can be the results of organism's adaptation to high physical loads, which, during long time, do not cause distortions of myocardial-hemodynamics homeostasis, but only lead to some shifting of physiological indicators. This shifting is conditioned by long term structural mechanisms of adaptation to systematical loads during long time [1, 3], that, probably, took place in this research.

The results of correlation analysis obtained in the present research, witness in favor of this theoretically grounded assumption. They are characterized by the presence of ECG heart characteristics' dependence on the level of

the studied chemical elements in organism on all stages of testing, expressed in different extent and manner (see table 3, table 4).

Table 3  
*Correlative analysis of heart activity indicators and chemical elements in the hairs of physically trained students (1<sup>st</sup> group, n=40)*

Chemical element	Indicators	Rest		Load		Recreation	
		(r)	(p)	(r)	(p)	(r)	(p)
Cd <sup>++</sup>	PQ interval	-0,47	0,01	-0,52	0,01	-0,43	0,05
	QRS complex	-0,47	0,01	-0,35	0,02		
	QRST complex			-0,50	0,02	-0,56	0,01
	ST segment					0,52	0,01
	R-R interval			-0,31	0,04		
Ca <sup>++</sup>	QRST interval			0,44	0,05		
	R-R interval			-0,46	0,01	-0,37	0,04
K <sup>+</sup>	QRST interval			-0,54	0,01		

Table 4  
*Correlative analysis of heart activity indicators and chemical elements in the hairs of physically not trained students (2<sup>nd</sup> group, n=40)*

Chemical element	Indicators	Rest		Load		Recreation	
		(r)	(p)	(r)	(p)	(r)	(p)
Cd <sup>++</sup>	PQ interval			0,37	0,01		
	QRS complex			0,46	0,02	-0,37	0,02
	QRST complex			0,36	0,02		
K <sup>+</sup>	ST segment			0,36	0,02	0,31	0,05
	R-R interval			-0,33	0,03		
	QRST interval			0,36	0,02	0,40	0,02
	R-R interval			0,40	0,01		
	QRST interval						

First of all it should be noted that the 2<sup>nd</sup> group students manifested this dependence only after physical load and, to a less extent, in recreational period with two elements from three (table 4). The first group students had such dependence also in rest; in anyway ECG characteristics responded to all three elements and the character of this response was other than of not trained students (table 3).

The quantity of responding parameters and found correlating connections of students-sportsmen were also greater and this, probably, permits to affirm that their organisms are more sensible to oscillations of these elements level in organism that can be connected with higher demand in appropriate microelement provision with systematical physical loads.

From this point of view, correlation links of intervals QRST, R-R, for example, with Ca<sup>++</sup> level of sportsmen, but not of students, who do not go in for sports and also opposite by character correlation with its functional antagonist K<sup>+</sup> (table 3). Correlation with concentration K<sup>++</sup> were found among not trained with ventricle complex. With it, their multidirectional potassium influence on different stages of ventricles excitement phase.

But the most substantial influence of both groups students' ECG characteristics was found from the side of toxic Cd<sup>++</sup>, though its content in organism was very insignificant, So, for physically not trained students, the more Cd<sup>++</sup> content was, the longer time excitement form auricle to ventricle passed under physical load

An opposite situation was observed with trained students on all stages of testing: before, after physical load and during recreational period. For the students of the 2<sup>nd</sup> group, Cd<sup>++</sup> influence took place only for the time of duration of full excitement of both ventricles (segment ST), while for the 1<sup>st</sup> group students they were the different stages of ventricles excitement, with it the character of dependence was opposite: the higher Cd level the less time was required for excitement's passing. In other words positive dromotropic effect took place.

#### Summary

1. It was found that average content of chemical elements in organisms of sportsmen was within the frames of conventional physiological norm, while concerning the students, not doing sports deficit of calcium and, especially, potassium, was observed in organisms.

2. It was established that cadmium affected in a certain way on electrophysiological indicators of sportsmen's heart activity: interval PQ, complex QRS, interval QRST, segment ST, interval R-R with

$0,31 \leq r \leq 0,52$  и  $0,01 \leq p \leq 0,05$ , in rest on different stages of load and in recreational period. For not trained students cadmium did not have so expressed significance, with the exception of its general influence on the duration of heart cycle at the expense of elongation of atrio ventricular excitement's passing (interval PQ ( $r=0,37$ ;  $p \leq 0,01$ ) and the period of general excitement of ventricles (segment ST ( $r=0,46$ ;  $p \leq 0,02$ ) though in opposite manner in comparison with sportsmen and practically only under physical load.

3. Functional significance of essential elements for not trained students manifested only after physical load and, to less extent, in recreational period, while for sportsmen such dependence was observed also in physiological rest. This showed at higher demand in appropriate microelement provision under systematical physical loads.

*Further researches* are offered to be conducted in direction of studying of other problems, connected with analysis of heart activity indicators.

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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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**THE COMPLEX TESTING CONTROL OF STUDENTS' MOTOR ABILITIES AGED 17-20 YEARS**

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**Annotation.** Directions of evaluation of motive capabilities of students are considered. It is used 12 ball sigmoid scale of the American test complex (YMCA). In research took part 1200 students up-diffused on according to ages 17, 18, 19, 20. It is marked a tendency to the decline of middle indexes of motive capabilities with the increase of age of students. The indexes of development of power capabilities, capacity for endurance and flexibility and their complex testing are described. Measures are offered on the increase of motivation of students to the improvement of results of motive preparedness in the process of physical education. The indexes of testing of the level of motive preparedness of students allow to compare them during all period of studies, to estimate and carry out their analysis. The method of complex estimation allowed high-quality estimate on «satisfactorily» motive preparedness of students of different age within the limits of 61,7-65,7%.

**Keywords:** motor skills, control, complex testing, sigmoid scale, preparation.

**Introduction**

The most important condition of physical education process's efficiency improvement is regular control of testing results' dynamics for methodologically correct construction of educational process. One of the most often used means of control, which permits to obtain grounded data about motion preparedness, is testing. Testing has been successfully applied in sports diagnostics for long time, but, unfortunately, the offered evaluation methodologies have great number of problems, namely, insufficiency of objective, prompt, unified and predicted means of control. There is no optimal and clear methodology of complex control, which would include basic factors of physical development, permitting to obtain actual objective data about students' physical state. Physical educative-training process shall be corrected, if 15% of students with low level of motion abilities' or their complex's development are found in an academic group or in several groups [5; 9].

As on to day, there is a significant quantity testing systems of motion preparedness for population's groups of different age, which help to solve practical and scientific tasks by the specialists in the field of physical education and sports [3; 7]. Foundation of pedagogical principles' dynamics control of studying youth motion preparedness, determination of the most reliable and objective criteria of different motion abilities' (especially of their complex) levels of development have not been studied sufficiently yet in the theory of physical culture. So, implementation of this knowledge in practice is important.

The research has been fulfilled as per the combined plan of scientific and research work in the sphere of physical culture and sports for 2011-2015 in direction "Methodological and organization-methodological foundations of rational training of sportsmen" as per scientific subject 2.18. "Improvement of sportsmen' motion activity's control mechanisms".

**Purpose, tasks of the work, material and methods**

*The purpose of the research:* to evaluate 17-20 years old students' motion preparedness level on the base of 12 point, sigmoid scale by American testing complex (YMCA).

The contingent of the tested included 1200 persons of 17-20 years old age (each age group consisted of 300 persons), who were 1<sup>st</sup> – 4<sup>th</sup> year students of higher educational institutions of Sumy. As per international standards the age of students was determined by decimal system, with consideration of testing date (12.05.2010) and birth date (17 years old – from 16,5 to 17,5 years; 18 years – from 17,5 to 18,5 years; 19 years – from 18,5 to 19,5 years; 20 years – from 19,5 to 20,5 years). All students related to main training group as the students, who do not go in for sports systematically.

In the process of research we processed the results by the methods of mathematical statistics with the help of Excel program.

**Results of the research**

Last time, a number of methodologies, which combined commonly known exercises and other different variants, have been used for complex evaluation of students' motion preparedness. As an example we can take The Tests of President Council of the USA, The tests of motion activity of European Council "Eurofit", The tests of mayor of Moscow, ICSPFT – International Committee on the Standardization of Physical Fitness Test [Trzeźniowski R., Pilicz S. Tabele sprawności fizycznej młodzieży w wieku 7–19 lat. Warszawa, Z warsztatów badawczych AWF, 1989, 127 p.]. But alongside with positive moments, the existing control exercises have certain disadvantages, which severely restrict their application in conditions of higher educational establishments. First of all they require application of complex equipment, less quantity of students in academic group, presence of medical worker during functional tests, Secondly, the mentioned above control exercises were created for main health group.

The testing of students is and element of physical education systems in higher educational institutions of Ukraine and, accordingly, it shall meet the requirements, reflecting legal, resources, organization and other aspects of

the functioning of these systems. By observing of this requirement we can formulate the following: quantity of testing exercises as minimal as possible; testing exercises shall be relatively simple; application of complicated technical equipment shall be excluded; execution of testing exercises shall not result in traumas; compulsory observation of safety regulations during testing.

As on to day, two essentially different approaches to evaluation of a persons motion activity have been known: 1) for every testing the norms, in accordance to which development level is evaluated, are established; 2) integral evaluating of a person's motion preparedness is being developed. This evaluating is based on transferring of multi dimensional measuring system (seconds, meters, quantity of repetitions) into one-dimensional (points, scores).

Most of specialists in the sphere of theory and methodology of physical education in higher educational institutions are the supporters of complex approach to evaluation of students motion preparedness, though there is no unanimous opinion concerning the quantity and quality of the required indicators [1; 2; 4; 6; 10].

For controlling the complex of 17-20 years old students' motion abilities' development American testing complex (YMCA) was offered, which was recommended by professor B.D. Franks, the headmaster of school of health, physical education, recreation and dances at Louisiana (USA) university, [Franks B. D. Test sprawności fizycznej dzieci i młodzie y YMCA. Poznan, 1994. – 58 p.] at the end of XX century (see table 1).

Table 1

*Complex testing of Male students' motion abilities (YMCA)*  
( $\bar{X} \pm S$ )

Nos	Test exercises	Age, quantity, results			
		17years old <i>n</i> =300	18 years old <i>n</i> =300	19 years old <i>n</i> =300	20years old <i>n</i> =300
1	I mile run (1609 m), <i>s</i>	478,32±17,12	483,97±11,84	489,08±11,62	493,04±14,72
2	Sitting bending of body, <i>cm</i>	25,17±3,53	25,73±3,67	25,06±3,92	24,88±3,93
3	Lying raising of body, <i>times</i>	38,07±13,61	35,66±9,71	37,57±13,47	35,54±12,52
4	Half lying pulling up, <i>times</i>	24,22±6,52	26,63±7,82	27,74±7,76	25,04±6,69
5	Total thickness of skin-fat folds (triceps +hip), <i>mm</i>	11,67±5,07	12,12±6,08	12,96±7,33	14,31±7,05

Testing complex included: I mile running (1609 m) (cardiac & respiratory endurance); sitting bending of body (active flexibility); lying raising of body (dynamic strength of prelum abdominale and back muscles), measurement of two skin-fat folds' thickness: on shoulder and shank (parts of body).

