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ФІЗИЧНЕ ВИХОВАННЯ, СПОРТ І КУЛЬТУРА ЗДОРОВ'Я У СУЧАСНОМУ СУСПІЛЬСТВІ

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Східноєвропейського національного університету імені Лесі Українки
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У збірнику наукових праць подано окремі положення розвитку фізичної культури, фізичного виховання різних груп населення, підготовки фахівців для галузі. Охарактеризовано методи, засоби тренування, особливості підготовки спортсменів, адаптації організму людей різного віку в процесі фізичного виховання, адекватність яких підкріплюється педагогічними, психологічними та медично-біологічними експериментами.

Журнал є науковим фаховим виданням України, у якому можуть публікуватися результати дисертаційних робіт на здобуття наукових ступенів доктора і кандидата наук за напрямами «Педагогічні науки» (дивитися перелік наукових фахових видань, затверджений наказом Міністерства освіти і науки України від 12 травня 2015 р. № 528) та «Фізичне виховання і спорт» (дивитися перелік наукових фахових видань, затверджений наказом Міністерства освіти і науки України від 13 липня 2015 р. № 747).

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№ 4 (40)

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Ф 50 **Physical** Education, Sports and Health Culture in Modern Society : Collected Research Papers of Lesya Ukrainka Eastern European National University / compiled by A. V. Tsos, S. J. Indyka. – Lutsk : Lesya Ukrainka Eastern European National University, 2017. – № 4 (40). – 152 p.

Scientific works on various topics of physical culture, the physical education of various groups of people, and the training of professionals have been assembled in this digest. A description is given of methods and means of training, specifics of athletic training, and the adaptation of the bodies of individuals of various ages to the process of physical training, the suitability of which is enhanced by pedagogical, psychological, methodological and biological experiments.

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Історичні, філософські, правові й кадрові проблеми фізичної культури та спорту

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THE DYNAMICS OF THE DEVELOPMENT OF WALKING TOURISM AMONG THE ADULT POPULATION OF THE SOUTHERN REGION OF UKRAINE IN THE SECOND HALF OF THE XXth AND THE BEGINNING OF THE XXIst CENTURY

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Abstract

Sports tourism as a kind of sport is developing in all former Soviet Union countries. The first steps to establish sports tourism were made in Tsarist Russia, and the rapid development was reached during the period of Soviet Union. There were ups and down in development of the sports tourism in Ukraine. The basis for the development of any sport are indicators of the involvement of children and youth. That's why the basis of the study is the study and analysis of the development of walking tourism among adults in Kherson, Mykolaiv and Odessa regions.

According to the study, there were a number of phases in the sports tourism development: hiking was the main form of sports tourism, which was developing during the time of the former Soviet Union. The sports tourism in Southern regions of Ukraine depends on several factors, which have both positive and negative impacts on the development.

Key words: development, amateur tourism, sports tourism, hiking.

Олександр Кільніцький. Динаміка розвитку пішохідного туризму серед дорослого населення Південого регіону України в другій половині XX та на початку XXI ст. Спортивний туризм як вид спорту сьогодні має розвиток у державах, які утворилися після розпаду СРСР. Передумови його становлення закладено ще в царській Росії, а бурхливого розвитку досягнуто за часів радянської влади. В Україні розвиток спортивного туризму також мав певні підйоми й спади. Базою для розвитку будь-якого спорту є показники участі дітей та юнацтва. Тому основа дослідження полягає у вивченні та аналізі розвитку пішохідного туризму серед дорослих у Херсонській, Миколаївській та Одеській областях.

За результатами дослідження визначено, що розвиток спортивного туризму відбувався за декілька етапів; основною формою спортивного туризму був самодіяльний туризм, котрий розвивався за часів колишнього СРСР; динаміка розвитку спортивного туризму Південного регіону України залежить від низки чинників, що як позитивно, так і негативно впливають на його розвиток.

Ключові слова: розвиток, самодіяльний туризм, спортивний туризм, пішохідний туризм.

Александр Кильницький. Динамика развития пешеходного туризма среди взрослого населения Южного региона Украины во второй половине XX и в начале XXI в. Спортивный туризм как вид спорта сегодня имеет развитие в государствах, которые образовались после распада СССР. Предпосылки его становления заложены еще в царской России, а бурного развития достигнуто во времена советской власти. В Украине развитие спортивного туризма также имело определенные подъемы и спады. Базой для развития любого спорта являются показатели участия детей и юношества. Поэтому основа исследования заключается в изучении и анализе развития пешеходного туризма среди учащейся молодежи и взрослых в Херсонской, Николаевской и Одесской областях.

По результатам исследования установлено, что развитие спортивного туризма проходил за несколько этапов; основной формой спортивного туризма был самодеятельный туризм, который развивался во времена бывшего СССР; динамика развития спортивного туризма Южного региона Украины зависит от ряда факторов, как положительно, так и отрицательно влияют на его развитие.

Ключевые слова: развитие, самодеятельный туризм, спортивный туризм, пешеходный туризм.

Introduction. Sport tourism is a kind of sport that is widespread in Ukraine. It provides the carrying out of hiking trips from the types of sports tourism of various levels of complexity, and participation in competitions for both young tourists and adult athletes. The tourism was developed especially active in the 60-80 years of the twentieth century in the former Soviet Union. At this time the tourist clubs are being created very active, tourist sections are opened at the enterprises and educational establishments, new tourism centers are being constructed throughout the territory of former Soviet Union and various tourist routes from different types of tourism are opened.

Sport tourism as a kind of sport continued to develop in the countries that were formed after the collapse of the Soviet Union. The development of sport tourism in Ukraine also had certain ups and downs. After the independence Ukraine, sport tourism gradually collapsed. This is due to a significant reduction in financing, the closure of enterprises in which there were tourist clubs, and economic problems in the country.

All these aspects did not allow developing and carrying out the tourist raids, competitions and long-distance campaigns, especially the largest categories of complexity that cannot be held on the territory of Ukraine.

The problem of development of sports tourism in Ukraine in their works

The problem of the development of sports tourism in Ukraine is clarified by such scientists as: V. V. Abramov [1] active raises the questions of the tourism's periodization and the perspectives of sports tourism's development in the historical aspect; The prospects and backgrounds for the development of sports tourism in Ukraine were examined by V. N. Zihunovym [3].

Sport tourism is a massive remedy of recovery, learning of the environment, achievement of high sports results, and is an effective method of applied training. But in recent years there has been a tendency for a significant decrease in the number of hikes, number of participants in campaigns and competitions of all levels among adults. Therefore, we consider, that the research of development's state and the efficiency of sport tourism in the southern region of Ukraine is actual today.

The purpose of the study: to investigate the effectiveness of sport tourism of the southern region of Ukraine among adult tourists in the second half of the 20th and the beginning of the 21st century.

Material and methods of research. In order to determine the dynamics and development of sport tourism among adult tourists, we analyzed the statistics of the journals of route-qualifying commissions of tourist clubs, cities of Kherson, Mykolaiv and Odessa during the period of 1982–2016. In the process of work, the following research methods have been used: the method of theoretical analysis and generalization of data official documents, historical method, comparative-historical method.

Research Results. Discussion. Consider the example of the activity of the Kherson tourist club «Slavuta» and the local tourist club of Odessa (modern name is «Educational and methodical coordination center for sports tourism "ODESA"») the development of walking tourism during the period of the former Soviet Union from 1982–1991 and in the period of independent Ukraine from 1992–2016 according to the registration logs of the route-qualification commission of tourist clubs.

It should be mentioned that from all types of tourism were non-categorical and categorical campaigns. Categorical hikes, in turn, were divided into five categories of complexity. Non-category hikes and trips of the first category of complexity, as a rule, have a high health effect and were carried out for this purpose. Although at the same time the sporting goal was reached: for the participation in stepped campaigns participants were assigned to youth grades; for participating in the campaign of the first category of difficulty – the third adult category. At that time, higher discharges were assigned not only for participation in campaigns, but it was necessary to conduct campaign marches.

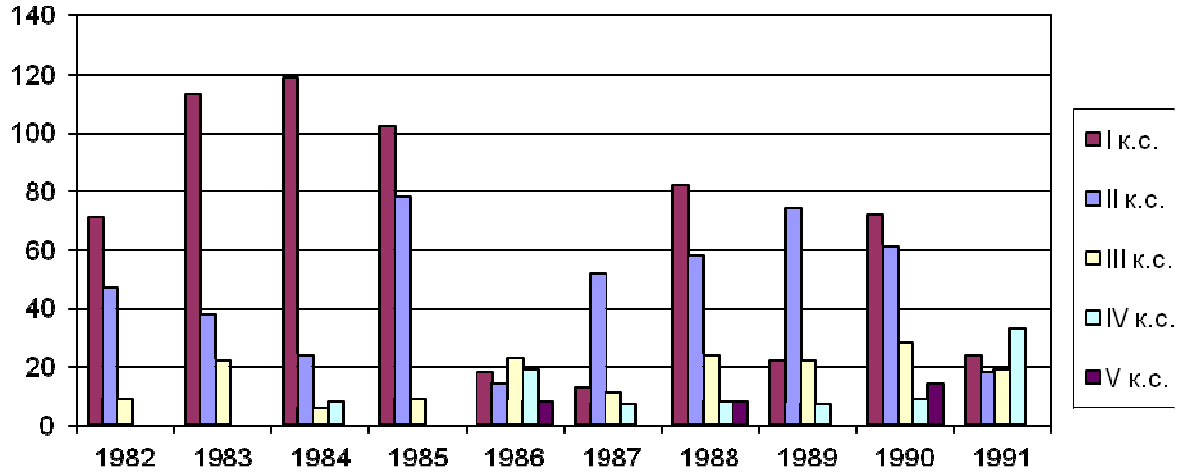
For example, the second grade was assigned to those who took part in the campaigns of the first and second categories of complexity, and carried out the campaign of the first category of complexity. In addition to the tourist experience, the leader of the tourist group put forward another requirement – age: the head may be a person who has reached the age of 18 years (for stepped trips, and campaigns of the first and second categories of complexity). Today high rankings and titles can be performed not only in campaigns, but also in sports tourism's competitions [5].

The club of tourists of Kherson «Slavusa», working with tourism sections and clubs of enterprises, directed its activity on increasing the complexity of hikes. For this, at the club there was created the permanent school of average tourist training, and tourists, who achieved some success, were sent to the All-Ukrainian or All-Union seminar on higher tourism or instructor training. In the city tourist's club was a massive section of mountaineering and the majority of tourists was involved in mountain hikes (pic. 1).

As it can be seen from Figure 1, that the number of hiking trips of varying difficulty is disproportionate during the specified period. This is explained by the possibilities of tourist sections at enterprises, the

coincidence of vacation time with tourists, the availability of the appropriate level of training of the head and group. Data on carrying out uncategorial tours of Kherson region have not been preserved.

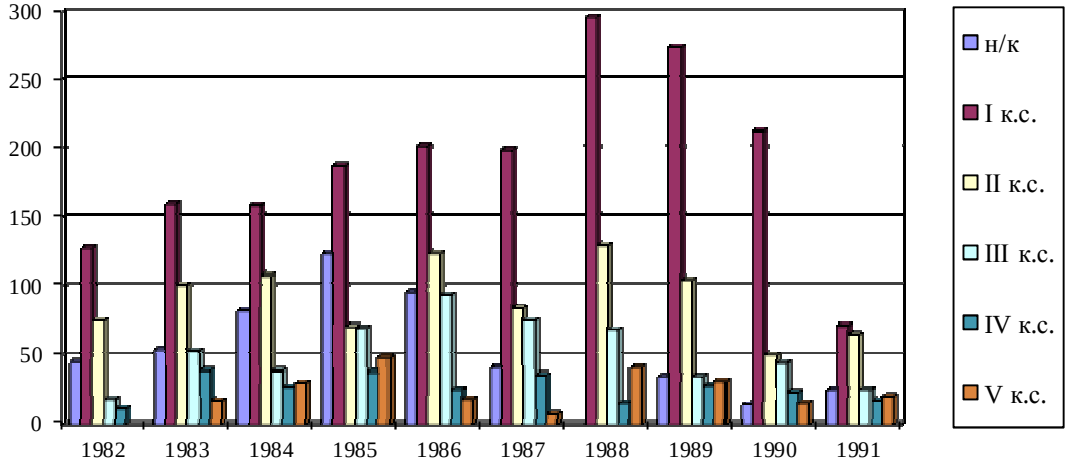
In the period from 1992 to 2016 in the categorial hikes in Kherson region of various types of tourism, only 92 persons took part, which is critically small. First of all, it is due to the precarious economic and political situation in the country, to make hiking in which becomes an increasingly difficult task [4].



Pic. 1. *The Dynamics of the Number of Adult Tourists who Participated in Walking Hikes of Kherson Region From 1982 to 1991*

Unfortunately, the data of carrying out of hiking trips by the adult population in Mykolaiv have not been preserved, therefore, it is unpossible to analyze the development of sports tourism in Mykolayiv during the former USSR. But the data of the current stage have preserved only since 2009. In Mykolayiv during 8 years, 9 hikes were carried out in which 43 tourists took part, which is extremely small [6].

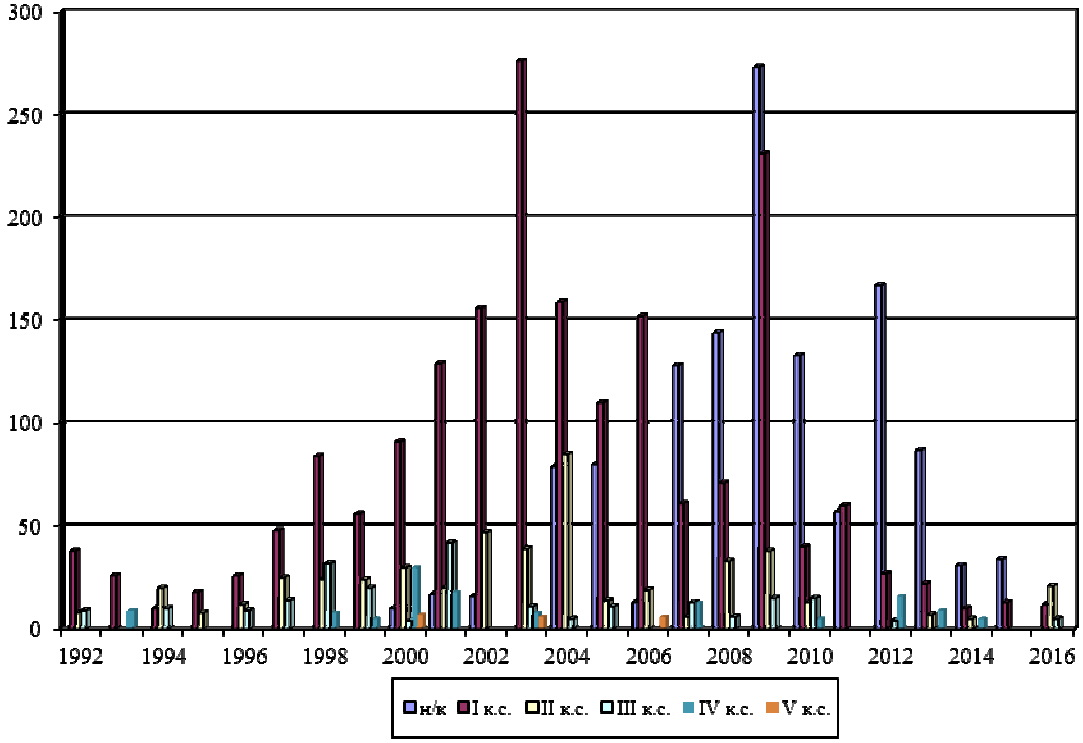
As it can be seen from picture 2, that the indicator in the number of participants in uncategorial hikes among the adult population of Odessa is insignificant.



Pic. 2. *The Dynamics of the Number of Adult Tourists from Odessa Region, who Participated in Categorial and Uncategorial Walking Hikes From 1982 to 1991.*

For 10 years, the quantitative indicator of the participation of adult tourists in uncategorial hikes is 516 persons. Such low indicator is explained by the interest of adult tourists to the hikes of more difficult category, whose routes run through hard-to-reach areas, thereby attracting attention to yourself. It should be noted that 259 and 277 tourists from Odessa took part in hikes of the fourth and fifth categories of complexity during this period. For comparison, 91 and 38 tourists from Kherson participated in hikes of the fourth and fifth categories of complexity during the same period.

In picture 3 we can see the gradual increase in the number of adult tourists from Odessa, who participated in categorial hikes, unlike uncategorial, which were not conducted at all until 2000 year. The peak of participation in categorial hikes was 2003 year, in which 340 tourists took part. Also in 2009, this figure has reached to the mark of 284 tourists who participated in categorial hikes. In the same year, 273 tourists took part in uncategorial hikes.



Pic. 3. *The Dynamics of the Number of Adult Tourists From Odessa, who Took Part in Walking Hikes From 1992 to 2016.*

This gradual increase in the number of participants in tourist trips coincides with the beginning of conducting in the territory of Crimea in 2003 by the children's touristic youth club «Put» an extreme marathon called «Crimean Sotka», which was held in the form of categorial and uncategorial hikes. The difference from the usual hike was only the contracted terms of its conduct, namely 72 hours. In subsequent years there is a gradual decline in the participation of adult tourists in all categories of complexity. During the entire period from 1992 to 2016, 126 and 19 people took part in campaigns of the fourth and fifth categories of difficulty. It is respectively 17 and 3 campaigns for 24 years.

As it can be seen from the Table 1, that the indicator in the number of hikes of all categories of complexity both during the period of the former USSR and during the independence of Ukraine in the Odessa region, twice exceeds the indicators of Kherson tourists. The smaller number of hikes can be explained by the demographic factor: in the 70–80 years of the last century the population of Kherson was 360 thousand. At the same time in Odessa there were more than a million inhabitants. The low rate of sports hikes, which were held by the tourists of Kherson, can be explained by the termination of the work in 1992 of tourist club «Slavuta», as a result of which practically stopped carrying out of tourist sports hikes. Therefore hiking in Kherson region among the adult tourists are sporadic.

Table 1

The Indicators of Conducted Categorial and Uncategorial Walking by Adults Tourists From 1982 to 2016

Period (Years)	Kherson						Odessa						
	К/П	I с.с.	II с.с.	III с.с.	IV с.с.	V с.с.	Н/К	К/П	I с.с.	II с.с.	III с.с.	IV с.с.	V с.с.
1982–1991	143	65	45	20	10	5	45	434	213	101	60	31	29
1992–2016.	11	6	3	2			197	392	275	67	30	17	3

The Federation of Sport Tourism of Ukraine was created 2000, in September, which certainly had a positive effect on the restoration of sports tourism in the our country [5]. But more attention was paid to the organization and conducting the competition, and not to the carrying the hikes, although the educational, recreational and educational effects from the hikes is much greater than that from the competitions.

Today, the implementation of hikes of high categories of complexity (starting with the fourth category of complexity for walking tourism) is possible only in certain areas: Sybir, Khibina, eastern and western Sayan, Kodar, etc, to get to which cost a lot of money.

Conclusions and Perspectives of Further Research. Based on the research conclusions can be drawn:

1) the development of amateur tourism during the former USSR became the basis for the development of sports tourism in Ukraine;

2) the dynamics of sport tourism development in the southern region of Ukraine, both at the stage of intensive development and during the stage of development of sport tourism in the independent Ukraine, depends on the economic, social and political factors of society's development.

3) the various «extreme marathons» and «multi-sport» competitions are also influenced by the increasing in the number of tourists participating in the sporting events.

The perspective of further research is the study and analysis of the development of other types of sports tourism in the southern region and Ukraine as a whole.

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PTOBLEMATICS OF INVOLVEMENT OF YOUTH IN MASS AND PROFESSIONAL SPORTS ACTIVITIES

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Abstract

Today the strategy of human development should predominate on a scale of the state. In fact the formation and the progress of the nation, and therefore of the state itself, are possible only if all the necessary favorable conditions for the self–development and self-realization of each individual are created. The author examines the current state of the development of sport and its relevance. The attention is focused on the development of sport, as one of the priority issues of state policy of Ukraine. The author covers thorny questions of problematics of involvement of youth in sports activities, tasks of the existing sport system in Ukraine. The legal framework, state legislative acts, materials of state institutions, social polls, conclusions of specialists in the sphere of sports, sports observers are used for the research. The author emphasizes the need of the solution of a number of existing problems at the state level and creations of necessary conditions for sport progress in Ukraine. The use of international practices is suggested and recommendations are given for taking concrete steps in the creation of an effective model for the development of sport that is provided on condition of the active participation of the state and society.

Key words: sports activities, youth, value orientations, healthy lifestyle, legal framework, state policy.

Андрій Коваль. Проблематика залучення молоді до занять масовими та професійними видами спорту. Сьогодні стратегія людського розвитку має виходити на перше місце в масштабах держави, адже формування та розвиток нації, а отже, і самої держави можливе лише за умови створення всіх необхідних сприятливих умов для саморозвитку та самореалізації кожної окремої особистості. Здійснено дослідження сучасного стану розвитку спорту, його актуальності. Акцентовано увагу на розвитку спорту як на одному з пріоритетних напрямів державної політики України. Висвітлено гострі питання проблематики залучення молоді до занять спортом, завдання наявної системи розвитку українського спорту. Для досліджень використано нормативно-правову базу, державні законодавчі акти, матеріали державних інституцій, соціальні опитування, висновки фахівців у сфері спорту, оглядачів спортивної сфери. Підкреслено необхідність розв'язання низки наявних проблем на державному рівні й створення необхідних умов для розвитку спорту в Українській державі. Запропоновано використання досвіду інших країн і надано рекомендації щодо здійснення чітких кроків у побудові ефективної моделі розвитку спорту за умови активної участі держави та суспільства.

Ключові слова: заняття спортом, молодь, ціннісні орієнтації, здоровий спосіб життя, нормативно-правова база, державна політика.

Андрей Коваль. Проблематика привлечения молодежи к занятиям массовыми и профессиональными видами спорта. Сегодня стратегия человеческого развития должна выходить на первое место в масштабах государства, ведь формирование и развитие нации, а значит и самого государства возможно только при условии создания всех необходимых благоприятных условий для саморазвития и самореализации каждой отдельной личности. Осуществляется исследование современного состояния развития спорта его актуальности. Акцентируется внимание на развитии спорта, как на одном из приоритетных направлений государственной политики Украины. Освещаются острые вопросы проблематики привлечения молодежи к занятиям спортом, задания существующей системы развития украинского спорта. Для исследований использованы нормативно-правовая база, государственные законодательные акты, материалы государственных институций, социальные опросы, выводы специалистов в сфере спорта, обозревателей спортивной сферы. Подчеркивается необходимость решения ряда существующих проблем на государственном уровне и создания необходимых условий для развития спорта в Украинском государстве. Предлагается использование опыта других государств и предоставлены рекомендации для осуществления конкретных шагов в построении эффективной модели развития спорта при условии активного участия государства и общества.

Ключевые слова: занятия спортом, молодежь, ценностные ориентации, здоровый образ жизни, нормативно-правовая база, государственная политика.

Introduction. Obviously, the state of the public health is one of the most important social indicators of the progress of a society, the potential of economic growth and state security, which reflects the well-being of the whole nation, its social, economic, ecological, demographic, and sanitary and hygiene status, etc.

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Health and quality of life are determined by a variety of factors related to each other. Therefore, issues related to improving the health and well-being of the population cannot be limited to the health sector and requires a multi-faceted approach, in particular, active participation and involvement of other sectors of society at all stages of improving the life quality and health promotion. It's common knowledge that investing in children and young people health is a prerequisite for human and economic development. Such an investment is sport. As a social institution, sport plays a significant role in a society, providing facilities for socialization, social mobility, and making human life strategies. Sports activities lay the foundations of a healthy lifestyle, working ability, teach to overcome difficulties and work on the result.

Relevance and viability of the article research are conditioned by the necessity of expedient, effective development of both mass and professional sport in Ukraine.

The Aim of the Study. To investigate the current state of sport development, its relevance. To provide a characteristic of the factors that affect the involvement of youth in mass and professional sports. To analyze the legal framework, state legislation, materials of state institutions, social polls that characterize the current state of the sports sphere. To cover existing issues at the state level that affect the creation of conditions for the qualitative development of sport in Ukrainian. To suggest the use of international practices and work out recommendations for taking distinct steps in the formation of an effective sport model.

To achieve the aim of engaging young people in sports, it is appropriate to set clear goals to be achieved, namely:

– formation of consciousness of each citizen of our country concerning the necessity of motor activity, as an important part of a healthy lifestyle; popularization of physical culture and sports and healthy lifestyle among all age groups and segments of the population, especially children and youth;

– creating the conditions of systematic motor activity for health improvement, taking into account interests, wishes and individual characteristics of each person.

Thus, Oleksandr Lozovytskyi, Research Director of the Ukrainian Public Scientific Organization «Experts of Ukraine» emphasizes the need to identify possible conditions, ways, and mechanisms of social and educational work with young people, which is conditioned by the process of humanization of modern society. The new generation, which is growing in a free market economy, and is significantly different from the previous, has its own values, priorities. As the expert notes, the most important task of youth socialization is the organization of leisure time, which significantly and completely affects the formation of moral, spiritual, intellectual, cultural, physical qualities of the individual. One of the factors that forms the value orientations of young people is the practice of physical culture and sports as an effective means of developing a healthy young person [6].

The data presented in the annual report to the President of Ukraine, the Verkhovna Rada of Ukraine on the situation of youth in Ukraine (according to the results of the year 2015) are interesting and informative for analyzing the issues of youth involvement in sports [9]. Thus, according to data received from the poll center of independent sociological research «Omega», more than a third of young people (40,7 %) aren't engaged in sports exercises at all. Actually the number of such young people in cities (40,2 %) and countryside (41,6 %) does not differ. The number of people unoccupied with physical activity increases with the age of a young person – from 32,0 % among young people aged 14–19 to 47,7 % among young people aged 30–34. The survey data are given in table 1.

Table 1

Distribution of Answers to the Question «How Many Hours do you Spend on any Physical Activity or any Active Sport During the Last Week (7 Days)?», *%*

	14–19 Years Old	**20–24 Years Old**	**25–29 Years Old**	**30–34 Years Old**	**Total**
None	32,1	38,4	42,1	47,7	40,7
About an Hour	30,6	29,0	30,6	26,4	29,1
Approximately From 2 to 3 hours	20,6	18,6	15,6	12,2	16,4
Approximately From 4 to 6 Hours	7,9	6,1	5,9	6,4	6,5
7 Hours or More	5,2	3,6	3,2	3,6	3,8
Difficult to Answer	3,6	4,3	2,6	3,6	3,5

According to a sociological survey lack of free time (40 %), lack of own funds for visiting sports centers (30 %), inability to organize themselves and their sports (14 %) affect sporting activities or various types of motor activity of young people. 11 % of respondents indicated insufficient number of sports clubs, fitness

centers or lack of them near their home or place of study/work. 8 % of respondents indicated a low level of improvement and comfort of existing sports facilities. 4 % of young people do not exercise because of their health. 26 % of respondents do not interfere with sports [9].

These surveys give us the opportunity to conclude that the existing ways of involving in sports should be more effective and oriented towards the spiritual, physical and cultural needs of young people, creating equal opportunities for the realization of creative, professional and intellectual potential.

The study of sport development in Ukraine was carried out by S. Zaporozhets, who investigated the problems that hamper the development of Ukrainian sports: the outdated management system, the low level of financing and the unsatisfactory state of the sports industry [5]. S. Nikitenko analyzed the positive and negative trends in the development of the sports sphere [7]. D. Gubenko made an assessment of the financial level of Ukrainian sports following the results of the Olympic Games in 2016 [3]. The interaction of mass sports, professional sports and sports of higher achievements is considered in the article of A. Vatoropin [2]. N. Bachynskaia gave a characteristic of professional sports development in our country and prospects for the process of integrating national sports into the international system [1].

According to Edwin Ozolin, the Honored Master of Sports of the USSR in athletics, a candidate of pedagogical sciences, one of the main factors to be involved in sport is public opinion that is formed under the influence of the media and a family. For young athletes, the most important factors are joy and pleasure. In this case, satisfaction is evaluated by the following factors, as: to be with friends; to stand well with a coacher; feel a sense of victory; to be a member of a team. Athletes also define such factors as the winning of medals and prizes; team competitions; training in the gym [8].

The factors that influence the decision of an athlete to stay or leave sports activities are the following:

– stress characterized by a double load of education/work and sports training, lack of time required for quality workouts;
– injuries;
– influence of parents (they play a major role in the motivation and support of a young sportsman)
– influence of a coach (both in problems of improving the sport results and in the completion of a sports career);
– motivation characterized by a personal orientation to a high result; a real evaluation of possibilities for successful competitions; teaching to overcome difficulties, helping to stay in sports for a long time;
– conflict of interests (between serious sports and leisure time);
– social activity;
– criticism of professional sports.

Consequently, we can make the following conclusion. Sportsmen are set to be the part of the social structure, which should be taken into account when compiling any training or competition programs. A kind of positive impulse in the development of sports careers of young sportsmen is created thanks to the support of (emotional, material and information) their families (namely, parents). The parents should be involved more often in the training process. Creating a positive psychological climate and constant personal improvement in the theory and practice of sport are the keys to successful and effective work in future. It is important to consider the interests of the sportsman in order to prevent his premature completion of sport, and to increase the skill level in the methods of motivating sportsmen, that will make the effective process of interaction between the coach and the sportsman.

The Law of Ukraine «On Physical Culture and Sports», based on the Constitution of Ukraine, defines such concepts as mass sports, non-Olympic and Olympic sports. The definition of children sports is given as a sport, «which provides children with the views of sports and identifies their abilities to further sports».

The development of children sports is followed by children and youth sport, «which ensures the involvement of children in a certain kind of sports from the children sport for providing their sports specialization and conditions for the transition to reserve sports». Sport of higher achievements is formed on the basis of reserve sports and is characterized by further specialization and individualization of the training process of sportsmen for the preparation and participation in sports competitions at the national and international levels. Professional sport is considered separately, and is determined as a commercial activity in sport that «is associated with the preparation and holding of spectacular sporting events at a high organizational level for profit» [4].

An important issue today is the preparation for a sports reserve in basic sports and the achievement of the main tasks, such as receiving prizes at international competitions. Experts and researchers point out the existence of a crisis in «big» sports (including professional sports and sports of higher achievements) due to excessive regulation, increased injuries, and the use of banned drugs. A. Vatoropin points out that mass sports are focused

on strengthening health through competitive activity, professional sportsmen focus their attention on receiving material prizes, and sports of higher achievements is focused on participation at high-level sports competitions in order to demonstrate high results [2]. Consequently, massive and professional sports, as well as sports of higher achievements, have to solve one common task using a variety of facilities. At the same time, young person is unlikely to be engaged in professional sports or sports higher achievements, without engaging previously in mass sports, which can indicate the importance of mass sports as the first step in sports activities.

The use of positive international practices will allow building an effective model of interaction of mass sports and sports of higher achievements. For example, school and student sports are the basis for the formation of teams of professional sportsmen in the United States. The Canadian sport model is based on the mass, the involvement in the national sport – hockey, is carried out in childhood. In Norway, sport develops on the principles of mass, availability of high-quality sports infrastructure, government financing of sports clubs, which are obliged to involve all children in sports. Sweden sports model is also of interest. It is based on the club system. About 90 % of all children are members of sports clubs. And the path to professional sports begins with the junior high school. Coach teachers combine the main work with the coach work on a voluntary basis.

What should our state do to ensure equal access of young people to opportunities for physical education and sports?

The key step is to solve a number of economic and social problems at the state level and create the following conditions, such as:

– creation of effective sport advertisement for a social cause;

– targeted, broad propaganda and popularization of a healthy lifestyle, creation and cultivation of the values of health and healthy lifestyles;

– improvement of the physical education system for the formation of active physical culture among young people in the system of formal education and the expansion of additional free opportunities for physical education and sports in the system of educational institutions;

– creation, development and modernization of sports infrastructure accessible to all segments of the population: sports grounds, swimming pools, modern sports centers with sections of the Olympic and non-Olympic sports;

– active running of all-Ukrainian, interregional and regional physical culture events, festivals, organization of sports camps;

– support the development of physical culture and sports in countryside by regional authority and community involvement;

– development of a model of cooperation between pre-school, school, higher educational institutions and the Youth Sports School for the selection of talented children and youth;

– development of effective mechanisms for allocating of funds at the state level for the qualitative functioning of the Youth Sports School. In most regions, local budgets provide payment only for communal services and salaries for coaches of the Youth Sports School, and the purchase of new inventory and sports wear is often made by parents of sportsmen);

– modernization of the infrastructure of the Youth Sports School at the expense of public-private partnership;

– use of leading international practices such as USA, Canada, Sweden, Norway.