The above described test stipulates evaluation of three motion abilities' development and determination of body composition, i.e. five measurements. The development of strength abilities is evaluated by two tests: flexibility and endurance – one test for each. Comparative analysis of data, reflecting motion abilities' development of 17-20 years old students (table 1) witnesses that in majority of tests exercises optimal indicators were manifested by 17-18 years old students but not 19-20 years old ones. Comparing total thicknesses of two skin-fat folds (on shoulder and on shank), we noted the increase of fat component in every age group and it is a negative prognosticating factor of possible obesity and lipotropic abnormalities.

For development of norms for evaluation of motion abilities' development with complex testing, we determined typical indicators ( $\bar{x}$ ) and quadratic deviation (*S*) of test exercises for every age group. Calculation of limits and norms of test exercises' evaluation were carried out by 12 point, sigmoid scale, which was recommended by Bologna system of education and permitted to determine the availability of corresponding level of students' motion abilities' development. 12 point, sigmoid scale takes test result  $\bar{x} \pm 0,5S$  as a medium norm,  $\bar{x} \pm 1,5S$  – lower or higher than medium norm,  $\bar{x} \pm 2,5S$  –low or high norms. Let us take 0,5*S* as evaluated step. Depending on the calculated values it is possible to determine the levels of development (low, lower than medium, medium, higher than medium, high) [8].

As per the data, give in table 2, in 1 mile running of male students it was registered: low and lower than medium levels were manifested by 0.3% and 37.3% of 17 years old students, 3% and 41.3% of 18 years old students, 0% and 41% of 19 years old students, 43.3% of 19 years old students Higher than medium and high levels were shown by 14.4% and 10.7% of 17 years old students, 32.3% and 4.7% of 18 years old students, 19.3% and 10.7% of 3a 19 years old students, 26.7% and 4% of 20 years old students. Besides, they correspondingly showed higher than medium and high levels of cardiac & respiratory endurance.

Table 2

*Complex testing indicators of motion abilities (YMCA), which were calculated by 12 point sigmoid scale. (17-20 years old students) %.*

Age	Points, levels of development											
	1	2	3	4	5	6	7	8	9	10	11	12
	low			lower than medium		medium		higher than medium		high		
One mile run (1609 m), <i>s</i>												

17	–	–	0,3	14	23,3	11,6	25,7	10	4,4	5	3	2,7
	0,3			37,3			37,3			14,4		10,7
18	–	–	3	13	28,3	12	6,7	18	14,3	1,7	1	2
	3			41,3			18,7			32,3		4,7
19	–	–	–	18,3	22,7	21,3	7,7	5	14,3	9,3	0,4	1
	–			41			29			19,3		10,7
20	1	3	6	6	10	26,6	16,7	6,7	20	4	–	–
	10			16			43,3			26,7		4
<i>Sitting body bending, sm</i>												
17	13,6	8,7	–	–	15,3	19,4	0,3	10,7	4,3	16	11,7	–
	22,3			15,3			19,7			15		27,7
18	–	9,7	3	4	–	26	26,3	15	7,7	8,3	–	–
	12,7			4			52,3			22,7		8,3
19	2	2	10,3	0,7	6	27,7	28,3	10,3	7	5,7	–	–
	14,3			6,7			56			17,3		5,7
20	2	2,3	10	1,7	5,3	10,7	36	21	5,7	5,3	–	–
	14,3			7			46,7			26,7		5,3
<i>Lying body raising, times</i>												
17	–	–	14	6,6	0,7	22,3	13,7	29,4	13,3	–	–	–
	14			7,3			36			42,7		–
18	–	1,7	4,3	9,7	22,3	11,4	17,3	9	19,7	3,6	1	–
	6			32			28,7			28,7		4,6
19	–	–	14	7,3	0,7	22	16	25,3	14,7	–	–	–
	14			8			38			40		–
20	–	–	14	7,3	2,7	23,3	13,4	21	17,7	0,6	–	–
	14			10			36,7			38,7		0,6
<i>Half lying pulling up, times</i>												
17	–	–	11,3	6,7	11,6	3,4	35	21	6,3	3,7	1	–
	11,3			18,3			38,4			27,3		4,7
18	–	1	7	10,3	15,3	10,4	22,3	17,3	10,4	5	1	–
	8			25,6			32,7			27,7		6
19	–	4,7	5	8,7	12,6	12	22	21,3	9	3,7	0,3	0,7
	9,7			21,3			34			30,3		4,7
20	–	–	8,7	15	4,7	9,3	33	14	12	3	0,3	–
	8,7			19,7			42,3			26		3,3

The obtained data of sitting body bending of 17-20 years old students have been distributed as follows: low level was shown by 22.3% of 17 years old students; 12.7% of 18 years old; 14.3% - of 19-20 years old students. Low than medium level was manifested by 15.3% of 17 years old students; 4%- by 18 years old students; by 6.7% of 19 years old and by 7% of 20 years old students. Medium, higher than medium and high level of development was showed by 19.7%, 15%, 27.7% of 17 years old students; by 52.3%, 22.7%, 8.3% of 18 years old students; by 56%, 17.3%, 5.7% of 19 years old and by 46.7%, 26.7%, 5.3% of 20 years old students.

As per the comparative analysis results of lying body bending indicators it was found out that low, lower than medium and medium levels for 17 years old students were correspondingly: 14%, 7.3%, 36%.; for 18 years old students: 6%, 32%, 28.7%; for 19 years old students: 14%, 8%, 38% and for 20 years old students: 14%, 10%, 36.7%. Nearly 42.7% and 0% of 17 years old students, 28.7% and 4.6% of 18 years old students, 40% and 0% of 19 years old and 38.7% and 0% of 20 years old students manifested higher than medium and high levels of development.

Generalizing the obtained data on half lying pulling up it should be noted that low level of development was observed in 11.3% of 17 years old students, in 8% of 18 years old students, in 9.7% of 19 and in 8.7% of 20 years old students. The results also witness the level lower than medium was showed by 18.3% of 17 years old students, by 25.6% of 18 years old students, by 21.3% of 19 and by 19.7% of 20 years old students. Medium and higher than medium levels were determined for 38.4% and 27.3% of 17 years old students, for 32.7% and 27.7% of 18 years old students, for 34% and 30.3% of 19 and for 42.3% and 26% of 20 years old students. With high level 4.7% of 17 years old students, 6% of 18 years old students, 4.7% of 19 and 3.3% of 20 years students comply.

So, complex testing as per American series of tests (YMCA) permitted to determine individual level of every student's motion abilities' development both: by age and by sex. On the base of all indicators, with the help of complex evaluation it is possible to determine general level of motion preparedness of a certain contingent. Complex evaluation stipulates determination of every motion ability in points; then total indicator for the whole complex is calculated; as per generalized scale – qualitative value of development is determined (see table 3).

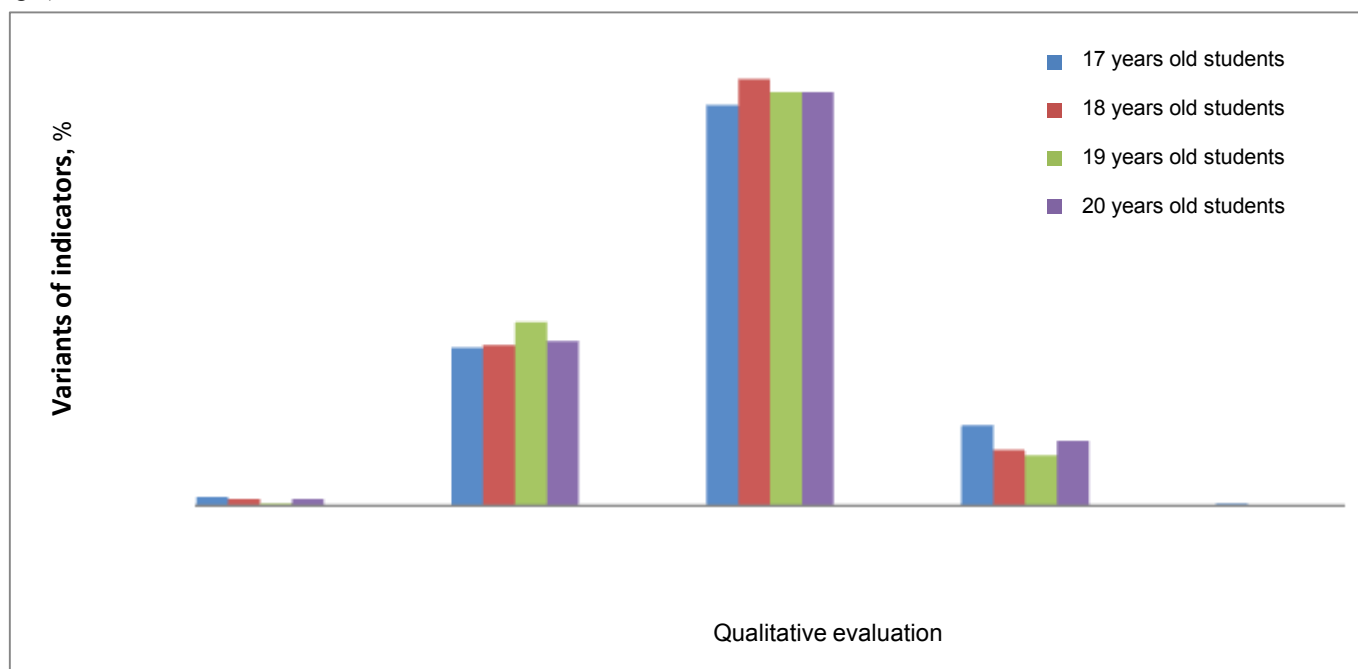
Table 3

*Complex evaluation of motion abilities' development with the help of YMCA series of tests.*

Quantitative evaluation (points)		Qualitative evaluation
Calculated by 5- points sigmoid scale	Calculated by 12- points sigmoid scale	
By four indicators		
18–20	40 i <	excellent
14–17	32–39	good
10–13	24–31	satisfactory
6–9	16–23	unsatisfactory
2–5	15 i >	bad

Indicators of students' motion preparedness level's testing permit to compare them during the whole period of studying, to evaluate and analyze them; besides, to determine advantages and disadvantages of the applied means, methods and forms of physical training organization; to correct curriculums for the next year on the base of analysis.

So, the next stage of our research was determination of motion abilities development's complex evaluation by 12-point sigmoid scale with the help of four tests of YMCA methodology applied for 17 -20 years old students (see fig.1).



*Fig. 1. Indicators of complex evaluation (YMCA), calculated by 12-points, sigmoid scale for 17-20 years old students*

The data, obtained by complex evaluation of four test exercises of motion abilities' development witness that "bad" mark was received by 1.3% of 17 years old students, by 1% of 18 years old students, by 0.3% of 19 and by 1% of 20 years old students; "unsatisfactory" mark was given to 24.3% of 17 years old students, to 24.7% of 18 years old students, to 28.3% of 19 and 25.3% of 20 years old students. "Satisfactory" was given to 61.7% of 17 years old students, to 65.7% of 18 years old students, to 63.7% of 19-20 years old students. 12.4% of 17 years old students, 8.6% of 18 years old students, 7.7% of 19 and 10% of 20 years old students have "good" mark. "Excellent" mark was given only to 0.3% of 17 years old students.