Conclusion. The activity of the formation of a healthy lifestyle should be developed and improved in accordance with the requirements of the present. This is possible on the assumption of the learning, rethinking and reorganization of various sections of cultural and educational work, the introduction of domestic innovative ideas and world experience.

It should be noted that the problem of reducing the number of young people appears both because of economic factors, and because of the emergence of a diverse range of attractive activities for young people, the increase in opportunities for alternative choice of their leisure. Earlier, sport was an impetus to move within a particular social group, and today incitement is entertainment centers, entertainment drinks, computer games, accessible halls of «national lotteries», easy access to narcotic substances.

Taking into account the foregoing, we conclude that there is an urgent need to create a comprehensive effective model aimed at involvement in mass sports. Such a model should be based on the principles of the theory and practice of the formation of a healthy lifestyle recognized by the international community. A model should not be worked out on the parallel development of mass and «big» sports, but on the vertical direction of development, when mass sport is the sports reserve that allows candidates to be selected for national teams and professional clubs. This created system will enable the realization of the potential of sport as a mechanism for

maintaining and keeping a healthy lifestyle when the goal of winning at any price is not necessary. Children and young people are simply engaged in sports, and at a more mature age, they make a choice between a professional sport career and self-realization in another sphere.

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CONCEPTUAL BACKGROUND OF THE SCHOOL SYSTEM REFORM OF PHYSICAL EDUCATION IN UKRAINE

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Abstract

Despite modern requirements and the reform of the education system in Ukraine, the problem of health and the level of physical development of children of both school age and youth has not been solved yet and remains a burning issue. Studies conducted by the Ministry of Health of Ukraine show that 45 % of students suffer from various chronic diseases, 66 % have a violation of posture, 19 % of senior pupils have high blood pressure, etc.

That is why, the purpose of this research is to reveal the conceptual background that determines the importance of physical education in the modern educational system. The article shows the necessity of strengthening the health-improving focus of school physical education lessons. The approximate educational program for physical education at school has been proposed. The necessity of introducing physical culture and recreation hours in a school day, the need to strengthen athletic classes, the introduction of the theoretical course of the principles of a healthy lifestyle, the issues of material support for physical education at school, promotion and management of physical education and other issues dealing with the implementation of a healthy lifestyle not only for students, but also for other population groups have been studied.

Key words: conception, background of the reform, the reform of school physical education system.

Александр Куц, Борис Кедровский, Валентина Леонова. Концептуальные предпосылки перестройки школьной системы физического воспитания в Украине. Несмотря на современные требования и реформирования системы образования в Украине, нерешённым и острым вопросом стоит проблема здоровья и уровня физического развития детей как школьного возраста, так и молодёжи. Исследования, проводимые Министерством здравоохраниния Украины, свидетельствуют о том, что 45 % учащиеся страдают различными хроническими заболеваниями, 66 % имеют нарушение осанки, у 19 % старшеклассников отмечены завышенные показатели артериального давления и т. д.

Поэтому ***целью исследований*** и данной работы являются концептуальные предпосылки, определяющие значение физического воспитания в современной системе образования. В статье раскрыты необходимость и усиление оздоровительной направленности уроков школьного физического воспитания. Предложена ориентировочная программа по физическому воспитанию в школе. Раскрыты вопросы необходимости введения физкультурно-рекреационного часа в режиме учебного дня школы, необходимость усиления секционных форм физического воспитания учащихся, введение теоретического курса основ здорового образа жизни, вопросы материального обеспечения занятий по физической культуре в школе, пропаганде и управлению физическим воспитанием учащихся и другие вопросы, способствующие реализации здорового образа жизни те только школьников, но и других групп населения.

Ключевые слова: концепция, предпосылки перестройки, перестройка школьной системы физического воспитания.

Олександр Куц, Борис Кедровський, Валентина Леонова. Концептуальні передумови перебудови шкільної системи фізичного виховання в Україні. Незважаючи на сучасні вимоги та реформування системи освіти в Україні, не вирішеним і гострим питанням є проблема здоров'я й рівня фізичного розвитку дітей як шкільного віку, так і молоді. Дослідження, що проводилися Міністерством охорони здоров'я України, свідчать про те, що 45 % учнів страждають на різні хронічні захворювання, 66 % мають порушення постави, у 19 % старшокласників відзначені завищені показники артеріального тиску і т.д.

Відтак ***мета дослідження*** – концептуальні передумови, що визначають значення фізичного виховання в сучасній системі освіти. У статті розкрито необхідність і посилення оздоровчої спрямованості уроків шкільного фізичного виховання. Запропоновано орієнтовну програму з фізичного виховання в школі. Розкрито питання необхідності введення фізкультурно-рекреаційної години в режим навчального дня школи, необхідність посилення секційних форм фізичного виховання учнів, уведення теоретичного курсу основ здорового способу життя, питання матеріального забезпечення занять із фізичної культури в школі, пропаганди й управління фізичним вихованням учнів та інші питання, що сприяють реалізації здорового способу життя не тільки школярів, а й інших груп населення.

Ключові слова: концепція, передумови перебудови, перебудова шкільної системи фізичного виховання.

Formulation of a Research Problem and its Significance. Health and physical preparedness of children and youth are the most important components of the health and physical potential of a nation. Everyone attends school. The problem of physical education and public physical culture must be solved, first of all, and mainly, with the help of school. At school age, it is necessary to develop a strong need for physical education and sports, willingness and ability to improve a physical state, and also to provide sport literacy for everyone.

We should mention that it is practically impossible to change the situation in the whole country regarding the development of popular physical culture and sport in a short time. To move to the solution of this problem more widely, covering the entire population, means postponing a real turning point in this direction for decades. It is necessary to concentrate our efforts on the main direction – the reorganization of the physical culture of children and youth.

The school reform, as we know, has not produced the expected result: the school has been focused on the students' knowledge of theoretical subjects for many years and continues doing this. The physical education of students is practically «pushed into the background». It is not a surprise that the level of children and young people's physical preparedness is assessed as extremely unsatisfactory [3; 17]. At the same time, a radical reorganization of the system of school physical education should be considered as an urgent social task, the background of which we see in 12 conceptual positions.

The aim of the study is to characterize the conceptual background determining the importance of physical education in the modern education system.

Statement Regarding the Basic Material of the Research and the Justification of the Results Obtained.

1. The Need to Strengthen the Health-Improving Orientation of School Physical Education.

Many facts cause an acute concern about the health of the younger generation. Here are just some of them. According to our data, the number of students applying to medical institutions has noticeably increased in recent years. There are more than 200 such appeals per year for every 1000 10–14 year-old boys, as for girls of the same age - up to 300, one of the main causes is respiratory diseases.

At the same time, there is an increase in the number of nervous diseases among children. It is due to psychoemotional stress and load of the child in pre–school and school institutions and in the family. On average, the country annually accounts for 12 days of incapacity for work for an adult, 8 days for a student and 17 for a pupil. Every day more than one million people do not go to work due to their illness [15].

Studies conducted by the Ministry of Health of Ukraine show that 45 % of students suffer from various chronic diseases, 66 % – have a violation of posture; 21 % – have a disposition toward high blood pressure; in 19 % of senior pupils, high blood pressure indices were noted [17].

Specially conducted studies indicate that 34 % of school leavers have health restrictions; up to 46 % of schoolchildren have various degrees of musculoskeletal disorders; up to 28 thousand schoolchildren are exempt from physical education classes; 61–65 % of students suffer from respiratory diseases; by the end of the school, 47 % of children are visually impaired [11; 17].

A chronic deficiency of motor activity hinders children's normal physical development, threatens their health. About 30 % of school-aged children are at risk. After they turn 17, they begin to face such diseases as diabetes, hypertension, atherosclerosis [13]. These features contribute to a low level of physical preparedness of schoolchildren, worsen their adaptation to the mode of work, and especially, to the conditions of military service [7].

As a result of 25-year observations of the schoolchildren's physical development in Ukraine, a reduction in the number of boys with a muscular type of constitution was found. In comparison with 1990–1991, among 8 year-olds the number of such boys was 26 %, in 2015 – 7 %; among 11-year-olds – 32 and 16 %, among 14-year-olds – 46 and 20 % respectively. In 2015, there are more than 200 thousand mentally and physically disabled children in the country, and in the cities this number is 5 times bigger than in rural areas [8].

For many years, Ukraine has been one of the last among the European and Asian countries according for the number of child mortality.

A reliable relationship between children's illnesses and their physical development was revealed. Numerous studies carried out in our country show that schoolchildren with low motor activity have an increased number of illnesses due to a decrease in the overall level of functional capabilities and immune system. With age, the after–effects of low motor activity deepen and lead to rapid aging of the human body and early disability. Our country ranks only among the fifth decade for life expectancy, while it is proved that 75 % of all diseases begin in childhood [19].

The dynamics of deterioration in the health of our children was outlined many years ago but so far, apart from numerous decisions and decrees, nothing concrete has been done to decrease the threat to the nation.

2. A Program for Physical Education at School.

Needless standardization of the imposed national programs for physical training of schoolchildren prevents the progressive development of school physical education. Such programs do not stimulate teacher's creative activity and their vigorous search for new solutions. In addition, the recent tragic events at physical education lessons caused the unjustified exclusion from programs the vital exercises for the development of strength and endurance of schoolchildren.

The analysis of the existing school curriculum for physical education showed that a standardized program for all regions often does not take into account the peculiarities of the child's organism development in different climatic and geographical zones of Ukraine [15]. There is a clear need for specific versions of school curricula applied to the peculiarities of the regions of the country, taking into consideration their typical climatic, geographic and socio–economic conditions.

In the context of the strictly regulated program, there is no real opportunity to implement the most important principle of physical education system – to provide a differentiated and individual approach to students, taking into account their health, physical development, and fitness.

An interview with physical education teachers showed that only 8 % of them are fully guided by the requirements of the physical education program at physical education lessons [21]. In connection with this, it is necessary to develop a single basic model program, on the basis of which regions and certain schools, in accordance with their needs, could specify their own versions of the program, provided that the basic minimum of requirements will be compulsorily fulfilled.

Undoubtedly, the basic model program should set the tasks of physical culture and education that need to be performed (involving the formation of the vital motor skills and knowledge related with them). It is necessary to develop a legal framework for the basic school curriculum. Regional standard training programs should be developed on a competitive basis with the involvement of the leading specialists of the country. The same should be done during the preparation of textbooks and training manuals on a students' healthy lifestyle, including the physical culture.

3. The Lesson of Physical Education as the Main Form of Physical Exercising at School.

According to our data and the data of other researchers, the average increase in fitness indicators achieved in a year is 3–5 % for boys and 2,3–3,2 % for girls thanks to two physical training lessons per week and one football lesson, but it is still a significant deficit for the normal development of the schoolchildren's organisms.

Two lessons of physical education do not form schoolchildren's habit of doing sport systematically. In developed countries, a lot of attempts are being made to increase the number of compulsory school classes on physical education up to 4–5 times a week. Our experts also insist on this [15].

However, the increase in the number of physical training lessons is justified only after a big improvement in their quality. Now, physical training lessons at school are often formal and do not strengthen the students' health. At school, these lessons are often considered to be peripheral. The frequency of the pulse at these lessons often does not provide a training effect on the children's organisms. According to our data, 46 % of all lessons are conducted with a lower average load, 38 % – with an average load, and only 16 % – with a training load [20].

The school lesson of physical education, in contrast to the training session, is usually aimed at pulling up underdeveloped sides of the physical and technical training of schoolchildren. The teacher sets the task of training the child to the level of an average student, while he does not actively develop his leading abilities and inclinations, as, for example, the coach does.

The basis for the content of physical training should be a system that has a visible training effect and is aimed at improving the body functions. The optimal motor activity with heavy enough physical load leads to a noticeable improvement in physical development, to a significant improvement of the organs and systems of a growing body causing the improvement of non-specific nature which makes an increase in resistance to various unfavorable factors of the external environment and complex biochemical and hematological changes affecting protective forces of the organism.

At the same time, the pursuit of the high motor activity and its training effect does not allow to solve educational tasks systematically, for example to teach massage and warming up, to lead up students to self–tuition and self–improvement. Submitting lessons only to training purposes leads to the fact that school leavers often find themselves helpless in organizing and conducting self–tuition and soon give it up at all.

Teachers of other subjects sometimes experience certain difficulties in teaching their lessons after physical training lessons, even if the latter were of low intensity. The physical training lesson should have a different place in the school schedule in comparison with the general educational lessons and be accompanied by a «normalizing» phase.

Thus, on the one hand, the school sets the task to teach schoolchildren the basic physical culture in a broad sense, to adapt healthy lifestyle skills, and on the other hand, to enhance the physical qualities of schoolchildren. The teacher practically does not have enough time to effectively combine the educational and practical courses of physical education. Basic improvements in the physical education of students cannot be done within the improvements in a school schedule, because it is too narrow and uncomfortable for this [20; 22].

According to our research data, more than 80 % of high-school students expressed their negative attitude toward physical education lessons. These data coincide with the opinion of American scientists who determined that 84,6 % of American schoolchildren are engaged in physical exercises outside school hours [4; 6].

The obvious decrease in the schoolchildren's interest in the standard lessons was the reason for the intensive research done by scholars, particularly foreign ones, on the expansion of the sports program and incorporation of out of the curriculum and out of school activities: in sports sections, hobby groups, etc. Currently, there is a clear shift in physical education and sports from school to extracurricular activities. At the same time, the emphasis is on the training effect, general educational tasks are solved simultaneously [4].

A serious obstacle to increasing the number of physical education lessons, as well as other physical education classes, is the weak material and technical basis and unfavorable sanitary and hygienic conditions in many schools in the country. This requires a wider use of outdoor sports grounds, temporarily adapted places and a search for other opportunities.

Despite the economic difficulties that our country is facing today, school physical education needs additional expenses. A humane country and society cannot afford to save on health and normal development of the younger generation. Besides, these expenses will be repaid many times by high working capacity and reduction of cases of illness among youth, and even the whole nation in the future.

The harmony of the educational curricular and extracurricular activities aimed at providing the daily physical activity of students (reasonably arranged, but not «over-arranged») is one of the most important principles of reforming the school system of physical education.

In addition, one of the basic forms of physical education of schoolchildren should be a daily physical culture and recreation hour (an active break).

A new approach to the physical education of children and young people should be based on the expansion, first of all, of sports activities, usually conducted out of school hours.

4. The Need to Introduce a Physical Culture and Recreation Hour («an hour of health») in the School Day Schedule.

The school should necessarily take responsibility for an efficient organization of extra–curricular forms of physical exercise, especially during a recess period in the fresh air.

If the school manages to organize daily exercises during a recess period, then the health effect from them can be higher than from 2–3 physical education lessons [10; 12]. Extracurricular activities have various forms that will better meet the non–standard needs and interests of schoolchildren.

Despite the limited effectiveness of small forms of physical education (morning exercises, physical breaks at lessons, active breaks and home tasks), their presence in the school schedule is necessary.

We cannot disagree with the fact that two lessons of physical education are a destructive form of work for children's health. They need everyday lessons [10].

It is known that in 12 schools of the Estonian SSR a daily physical education lesson in the open air was introduced as an experiment. It was allowed to conduct a lesson at the gym only at the temperatures below –15^{o}C. In addition to daily lessons, there were organized «active breaks» lasting 15–20 minutes in the open air. The increased motor activity of students positively affected their health and performance and contributed to the strengthening of discipline at school. The schoolchildren's appetite became better, sleep became quieter, and health was strengthened [15].

It is important to determine an efficient organization of active breaks: for children of primary school age – after the second lesson, for students of secondary school age – after the third, for high school students – after the fourth lesson.

All schoolchildren should be involved in sports activities conducted during a break, as a rule, in the open air both in winter and in summer.

To ensure the effect of active breaks, it is necessary to involve the entire teaching staff of the school in their organization. This form of training, which gives the child 6 hours of additional motor activity per week,

almost does not require additional funding and staffing. But it makes sense to give an extra charge to the salary for the educational work for those, who take on the responsibility of methodical preparation of «health hours»

It is important that the recreational «hours of health» are held in outdoor sports grounds in the form of elementary active and sports games, leisure-time entertainment, and other emotionally-active exercises.

Based on our own and foreign experience, we need to specify the organizational and methodological measures for the wide replacement of schoolchildren's physical exercises by the ones conducted in the fresh air both in winter and in summer.

5. The Necessity of Radical Strengthening of Sectional Forms of Physical Education of Pupils.

It is known that, in comparison with other forms of physical education, the greatest positive effect on the physical preparedness of students is provided by classes in school and out-of-school sports sections in general physical preparedness and kinds of sport. According to our data, the physical preparedness of those who are engaged in youth athletic centers and school sports sections is much higher than that of schoolchildren who attend only compulsory physical education lessons [1; 18].