### Summary

One of the most important means of improvement of students' motion activity and training efficiency is an adjusted system of objective control and evaluation of motion abilities' complex testing. Such system, on the one hand, expands possibilities of educational training process and on the other hand, every student can receive objective information on different stages of his activity, that permit to significantly raise his motivation for improvement of motion preparedness results in the process of physical education in higher educational institution.

The further researches are planned to be conducted in direction of determination of motion abilities and physical development interconnection, considering students' age aspect.

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## SOLES DERMATOGLYPHICS IN THE PROGNOSIS OF SPORTS ENDOWMENT: DIFFERENCES OF SOLES DERMATOGLYPHICS IN SPORTSMEN OF DIFFERENT SPORT KINDS

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**Annotation.** The problem of determining associations between certain groups of sports and dermatoglyphics feet. The study involved 207 men, the general population (those who are not in sports), aged 17-19 years and 78 men highly skilled athletes. It is shown that as a criterion in the sports orientation of children and adolescents can be dermatoglyphics. The features of the structure of the foot dermatoglyphics in men of different sports specialties. There are informative signs dermatoglyphics thumb and feet, which can be recommended to assess the prospects of a particular athlete's motor activity. Among these are the types of finger patterns, combined account and certain dermatoglyphic phenotypes. It is proved that certain features of dermatoglyphics feet act as genetic markers in predicting propensity athletes to realize the potential of high specific energy pattern.

**Key words:** sport, orientation, soles, dermatoglyphics, genetic, markers.

### Introduction

Dermatoglyphics (Greek derma, dermat [os] – skin, glypho – to engrave) is a science about peculiarities of dermal ridges constructions on humans' and primates fingers and hands as well as on feet and toes. Dermatoglyphics researches can be perspective in different fields of knowledge [7]:

1. Clinical medicine. Peculiarities of dermal ridges can help to diagnose many hereditary diseases: severe chromosome aberrations (Down's disease, Shereshevskiy-Terner's syndrome), genomic abnormalities (femilketonuria, valvular defect and etc.), diseases with bent to hereditary character (epilepsy, schizophrenia, alcoholism, drug addiction, insular diabetes and so on).

2. Forensic medicine. Possibilities and prospects of dermatoglyphics' application in forensic medicine are connected with identification of a person, with affiliation and substitution of children.

3. Psycho physiology. There is a connection between dermatoglyphics and psychic features of a person. By dermatoglyphical markers it is possible to prognosticate a person's bent to high intellectual development. There is interconnection between dermatoglyphics and functional skewness of human hands.

4. Morphology. Dermatoglyphical markers make it possible to prognosticate development of morphological features even in early childhood.

5. Physical education and sports. Dermatoglyphical markers can help to determine child's bent to development of high level of strength, coordination, speed abilities and faculty for endurance and joints' flexibility. With sports selection by dermoglyphical markers it is possible to evaluate the prospect of a child for doing certain kind of sports. Considering high informational character of dermatoglyphics in genetic prognostication we the subject of this research to be an urgent one.

In scientific researches it has been proved that the representatives of different kinds of sports have their peculiar dermal ridges of fingers and hands [2, 7]. Even within certain kind of sports, dermatoglyphics of sportsmen of various specializations is different. So, sprinters, long-distance runners, jumpers and throwers [3, 4, 6], footballers forwards, halfbacks, fullbacks [1], boat racing sportsmen of different types [5] have differential distinctions in dermal ridges. However researches of differential distinctions of feet dermatoflyphics formations of sportsmen of different kinds of sports are unknown to us.

The work has been fulfilled as per the plan of scientific & research works of Kherson state agrarian university.

### Purpose, tasks of the work, material and methods

*The purpose of the research* is determination of differential distinctions of phenotypic manifestation of foot dermatoglyphics of sportsmen of different specialties.

*The tasks of the work were the following:*

1. To determine the peculiarities of foot dermatoglyphics of different specialties' sportsmen.
2. To recommend certain foot dermatoglyphical signs as genetic markers for prognostication of sportsmen's bent to high level realization of potential possibilities of the determined energetic orientation.

*The methods of the research.* As per the methodology of T.D. Gladkova, we evaluated phenotypic manifestation of foot and toes' dermoglyphical signs. The technology of footprint obtaining and analysis of dermatoglyphical signs were described by us earlier (message 1).

*Organization of the researches.* The research embraced 207 person of general population (those who do not sports) of 17-19 years old age (the inhabitants of the south of Ukraine) and 78 sportsmen of high qualification. Among the sportsmen there were 4 Honoured Masters of Sports, 12 masters of sports of international category and 62 masters of sports. Dermatoglyphics of three groups of sportsmen was compared:

1) group with dominating execution of competition speed-power oriented orientation (track and field sportsmen – sprinters, jumpers, throwers and weightlifters). They were 33 of them. In tables they were conventionally marked as SP;

2) group with dominating realization of anaerobic-aerobic abilities (general exercise’s duration: from 20 seconds to 10 -12 minutes). This group consisted of sportsmen, specializing in boxing, free style wrestling, karate, weightlifting. 21 sportsmen took part in the researches. Designation: AnAe;

3) group with dominating manifestation of aerobic energy supply mechanisms in competition activity. This group consisted of boat racing sportsmen: kayak and canoe; long distance runners (1 500 m, 3, 5, 6, 20 km). The group included 24 persons. Designation: Ae.

**Results of the research**

Dermatoglyphics of big toe. Distribution of main types of left and right big toes as well as of both feet of general population persons and sportsmen of three groups dermal ridges are given in table 1: analyzing the obtained results we note availability of insignificant quantity of arc (A) and scroll (W) types ridges. The representatives of speed-power and aerobic kinds of sports practically have no arc ridges. The sportsmen of speed-power and anaerobic-aerobic kinds of sports have such ridges more often (12.2-16.7%) than the members of general population (9.3%). Concerning loop type ridges (L) the following trend can be noted: the representatives of anaerobic-aerobic kinds of sports have less quantity of loop ridges (71.4%) than the members of general population(81.6%). The sportsmen of aerobic kinds of sports have greater quantity of loop ridges (95.9%). The representatives of speed-power kinds of sports’ indicators do not significantly differ form the population ones.

Table 1

*Distribution of dermal ridges’ main types of general population persons and sportsmen of three groups big toes*

Groups of the tested	Dermatoglyphical ridges’ types of big toe					
	A		L		W	
	Quantity	%	Quantity	%	Quantity	%
<b>Right foot</b>						
Sportsmen						
SP	0	0	29	87,8	4	12,2
AnAe	4	19,0	14	66,7	3	14,3
Ae	0	0	24	100	0	0
<b>Left foot</b>						
Sportsmen						
SP	1	3,0	28	84,8	4	12,2
AnAe	1	4,8	16	76,2	4	19,0
Ae	1	4,2	22	91,6	1	4,2
<b>Total on two feet</b>						
General population	38	9,1	341	81,6	39	9,3
Sportsmen						
SP	1	1,5	57	86,3	8	12,2
AnAe	5	11,9	30	71,4	7	16,7
Ae	1	2,05	46	95,9	1	2,05

Comparing dermatoglyphics of foot with dermatoglyphics of hand we can note for the sportsmen of some kinds of sports there is the same trend. So, boat racing sportsmen (with successes determined by aerobic workability) have mainly loop type ridges on hands. Track and field sprinters (speed-power kinds of sports) have more often scroll type ridges [7]. From this we can make the conclusion that loop and scroll ridges on big toe can be informative in sportsmen’s orientation concerning doing certain kind of sports.

The quantitative indicators of different specialties sportsmen’s dermatoglyphical deltas and ridges in comparison with the members of general population are given in table 2.

Table 2

Quantitative indicators ( $\bar{X} \pm m$ ) of dermatoglyphical deltas and ridges on big toes of general population's members and different specialties sportsmen

Groups of the tested	Right foot	Left foot	Two feet in total
Deltas			
General population	0,96 ± 0,03	0,98 ± 0,03	1,94 ± 0,04
Sportsmen			
SP	1,09 ± 0,06	1,06 ± 0,04	2,15 ± 0,09
AnAe	0,86 ± 0,07	1,05 ± 0,10	1,90 ± 0,14
Ae	1,00 ± 0,01	1,08 ± 0,08	2,08 ± 0,08
Ridges			
General population	13,00 ± 0,54	12,61 ± 0,523	25,60 ± 0,988
Sportsmen			
SP	14,00 ± 1,09	15,00 ± 1,36	29,00 ± 2,20
AnAe	13,29 ± 1,60	15,81 ± 2,28	29,10 ± 3,06
Ae	14,58 ± 1,22	15,42 ± 2,08	30,00 ± 2,80

The trend is as follows:

1) by the indicators of dermatoglyphical deltas no substantial distinctions between different specialties' sportsmen and population data are observed;

2) for sportsmen of different specialties greater quantity of dermatoglyphical ridges was determined in comparison with population data. Especially substantially it is noted for left foot. However, by ridges total data of big toes substantial distinctions between sportsmen of different specialties were not observed.

Dermatoglyphics of foot sole. The distinctions of dermal ridges on feet soles of general population members and sportsmen of different specialties were not substantial (see table 3).

Table 3

Quantitative indicators ( $\bar{X} \pm m$ ) of foot sole dermatoglyphics of general population members and sportsmen of different specialties

Groups of the tested	Right foot	Left foot	Two feet in total
General population	1,88 ± 0,64	1,72 ± 0,06	3,60 ± 0,11
Sportsmen			
SP	1,64 ± 0,78	1,48 ± 0,75	3,12 ± 1,43
AnAe	1,38 ± 0,59	1,57 ± 0,74	2,95 ± 1,28
Ae	1,67 ± 0,96	1,75 ± 0,73	3,42 ± 1,58

There are no substantial distinctions of dermatoglyphical deltas between the sportsmen of different specializations and the members of general population (see table 4). Concerning dermal ridges on both feet, the indicators of speed-power kinds of sports differ a little (they are less) from indicators with anaerobic-aerobic and aerobic energy supply mechanisms and from the indicators of general population's members.

Table 4

Quantitative indicators ( $\bar{X} \pm m$ ) of foot sole dermal deltas and ridges of general population members and sportsmen of different specializations

Groups of the tested	Right foot	Left foot	Two feet in total
Deltas			
General population	2,11 ± 0,09	1,94 ± 0,09	4,05 ± 0,16
Sportsmen			
SP	1,79 ± 0,21	1,58 ± 0,14	3,36 ± 0,27
AnAe	1,62 ± 0,92	1,81 ± 0,12	3,43 ± 0,91
Ae	1,83 ± 0,43	1,96 ± 0,16	3,79 ± 0,41
Ridges			
General population	44,40 ± 0,94	40,61 ± 1,93	85,01 ± 3,57
Sportsmen			
SP	35,64 ± 1,43	33,97 ± 1,91	69,61 ± 3,63
AnAe	41,24 ± 1,24	41,71 ± 1,54	82,95 ± 2,51
Ae	40,50 ± 1,60	42,08 ± 1,06	82,58 ± 2,96

Distribution of dermatoglyphical phenotypes on both feet of general population members and sportsmen of different specializations are presented in table 5. If to compare the dermatoglyphics of different specializations' sportsmen, it should be noted that the most simple types belong to the sportsmen, having domination of aerobic energy supply mechanisms (LW=20,8%; WL=0%; L=25,0%). That means that the sportsmen of this group nearly have no phenotypes with scroll (W) type of ridges. But in comparison with other two groups and the members of population's members they have two times greater quantity of arc type (L) ridges. The representatives of speed-power and anaerobic-aerobic kinds of sports more often have phenotypes with "W" dermatoglyphical picture (phenotypes WL and LW) in comparison with the sportsmen of aerobic kinds of sports and persons, not doing sports.

Table 5

*Distribution of feet soles' dermatoglyphical phenotypes, belonging to the members of general population (GP) and the sportsmen of different specializations.*

Tested groups	Feet dermatoglyphical phenotypes															
	ALW		LW		WL		SLSW		L		W		LA		AL	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
GP	0	0	165	39,5	13	3,1	47	11,2	47	11,2	37	8,9	58	13,9	51	12,2
Sportsmen																
SP	0	0	27	40,9	5	7,6	4	6,1	6	9,1	6	9,1	9	13,6	9	13,6
AnAe	0	0	13	31,0	8	19,0	4	9,5	3	7,1	4	9,5	7	16,7	3	7,1
Ae	0	0	10	20,8	0	0	6	12,5	12	25,0	3	6,3	9	18,8	8	16,7

The presented above gives the basis to affirm that dermatoglyphical signs of feet can be used in sport orientation of children and teenagers. As genetic markers, we may consider the following trend of feet dermatoglyphics' formation:

- Children with bent to kinds of sports with aerobic energy supply mechanisms, must have larger quantity of loop ridges (L) on big toes, than children and teenagers of general population and sportsmen, who are oriented to speed-power and anaerobic-aerobic kinds of sports. Children with bent to kinds of sports, requiring high levels of endurance, must have LW and L foot dermatoglyphical phenotypes;
- Children with bent to speed-power kinds of sports must have smaller ridges on both feet than the children, who have no bent to sports training and promising sportsmen of other specializations. They must have a little bit larger quantity of loop (L) and scroll (W) ridges on big toes in comparison with children of general population;
- Feet dermatoglyphics as a marker of children's bent to anaerobic-aerobic kinds of sports is less reliable for prognostication. For this purpose recommendations are the following. Children with bent to such work, as a rule, have less quantity of loop ridges (L) than children of general population and children with bent to speed-power and aerobic kinds of sports. By other foot dermatoglyphical quantitative indicators, children with bent to anaerobic-aerobic kinds of sports take intermediate place between typical dermatoglyphics of children with bent to speed-power kinds of sports and children with bent to aerobic kinds. So, the quantity of ridges can be the same as it is characteristic for promising children, having bent to aerobic kinds of sports, while foot phenotypes can be similar to children with bent to speed-power kinds of sports.

**Summary**

1. Dermatoglyphics of feet can be used as genetic markers for young sportsmen's orientation to training of different kinds of sports.

2. Prognostication of aerobic kinds of sports training for children with the help of feet dermatoglyphical signs is more reliable, while it is less reliable for prognostication of orientation to anaerobic-aerobic kinds of sports.

3. In our opinion dermatoglyphics of fingers and hands can be more reliable genetic marker than dermatoglyphics of big toes and feet.

4. Dermatoglyphics of feet shall be used in combination with other criteria, which can be recommended for genetic and pedagogical prognostication of children's bent to certain sports specialization.

*The further prospects* lie in research of efficiency of complex gifts to different kinds of sports.

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## STRUCTURE AND STATE OF THE UNIVERSITY OF PHYSICAL CULTURE STUDENTS' PROFESSIONAL-PEDAGOGICAL MOTIVATION

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**Annotation.** The state and dynamics of the university of physical culture students' motivation was determined. The complex of diagnostic methods was used to determine the level of professional-pedagogical motivation, which was directed on outlining motivation components and its development levels determination. The research involved 232 students. It was found that for the 1<sup>st</sup> year students the first place was obtained by the professional-cognitive interest, second by achievement motive and third by professional intention. For the 4<sup>th</sup> year students, the first place is possessed by professional cognitive interest, then followed by motives referred to professional and then – motives of achievement. The diagnostics have outlined absence of certain professional intentions. Also from first to fourth year of studies the tendency of increasing the amount of students interest of which is not connected either to physical culture, sports nor to pedagogical activity is followed.

**Key words:** students, professional, pedagogical, motivation, structure, dynamics.

### Introduction

The problem of professional-pedagogical motivation of future specialists has been remaining even to day, in spite of the fact that a lot of researches were devoted to its solution [2, 5, 6, 10, 11]. At the present stage young people's interest to higher education is of pragmatic character and cannot facilitate professional orientation of future specialists to full extent. Reduction of orientation to professional activity, pedagogical inclusive, is stated [1, 3, 4, 8, 9]. With this, analysis of theoretical sources showed that students' professional motivation problem in the system of physical culture educations, still is remaining insufficiently studied, due to its essential traits: its structure, evaluation criteria, peculiarities of motivation's formation in the process of professionally oriented disciplines' study have not been determined. [7]. That is why such research becomes especially urgent.

The work has been fulfilled as per subject 1.5 – “Methodological and normative-legal foundations of physical culture education's organization and peopleware in the sphere of physical culture and sports” of combined plan of scientific & research works in the sphere of physical culture and sports for 2011-2015.

### Purpose, tasks of the work, material and methods

*The purpose of the work:* research of professional motivation status of physical culture higher educational institutions' students.

*The methods of the research:* review and analysis of literature, questioning.

*Organization of the research.* 232 students of LSUPC took part in the research. The researches were being carried out during 2006-2011 with 1<sup>st</sup> year students (2006) and 4<sup>th</sup> year students (2011). The period of professional-pedagogical motivation's diagnostics permitted to observe the dynamics of its formation levels.

The basis for diagnostics of students' pedagogical motivation development levels was model of personality's features levels, which was characterized by complex structure of components and their indicators. The characteristics of levels reflect dynamic of this feature's development, i.e. the process enriching of future teacher-coach's personality with new values, motives and targets, appearance of interests, intentions, manners of behavior, which are adequate to training content in physical culture higher educational institute and future pedagogical activity. The levels characterize development level of every professional-pedagogical motivation's component of future pedagogue.

When choosing different diagnostics means we base on such methodological principles as personal-activity approach, system and conception.

The principle of personal-activity approach is based on studying of personality in the process of educational cognitive activity. And vice a versa, the specific of activity can be understood with reasoning of personality's creative potentials, which guarantee the success of such activity. The principle of system permits to study professional motivation components as an integral system. The principle of concept stipulates availability of output theoretical and empiric conceptions about essence of professional-pedagogical motivation.

The complex of diagnostic methodologies includes methodologies, which are directed to revelation of professional motivation components, methodology of its different levels' study, characteristics of both: as separate components of professional-pedagogical motivation' system and in the whole, and its influence on future teacher's personality (methodology of G. Kazantseva “Study of Attitude to Learning and Academic Subjects”, “The Map of Interests” by Ye. Rogov – questionnaire of awareness about future profession; “Value Orientations” by M. Rokich, “Morphological Test of Life Values” by V. Sopov; questionnaire “Motives of Profession Choice”, the method of unfinished sentences “ When I graduate from university...”; “Demand in Achievement” by Yu. Orlov; “Study of Teaching Activity's Motives” by O. Rean & Ya. Yakunin; “Orientation of Personality” by V. Smekala & M. Kuchera).

The choice of academic years, in which professional motivation was studied, was conditioned by the fact that at the first year of study, research of motives of entering higher educational institution and pedagogical profession's

priority are important, while at the fourth year of study student reconsiders himself as a subject of professional activity and due to this the problem of professional motivation again becomes acute. Besides, for bachelors the 4<sup>th</sup> year is a graduate period, in which all kinds of practices (pedagogical, coach, organizational) as well as the study of psychological-pedagogical disciplines' block complete, that, in its turn, affects on ideas about future profession.

### Results of the researches

The study of orientation levels of students' professional-pedagogical motivation was carried out by its following structural components:

- 1) professional-cognitive interest;
- 2) professional intentions;
- 3) motive of achievement.

We start the description of future physical culture pedagogues' professional motivation's diagnostics with methodologies, which are directed to studying of the first, marked by us, structural component of professional motivation: professional-cognitive interest. This component was studied by two criteria: professional and value orientations.

Professional orientation was researched with the help of such methodologies: "Study of Attitude to Learning and Academic Subjects", by G. Kazantseva (III chapter "Why do you study?", adapted to our researches; "The Map of Interests" by Ye. Rogov – questionnaire of awareness about future profession.

Value orientation was researched with the help of the following methodologies: "Value Orientations" by M. Rokich, (modified test) and "Morphological Test of Life Values" (MTLV) by V. Sopov.

Analysis of researches results concerning first component witness that in average 44.03% of first year students manifest rather wide interest for teaching's orientation but this interest is not connected with practical activity (see table 1). With this the highest percentage of this indicator was found by us at faculty "Health of a person" (48.38%). We explain this by the fact, that the majority of entering this faculty, are the leavers of nursing schools with already formed professional attitude to specialty. And with it, at the 4<sup>th</sup> year of study they manifest reduction of interest to profession from 44.03% to 10.20%.

Table 1

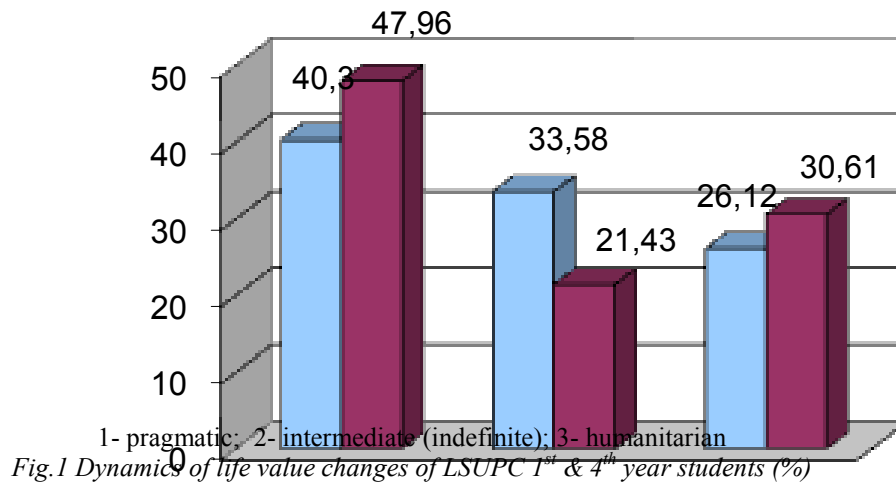
*Indicators change dynamics of the 1<sup>st</sup> and 4<sup>th</sup> year LSUPC students' professional orientation (%)*

Orientation	1 <sup>st</sup> year (n=134)	4 <sup>th</sup> year (n=98)
Attitude to teaching & orientation of training	44,03	10,20
Interest to other fields	16,42	28,57
Interest to pedagogical activity	19,40	29,59
Absence of steady interest to profession	20,15	31,63
Level of awareness about sports pedagogue profession	20,90	61,22

We explain such phenomenon by this fact that ideal notions of the 1<sup>st</sup> year students about profession were correlated by the fourth year students with actual status of sports pedagogue in society. Only 19.40% of the 1<sup>st</sup> year students and 29.59% of bachelors manifest interest to pedagogical activity. The fact, that up to the 4<sup>th</sup> year of study the quantity of students, who manifest interest to other fields of knowledge, increased cannot by cause worry. One third of the 4<sup>th</sup> year students has no steady interest to profession. And with it, the awareness level about future profession increased up to the 4<sup>th</sup> year from 20.90% to 61.22%.