Sectional forms allow to implement an individual approach to the physical education of students, taking into account their needs, inclinations and goals, rather than equaling all to the average level. Here the developmental (training) orientation to the children's organism is appropriate. Each school together with the youth athletic centers should have a wide network of sections and groups on kinds of sport, general physical preparedness and tourism, and regularly organize sports competitions and sports festivals. In this case, children will exercise not 1–3 times a week, but 5–6 times – as much as it is necessary for the normal functioning of the child's body [6].

Additional lessons in the school sports sections out of the curriculum may be paid by the parents of the students. In this case, physical culture lessons taught by teachers and 3–4 sports classes per week will be conducted on the self–supporting basis, with the involvement of both sports volunteers and physical education teachers. It is possible to create cooperatives for sports activities with children.

The main goal is the health of children by means of everyday exercises.

There is a sense, especially in the high-school, to combine the obligatory school lessons of physical education with sectional classes, conducting them 3–4 times a week after classes on other subjects. The salary of physical education teachers should depend on the completeness of the coverage of all schoolchildren by such forms of activities. The school should have the financial resources to invite children's coaches and other assistants to help school teachers with the aim of encompassing all students with physical fitness and recreational work.

Expanding the form of physical education classes is effective only in elementary school, then it is necessary to have physical education in the form of children's sports activities outside the school schedule – in the numerous sports sections of the school. The school should become a powerful children's sports center at the place of their residence [1; 3; 19].

Expanded use of sectional forms of classes does not bind the teacher and students to the school sports base, it allows the use of sports facilities of the district (city) throughout the day.

6. The Development of a Programme of Joint Physical Culture and Sports Classes for Parents and Children.

Parents are also responsible for the physical education of the child. The way they treat physical education affects the attitude of their children toward it. First of all, parents should introduce their children to a healthy lifestyle. It is necessary to develop a program for family physical education and a regulation of the participation of parents in physical education classes.

Education of health culture should be carried out in the family continuously. In well-to-do families, neuropsychic disorders in children occur four times less frequently than in unsuccessful families, the diseases of the digestive system are 2,5–3 times less frequent; children fall ill 6 times less. The Ministry of Health of Ukraine testifies to the positive influence of the family on the formation of health of the younger generation [21].

7. The Development of a Special Physical Education Program During School Holidays.

Both the school and the family need to ensure a special activation of fitness and health recreation events with the involving of all students during school holidays. An additional fund to encourage this work can be created with the help of the parents of schoolchildren.

8. The Expansion and Modification of the System of School Competitions.

Sports competitions as one of the most effective stimuli maintaining the interest of children in sport, should become a constant part of school and extracurricular life of students.

The existing system of children's competitions does not provide the opportunity to participate for many students: talented children usually take part in competitions.

According to our data, more than 90% of schoolchildren would like to do sport systematically. We artificially restrain this desire. At the older age, on the contrary, we start to encourage people to do sport, but in most cases these efforts are unsuccessful [15].

We can talk about the formation of the need for physical self–improvement in adults, but at school age, the motivation and interest in physical training and sports come to the fore. At the same time, playing and competitive activities are the most effective means of attracting students to regular physical education and sports.

The center of competitive activity of students should be transferred directly to school, sharply limiting the number of district, city and all–Ukrainian internal competitions. The bet must be made on the system of internal competitions within the school and between neighboring schools and on the system of post sport at any level.

Every pupil of the school who has no contraindications must participate in at least two sports competitions every month. At the same time, the efforts of the school's employees should be directed towards creating the principle of «sport for all students»

After the transition of the school to a five-day work, there are enough arguments for using one free day as a «Sports Day».

9. Introduction of the Theoretical Course of Fundamental Principles of a Healthy Lifestyle in Physical Culture.

School leavers practically do not receive systematic knowledge about a healthy way of life, functions and methods of directed use of the main factors of physical culture, rational mode of work and rest, rules of toughing up etc. Such kind of knowledge should be formed during the classes of physical education. At such lessons students are given knowledge and skills of independent use of methods of physical education.

Students at school (and not only at physical education lessons) should get serious knowledge of the basic principles of hygiene, toughing up, nutrition, sexual relations, etc. In the process of physical training, special attention should be given to the ability to exercise independently.

With this in mind, it is necessary to develop a coordinated course of lectures, seminars and practical classes on human hygiene, rational nutrition, principles of a healthy lifestyle, scientific and methodological foundations of physical culture and sports, the basics of medicine and physiology.

It is advisable to invite specialists from universities and other institutions, including parents of schoolchildren, to conduct theoretical classes.

In middle school and high school students should have a theoretical lesson once a week.

The theoretical course with seminars and lectures on a healthy lifestyle will serve as the basis for out-of-school physical culture classes and will arouse schoolchildren's sustained interest in doing sports. Physical literacy of the population is possible only if we solve this issue at school age.

10. Introduction of Examinations in Physical culture.

It is necessary to clearly define the criteria for assessing the activity of the whole school staff aimed at providing fitness and health promotion in students, to improve the methods for monitoring physical fitness. The lack of adequate criteria hampers the development of school physical education to a large extent.

Evaluation of the effectiveness of physical education classes, apparently, should be the fulfillment of the requirements of the program, the dynamics of development of physical qualities and functional preparedness of students.

At the same time, it is important to introduce the official «Personal profile of a physical fitness» of students as a part of the «Health passport».

Physical education examinations should be conducted in the first, fourth, eighth, and eleventh forms on the same terms as the general subjects.

Such practice of introduction of examination certification of pupils existed in Soviet Estonia (since 1982). Since then, the attitude of schoolchildren and their parents to physical culture and sport has changed significantly and positively in this country [15].

11. Material Resources.

The new conceptual approach to problems of school physical education will require change of attitude of domestic industry to it.

It is necessary to establish a priority in the production of sports equipment and installations for schools. In the present conditions of self-financing of industrial enterprises, this task becomes more complicated.

Apparently, it is advisable to introduce state allowances for children's outfits. For the coming years, the ratio of the volume of production of children's and adult sportswear and footwear should be about 3:1 (now it's the other way around). For this purpose, taxation should be eliminated from the enterprises that produce children's equipment, installations, sports clothing and footwear.

It is necessary to legalize the deductions of a certain percentage of the profits of all industrial enterprises to the social fund for children's health and physical education.

Perhaps the creation of sports co–ops at schools will allow them to independently solve economic issues related to the expansion of the school sports base, including additional payment for teachers, coaches, volunteers, etc. Part of the profit will be deducted to the school by agreement.

It is necessary to create sports campuses at schools, equipped with elementary machines, including those made by the students themselves during home economy classes.

A good material and technical base of preschool and school institutions can be created quite effectively only by successful handling of taxation policy in the whole country. We must eliminate taxation from the funds allocated by enterprises, cooperatives, and joint ventures for the development of the sports and recreational facilities of children's institutions. Only this action will significantly improve the health of children.

12. The Involvement of Social Services, Science and Promotion in the School Physical Education. Management of the Physical Education of Students.

Over the past 20 years only 3 dissertations on physical education were written and during a 25–year period only a few major works concerning the innovative methods of physical education in schools were published [2; 5; 17].

Nowadays teachers and students need manuals which contain an interesting, and practically useful material.

One of the most important reasons for the lack of interest among adult citizens in the physical education is an unacceptably low level of organizational and educational work on the issues of the physical culture and its vital importance among school–aged children.

During the 11 years of study, children do not get interested in physical culture and sport. Of course, it is highly unlikely that this interest will emerge in adulthood.

The mass media, particularly television, should not just encourage young people to do sport, but also take an active part in organization of such specific campaigns which deal with the reform of the physical education in schools as «Sports Days», competitions «Test yourself» etc. Besides, it is very important to do it skillfully, intelligibly and excitingly [16].

Efforts for the health and physical preparedness of children should be made by non–departmental public system. The fundamental direction should be the expansion of the authority of local Councils of People's Deputies and the transfer of the management of physical education to them.

In turn, the Ministry of Health, the Academy of Pedagogical Sciences, the Ministry of Education and Science, and the State Sport Committee should build up one whole concept for the health care of children [9].

The state of health of children and adolescents, which determines the main trends in the health of the country's population, is an indicator of the most important achievements of society in the socio-economic, scientific and cultural spheres. The local Soviets of People's Deputies are the real force capable of changing the physical education of the population at the local level. At the same time, the school councils should determine a school curriculum and the place of the motor activity of students in it.

Each body of the local Soviets of People's Deputies should create a fund for the health and physical culture of children with a certain monthly deduction from state and private enterprises. It is necessary to put under the control of the local Soviets of People's Deputies the use of 3 % deductions from the residential rental payments of citizens.

Students' physical education should become a priority in our national health policy. The state should legislatively fix the need for special care for the health of the younger generation. After all, healthy children are our potential, they are the starting point of recreational activities with the whole population.

Conclusions. In this article the conceptual background of the school system reform of physical education covering a period of 30 years has been described. It was carefully studied and implemented in practice by its authors and their students, it also has to be taken into consideration while creating a new programme for general education schools in Ukraine.

We do not pretend to cover all preconditions of the school system reform: they include the need to implement programs for teaching children swimming, personnel supply problems, and so on.

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TOURISM AND REGIONAL STUDIES IN GALICIA IN THE LATE XIX AND FIRST HALF OF THE XX CENTURY

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Abstract

The purpose of the article is to highlight the general conditions and main directions of development of tourism and regional studies in Galicia in the late XIX and first half of the XX century. Author analyzes the role and contribution of individual scholars and public figures in the development of the tourist–local lore movement, starting with the activities of the members of the «Ruska trijcia». It was established that their travels were ethnographers and directed to study ethnographic and linguistic features of the region. Due to the work of I. Havryshkevich, O. Partytsky, cartography was developed, the tourist routes for the first time in the vicinity of Galicia and Lviv were described. In the course of regional travels A. Petrushevich and I. Sharanevych created the first Ukrainian museums in Lviv, an ethnographic exhibition was held in Ternopil, and since 1882 have begun excavations of the city of Galich. An important role in the development of tourism and local lore studies was played by I. Franko and V. Shukhevych.

Author pays special attention to the activities of tourist associations «Chornogora» in Stanislaviv, «Plai» in Lviv and in Ternopil. Already in the 20's of the XX century tourist studies of children and youth became an integral part of the activity of the societies «Sich», «Sokil», «Lug», «Orly» and Plast. Metropolitan Andrey Sheptytsky and historian I. Krypiakevich took an active part in popularizing and developing the tourist-local lore movement. Author asserts that the development of the tourist-local lore movement in Galicia contributed to the growth of the national consciousness of children and youth.

Key words: tourism, regional studies, tourist route, travel.

Василь Луцький, Богдан Мицкан. Туризм і краєзнавство на території Галичини (кінець XIX ст. – перша половина XX ст.). ***Мета дослідження*** – висвітлення загальних умов і головних напрямів розвитку туризму й краєзнавства в Галичині наприкінці XIX – у першій половині XX ст. Проаналізовано роль і внесок окремих науковців і громадських діячів у розвиток туристсько-краєзнавчого руху, починаючи від діяльності членів «Руської трійці». Установлено, що їхні подорожі були народознавчі і спрямовувалися на вивчення етнографічних і лінгвістичних особливостей регіону. Завдяки діяльності І. Гавришкевича, О. Партицького, розвинулася картографія, уперше описано туристичні маршрути в околицях Галичини й Львова. У ході краєзнавчих мандрівок А. Петрушевича та І. Шараневича створено перші українські музеї у Львові, відбулась етнографічна виставка в Тернополі й із 1882 р. розпочато розкопки міста Галича. Велику роль у розвитку туризму та краєзнавчих досліджень відіграла діяльність І. Франка й В. Шухевича. Особливу увагу звернуто на діяльність туристичних товариств «Чорногора» в Станіславові, «Плай» у Львові та в Тернополі. Уже в 20-х рр. XX ст. туристично-краєзнавча підготовка дітей і молоді стала невід'ємною частиною діяльності товариств «Січ», «Сокіл», «Луг», «Орли» й Пласт. У популяризації та розвитку туристсько-краєзнавчого руху брали активну участь митрополит Андрей Шептицький та історик І. Крип'якевич. Відзначено, що розвиток туристсько-краєзнавчого руху в Галичині сприяв зростанню національної свідомості дітей і молоді.

Ключові слова: туризм, краєзнавство, туристичний маршрут, подорож.

Василий Луцкий, Богдан Мицкан. Туризм и краеведение на территории Галиции (конец XIX в. – первая половина XX в.). ***Цель исследования*** – освещение общих условий и основных направлений развития туризма и краеведения в Галиции в конце XIX – первой половине XX в. Анализируется роль и вклад отдельных ученых и общественных деятелей в развитие туристско-краеведческого движения, начиная от деятельности членов «Русской троицы». Установлено, что их путешествия были народоведческие и направлялись на изучение этнографических и лингвистических особенностей региона. Благодаря деятельности И. Гавришкевича, А. Партицкого, развилась картография, впервые описаны туристические маршруты в окрестностях Галиции и Львова. В ходе краеведческих путешествий А. Петрушевича и И. Шараневича созданы первые украинские музеи во Львове, состоялась этнографическая выставка в Тернополе и с 1882 г. Начаты раскопки города Галич. Большую роль в развитии туризма и краеведческих исследований сыграла деятельность И. Франко и В. Шухевича. Особое внимание обращается на деятельность туристических обществ «Черногора» в Станиславе, «Плай» во Львове и в Тернополе. Уже в 20-х гг. XX в. туристско-краеведческая подготовка детей и молодежи стала неотъемлемой частью деятельности товариществ «Сечь», «Сокол», «Луг», «Орлы» и Пласт. В популяризации и развития туристско-краеведческого

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движения принимали активное участие митрополит Андрей Шептицкий и историк Крип'якевич. Утверждается, что развитие туристско-краеведческого движения в Галиции способствовало росту национального сознания детей и молодежи.

Ключевые слова: туризм, краеведение, туристический маршрут, путешествие.

Introduction. In the history of Ukrainian culture deep into the human mentality entrenched attraction to travel meeting with others, willing to understand the other side, join it to broaden the world of the own existence [10].

Tourism is a fun and addictive inseparable part of local history and effective means of the proper formation of the human world and roam in intimacy with the world [5].

The theoretical and methodological aspects of the tourism issue in recent years began vigorously considered and developed by many experts. It should be noted that the attention of researchers in this field are points of the histology, history, ecology, sociology, law, culture, ethics, religion, anthropology, economics and marketing, education and psychology, geography. However, the issue of tourism and local activities in the history of Galicia has still not been resolved.in recent years began vigorously considered and developed by many experts. It should be noted that the attention of researchers in this field are points of contact histology, history, ecology, sociology, law, culture, ethics, religion, anthropology, economics and marketing, education and psychology, geography and area studies. However, the issue of tourism and local activities in the history of Galicia of the first half of the XX century has still not been resolved.

Research goal – set the general conditions and main directions of tourism development and touring in Galicia in the late XIX and first half of the XX century.

Research Methods. In the work theoretical analysis and historical research method were used.

Result. Ukrainian wanderings in Galicia are beginning in the first half of the 18th century, supporting the experience of European and world tourism. A great role in its development in 20–40 years of this century was played by V. Barski, who spent half of his life in wandering and published «The pilgrimage of Vasiyl Grygorovych Barsky in the holy cities of the East, 1723–1747».

Under the influence of the teacher-traveler A. Chornocky, who was a member of the «Ruska Trijca» and the first raised the question of the organization of the scholarly wanderers and how much they wandered.

At first J. Holovatsky travelled in the summer of 1832 «carrying the seeds of the prosperity» and gathering folklore, he was not a painful effort, so that in the wanderings he knew better his nation [7, p. 84].

I. Vagylevych has travelled extensively, using every opportunity to study life and culture, making archaeological sights, folklore and ethnographic notebooks.

Thanks to the membership of the «Ruska Trijtsia», who led the regional researches, using this purpose of travel and the first, who raised the question of the ethnological travels. They travelled a lot throughout the territory of the Eastern Galychyna, North Bukovyna and Zakarpattia. The activity of the national rebirth of Galychyna has been a stimulus for the next generations of the ethnologists.

The historian and pedagogue Ilnytsky was a significant contributor to the development of the tourist movement [9]. Valuable material of the gutsul`s lifestyle, customs and nature has its column «From the Carpathian Mountains». His first trip abroad with his colleagues was done in 1844 to Hungary.