"Morphological Test of Life Values" (MTLV) by V. Sopov permits to diagnose two groups of values. The first group includes components of personality's humanitarian orientation (self-development, spiritual growth, creativity, active social contacts). The values of other group are of pragmatic orientation (prestige, material state, achievements, maintaining of own individuality).

The obtained, by this methodology, results permitted to determine three groups of students by the level of personality's value orientation's expressiveness: humanitarian, pragmatic and intermediate (indefinite) types.



The biggest quantity of students, both of 1<sup>st</sup> (40.30%) and 4<sup>th</sup> (47.96%) years of study manifest pragmatic type of values. The next by the quantity of 1<sup>st</sup> year students (33.58%) was intermediate type of orientation. At the 4<sup>th</sup> year this type of orientation was manifested by 21.43%. The least quantity of 1<sup>st</sup> year students (26.12%) manifested humanitarian type of orientation. At the 4<sup>th</sup> year, this type of orientation increased to 30.61%. In fig.1 the dynamics of life value changes of students from 1<sup>st</sup> to 4<sup>th</sup> year of study is presented, which witness, that the quantity of students with pragmatic type of orientation increased from 40.30% to 47.96%; the quantity of students with intermediate (indefinite) type reduced from 33.58% to 21.43%, humanitarian type increased from 26.12% to 30.61%, and it, in our opinion, witnesses about certain increase of awareness level and integration of different professional motives' forms in the process of education.

For more profound and exact application of value orientation we used methodology "Value orientation" by M. Rokich. Pedagogical profession as a life value of the first priority, was entered by us into list of terminal values, and pedagogical activity - into the list instrumental values. Analysis of the methodology's results permitted to estimate the values hierarchy of students of different years of study (table 2).

Table 2

Hierarchy of life values of LSUPC students

Value orientations	I year			IV year		
	Quantity of students	Percentage from total q-ty	Rank	Quantity of students	Percentage from total q-ty	Rank
Priority of the chosen profession	32	23,90	1	30	30,61	1
Other priorities	27	20,15	2	3	3,12	6
Family as a life value	25	18,65	3	20	20,40	3
Education as a life value	22	16,42	4	22	22,44	2
Physical and spiritual improvement	18	13,43	5	14	14,28	4
Priority of creative activity	10	7,46	6	9	9,18	5

Percentage correlation of the first year students' and bachelors' priorities distributed in the following way: 23.90% of 1<sup>st</sup> year students and 30.61% of 4<sup>th</sup> year students regard pedagogical profession as main life value; the second place (20.15% - 1<sup>st</sup> year students) was taken by other priorities, in opposite to this 4<sup>th</sup> year students (22.41%) regard education as a life value. Family as a life value is regarded only by 18.65% of 1<sup>st</sup> year students and by 20.40% of bachelors; only 7.46% of 1<sup>st</sup> year students and 9.18% of 4<sup>th</sup> year students consider creative activity the most important. And with it, the quantity of students with other priorities reduced from 20.15% to 3.12% up to the 4<sup>th</sup> year.

The level of professional cognitive interest formation of the 4<sup>th</sup> year students proves our assumption that the content of professional disciplines ensures more attentive attitude to pedagogical activity. Though, alongside with it, the quantity of students, whose interests are not connected with the future profession, increases up to the 4<sup>th</sup> year. The fields of knowledge, which attract interest of students, become more pragmatic, with it, the largest quantity of "pragmatics" (50.20%) was found at faculty of sports. May be, it is connected with the work, in which students are engaged in

parallel to studying at university (in spheres of selling and service, security agencies, model business, fitness clubs). Some of students receive other higher education, studying, in parallel, in other higher educational institutions.

Generalizing the results of research of students' professional-cognitive interest, we singled out its initial, middle and high levels (table 3).

Table 3

*Levels of professional-cognitive interest formation of LSUPC students (quantity of students, %)*

Levels	I year (n=134)	IV year (n=98)
Initial	20,15	31,63
Middle	60,45	38,78
High	19,40	29,59

Dynamics of changes of professional-cognitive interest formation from 1<sup>st</sup> to 4<sup>th</sup> year of study witness that the quantity of students with initial level of professional cognitive interest formation increased by 11.48% at the 4<sup>th</sup> year; the quantity of students with the middle level reduced by 21.67%; the quantity of students with high level increased by 10.119%.

Monitoring of students' progress showed that among the expelled students 89.70% belonged to initial level of professional-cognitive interest formation and only 7.20% belonged to group with high level.

Study of the next, marked by us component of professional motivation, namely professional intentions, was carried out with the help of questionnaire "Motives of profession's choice" and method of unfinished sentence, "When I graduate from university...".

Distribution of students' answers concerning the motives of profession's choice are given in table 4.

Table 4

*Dynamics of students' judgments concerning the motives of profession's choice  
(n=232)*

Nos.	Motives	I year (n=134)			IV year (n=98)		
		Quantity of students	Percentage of total quantity	Rank	Quantity of students	Percentage of total quantity	Rank
1	Receive higher education	34	25,37	1	24	24,48	2
2	Like profession	29	21,64	2	12	12,24	4
3	Desire to be good specialist	21	15,67	3	30	30,61	1
4	Desire to be cultural, educated person	18	13,43	4	13	13,26	3
5	Work with people attracts	14	10,45	5	9	9,18	5
6	Family traditions	8	5,97	6	4	4,08	7
7	State higher educational institute	5	3,73	7	2	2,04	8
8	Other reasons	5	3,73	7	6	6,12	6

The greatest quantity of respondents marked "desire to receive higher education" (25.37%). This motive takes the first rank place. About on fourth of students (21.64%) entered university due to the love to profession. Only 15.67% want to be good specialists, 13.45% - wish to be cultural, educated person, 10.45% are attracted by the work with people.

From the 1<sup>st</sup> to 4<sup>th</sup> years no essential changes were noted, though the rating and desire to be good specialist increased (from 3<sup>rd</sup> place to the 1<sup>st</sup>). Rating of "receive higher education" did not change (1<sup>st</sup> place changed to 2<sup>nd</sup>) and "receive to be cultural, educated person" (4<sup>th</sup> place changed to 3<sup>rd</sup>). The status of motive "Like profession" reduced (from 2<sup>nd</sup> to 4<sup>th</sup> place).

The fact, that significance of profession of pedagogue is understood relatively by low quantity of respondents is a demonstrative one. It reflects the situation in our society. With it, low level of pedagogical activity's evaluation in modern education system directly or indirectly is connected with low status of profession of sports pedagogue.

Indicators of students' professional intentions projecting became an important supplement to the obtained data. For their determination a certain scale was offered. It consisted of six following statements: "I shall obligatory work by specialty"; "most likely"; "may be"; "I have not decided yet"; "I should not like". Diagnostics showed that 84.33% of 1<sup>st</sup> year and 60.20% of 4<sup>th</sup> year students have no clear professional intentions. There was stated a trend of increasing students' quantity with negative professional motivation; at the first year of study 9.70% of the questioned students do not want to work by specialty and at the fourth year – 16.32%. Clear professional intentions to work by specialty were shown by 8.96% of the 1<sup>st</sup> year students. The quantity off the 4<sup>th</sup> year students with such intentions increased to 25.51%.

Application of methodology of unfinished sentences permitted to clear up the found trends. For most of 1<sup>st</sup> year students, continuation of sentence “When I graduate from university...” was characterized by the absence of prospects of education results’ realization in their lives (83.58%). The most typical answers were planning of personal life (“to marry, to have good family, children”) and “good work” without detailing in which field they want to use their education.

In continuation of sentence “When I graduate from university...” approximately equal quantity of 4<sup>th</sup> year students used variant “I shall work at school” (22.54%) and “I shall be good specialist” (25.48%). The rest of students, after graduation of higher educational institute, see prospects in family life (23.52%), earning money, gaining new social status and so on.

Diagnostics data of professional intentions permitted to established dynamics of development levels of this component, showed by future teachers (table 5).

Table 5

*Levels of LSUPC students’ professional intentions’ formation (quantity of students, %)*

Levels	Years of study	
	I year (n=134)	IV year (n=98)
Initial	7,46	14,28
Middle	84,33	62,24
High	8,21	23,48

Study of achievement motive as a component of future physical culture pedagogue’s professional motivation was conducted with the help of Yu.M. Orlov’s methodology “Demand in achievement”. In this test demand is regarded as a feature of personality. As a result of the conducted methodology we obtained the following results: low level of demand in achievement was shown by 46.21% of the 1<sup>st</sup> year students, for the 4<sup>th</sup> year students this figure was 37.76%. Average level of development was manifested by 43.18% of the 1<sup>st</sup> year students and by 42.86% by the 4<sup>th</sup> year students. High level of demand in achievement was manifested by 10.61% of the 1<sup>st</sup> year and by 19.38% of the 4<sup>th</sup> year students (table 6).

Table 6

*Dynamics of achievement motive development of LSUPC students (quantity of students, %)*

Levels	Years of study	
	I year (n=134)	IV year (n=98)
Initial	46,21	37,76
Middle	43,18	42,86
High	10,61	19,38

The research data show that the quantity of students with low level of achievement motive’s development a little reduced from the 1<sup>st</sup> to the 4<sup>th</sup> year of study, but not significantly; indicators of middle level remained nearly unchanged, while the quantity of students, who are able to be persistent in reaching of their aims to finds new methods of work and are not able to work bad increased by 8.77% but in the whole does not exceed even 20% from total quantity of respondents.

In order to reveal the level of professional motivation in general, we studied the level of its structure development as a system. As indicators we regarded the presence or absence of structural components, the level of their development and hierarchic subordination. To reach this target we used modified for our research methodology “Study of motive of students’ educational activity” by O.O. Rean and V.A. Yakunin. The study of dynamics of motivation processes, which were regarded by us also in order to characterize professional motivation in general, we carried out with the help of scale “Orientation to task” from methodology “orientation of personality” by V. Smekala and M.Kuchera, where firmness, strength, depth and breadth of motivation processes were the indicators.

For adaptation of methodology “Study of motive of students’ educational activity” by O.O. Rean and V.A. Yakunin to our work we partially replaced the proposed by authors motives with those, which relate to the marked by us main structural components of professional motivation. The list of teaching activity motives included the motives, which characterize professional-cognitive interest: “to receive profound and sound knowledge”, “any knowledge will be required in pedagogical profession”, “to give answers to specific professional questions”; the motives, which characterize professional intentions: “to become highly qualified specialist in physical culture and sports field”, “to receive diploma of teacher coach”, “because my future depends on the progress in studying”; the motives, which characterize motive of achievement: “to successfully continue studying”, “to ensure successfulness of future professional activity”, “to win approval of parents and other people around me”. Then, the students were proposed to evaluate motives by 7-point scale, depending on their significance. Then, we determined the frequency of one or another motive’s choice, calculated arithmetic mean for each motive and their total.

For the first year students the greatest sum of arithmetic means was obtained by motives, which related to professional-cognitive interest (42.35), the second place was taken by motive of achievement (40.10) and professional intentions (39.55). For the fourth year students, the highest total of arithmetic means (59.5) was taken by motives,

which characterize professional-cognitive interest, the least value had motives, which related to professional intentions (45.2) and motives of achievement (41.5).

The study of dynamic properties of future physical culture pedagogues' professional motivation as per scale "orientation to task" of V. Smekala & M. Kuchera methodology permitted to state, that 11.36% of first year students and 16.33% of fourth year students have initial level of orientation to task. These students are characterized by adhesion with items: "students give the lowest mark to teachers who present the subject, taught by them, as not arousing his interest" or "in the process of studying I like most of all, when I make a push at classes".

48.48% of first year and 51.02% of the fourth year students showed middle level of orientation to task. For representatives of this level, we noted distinction between students of different years of study in the character of adhesion with sentences. For example, the first year students agree more often with sentences: "for me, the most important is to know, how to achieve target" and "I study better if teacher stimulates me for more intensive work".

High level of orientation to task was manifested by 40.16% of the first year and 32.65% of the fourth year students. For the representatives of this level adhesion with most of the test's items is characteristic. Observations, which conducted during classes, permitted for us to specify dynamic properties of professional motivation of different levels' students. As indicators we regarded:

- frequency of appearance of professional motives;
- duration of action;
- dependence on the character of situation;
- steadiness and strength of professional motives;
- attempts to solve pedagogical situations;
- activity in preparation of problematic tasks.

The summarized results of dynamic characteristics' development of future teachers-coaches' professional motivation are given in table 7.

Table 7

*Changes of dynamic characteristics ' development of LSUPC students' professional motivation (%)*

Levels	Years of study	
	I kypc (n=134)	IV kypc (n=98)
Initial	11,36	16,34
Middle	48,48	51,02
High	40,16	32,65

In general, the carried out diagnostics of professional motivation levels' formation permitted to identify the groups of students, which differ by its character. The examples of monographic characteristics of students with different professional motivation's formation levels have been provided.

#### Summary

Thus, as a result of our durable researches with application of the complex of diagnostic methodologies, we obtained data about state and dynamics of students' professional motivation. Among first year students we found wide cognitive interest to training and professionally oriented subjects. It has been stated that the profession of a teacher-coach is not of the first priority as a life value for majority of students. By the fourth year of study the quantity of students, having interest alien to either physical culture & sports or to pedagogical activity has been increasing.

Diagnostics showed that majority of students have no definite professional intentions, with it, we stated the trend of increasing of students', having negative professional intentions, in the period from the 1<sup>st</sup> and up to the 4<sup>th</sup> year of study.

In the structure of the first year students' motivation the first place is taken by professional-cognitive interest, the second – motive of achievement, the third – professional motives; lower motives, relating to professional intentions are located, followed by motives of achievements.

Dynamic characteristics of the first year students' professional motivation advantageously differ from dynamic characteristics of the fourth year students' professional motivation, with it, there is less quantity of fourth year students with high level of dynamic characteristics' development and greater quantity with its initial level.

*The prospects of future researches* lie in studying of other problems, connected with motivation of students.

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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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## COMPARISON OF ECONOMIC ACTIVITY LEADING U.S. SPORTS LEAGUES

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**Annotation.** The main activities of the leading sports leagues were described. Sources of revenue and expenditure were identified. The economic performance of professional sports leagues of the United States of America was compared. In the course of the study of economic efficiency of the leading American sports leagues are defined payroll (expense commands on the salaries of players for each team, the total payroll in the League and the average payroll, respectively, for each of the American League. The largest estimates on wages, both in the League and in teams – in the National football League, the largest player's contract – in the Highest League baseball, the minimum wage in the National hockey League; the highest average wages, a greater percentage of athletes with a salary of more than 1 million. \$ (82,85 %) in the National basketball Association were showed. This difference in the maximum income of the League and of average wages is due to several factors: the number of players in the team, the number of games in a season, and expenses on carrying out of competition and training activities.

**Key words:** professional, sport, national, league, business.

### Introduction

For the last years sports have become an important branch of economy of many countries, including the USA. It involves significant amount of finances and a lot of labor force. New models of sports' managing and financing are constantly developing and improving [1]. The trend to commercialization and professionalization, acute competition witness that sports shall independently gain profit from resources available at its disposal. [7].

As V.M. Platonov, S.I. Guskov, M.M. Linets, B.M. Yushko affirm for long time sports and economics have been regarded, even in the West, as two different branches. It was considered that sports is only hobby, amusement and has nothing common with economics, profession, trade. In our time everything has radically changed: in modern professional sports great money is earned in conditions of severe competition [3, 4].

Due to these processes it is clear that sports require not only professional sportsman and coaches, but also professional economists, managers, administrators, lawyers, sociologists. Sports require people, who have substantial knowledge of finances, management, marketing and are the experts in sports produces, organization, culture of sports [9].

R. Berry, G. Wong, G. Sade affirm that, as far as sports in many of its manifestations is classified quite clearly form economical and management side, then a lot from economical and management theories is purposeful to use in sports. That is why, it is reasonable to interpret economics of sports as a science, which studies economical, psychological, legal and sociological aspects of sports [8, 10].

Sports economics undoubtedly still has many unsolved problems, among which there are the problems of sports management, labor market, sports sponsoring, etc. Though, the process of its development progresses rather quickly [5].

One cannot but agree with specialists in the field of sports, that for the development of professional sports in Ukraine, it is necessary to have certain experience of leading sports leagues and associations. In the opinion of economists of the whole world American sports in general and National association of basketball in particular are the standard of sports business for the whole world. It is one of the most profitable and perspective sports leagues [2]. Economical activity of this sports organization points at constant increase of money turnover around this league. Just due to this fact, for development of professional sports in our country it is useful to study the efficiency of economical activity of leading American sports leagues and it proves the urgency of our research.

This scientific work has been fulfilled as per the plan of scientific & research works of Olympic and professional sports department of KSU, subject 1.1.4. "Historical and organization directions of professional sports' development in Ukraine". "State registration No. 0106U010760".

### Purpose, tasks of the work, material and methods

*The purpose of the research:* study and comparison of economical activity of different leading American sports leagues.

*The methods of the research:* a lot of special scientific and scientific-methodological literature has been analyzed as well as many electronic sites of leading teams and leagues of United States.

*The tasks of the works:*

- 1.To determine main directions of economical activity of leading sports leagues of the USA (National basketball association, National hockey league, National football league, Higher basketball league);
- 2.Compare the leading American sports leagues' economical indicators;
- 3.To prove experimentally the efficiency of NBA economical activity, comparing it with other spots leagues off United States.

Experimental part of the work has been executed as an analytical analysis of the obtained information with determination of peculiarities and efficiency of National basketball association activity's efficiency.

**Results of the research**

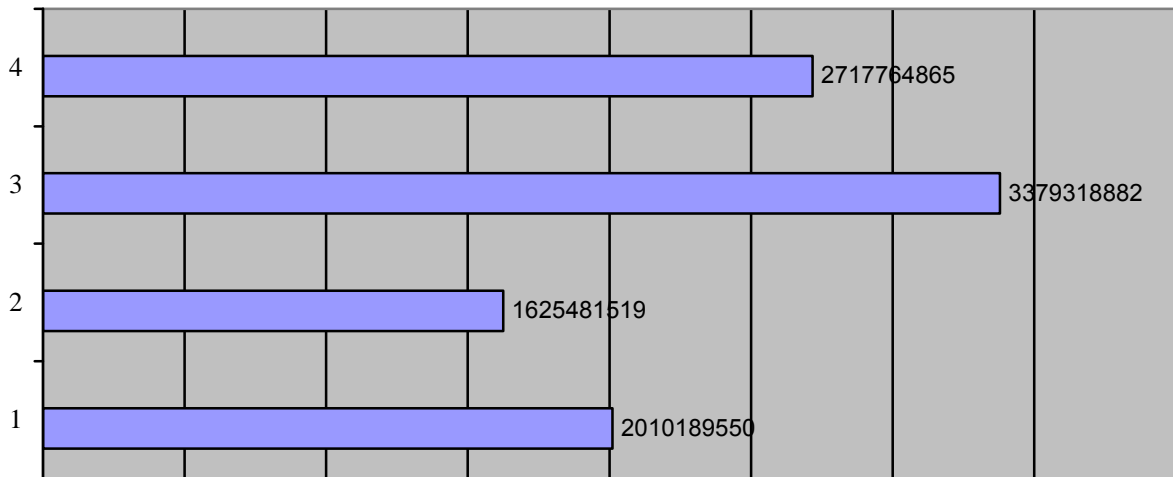
For determination of economical activity's efficiency of National basketball league in relation to other professional leagues, we compared its profits with the profits of National hockey league, National football league and Higher baseball league.

During researching of the enumerated above leagues' activity with the help of mass-media and internet resources we analyzed: payroll for every team, total payroll in a league and average payroll for every leading American league.

Due to analysis of the research's results it was established that High baseball league is a league of contrasts. Maximal quantity of payroll money is 6 time higher than minimal. So, the richest club "New York Yankees" affords to spend 206.333.389 \$, and the least payroll of "Pittsburgh Pirates" is only 34.943.000 \$. Total sum of expenses for players by league's contracts is 2.717.764.865 \$, while average payroll of one team is 90.592.162 \$. Average profit of one conducted match is not very high in comparison with other professional sports leagues (20.237 \$), however, gaining of substantial profit is possible due to the fact that during season, baseball leagues have by two times more games than in basket ball or hockey.

After studying of economical activity's efficiency in different sports leagues, we compared the obtained results. From main criteria of comparison we selected the most informative: general fund of salary, average payroll of a team, minimal and maximal salaries, average salary of a player, average profit for a match. The results of salary general funds' comparing in NBA, NHL, NFL, MBL are presented in figure 1.

Comparative analysis of teams' expenses for players' salary proved that this indicator is the highest in National football league (3.379.318.882 \$) and the least is in National hockey league (1.625.461.519 \$). The indicators of other leagues are within the limits 2.0 to 2.7 million \$.



1 – NBA; 2 – NHL; 3 – NFL 4 – MLB.