Among the famous Galychyna's researchers is I. Gavryshkievych, who in his student years (1848–1851) with his colleagues organized a multi–day tour on carts [19]. The validity of these travels is that «discovered eight summits that did not include to the catalogue «The heights of the East Galychyna and Bukovyna», which was published in Galychyna in 1863.» So, I. Gavryshkievych can be called a pioneer in the cartography.

O. Jartytski is a passionate traveller. In particular, in the summer of 1865, he accompanied by Paslavsky, D. Tanyiachkevych, I. Shandychevsky, J. Tselevych, N. Vakhninyn, participated in a week-tour through Galychyna. The materials, gathered in their trip became very important for the ethnographic, archaeological, linguistic, historical, geological studies. Patrytsky`s travel guide was published in the Journals such as «The School Newspaper», «From the life of the Volyn people», «Travel-ethnographic notebooks», «Ruins of the ancients Castles» and other. In addition, he had made a number of tourist routes in Galychyna, especially around Lviv.

In 1878 O. Patrytsky returned to the people with the suggestion that they would make up new tourist routes and study their native country, what the others European countries had done [13].

A great value in the development of the travel was made by A. Petrushevych and Prof. Sharanevych, who not only studied their country, but also «organized a sightseeing and archaeological exhibitions, which were reformed in the first Ukrainian museums in Lviv (1870), at the National House (1873) and at the

Staropigiisky Institute (1875) [2]. There is a fact, that I. Sharanevych, in 1882, assisted by the protection of the memorial's heritage, the Galych had been digging up [22]. In 1886, he created an archaeological and bibliographical exposition and the museum of Galician-Ukrainian antiquities at the National House, which was located in the Staropigiiski Institute.

On July 7, 1887, an ethnographic exhibition was held in Ternopil, where Hutsulshchyna, Pokuchia and Podillia things were presented. Firstly, after the exhibition, the photos were taken [21].

The wonderful organizer of various scientific and cognitive travels and expeditions was I. Franko. In 1883 he organized an ethnographic and statistical team, which reorganized itself in the «Team for the organization of travelling in the native country». As a result of his constant expeditions, the quantitative publications of folklore and ethnographic materials were published and also the theoretical works of ethnology and ethnography were created, which in our time have scientific and essential value.

Under the influence of his sightseeing activities on the territory of the East Galychyna in 1883–1889, there were six annual enlightenment expeditions of the youth. The descriptions of which were preserved in printed newspapers of the 80th yeas of the19th century. The first attempt to make them generalizations was made by I. Krypiakevych in his historical-geographical essay «From the essence of the local history of Galicia».

Professor V. Shuchevych was the one of the participants in Hutsul`s journey was the founder and editor of «Dzwinok», «Uchytel», co-editor «Zori», «Dila», «Ruska Chytanka» We suggest that he has released the publication of the five-chapters book «Hutsulshchyna», what has a great importance to the development of tourism and local history. He was an honour member of the Scientific Company of Taras Shevchenko, a member of the Ethnographic Commission of the Austrian Ethnographic Company and a member of the Ethnographic Company of Chechoslovakia [1].

V. Gnatiuk – secretary of scientific company of T. Shevchenko in Lviv, secretary of the Ethnographic Scientific Committee of the Company and the editor of the Editorial Office, played a great role in the development of tourism and local histoty in Galicia. He has written more than 300 works and touring interviews.

V. Gnatiuk maintained close ties with the Galicia local historians. In 1902, he and their members asked thier native citizens to collect old things, souvenirs of art and donate them to the museum, presented in the Company (founded in 1895) [20, p. 78]. In addition, the materials were donated to the Lviv museum (founded in 1886) by the company «Prosvita» [8].

The stage of the developing of Ukrainian museum's deal began on public principles in two directions: creating them at mass institutions and like an independent museum organizations. The beginning of this case was done by the Company of «Prosvita», the manager of which was K. Lankivsky.

In 1905 A. Sheptytsky was founded a Church Museum, which under the leadership of I. Svienchitski in December 1908 received the status of «Scientific Foundation», and since July 1911 was named «National» [14]. A. Sheptytsky gave the museum his personal collection of 9880 items. Among them were the manuscripts of XV–XVIII c., old prints, archives materials of XVI–XVIII c., icons, creatures of painting and graphics, things of cultural destiny. [7]. He bought a large chamber in Lviv for these treasures. At the museum, A. Sheptytsky spent 2 million krone and provided its maintenance [24].

In addition to the museums, there were expositions, especially in Stryj in 1909, the exhibition of Home Handicraft in Kolomyia [23, p. 1–11].

Considered the great value of touristic and local historic movements, the Ukrainians schools and gymnasiums began the conduction of some travels, journeys inside the native places. In 1912, a teacher of a gymnasium of O. Tsisyk with a group of the gymnasium pupils from Kolomyia, travelled from «Kolomyia, Molodiatyn, Oslal, Yaremche, Mykulychyn, up to Goverla» [25]. Beside it, some pupils get the opportunity to stay in some European countries. For example, the high school gymnasium students in Stanislav «were fortunate enough to spend a few days under the cloudless sky of Italy» [16].

On May 20, 1910 r. a General Meeting was held in Stanislav, where the Statute of the Ukrainian Tourist Company «Chornogora» was approved and the Head with its membership of the Board were elected. S. Steblytsky became its Head, and J. Trushkevych, I. Stasynets, L. Chachkovsky and J. Bilynsky –members. On June 10, 1910 the Statute of «Chornogora» Company was approved by the decision of the governor of Galychyna M. Bobrzynsky [4].

For the time of its existence the «Chornogora» led collections, conferences, walks, printed the photos of the Carpathians mountains etc. The artefacts, the touristic–sightseeing issues and other information became free for amateurs [15, p. 67]. The «Chornogora» had been worked to the beginning of World War I.

In 1920 in the East of Galicia, the touristic and local historical movements was reviving, widening and taking on more organized forms. At that time, great expansions in the country were recognized not only by

the educational organizations which dealt with tourism and studies of local history, but also the gymnastics and fire companies of the «Sokil» and «Sich» in which tens of thousands of urban youth were presented. In addition, thousands of juniors and juniors were in «Lyzhi». «Orlach» – KAUM (Catholic Action of Ukrainian Youth), and especially «Plast» [6, p. 252] also paid a great attention to the touristic and local history studies.

Active participation in increasing of the tourist's movement was conducted by the best representatives of Ukrainian intelligentsia. Thus, in spring of 1921, in Lviv professor I. Krypiakievych founded «Kruzhok» of Lviv`s amateurs. On his initiative, he organized the first wandering around Lviv and its surroundings, which had predominantly scientific character. Over time, «Kruzhok» has deluged its activities, complementing the tourist and local history studies by collecting and developing ethnographic material.

On May 30, 1922, the Company «Chornogora» was established in Stanislav, and its branch–office was founded in Kolomyia. It was headed by R. Shchypailo with M. Gorbov, who was the founder of «Plast» in Kosovo. The Head of the «Chornogora» was J. Grushkevych, and members of the office were F. Velychko, S. Nykyforak, S. Slusarchuk, S. Steblynski, L. Chakhovsky. It must be emphasized that Chakhovsky in 1925 revived the research on Galych. J. Pasternak mentioned that Chakhovsky was a «hot amateur-archeologist» [17].

The main goal of the «Chornogora» Company were: 1) studing of the Carpathians; 2) collecting and extension of the landscape–nature of the city of the country, 3) exploration and protection of the historical cultural and natural memorial; 4) collecting and preserving the ancient objects, the the national art things and the hand-crafts.

In order to reach the cell, the company organized collections, reports, joint tourist trips, theoretical and practical experiences with young people, maintained a professional library with special tourist literature, maps, diagrams, scientific articles and descriptions of tourist routes, led the publishing business.

In October 1924 in Lviv was founded a local-history travelling company called «Play». On 15th of November a Statute was approved and it envisaged the expansion of the «Play» for all territories.

The company formed some commissions (lecturing, travelling, and hiking). The first Head of the company was V. Starosolsky. The company «Play» had refined the plans of touristic-touring and historic-local works and the tasks that set the route of travels and propaganda of tourism. In addition, it convened general collections, conferences, recorded the essential memorials of the country, made up tourist routes in Galychyna. In 1925 the magazine «Tourism and local history» (supplement to the daily newspaper «Sprava») was issured, and in 1937, «Nasha Batkivshchyna» printed articles, schemes of tourist routes and descriptions of wanderings [12].

In 1925 in Ternopil was founded a tourist-local history company, which has its own filials in other cities. The task of this company was to get acquainted with the history and the nature of Ternopil's region.

The central office was located in Ternopil with its sections such as tourist and excursion, nature protection, ancient care, local history and other. This company played a great attention to the tourist-local history propaganda, organized and led trips and wanderings, protected nature and ancient things, small museums and libraries, the buro of the touristic equipment. Beside this company published different maps, guides and literature on tourist and historic topics.

The company held hostels in Ternopil, Chortkov, Zalishchyki, Terebovlia, Berezhany, Buchach, Krywch and other towns, where paid services (accommodation, meals, tours, transport services etc.) [18].

All tourist companies gave local touring teams and researches in the task of collecting folklore, ethnographic descriptions, drawings, photographs and old-fashioned things, so donated them to museums, especially for Kolomyiski Museum «Hutsulshchyna», founded in 1926, for the museum «Boikivshchyna» in Sambir (1927), Museum Stanislavsky, which began its work in 1928, the Museum Yavorivshchyna in Yavir (1931), Verchovyna Museum in Stryj (1933) and the Sokalshchyna Museum in Sokal (1937). By 1937, there were formed 12 Ukrainian museums in Galychyna where 20 full-time workers worked.

Conclusions. The most popular forms of tourist and local history work were wanderings, trips, expeditions, unions, competitions etc.

The tourist-local history movement had the influence on the formation of personalities, contributed to the development of tourism, the emergence of new tourist unions in youth sports companies and the growth of their members.

The priorities of tourist-local history in Galychyna were: acquaintance with the spiritual and cultural heritage of the Ukrainian people and its historical past; restoring Ukrainian youth to socioeconomic employment; national-patriotic education; preparation for the national-liberal struggle for Ukraine's independence, formation of national consciousness and Christian morality.

Thus, the tourist-local history movement with its character and content was a progressive social-historical phenomenon. It had the great impact on a rejuvenation of young people to the process of national-cultural revival of the country, preparation for national-liberal struggle, raising of cultural-educational work and national consciousness among the people in the Galicia region.

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CONSIDERATION OF THE SOMATOTYPE IN THE DEVELOPMENT OF PRIMARY TEACHING SWIMMING METHODS OF CHILDREN

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Abstract

The study reveals the issue of studying the physical development and a somatotype of a child to develop a methodology for initial swimming training in open water bodies. The following methods are used in the work: analysis and generalization of literary sources, medical-biological methods (anthropometric), pedagogical observation, methods of mathematical statistics with using «Excel 2000». The buoyancy of primary school children was diagnosed in real conditions of swimming training lessons with two tests: horizontal and vertical. The survey sample consisted of children aged 8–9, out of which there were 15 girls and 14 boys. They were at «Swimming school» in Kherson during June 2016. All children were able to swim. An individual assessment of the degree of anthropometric development indicators using centimetric tables revealed that children with an average level of physical development predominated in two sexually active age groups, but there was a significant percentage of children with a low level of physical development.

In the course of the study, it was discovered that boys and girls of hypersthenic somatotype had high level in two exercises; children of primary school age of normostenic and asthenic somatotype had less buoyancy. The analyzed values of the correlation coefficients indicated that there was an insignificant connection between height and buoyancy. The study observed the relationship between the indicators of body weight and the result of buoyancy test. The most significant relationship wass between the result of the chest volume and the result of the buoyancy tests.

Key words: swimming, buoyancy, physical development, somatotype, primary school age.

Ольга Ображей. Урахування соматотипу в розробці методики початкового навчання плавання дітей. У дослідженні розкрито питання врахування фізичного розвитку та соматотипу дитини для розробки методики початкового навчання плавання на відкритих водоймах. У роботі використано такі методи: аналіз й узагальнення літературних джерел, медико-біологічні методи (антропометричні), педагогічне спостереження, методи математичної статистики із застосуванням програми «Excel 2000». Плавучість дітей молодшого шкільного віку діагностували в реальних умовах проведення навчальних занять із плавання двома тестами – горизонтальним і вертикальним. Обстежуваний контингент склали 29 дітей віком 8–9 років, які перебували в «Школі плавання» м. Херсона у 2016 р. протягом червня місяця. Усі діти вміли плавати. Індивідуальна оцінка ступеня розвитку антропометричних показників із використанням центильних таблиць виявила, що у двох статевовікових групах переважають діти із середнім рівнем фізичного розвитку, але спостерігали наявність значного відсотка досліджуваних із низьким рівнем фізичного розвитку.

У ході дослідження виявили що високий рівень із двох вправ отримали хлопчики й дівчатка гіперстенічного соматотипу, діти молодшого шкільного віку з нормостенічним та астенічним соматотипом мають меншу плавучість. Проаналізовані значення коефіцієнтів кореляції свідчать про наявність незначного зв'язку між зростом і плавучістю. У ході дослідження помічено зв'язок між показниками ваги тіла та результатом тесту на плавучість. Найбільш істотні взаємозв'язки простежили між результатами об'єму грудної клітини та тестів на плавучість.

Ключові слова: плавання, плавучість, фізичний розвиток, соматотип, молодший шкільний вік.

Ольга Ображей. Учет соматотипа в разработке методики начального обучения плаванию детей. В исследовании раскрываются вопросы изучения физического развития и соматотипа ребенка для разработки методики начального обучения плаванию на открытых водоемах. В работе использованы такие методы, как

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кое

наблюдение, методы математической статистики с применением программы «Excel 2000». Плавучесть детей младшего школьного возраста диагностировалась в реальных условиях проведения учебных занятий по плаванию двумя тестами горизонтальным и вертикальным. Обследуемый контингент составили 29 детей в возрасте 8–9 лет, которые находились в «Школе плавания» в Херсоне в 2016 г. в течение июня месяца. Все дети умели плавать. Индивидуальная оценка степени развития антропометрических показателей с использованием центильних таблиц позволила определить, что в двух половозрастных группах преобладают дети со средним уровнем физического развития, но наблюдается наличие значительного процента детей с низким уровнем физического развития.

В ходе исследования обнаружено, что высокий уровень из двух упражнений получили мальчики и девочки гиперстенического соматотипе, дети младшего школьного возраста с нормостеническим и астеническим соматотипами имеют меньшую плавучесть. Проанализированы значения коэффициентов корреляции, свидетельствующих о наличии незначительной связи между ростом и плавучестью. В ходе исследования замечается связь между показателями веса тела и результатом теста на плавучесть. Наиболее существенные взаимосвязи между результатами объем грудной клетки и тестов на плавучесть.

Ключевые слова: плавание, плавучесть, физическое развитие, соматотип, младший школьный возраст.

Topicality. The education of a healthy generation with harmonious development of physical and spiritual qualities is one of the main tasks of modern society. Human health is the highest value in any society based on humanistic and democratic principles, the most important property of the state, it is an indisputable priority, a guarantee of vitality and progress of society [1; 2; 3]. Together the quantitative and qualitative display of physical development level, the relationship between the sizes and the intensity of their growth, like other somatometric features reflect the phase development and maturity level inherent in every stage of ontogenesis [1]. Physical development is one of the factors that determines the success of the development of motor activities in swimming [5]. Considering it as a morpho–functional state of a person, one should pay attention to the features that predominate in the pedagogical process of studying swimming. Anthropomorphological features of a human structure are an important precondition for effective mastering of swimming skills. However, data on the influence of anthropometric indicators on the ability of learning swimming is controversial. M. O. Bernstein points out that «... each body type, his muscles, and especially the structure and the degree of development of its brain levels are so diverse and unique that even when the skill is mastered in general, each student is very much attributed to the motor part of the skill to his personal characteristics». Therefore, the issue of studying the physical development and the somatotype of a child is still relevant to develop a methodology for initial swimming training in open water bodies [6].

The purpose of the study: to study the somatotype as a part of the methodology of primary teaching swimming.

Materials and methods of research: The survey sample consisted of 29 children aged 8–9, out of which there were 15 girls and 14 boys. They were at «Swimming school» in Kherson during June 2016. All children were able to swim.