*Fig.1. Average payroll indicators in American leagues*

Such distinctions are explained by the following factors: quantity and comfort of seats on arena, popularity of the kind of sports, and attendance of competition, quantity of matches in competition and ticket prices. Average payroll indicators for every team are distributed in correspondence with the date of players' average salary funds.

The greatest salary expenses are born by heads and presidents of clubs in NFL (105.603.715 \$), these indicators are less a little in main baseball league (90.592.162\$) and in the teams of National basketball association (67.006.318 \$; National hockey league is the lowest.

From the given comparison it is clear that the greatest profits are gained by those kinds of sports which have arenas of big capacity and which are popular in the USA.

The further step in our research was determination and comparison of maximal and minimal salaries in American professional leagues.

After analyzing indicators of maximal contracts in American sports it was established, that, in spite of the fact that maximal amount of money is assigned in NFL, the greatest salary is earned by base baler Alex Rodriguez 33.000.000 \$.

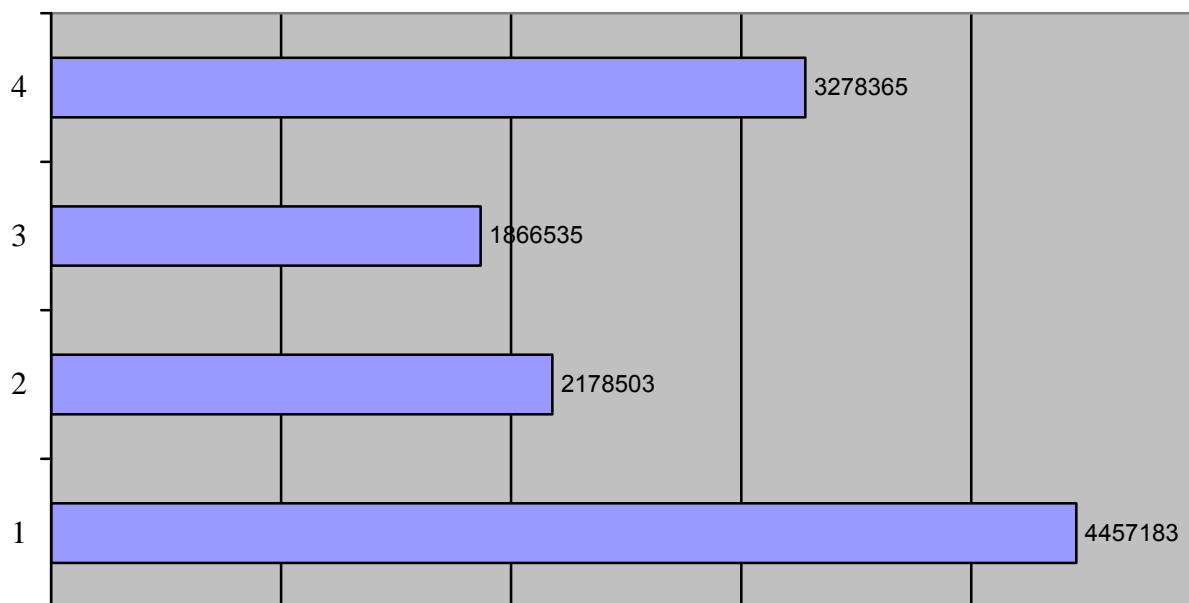
American footballers and basketball players have practically equal maximal fees (Philip Rivers – 25.556.630 \$ and Kobe Bryant – 24.806.250 \$ correspondingly), while maximal contract of hockey players is only 10.000.000 \$.

Absolutely other situation appears when comparing the levels of minimal salaries in sports leagues of the USA. So, in NHL, the salary of hockey player shall be not less than 500.000 \$, in NBA – not less than 473.000 \$ and the lowest level of minimal salary is characteristic just for NFL (310.000 \$).

The obtained results underline that, with maximal salary budget, sportsmen cannot always expect maximal income, and player-beginner earns salary which is practically two times less than a sportsman from other league.

However, in our opinion, for more objective analysis of the conducted comparison we determined average salary of every league (see fig.2).

In opposite to other comparisons the highest indicators of average salary are observed in National basketball association: 4.457.183 \$, and the lowest belong to American footballers (1.866.535 \$). Average salaries in baseball and hockey are 3.278.365 \$ and 2.178.903 \$ correspondingly.



1 – NBA; 2 – NHL; 3 – NFL 4 – MLB.

*Fig.2. Average salary indicators in leagues*

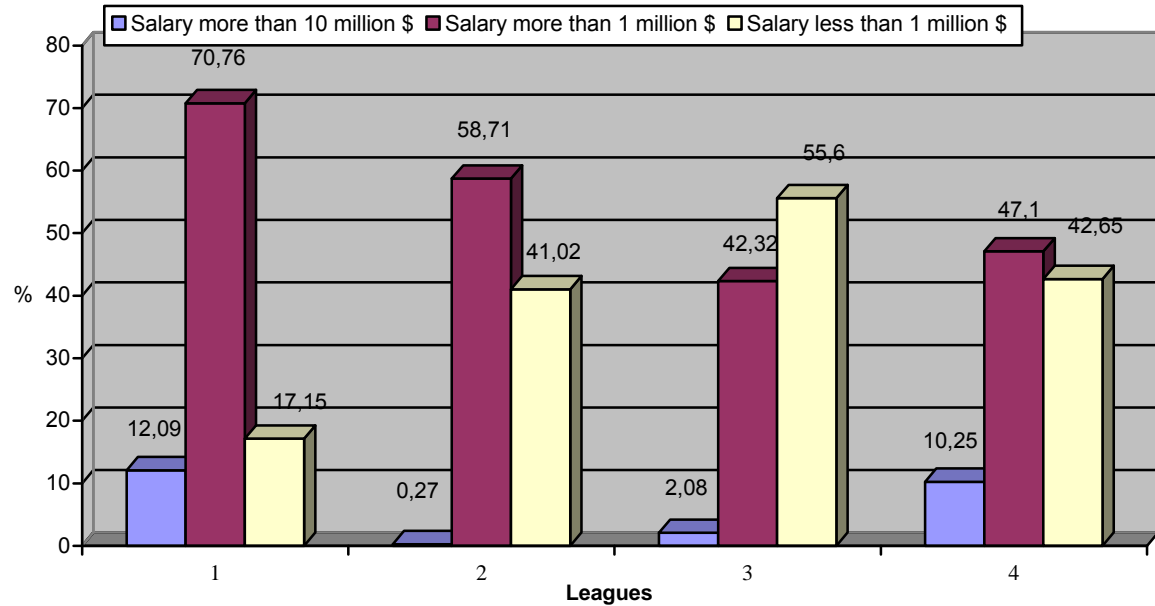
The obtained in the course of the research results show that in spite of high income of league and maximal payroll, average income of players and, correspondingly, the level of economical efficiency can be rather low. So, in National basketball association practically all indicators by every enumerated aspect were not maximal, though the level of income is the highest in this league. Besides, a little bit higher indicators of minimal players' salary show that players' income is maximally high and, consequently, league's activity is economically efficient [6].

The final stage of our research was percentage co-relating of salaries' quantity: more than 10 million \$, more than 1 million \$ and less than 1 million \$ in every sports league of United States (see fig.3).

Analysis of the obtained data helped to establish that the percentage of sportsmen, who earn by contract more than 10 million \$ is 12.09% in NBA, 10.25% in MLB, 2.08% in NFL, 0.27% in NHL.

Average salary from 10 million \$ to 1 million \$ is rather often observed in professional leagues, though in NBA every 7<sup>th</sup> player has such salary (70.76%), in NHL – every 6<sup>th</sup> (58.71%), in MLB – every 5<sup>th</sup> (47.1%) and at last in NFL – every 4<sup>th</sup> (42.32 %) with the greatest payroll in American sports leagues. In compliance with the said above the greatest quantity of sportsmen with salary less than 1 million \$ is observed just in NFL – 55.6% and the least – in NBA – 17.15%.

Summarizing the results, which were obtained in comparing of economical activity's efficiency, we determined that the highest salary budgets, both in league and in teams, is in National football league, the greatest player's contract is in High baseball league, the highest minimal salary is in National hockey league and the highest average salary, the highest percentage of sportsmen with salary more than 1 million \$ (82.85%) – in National basketball association.



1 – NBA; 2 – NHL; 3 – NFL 4 – MLB.

Fig.3. Comparing of salary's level in different sports leagues

#### Summary

Analysis of economical activity's comparing of leading professional sports leagues proved that:

- 1 the greatest salary budgets in league and teams are in National football league;
- 2 the greatest player's contract is in High baseball league, the most minimal salary is in National hockey league;
- 3 the greatest average salary, the highest percentage of sportsmen with salary more than 1 million \$ (82.85%) is in National basketball association.

Such discrepancy in maximal incomes of a league and average salaries is conditioned by a number of factors: the quantity of players in a team, the quantity of games in a season and by expenses for competition activity and trainings.

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## THE STUDY OF SELF-CONCEPT BETWEEN VOLUNTEER AND NON-VOLUNTEER STUDENTS IN SPORT OF UNIVERSITIES

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**Annotation.** Understanding personality characteristics of volunteers are important for their recruitment and retention in sport associations. This study compared self-concept as a personality characteristic between volunteer and non-volunteer students in sport associations. The method of this research was survey and descriptive. The statistical population consisted of volunteer and non-volunteer students in sport associations of Iran universities. Two hundred and fifty two students (120 volunteers and 132 non-volunteers) from 10 universities were selected as subjects by using random clustered sampling method. Pyryt and Mandaglio Self Perceived Survey (PMSPS) was used to collect the data. The content and face reliability of questionnaire was checked and confirmed. Cronbach's alpha coefficient was used to test the reliability of the questionnaire ( $\alpha=0.90$ ). Independent t test and U Mann-Whitney test were used for comparison of the factors between volunteers and non-volunteers. Findings of this study indicated that there was a significant difference between volunteer and non-volunteer students in social and athletic self-concept. The mean of scientific and value factors were higher in volunteers than non-volunteers, however, they were not statistically significant. We concluded that the nature of sport (active) and sport volunteering (social) encourage students who have higher self-concept for volunteering. Moreover, the characteristics of sport associations can increase self-concept in sport volunteers.

**Key words:** sport volunteer, student, self concept.

### Introduction

Voluntary organization were introduced as "third sector organization" that have flexibility, efficiency and high productivity and are the most complex sector of organization (1). Volunteer forces have important role in society and sport organizations beside staffs and customers in an organization; Hence Molliner states "success of each social organization depends on staffs and volunteers who are basis of executive in organization" (2). Volunteer forces have many economical and non-economic advantages for society and their organization. Since volunteers have no financial dependence to organization, they work more truthfully (1). According to statics of 2001-2003, in six countries (Japan, Australia, Canada, England, Germany and American), percentage of adults who participate regularly in voluntary activities is between 25-48 percentages of whole population of these countries (3). The developed countries emphasize on their human resources, because human resources use material resources and change it to wealthy and organization's production (4). Since volunteers constitute one of human forces in organization, managers of these forces can economize in organization's financial resources and also can use these individuals' experience and truthful services (1). Australian Bureau statistic (2004) pointed to differences in services limitation, to be informal and work without expectation in definition of volunteering and 5 traits of volunteering are 1) to be non-profit, 2) work for profits of association, 3) selected work, 4) work without salary, 5) defined works. These traits of volunteers caused to recruit them in many organizations until managers use their positive traits (5). Since individuals become volunteer with different personality traits, organizations should consider to these traits and use them proportional with traits. This matter is caused that volunteers' needs and desires are satisfied and they continue to their tasks in organization. Bussel and Forbes state "key of organization success is recognition about target group for recruitment and volunteers' instruction and effort for satisfying of their needs and desires" (2).

A person may service voluntarily for sensitiveness relative to obligation of attendance in voluntary activities, feeling of social responsibility or philanthropy. However evidences indicate that individuals volunteer for achieving experimental, mental and social benefits (6, 7, 8).

There is no agreement about relationship between individuals' personality and volunteering, whereas; it is possible that would be interpreted correlation between personality and volunteering to two types: a) personality may be resulted to be volunteer, b) volunteering may be caused formation of personality (9).

Personality traits in an individual are constant cases from individuals' traits. For example; researches have shown that individuals who are more extrovert, they become more volunteer (9) because extrovert individuals have more desire for joining to organizations and this matter provides special opportunity for being volunteer (10,11). These individuals are very clever and this characteristic is necessary for continuing activities which improve skills and increase knowledge such as voluntary activities (9).

In Finkelstein research (2009) has been indicated that internal motives are related to self-concept, prosocial personality, and volunteer's motive power and time which volunteer positively spend for voluntary activities (11).

Self-concept is an organized scientific structure that consists of adjectives, assessments, meaningful and periodical memory about self and controls process of information relate to self (12). In Schlosser's idea (2009),

leadership volunteers are different from other volunteers about quality of perceiving roles and their abilities and creating change in these roles. This interpretation can be ascribed to self-concept theory, because basis of each individual's self-concept depends on several factors: the fact that how employees observe themselves, how they react to experiences and how experiences make their motivations (13).

Atkins & et al (2005) concluded that the individuals who had more flexible personality traits, probability of being volunteer was more in adulthood and membership in social organization will be adjustable of volunteers' personality traits in adulthood (2). Allen and Rushten (1983) considered studies before decade of 1980 and they found that volunteers were more emotional than non-volunteers. The studies after 1980 indicated that empathy traits with others, truthful and altruistic increase desire to volunteering (14). Tapp and Spinier (1973) compared 26 telephonic advisors and volunteer students with 34 non-volunteer students with using Tennessee's self-concept questionnaire and personality traits. The research results indicated that volunteers were more realistic and free than non-volunteers and had more altruistically motives during work and they tried in encountering with customers a lot (15).

Wallach (2007) compared self-concept dimensions in volunteers and non-volunteers with method of pretest-posttest. Each two groups educated in psychological faculty. The results indicated that there is no significant difference between volunteers and non-volunteers except in dimension of agreeableness ability that agreeableness ability was more in non-volunteers. The researcher has stated "the reason of this matter can be limitation of statistical population and uniformity of two groups of testers" (14).

King et al (1970) who study on volunteers in a mental hospital found these individuals didn't indicate significant change in rate of their ethic endurance in comparison with before working in hospital; but this experience was resulted to achieve more concession in acceptance of self (16).

As background of research indicate there is no agreement about volunteers' personality traits and majority of these studies have been done in non-sport organizations. Since this research will compare one factor of sport volunteers' and non volunteers' personality traits (self-concept).

### Methodology

#### a) Research Performance Method

Research statistical populations are member and non-member students in universities' athletic associations and public superior educational institutes in whole country in volunteers and non-volunteers sector respectively. Two hundred and fifty two students (120 volunteers and 132 non-volunteers) were selected from ten universities which their athletic associations were active as subjects by using random clustered sampling method. Pryt and Mandaglio Self Perceived Survey (PMSPS) were used to collect data. Questionnaire consists of 24 questions which measures different self-concept dimensions (scientific, social, athletic, value). Every question has 4 option (from completely disagree to completely agree) which belongs to it score from 1 to 4.

This questionnaire has been compiled in basis on three portions of reflected appraisals, social comparison and attribution (17, 18) . For considering reliability of questionnaire questions was used Cronbach's alpha coefficient ( $\alpha=0.90$ ). At last, questionnaire was distributed in two sections of demography information and main sector of self-concept questionnaire questions among research samples.

#### b) Statistical Methods

Research method is descriptive and survey. For evaluation of demography features and also considering scores in self-concept different cases has been used descriptive statistics (frequency, mean, standard deviation). For determining to be normal data was used Kolmogorov-Smirnov test. Scientific and value self-concept factors had normal distribution and was used independent t-test for comparison of these factors between volunteers and non-volunteers and social and athletic self-concept factors had no normal distribution and was used U-Mann Whitney for comparison of these two factors between two groups. Also, for priority of different self-concept factors was used Friedman test between volunteers and non-volunteers.

### Findings

From 120 volunteers who participated in present research, 68.4% female, 31.6% male, 82% single and 18% were married. 43.2% were active in voluntary activities out of university. More volunteer students (74.4%) were in age of 21-23. 76.8% of volunteers educated in sport science faculty and 88.4% in licentiate's degree. From 132 non-volunteers who participated in this research, 56.6% female and 43.4% male, 96% single and 4% were married. 30.3% were active in voluntarily activities out of university. More non-volunteer students (45%) were in age of 18-20. 32.8% of non-volunteers educated in human science faculty and 72.1% with licentiate degree.

In reflected appraisals portion which involve 16 questions, students are asked to rate how they perceive themselves compared to age peers for each of the four factors (e.g., I am smarter than other children my age)), social comparison which involve 4 questions (the students are asked to rate themselves as they believe each of the four significant other perceive them (e.g., I perceive that my mother thinks I am smart)) and attribution which involve 4 questions (students are asked to acknowledge demonstrations of competence in the four domains (e.g., I have accomplished a challenging academic task) (16, 18). Among self-concept questionnaire questions, in volunteers section, sentence of "my mother thinks, I am a good person" from reflected appraisal portion and value self-concept factor is higher than other cases with  $mean=3.33\pm 0.65$  and in non-volunteers portion same factor is higher than other cases with  $mean=3.37\pm 0.63$ .

The comparison of psychological traits in volunteers and non-volunteers in their demography indicated that there is no significant difference in self-concept among single and married people, male and female, students of

different grade and the people who work in public and private section, but there is significant difference between athletes and non-athletes' self-concept and also among students of different faculties and students of physical education faculty. Also, there is significant difference among self-concept in different ages and highest rate is among students in age of higher 26 years old.

Test results of research hypothesis indicated that there is significant difference among athletic and social self-concept and self-concept between volunteers and non-volunteers in level of  $\alpha < 0.01$ , but there is no significant difference among value and scientific self-concept in volunteers and non-volunteers students, but mean of these factors in volunteers was higher than non-volunteers. Friedman test indicated that there is significant difference among priority of self-concept dimensions in volunteers and non-volunteers and scientific self-concept in volunteers with mean=3.14±0.51 and scientific self-concept in non-volunteers with mean=3.04±0.43 was higher than other dimensions among their peers.

*Table 1: The rate of reliability in self-concept options*

Kind of self-concept	Questions related to it in questionnaire	Reliability
Scientific	1,7,12,16,17,21	0.756
Social	2,8,9,13,18,22	0.757
Athletic	3,5,10,14,19,23	0.881
value	4,6,11,15,20,24	0.73

*Table2: The comparison of scientific and athletic self-concept in volunteers and non-volunteers*

variable	Parameter	Mean difference	Sig	df	T
Scientific self-concept		0.77	0.3	170.56	1.042
Athletic self-concept		0.64	0.001	215	7.68

*Table3: The comparison of social and value self-concept in volunteers and non-volunteers*

variable	Parameter	sig	Z	U Mann Whitney	Wilcoxon
Social self-concept		0.002	-3.04	4403.5	11906.5
Value self-concept		0.7	-1.8	4973	12476

## Discussion

The analysis of findings indicate that there is significant difference between volunteers and non-volunteers' self-concept. According to self-concept definition, we can state that volunteers describe themselves higher than non-volunteers. Since sport which is one of the indicators of social activities and on the other hand athletic environment is an energetic and excited environment; therefore, athletic volunteers have higher self-concept. Also, volunteer students are more active rather than their peers and this case can be other reason for this difference.

According to this hypothesis that individuals' self-concept don't change unless they settle in new situation, therefore; difference in volunteers' self-concept can result from students' membership in athletic association. These findings are accordance with King et al (1970), Atkins et al (2005) and Cemalcilar (2009) results(2,3,16). These researches have mentioned the reason of being volunteer is high self-confidant and ability of social life in these individuals and this case indicates high self-concept in volunteers. In the other word, the results of this research have no accordance with Tapp and Spanier (1973) and Wallach (2007) results. These researchers state "there is no significant difference between volunteers and non-volunteers self-concept; this problem may depend on minimizing their statistical population. Tapp and Spanier research is limited to dispatches office and Wallach research is limited to faculty's students in university and as before mentioned "individuals' self-concept impress on individuals' communications and society which work in it (14, 15).

The present research results indicated that there is significant difference between volunteers and non-volunteers' social self-concept. Existence of positive difference in volunteers' social self-concept resulted from psychological traits in volunteers. Since volunteers have flexible personality, extrovert, kind and optimistic and all of these traits are characteristics of society-oriented human, therefore; it is natural that volunteers have higher social self-concept than non-volunteers. Social nets provide opportunities for being volunteer and this factor is one of the most important individuals' motives for joining to voluntary activities.

In the other hand, researches have indicated that volunteers have more citizenship and morale obligations and this case can be indicator of social self-concept in volunteers. Also, it can be suggested that young people can remove their problems with presence in voluntary activities and creating proper social communication and reduce anxiety and

stress due to their age conditions. Findings indicated there is significant difference between volunteers and non-volunteers athletic self-concept. This topic can be explained to this way: since voluntary organization in this research is students of sport association in universities, sport nature of this environment necessitate. Majority of members of this association constitute physical education students (76.8%) and according to being athlete of samples research seems to higher self-concept in volunteers be normal.

The data analysis indicated that there is no significant difference between volunteers and non-volunteers' scientific self-concept. Self-concept dimensions are different essentially and aren't dependence to each other, therefore; existence of more positive self-concept in athletic and social cases isn't reason of being higher scientific and value self-concept. According to research has been done among students and they are in the same situation from professors, university environment and etc. Also environment and associates are effective in existence of self-concept, therefore; it seems logical.

There is no significant difference between volunteers and non-volunteers value self-concept. This case is probably related to nature of research samples, too. Since students of public universities are testers of this research and they have tried to enter university and have separated from small environment of family and school and have entered to larger environment and are independent in acts and imagine university as place of being potential of their talents and abilities, thus; they understand their value and importance of this value in interaction with others.

Then we can declare that volunteers potential abilities which are in environment a lot and create situations for progression and use them productively and also they are useful for sport events managers and sport managers in associations.

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