The following methods are used in the work: analysis and generalization of literary sources, medical-biological methods (anthropometric), pedagogical observation, methods of mathematical statistics with using Excel 2000. Anthropometric measurements (body length, body weight, and chest perimeter) were performed to determine the level of physical development of primary school age children. The value of each obtained indicator was estimated by comparing the actual value of each three indicators of physical development with the norms of the relevant standard according to the assessment tables of the centimetric type [1; 4]. Based on the data, the level of physical development was stated. Children with body length, body weight and perimeter of the chest in the range lower than average, average and above average obtained the evaluation of «harmonious development». The second values were evaluated as disharmonious: low or high growth, deficiency or excess weight. Diagnosis of somatotype was carried out according to the method of M. V. Chernorutsky [1; 2; 4]. According to the index of physical development – the Pinyu index (PI), the children were divided into somatotypes: asthenic with PI> 30, hypersthenic with PI <PI and normosthenic type at 10 <PI <30. Statistical data processing and the estimation of the probability of differences between the indicators were performed using Student's t-test for unequal number of observations. The buoyancy of the primary school children was diagnosed with two tests: horizontal and vertical [5; 6]. The first is the ability to lie on the water «Zyrochka». We offered the child to perform the exercise: to take a deep breath, to put arms and legs apart, to lie on the water on the chest immersing the face in the water, to hold the breath, to lie on water to the teacher's commands (count up to 7–9). The low level was reached by the children that breathed in, tried to lie on the

water, but were afraid to get their feet off the bottom of the reservoir, to lower the whole face in the water. The children who breathed in, lay on the water, but fixed the pose «Zyrochka» for a short time (count up to 3–5) or did it wrong, got the average level.

The high level was received by children who breathed in, lay on the water, fixed the pose «Zyrochka» correctly for a long time (count up to 7–9). When performing the second test, the child on a full breath gradually plunged into the water vertically with the hands raised up. The high level of buoyancy was characterized by immersion, in which the elbow joints at its end point were at the surface of the water, the average level was characterized by immersion, in which the bristles were above the water, the children who received a low level were immersed completely on the bottom of the river. All tests were carried out with safety precautions and under the supervision of two swimming instructors, a lifeguard and a nurse.

The Results of the Study. Indicators of length and body weight, chest circumference and their ratio to a certain extent predetermine such hydrodynamic qualities as body balance in water, buoyancy, streamlining. In its turn, the body weight is in close correlation (r = 0,84) with hydrodynamic resistance [6]. Transverse body sizes also affect the value of water resistance. Scientists emphasize the importance of body building (somatotype) in the process of teaching swimming [5]. This is due to differences in the manifestation of motor skills of a person depending on the somatotype. It should be noted that the proportions and constitutional features of the body structure have an effect on the kinematics of human movements through the spatial organization of the bio chains in the process of mastering the motor skills (A. N. Laputin, V. L. Kashuba). In swimming we are dealing with the process of spatial organization of movements in an environment that is radically different in its properties from the everyday human environment. It also requires pedagogical attention in the teaching process [5; 6].

The analysis of the results of anthropometric measurements showed that the growth rates of the surveyed girls and boys of 9 years old did not differ significantly and were: the boys of 9 years old 132,5 ± 1,61 cm and the girls 133,3 ± 2,20 cm. Such results are estimated according to the table of standards as the average development level of primary school children. Indicators of body weight of 9 year –old boys are 29,5 ± 1,65 kg, and the girls of 9 years old are 29,5 ± 1,65 kg, which correspond to the average physical development level of primary school children. The measurement of body weight revealed that, both girls and boys indicators correspond to the average level of physical development of primary school children. The results of the measurements of the chest perimeter of 9 year-old children correspond to the average level of physical development of primary school children and were 66,4±1,20, and 9 year-old girls were 63,9±1,57 cm. Analysis of results of anthropometric measurements are shown in table 1.

Table 1

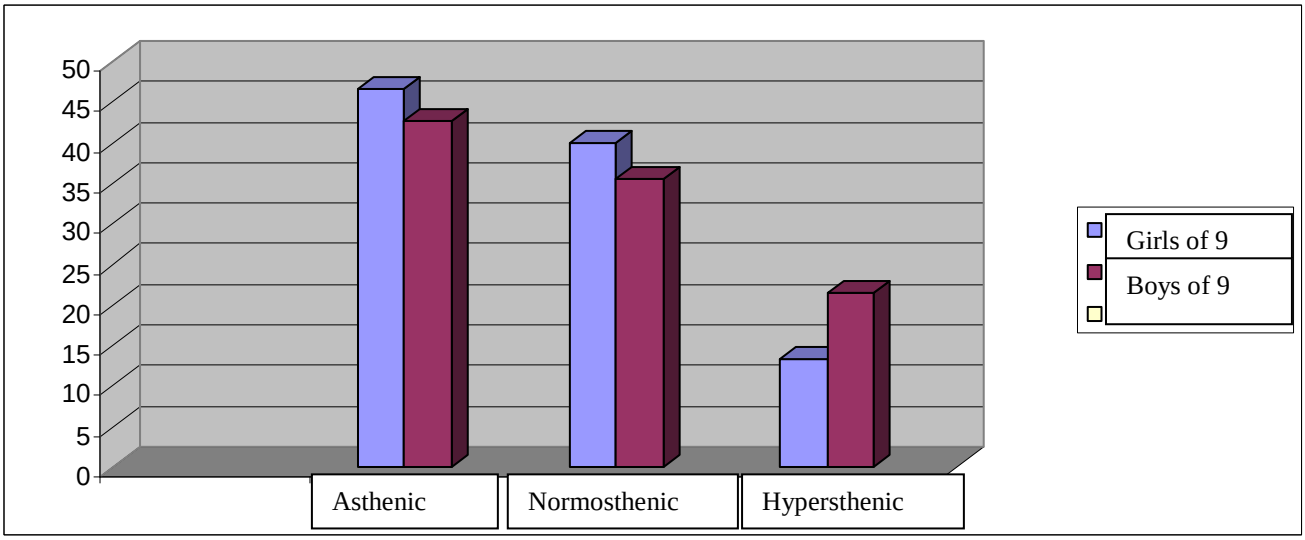
Somatometric Indicators of Primary School Children

Age	Sex	Body Weight	Length Body	Chest Circumference
8–9	B	29,5±1,65 (13,8)	133,3±2,20 (4,4)	66,4±1,20 (5,1)
	G	30,3±1,73 (5,3)	132,5±1,61 (1,2)	63,9±1,57 (2,3)

An individual assessment of the development degree of anthropometric indicators using centimetric tables revealed that the children with an average level of physical development predominated in two age groups, but there was a significant percentage of the children with a low level of physical development.

Thus, 86,6 % of the girls and 85,7 % of 9 year'old boys had harmonious physical development. 13,4 % of the girls and 14,2 % of 9-year-olds had disharmonious development.

The study of anthropometric profile of 9 year-old children allowed to identify three main somatotypes.



Pic. 1. *Percentage of 9 Year old Boys and Girls Somatotypes*

At the age of 9, 42,8 % of the boys had asthenic somatotype and 35,7 % had normosthenic, 21,5 % – hypersthenic. The girls of 9 years old had such somatotypes: 46 % asthenic, 40,5 % normostenic and 13,5 % hyperesthenic. At the age of 9 the growth rates prevail over body weight, so at this age the children of asthenic somatotype predominate. The results of the somatotype study of 9 year-old children are shown in pic. 1

To determine the buoyancy level of the primary school children, two common tests have been suggested [5]. The results of the tests are shown in table 2.

Table 2

The Result of the Buoyancy Tests in the Percentage of 9 Year-old Children

Nameof Buoyancy Tests	**Sex**	**Level, %**		
		High	Medium	Low
Horizontal	Boys n–14	28,5	50	21,5
	Girls n–15	26,7	53,3	20
Vertical	Boys n–14	28,5	57,2	14,2
	Girls n–15	26,6	46,8	26,6

A high level of two exercises had boys and girls of the hyperesthenic somatotype as found in the study. The results of buoyancy tests in the percentage ratio of somatotypes of 9 year–old children are given in table 3 and table 4.

Table 3

Test Result (Vertical) of Buoyancy in the Percentage of Somatotypes of 9 Year-Old Children

Name of the Somotype	**Girls**			**Boys**		
	High Level	**Medium Level**	**Low Level**	**High Level**	**Medium Level**	**Low Level**
Asthenic	28,5	42,8	28,5	16,6	66,6	16,6
Normosthenic	16,6	50	33,3	20	60	20
Hyperesthenic	50	50	0	75	25	0

The study found out that the children of primary school age with normosthenic and asthenic somatotype had less buoyancy. The highest percentage of the children who received the average level was one with asthenic somatotype (66,6 % of the boys). The highest percentage of the children who received a low level was the children with normosthenic somatotype (33,3 % of the girls).

Table 4

Test Result (Horizontal) of Buoyancy in the Percentage of Somatotypes of 9 Year-Old Children

Name of the somotype	Girls			Boys		
	High level	Medium level	Low level	High level	Medium level	Low level
Asthenic	14,3	57,2	28,5	16,6	50	33,4
Normosthenic	33,3	50	16,7	20	60	20
Hyperesthenic	50	50	–	75	25	–

The study allowed us to determine whether there is a correlation between growth rates, indicators of body weight, chest circumference and the results of buoyancy tests for the children of 8–9 years old.

Analyzing the values of correlation coefficients, it can be seen the slight connection between growth and buoyancy. Thus, the correlative connections are revealed between the growth and the result of the buoyancy tests (r = 0,6). There was also a link between the body weight and the result of the buoyancy test. The relationship between these indicators is (r = 0,7), which also indicates the average level of correlation. The most significant interconnections were traced between the result of the chest volume and the result of the buoyancy test. Their relationship is (r = 0,8), that indicates a high level.

The study clarified and confirmed that the children of primary school age with normosthenic and asthenic somatotype have less buoyancy. This can be explained by the fact that in a proportional way, muscle and bone mass prevail over fat mass. Muscles and bones have more buoyancy than water (i.e. heavier than water). It is difficult for them to stay afloat without moving, but they can easily develop speed and move in the water. It is also easy for them to maintain a balance in water. Swimming lessons of this type are most suitable in deep water [2].

It is found out that somatotype should be taken into account while developing water exercises. It is necessary to apply different positions of the body in order to allow children feel comfortable while exercising. The exercises, that require maintaining the horizontal position of the lower part of the body, will be inconvenient to perform for people with normosthenic type of body. They will have to make more efforts to keep the legs afloat. It is recommended to offer them the exercises that require a vertical position of the body. Horizontal position in the water is more natural for hypersthenetic somatotype. Lessons in a vertical position are less natural, when exercising they need to strain the abdominal muscles more strongly.

It is found out if fat accumulation is mainly found in the lower part of the body, the legs and hips become more buoyant. Thus, these children are easily kept on the water in a horizontal position. When fat accumulation is in the upper part of the body, the torso area becomes more buoyant, so it's easier for such children to stay in the water in a vertical position. The best buoyancy for the children of hypersthenetic somatotype leads to a problem of balance or maintaining a fixed position in the water. Therefore, the exercises that cause the perturbation of the wave, need to be transferred to «shallow water». It should be remembered that when exercising on «shallow water» a big burden will affect the joints. This requires adjustments to the training process.

Therefore, it is necessary to offer different positions that are appropriate for each type of buoyancy [2; 5; 6].

Conclusions and prospects for further research: An individual assessment of the development degree of anthropometric indicators using centimetric tables revealed that children with an average level of physical development predominate in two age groups, but there was a significant percentage of children with a low level of physical development.

The analyzed values of the correlation coefficients indicate that there is a slight correlation between growth and buoyancy. In the course of the study, there was a correlation between body weight and the result of a buoyancy test. The most significant interconnections were traced between the result of the chest volume and the results of buoyancy tests. Due to the study a high level of two exercises had the boys and girls of the hyperesthenic somatotype; the children of primary school age with normosthenic and asthenic somatotype had less buoyancy.

The prospect of further research is seen in the development of a method of accelerated swimming training for children in open water reservoirs based on the somatotype.

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OLYMPIC EDUCATION AS AN IMPORTANT COMPONENT OF A COMPREHENSIVE CURRICULUM ON PHYSICAL CULTURE

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Abstract

Topicality. The Olympic education of youth is one of the most important components in the formation of a harmoniously developed personality, the development of feelings and attitudes, habits of behavior, based on the Olympic principles, the Olympic values and the Olympic ideal. ***Task.*** To study the content component of the Olympic themes in the comprehensive curriculum on physical culture. ***Methods.*** Analysis of literary sources, method of comparative analysis, methods of theoretical interpretation. ***Results.*** The results of our research have made it possible to find out the importance and necessity of studying the Olympic theme information by schoolchildren. ***Conclusions.*** Olympic education plays an important role in the process of teaching physical education. Students engaged in sports must learn to constantly strive for self-improvement, to work daily on the development of their spiritual, mental, volitional and physical abilities.

Key words: Olympic education, curriculum, physical culture, general educational institutions.

Віра Ткачук, Ірина Турчик, Роман Чопик, Лариса Козіброда, Марія Чемерис. Олімпійська освіта як важлива складова частина загальноосвітньої навчальної програми з фізичної культури. ***Актуальність.*** Олімпійська освіта молоді – одна з найважливіших складових частин у формуванні гармонійно розвиненої особистості людини, розвитку почуттів і ставлень, звичок поведінки, що ґрунтується на олімпійських принципах, олімпійських цінностях й олімпійському ідеалі. ***Завдання статті*** – вивчити змістовий компонент олімпійської тематики в загальноосвітній навчальній програмі з фізичної культури. ***Методи*** – аналіз літературних джерел, метод порівняльного аналізу, методи теоретичної інтерпретації. ***Результати.*** Результати проведеного нами дослідження дали змогу з'ясувати важливість і необхідність вивчення школярами інформації олімпійської тематики. ***Висновки.*** Олімпійська освіта посідає важливе місце в процесі навчання фізичної культури. Учні, які займаються спортом, мають навчитися постійно прагнути до самовдосконалення, повсякденно працювати над розвитком своїх духовних, розумових, вольових і фізичних здібностей.

Ключові слова: олімпійська освіта, навчальна програма, фізична культура, загальноосвітні навчальні заклади.

Вера Ткачук, Ирина Турчик, Роман Чопик, Лариса Козиброда, Мария Чемерис. Олимпийское образование как важнейшая часть общеобразовательной учебной программы физической культуры. ***Актуальность.*** Олимпийское образование молодежи – одна з главных частей у формировании гармонично розвитой личности человека, развитие чувств и отношений, привычек поведения, основанный на олимпийских принципах, олимпийских ценностях и олимпийском идеале. ***Задания статьи*** – изучить содержательный компонент олимпийской тематики в общеобразовательной учебной программе по физической культуре. ***Методы –*** анализ литературных источников, метод сравнительного анализа, методы теоретической интерпретации. ***Результаты.*** Результаты проведенного нами исследования позволили выяснить важность и необходимость изучения школьниками информации олимпийской тематики. ***Выводы.*** Олимпийское образование занимает важное место в процессе обучения физической культуре. Ученики, занимающиеся спортом, должны научиться постоянно стремиться к самосовершенствованию, повседневно работать над развитием своих духовных, умственных, волевых и физических способностей.

Ключевые слова: олимпийское образование, учебная программа, физическая культура, общеобразовательные учебные заведения.

Introduction. In Ukraine, which is an important part of the international Olympic movement, the idea of dissemination of knowledge of the Olympic theme became widespread in the late XX – early XXI century. In the researches of M. Bulatova, B. Vedmedenko, V. Draghi, K. Kozlova, V. Platonova, N. Turchyna and others it is noted that awareness rising in the Olympic movement is aimed at solving a certain contradiction between

high level of development of sport and low level of physical culture, knowledge about the Olympic ideal and the values of Olympism among pupils and students.

In the works of Ukrainian and foreign scientists M. Antipova, C. Vysotsky, A. Efimova, E. Kulinkovych, M. Kobrynskyi, S. Stepaniuk, L. Suschenko and others it is stated that the increase in knowledge of the Olympic theme is also intended to solve one of the actual problems of the physical culture – to increase the interest of children and young people in exercising physical activity, which is the basis of health, physical development, motor activity and healthy lifestyle.

In the researches of S. Bubka, M. Bulatova, A. Vatseby, E. Vil'chkovsky, O. Deminsky, M. Zubalij, V. Yermolova, Yu. Shanin and others it is determined that the Olympic education is based on the concept of Olympism, which is a kind of philosophy of life that exalts and unites in the harmonious whole the highest qualities of spirit, will, soul, mind and body, forms respect for universal fundamental ethical principles and places physical culture and sport to serve the harmonious development of a person. A young person who is systematically engaged in physical education and sports is distinguished in the educational or work activity by a high sense of responsibility, ability to use time rationally, find adequate solutions, successfully communicating with his colleagues, active social position in the group and society in general [9].

We note that Pierre de Coubertin has repeatedly emphasized that the concept of Olympism should take a worthy place in educational and upbringing programs of all countries of the world. This Pierre de Coubertin's position generally defined a positive attitude towards the philosophy of Olympism and, consequently, the Olympic education of the other presidents of the IOC, especially former President Juan Antonio Samaranci. During his leadership of the IOC (1980–2001) he made a number of attempts to popularize the Olympic sports and the development of the Olympic education and upbringing system. It is worth pointing out that during his leadership of the International Olympic Committee, Juan Antonio Samaranci repeatedly emphasized «... the need to intensify the process of Olympism learning, which content is to spread cultural, aesthetic and educational principles, values of Olympism among different segments of the population…» [1; 8].

The results of numerous studies in the field of Olympic sports confirm that the study on the history and specifics of the Olympic movement, its principles, values, organizational, legal and economic foundations, the theory and practice of training sportsmen to the Olympic Games, the place in modern social life has a remarkable educational and upbringing importance in the development and formation of a person [7].

Therefore, the Olympic education is a pedagogical process of mastering and getting knowledge of the Olympic themes, Olympic values, principles, Olympic ideals, norms and requirements presented in the Code of Honor of Olympian of Ukraine [6]. According to these requirements students who go in for sports must learn to constantly strive for self-improvement, persistently go to the conquest of the heights of the skill of the future profession and work daily on the development of their spiritual, mental, volitional and physical abilities. These students must remember that they are in constant moral debt to their parents and therefore they must respect, appreciate, take care of them in all ways, and enrich the glory of their pedigree. They have to live, study and train with great faith and awareness of the selection of their land, their people, their Homeland, to love and honor them and to do their best for the good of their development and prosperity. They also have to remember that their native land, the evolutionary heritage of the Motherland give them the opportunity to reach the peak of their athletic skills, temper their character, strengthen their health and lead a healthy lifestyle.

That is why we have set ourselves the ***goal*** to study the content component of the Olympic theme in the comprehensive curriculum on physical culture.

Material and Methods of Research. The theoretical basis of the research is modern works on the Olympic sport and physical education (S. N. Bubka, M. M. Bulatova, L. V. Volkov, S. I. Gus'kov, T. Yu. Krutsevich, V. M. Platonov and others).

Methods of research – *theoretical*: studying and analysis of scientific sources on the problem of research, normative and program documents, comparison, systematization, classification, generalization of the obtained theoretical and experimental data in order to study the essence and structure of the Olympic education of students.

Research Results. It should be noted that in approved curricula for secondary schools on physical culture it is stated an important fact that since the beginning of the 5th form, the Olympic topics are in the first section (Educational priority material) (table 1) [3; 4].

Table 1

Theoretical and Methodological Knowledge of the Olympic Topics in the Curricula on Physical Culture for Secondary Schools (2005, 2009, 2017)

Form	Theoretical and Methodological Knowledge		
	2005 p.	2009 p.	2017 p
5		Physical education in Ancient Greece.	Kind of sport and the Olympic principle of «Fair Play». Physical education in Ancient Greece.
6	Physical education in Ancient Greece.	Olympic Games in Ancient Greece.	Olympic Games in Ancient Greece.
7	Olympic Games of Ancient Greece.	Revival of the modern Olympic games	The revival of the modern Olympic games
8	The revival of the modern Olympic games	The main values of Olympism. Famous sports achievements of olympians.	Famous sports achievements of olympiads. The main values of Olympism.
9	Humanistic ideals of Olympism.	Olympic Ukraine	Olympic Ukraine. National Olympic Committee of Ukraine.

Therefore, the introduction into the curriculum of theoretical and methodological knowledge of the Olympic theme necessitates the development of approaches to the formation of the national system of the Olympic education, the practical implementation of which is carried out both at physical education lessons, and in extracurricular sports-mass work, based on the use of various forms.

Thus, all the above-mentioned allows to conclude that in foreign countries, the Olympic education is actively being implemented into the school educational process. The analysis of special literature has showed that the Olympic education in schools is implemented in various forms, in particular, the Olympic Day, the Olympic Week; making Olympic symbols by schoolchildren; contests of drawings on the Olympic theme; holidays on sports and Olympics; design of stands and photo showcases on the Olympic theme; design of stands to honor the students who successfully combine studying and sports; quizzes on the Olympic theme; meetings with famous athletes, participants in the Olympic Games, coaches of national teams; the «Small Olympic Games» with using the Olympic attribute, etc.

The importance of implementation of the Olympic education into the educational process of students is conditioned by the fact that it is carried out in conjunction with the intellectual development of a personality, the formation of his ethical, moral and volitional qualities. In the complex, they form the spiritual sphere of the human personality and in the process of his development, an Olympic culture is gradually formed (pic. 1).

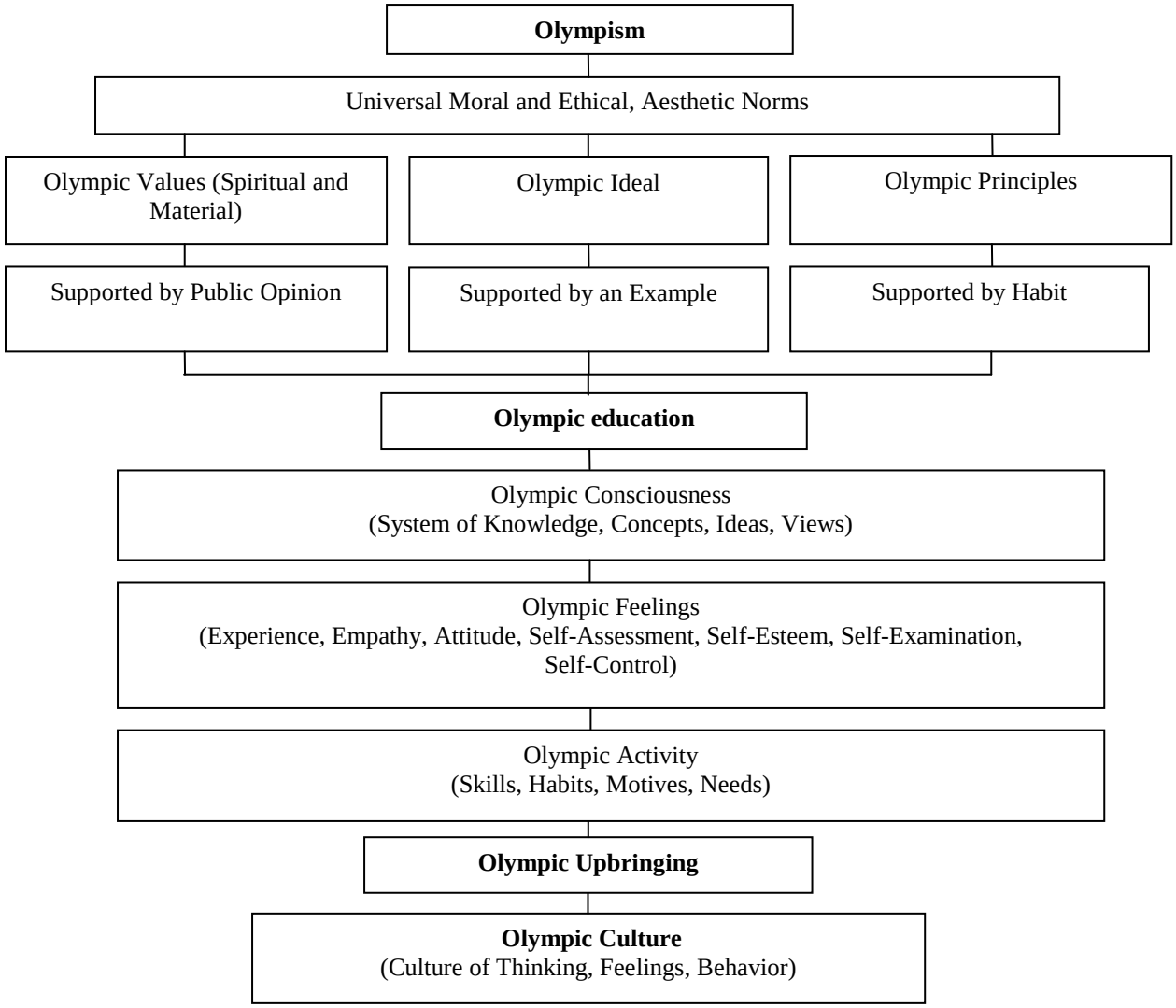
The content of the system of the Olympic knowledge, concepts, ideas, views is defined as universal norms and features of social relations, when there is

awareness (self-awareness) of a person himself as a person, his place in the social activity of people. The basis of the Olympic identity of the person constitutes the belief in his own attitude to them and the teacher`s task is to bring the generally accepted norms of human behavior in a society to the consciousness of students, promote quality and deep assimilation. At each stage of personality development the process of improving consciousness is carried out (self-consciousness - the central psychological process of transitional age).

So, in the formation of the correct understanding of the Olympic values, Olympic principles and the Olympic ideal, the main role is devoted precisely to the Olympic education. However, we think that it should not be limited only to providing people with knowledge of the laws of the development of the Olympic movement. But the Olympic education is not completed even by the highest level of understanding and gaining knowledge because the student can well master the necessary amount of scientific knowledge, but does not make the worldview and moral conclusions that follow them. He strives to behave in accordance with the requirements of the universal moral norm, but he lacks the power of will and appropriate skills. That is why, in our opinion, the Olympic education is intended to enrich and improve the Olympic thinking, memory and presentation.

The Olympic thinking manifests itself in the ability to use the learned concepts without distorting their essence, to clearly reconcile them with behavior.

In our opinion, the achievement of this is one of the important tasks of the Olympic education, because it is the memory that provides an understanding of social responsibility. He, who is indifferent to everything that is done before him and for him, has no sense of gratitude to the one who created the modern conditions of work and life.



Pic. 1. **The System of Olympic Education**

First of all, the Olympic imagination manifests itself in the ability to imagine as if from the side, how honest, fair, principal and humane your act is, that is, at the level of your imagination to evaluate it, to warn yourself and others against the wrong step.

Feelings occupy an important place in the students` activities. They are a form of experience of person's attitude to the objects and phenomena of reality, which are marked by relative constancy. Formation of feelings is an important condition of the man`s development as a personality. It is not enough to have only knowledge, motives, ideals, norms of behavior to control the person. First of all knowledge must go through the emotional sphere, that is, it must be experienced and we believe that only when knowledge becomes the subject of stable feelings, it becomes real incentives for active activity.

In the process of forming a personality, feelings are organized into a hierarchical system, in which some of them occupy a dominant position, others - remain potential, unrealized. The content of the dominant feelings determines one of the most important characteristics of the personality orientation. A special group is the Olympic feelings. First of all they are feelings of joy to life, the relation of man to man as to himself, feelings connected with activity (purposefulness, perseverance), aesthetic feelings (perception of beauty in movements, sense of beauty). On this basis, a person forms patriotism, a joy of work, a sense of duty, conscientiousness. One of the main human qualities is the experience of an individual which does not remain unnoticed by other people, namely: mutual understanding, empathy, compassion, complicity (the expression of mutual support, mutual assistance), without which it is impossible not only collective, but also individual existence.

It is worth mentioning that the Olympic rules are applied, when from the state of knowledge and awareness, they become virtually digestible and automatically adhered to. That is why in the Olympic education, great importance should be given to training in the mastering of Olympic standards, the development of the Olympic skills. So, the Olympic standards of a person are showed in his activity and attitude which actually motivate his activities. In the process of the activity they fix the Olympic knowledge, which turn into abilities, skills, feelings, form the usual rules of behavior, the need to act in accordance with generally accepted norms of behavior. Behavior in accordance with the Olympic norm is perceived by the person as the only possible for him, expressing the very essence of his personality. This behavior enables the person to maintain a positive attitude toward his and general emotional well-being.

The system of the Olympic education leads us to one of the generalized final results – the Olympic education and the Olympic culture of the individual, which is an integral unity of the elements and embraces the culture of Olympic thinking, feelings, compassion, empathy, a culture of behavior that characterizes the concrete way of exercising thoughts and feelings in practice, the level of their transformation into the daily norm of the act. The Olympic culture of the personality is a peculiar characteristic of his development, which reflects the level of assimilation the moral experience of society, the ability to organically and consistently implement moral values, norms and principles, readiness for constant self-improvement.

Conclusions and Perspectives of Further Research. Thus, all of the foregoing makes it possible to conclude that the Olympic education plays an important role in the process of teaching physical education – this is the pedagogical process of mastering, the acquisition of knowledge of the Olympic theme, Olympic values, Olympic principles, norms, according to which, sports students have to learn constantly strive for self-improvement, work daily on the development of their spiritual, intellectual, volitional and physical abilities. Our research does not cover all aspects of this problem. Among the further promising areas, we will note the study on the content, structure, tasks, principles of the Olympic education of preschoolers, schoolchildren and students, training of personnel for implementation of Olympic education programs, promotion of Olympism and the ideals of the Olympic Movement; the involvement of Olympians and veterans of sports for educational work among children and youth, etc.

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MODERNIZATION OF PHYSICAL EDUCATION OF STUDENTS BY MEANS OF CHOREOGRAPHY ON THE BASIS OF AN INTEGRATED APPROACH

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Abstract

To uncover the peculiarities of modernizing the physical education of students through the search for an effective technology of education and education by means of choreography on the basis of an integrated approach. The interest of scientists in solving the problem of integration of choreography in physical education has been revealed, but one should note the lack of scientific methodological developments in this direction. It is suggested to use choreography in the physical education of students on the basis of an integrated approach, which is aimed at motivational-value attitude to physical education and sports activities, orientation to physical perfection, mastering of the system of knowledge, skills and abilities from physical culture and choreography. The results of the research showed significant changes in the indicators of physical preparedness, physical health, theoretical preparedness, which occurred during the pedagogical experiment. It is proved that dance movement is an effective means of training the human body and can be effectively used in modern effective teaching and learning technologies that solve the problems of physical and intellectual development of students, meet the need for motor activity, and form a sustainable motivation to engage in physical education.

Key words: choreography, physical education, modernization, students, integral approach.

Наталія Чупрун. Модернізація фізичного виховання студенток засобами хореографії на основі інтегрального підходу. У статті зроблено теоретичний аналіз й розкрито особливості модернізації фізичного виховання студенток за допомогою пошуку дієвої технології навчання й виховання засобами хореографії на основі інтегрального підходу. Виявлено зацікавленість науковців у розв'язанні проблеми інтеграції хореографії у фізичне виховання, однак потрібно відзначити недостатність науково-методичних розробок у цьому напрямку. Запропоновано використовувати хореографію у фізичному вихованні студенток на основі інтегрального підходу, який спрямований на мотиваційно-ціннісне ставлення до фізкультурно-спортивної діяльності, орієнтацію на фізичне вдосконалення, оволодіння системою знань, умінь і навичок із фізичної культури та хореографії. Результати досліджень показали суттєві зміни в показниках фізичної підготовленості, фізичного здоров'я, теоретичної підготовленості, які відбулися протягом педагогічного експерименту. Доведено, що танцювальний рух є ефективним засобом тренування людського тіла й може ефективно використовуватися в сучасних дієвих технологіях навчання та виховання, які комплексно розв'язують проблеми фізичного та інтелектуального розвитку студенток, задоволення потреби в руховій активності, формування стійкої мотивації до занять фізичною культурою.

Ключові слова: хореографія, фізичне виховання, модернізація, студентки, інтегральний підхід.

Наталья Чупрун. Модернизация физического воспитания студенток средствами хореографии на основе интегрального подхода. В статье сделан теоретический анализ и раскрыты особенности модернизации физического воспитания студенток путем поиска действенной технологии обучения и воспитания средствами хореографии на основе интегрального подхода. Выявлено заинтересованность ученых в решении проблемы интеграции хореографии в физическое воспитание, поэтому необходимо отметить недостаточность научно-методических разработок в данном направлении. Предложено использовать хореографию в физическом воспитании студенток на основе интегрального подхода, который направлен на мотивационно-ценностное отношение к

физкультурно-спортивной деятельности, ориентацию на физическое совершенствование, овладение системой знаний, умений и навыков по физической культуре и хореографии. Результаты исследований показали существенные изменения в показателях физической подготовленности, физического здоровья, теоретической подготовленности, которые произошли в педагогическом эксперименте. Доказано, что танцевальное движение является эффективным средством тренировки человеческого тела и может эффективно использоваться в современных действенных технологиях обучения и воспитания, комплексно решают проблемы физического и интеллектуального развития студенток, удовлетворения потребности в двигательной активности, формирование устойчивой мотивации к занятиям физической культурой.

Ключевые слова: хореография, физическое воспитание, модернизация, студентки, интегральный подход.

Introduction. The most urgent problem of modern society is the health of the nation in general and the younger generation development specifically. This problem is especially acute among the young students – the most critical group of the population, in which the foundation of the future health and prosperity of the nation is very important. The most promising step in solving the problem of the modernization process of physical education is using different types of motor activity. G. P. Griban has proved that fact that students, after passing their test or graduating the university, stop training. This is because regulated program of physical exercise in school does not take into account the interests and motives of young students. N. Zems'ka has revealed the low level of motor activity among male and female students.

The necessity for the modernization of the physical education of students does not evoke any doubts. However, O. V. Timoshenko and Zh. G. D'omina emphasize on the measured and reasonable way – to determine the optimal conditions of its effective functioning and particular directions of improvement. Such modernization provides gradual implementation of the defined priorities considering socio-economic peculiarities of the present days.

Accessibility and variety of the ways, forms and types of choreography promote successful enrichment of the motor experience. However, in the modern system of physical education the importance of choreography is underestimated. First of all, that was caused by the insufficiency of the methodological support and absence of the teaching aids, which could solve the task and reveal the content of choreography work in the process of physical education of the students.

The aim of the study is to reveal the features of modern physical education program for students by means of an integrated approach using choreography.

The methods of the study: analysis and generalization of the scientific and methodological literature and pedagogical practice.

The Results of the Study. In the scientific literature it is espoused that the most effective way of modernizing physical education for students is for the inclusion of the most popular physical experiences of youth into the program. It is noted that one of the motives of female students in choosing the kind of sport or the system of physical exercise is the correction of perceived disadvantages of their physique. In this regard they consider choreography as an activity, which will help to solve this problem. Besides, the value of using a dancing experience lays in the fact that the influence on the body is excellent. Such activities help to change muscle groups, increase the mobility of joints through an increase of the elasticity of the ligaments and tendons, and strengthen the cardiovascular and respiratory systems. Coordination of movement, general and physical fitness and the enrichment of the motor arsenal are all benefits of these activities.

T. I. Liasova, O. M. Levic'ka have summarized their research and have recommended the implementation of an innovative physical education program, which is responsive to the goals and curriculum of the existing physical education program, as well as to the motives and goals of the students. It is important that new approaches to meet the needs of the younger population through an improved physical education curriculum be implemented.

Innovations in physical education programs provide students with effective methods to adequately develop their physical domain as well as enrich their worldview. An integrated approach includes proven methods and theories through accepted pedagogical practices, multivariable forms of motivational activities, and a personally oriented approach taking into account the student's personality and goals. Special attention was given to medical and pedagogical controls throughout the implementation. Using these methods of choreography during the process of physical education through integral approach students provides for student understanding in the educational, social, professional and public activities, which are based on the principles of humanistic pedagogy and psychology.

One of the principal conditions of the effectiveness of a teaching technology is the pedagogical interaction of the participants in the educational process. Effective motivational techniques, the use of a variety of methods to maintain student attention, and an adjustment of the degree of difficulty of the lesson are all necessary in providing student focus on the goals of the activity. Each lesson should take place in an

atmosphere of care and mutual support in order to take into account individual and group progress. V. O. Huzhevsky has found that the motivational attitude of students to the values of physical education is due to the following dominant categories of motivation. The need of the importance of physical education in future professional activities and for emotional satisfaction and future recreational activities are all paramount in the desire of the student to realize the importance of physical education as a necessary element in one's life [4].

The results of an analysis of scientific research show that modern teaching technologies include the consideration of individual physical and intellectual characteristics, individual-typological elements of physical preparedness and the perception of theoretical material for the effective organization of the educational process in multilevel groups [9].

The specific tool of choreography is the dance movement, which is not only an expressive means of choreography, but also means of aesthetic-physical training of the human body. The concept of «dance movement» can be defined as the integrity of harmoniously consistent elements – positions, postures and the movements of the legs, arms, head, and trunk. In unity, they express an image, action, emotions, and feelings. The dance movement is organized in time and space, subordinated to the laws of music and has a certain pace and tempo, which in turn contributes to the formation of a sense of rhythm.

At present, dance is widely used in the field of vocational and applied training, special and the extracurricular preparation of athletes, and the physical education of preschoolers and children of junior school age. As a synthetic art form, choreography has the potential opportunities for many physical education tasks because choreographic skills and abilities by their nature, structure and method of study are identical to motor training [12].

Choreography is a tool used in the process of physical education in order to create an aesthetic culture of students. Progressive educators, historians, and psychologists consistently discuss the expediency of conducting choreographic classes, in particular folk choreography. Note, that in the higher educational institutions of Ukraine, classes of various types of dance are offered mainly during extracurricular time and relate to the educational goals students.

Universities create dance groups. Students can join these groups, but it is difficult for beginners to participate. This problem is fully solved in Polish universities, where, along with professional dance groups, universities have been given the opportunity to engage in dance classes for students who are not adequately trained dancing before joining advanced classes.

Fedoseeva L.O. affirms that the use of choreographic exercises motivates students to increase their interest in physical education and further self-improvement [11].

Moreover, American scientists [14; 16; 19], conclude that dance covers psychomotor (since it includes movements that can be used throughout life), cognitive (critical thinking) and affective (self-expression) human sphere. It helps students to succeed in learning and provides benefit throughout their lives by maintaining an active lifestyle [14; 16; 19].

In the Swedish system of physical education Torun Mattsson and Suzanne Lundvall have studied dance during 50 years (1962–2011). Scientists concluded that pedagogical dance training remains within the framework of a highly disciplined system of social control [18].

M. Angioi, G. S. Metsios, E. Twitchett, Y. Koutedakis, M. Wyon found a significant correlation between aesthetic competence and jump-like ability and repulsion ($r = 0,55$ and $r = 0,55$, respectively) and concluded that muscle endurance of the upper body and jump-like ability are the best indicators of aesthetic competence [13].

L. Steven Kone, in his studies, concluded that dance could be an important part of a curriculum that encourages the study of psychomotor, cognitive and emotional skills associated with any physical activity and can be integrated as a part of a curriculum [15]

Method of complex application of choreographic and gymnastic exercises on elective physical education classes for students of higher educational institutions of different degrees of physical preparedness, were developed by T. I. Zubkova The researcher discovered a significant improvement in the indicators of physical qualities, the possibility of improving mood, the increased interest of students in physical education, the possibility of a complete and consistent solution of the problem of physical education of students of different degrees of physical fitness and the improvement of their functional state [6].

The research of T. M. Kravchuk, and O. S. Rohanina shows that the use of dance exercises in the process of physical education of students of higher educational institutions contributes to a significant increase in their physical health in general and improvement of individual indicators, in particular the strength and vital index. The time of recovery of the heart rate after 20 squats was used as a determining factor. Dance exercises also enhance the mood, increase a sense of well-being and the activity of the students, and were statistically confirmed by the scientists [7].

Problems of mutual influence and integration of physical education and choreography are discussed in the writings of S. Rafferty The scientist marks the gaps in the structure of dance teacher training programs, which can be filled with the use of physical education and gives recommendations for eliminating gaps in physical education through dance [17].

The results of their own studies confirm the information that the physical act of dance involves solving tasks aimed at optimizing motor activity, depending on individual and age characteristics, and improving the functional capabilities of the organism and correcting minor deviations of physical development. This encourages the consideration of dance exercises in the system of physical education [12].

Conclusions. The analysis of scientific methodological literature and world practice allow us to conclude that the inclusion of choreography in the program of physical education of students based on the integral approach will contribute to the successful resolution of the problem under investigation. It demonstrated that dance movement is an effective mean of the human body training and can be effectively used in the modern effective teaching and learning technologies that solve the problems of the physical and intellectual development of students, by the fulfillment of the need for motor activity, and form a sustainable motivation to engage in physical education. Availability, variety of tools, forms, and types of choreography contribute to the successful enrichment of motor activity, and the high emotionality of classes enhances students' interest in systematic physical exercises.

Prospects for further research are to check the effectiveness of modernizing the physical education of students through choreography based on the integral approach.

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THE EFFECT OF SPORTS CLUB PARTICIPATION ON THE STUDENTS' SOMATIC HEALTH

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Abstract

The implementation of female crossfit for girls and football classes for boys as a part of the sports club participation appears to be prospective for the optimization of the physical education in higher educational institutions and for the somatic health of students. ***The purpose of the research*** is to estimate the effect of crossfit and football classes as a part of the sports club participation on the morphofunctional parameters of the physical development and the somatic health of students. ***The results of the research.*** It is specified that during the main pedagogical experiment we were observing essential differences in functional parameters of the physical development for students in the experimental group: the growth of lung capacity ratio – by 5,94–8,70 %, handgrip strength – by 5,76–12,60 %, declining resting heart rate by 1,62–5,28 % comparing to the students of the control group where the changes were not significant. In the dynamics of morphological parameters, there were no changes. The comparative analysis of the basic and finite data of the somatic health parameters proved the efficiency of experimental methods. Influenced by them, the students of the experimental groups significantly improved their data: the correlation of lung capacity to body mass – by 3,87–9,61 %, the correlation of handgrip strength to body mass index – by 3,68–13,54 %, Robinson's index – by 1,78–6,23 % and Ruffier's index – by 12,85–16,52 %. The changes in parameters of basic and finite data of the somatic health index of the experimental groups were essentially different from the same parameters of the students in the control groups. **Conclusions.** Sports club participation in a female crossfit for girls and football classes for boys has a great impact on the physical fitness of student youth specifically on improving morphofunctional parameters of their physical development and the level of the somatic health.

Key words: physical education, crossfit, football, morphofunctional parameters, somatic health.

Валерій Григор'єв. Вплив секційних занять із фізичного виховання на соматичне здоров'я студентів. ***Актуальність.*** Перспективу оптимізації процесу фізичного виховання у ВНЗ та покращення соматичного здоров'я студентів убачаємо у впровадженні занять жіночим кросфітом для дівчат та занять футболом для хлопців у межах секційної роботи. ***Мета дослідження*** – оцінити вплив занять кросфітом та футболом у рамках секційної роботи з фізичного виховання на морфофункціональні показники фізичного розвитку та соматичного здоров'я студентів. ***Результати роботи.*** Установлено, що за період основного педагогічного експерименту ми спостерігали суттєві відмінності у функціональних показниках фізичного розвитку в студентів експериментальних груп: зростання життєвої ємності легень на 5,94–8,70 %, сили кисті (на 5,76–12,60 %), зниження частоти серцевих скорочень у спокої (на 1,62–5,28 %), порівняно зі студентами контрольних груп, у яких зміни були не значними. У динаміці змін морфологічних показників та артеріального тиску таких відмінностей ми не спостерігали. Порівняльний аналіз вихідних і кінцевих даних соматичного здоров'я підтвердив ефективність експериментальних методик. Під їх впливом студенти експериментальних груп значно покращили свої дані: підвищився життєвий індекс (на 3,87–9,61 %), силовий індекс (3,68–13,54 %), покращилися індекс Робінсона (на 1,78–6,23 %) та індексу Руф'є (12,85–16,52 %). Зміни в показниках вихідних і кінцевих даних індексів соматичного здоров'я експериментальних груп студентів достовірно відрізнялися від аналогічних показників студентів контрольних груп. ***Висновки.*** Секційні заняття з жіночого кросфіту для дівчат і з футболу для юнаків чинять значний вплив на фізичний стан студентської молоді, а саме покращують морфофункціональні показники їхнього фізичного розвитку та рівень соматичного здоров'я.

Ключові слова: фізичне виховання, кросфіт, футбол, морфофункціональні показники, соматичне здоров'я.

Валерий Григорьев. Влияние секционных занятий по физическому воспитанию на соматическое здоровье студентов. ***Актуальность.*** Перспектива оптимизации процесса физического воспитания в вузах и улучшение соматического здоровья студентов усматривается во внедрении занятий женским кроссфитом для девушек и футболом для юношей в рамках секционной работы. ***Цель исследования*** – оценить влияние занятий кроссфитом и футболом в рамках секционной работы по физическому воспитанию на морфофункциональные показатели физического развития и соматического здоровья студентов. ***Результаты работы.*** Установлено, что за период основного педагогического эксперимента мы наблюдали существенные различия в функциональных показателях физического развития у студентов экспериментальных групп: рост жизненной емкости легких (на 5,94–8,70 %), сила кисти (на 5,76–12,60 %), снижение частоты сердечных сокращений в покое (на 1,62–5,28 %),

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по сравнению со студентами контрольных групп, в которых изменения были не значительными. В динамике изменений морфологических показателей артериального давления таких различий мы не наблюдали. Сравнительный анализ исходных и конечных показателей соматического здоровья доказал эффективность экспериментальных методик. Под их влиянием студенты экспериментальных групп значительно улучшили свои данные: повысился жизненный индекс (на 3,87–9,61 %), силовой индекс (3,68–13,54 %), улучшились индекс Робинсона (на 1,78–6,23 %) и индекса Руфье (12,85–16,52 %). Изменения в показателях исходных и конечных данных индексов соматического здоровья экспериментальных групп студентов достоверно отличались от аналогичных показателей студентов контрольных групп. ***Выводы.*** Секционные занятия по женскому кроссфиту для девушек и по футболу для юношей имеют существенное влияние на физическое состояние студенческой молодежи, а именно улучшают морфофункциональные показатели их физического развития и уровень соматического здоровья.

Ключевые слова: физическое воспитание, кроссфит, футбол, морфо-функциональные показатели, соматическое здоровье.

Introduction. The process of the physical education of the student youth plays an important role in forming a harmoniously developed and competitive personality. As it is known health and the development of necessary physical qualities are directly connected with the physical activity of students which, unfortunately, decreases both during the school time and during university education.

In scientific works (M. O. Nosko, O. O. Danilov, V. M. Maslov, 2011) it is suggested that one of the most perspective trends in the optimization of the physical fitness of students is the enrollment in sports club work such as crossfit and football which are among the most popular sports in youth nowadays due to the curriculum in physical education at universities [6].

In spite of the fact that football is rather popular among students and there is a variety of scientific research in the field of football (Ie. I. Maliar, 2007, O. M. Oksiom, O. V. Shumakov, 2007, D. V. Bondariev, 2008), it is necessary to point out that due to the external and internal reasons football as an efficient means to improve physical fitness, health and constant interest in physical culture has not taken the appropriate place in the physical education curriculum in higher educational institutions [3; 5; 7].

In the experts' opinion (A. Z. Zynnaturnov, I. I. Panov, 2014), crossfit at physical education lessons will promote the complex development of physical and mental qualities [4]. The scientists think (N. O. Bazylevych, O. S. Tonkonoh, 2017) that crossfit, as a new sport, might be a strong stimulus to practice sports regularly but there is still lack of the scientific works in this area. The mentioned above makes it necessary to solve the problem and experimentally prove the influence of crossfit on the physical fitness of students [2].

That's why the research on crossfit or football is meaningful. Some effective their techniques can be done in sports club work to develop physical qualities and functional capabilities of students. This is a relevant task the solving of which will promote the physical activity of students and their health.

The Purpose of the Research is to estimate the effect of crossfit and football classes as a part of the sports club participation on the morphofunctional parameters of the physical development and the somatic health of students.

Materials and Methods of the Research. The research on morphofunctional parameters and the level of the somatic health of students was carried out in Kherson State University in the period since September 2015 up to June 2016. The second-year students took part in this research. There were students who attended traditional physical education lessons (control $group_1$ (CG) – 22 female students, CG_2 – 20 male students) and students who attended experimental physical education lessons such as female crossfit sports club (experimental $group_1$(EG) – 18 female students) and football sports club (EG_2 – 6 male students).

We determined morphofunctional parameters of the physical development (height, body mass, lung capacity, handgrip strength, heart rate, systolic arterial blood pressure (ABP) and diastolic ABP); quantitative parameters of the somatic health (SH) (H. L. Apanasenko's method) [1].

Results of the Research. Discussion. The main task of the teaching methods was to keep and improve the health and physical fitness of students by doing female crossfit for girls and football for boys.

The process of practical implementation of female crossfit and football presupposes the unity of learning, recreational and educational tasks, adherence to such common didactic principles as the principle of awareness and action, visualization, availability, individuality, gradualness and consistency, systematic approach to training, the realization of which promotes the efficiency of the physical education process.

A general structure of crossfit training lessons was worked out by us. Sets of exercises involved individual selection of means according to the objective at hand. The schedule of lessons, intensity and the volume of training load, the dynamics of the parameters of the body functional system were taken into

account. To realize these tasks, we selected exercises taking into account the physical fitness of the girls, the level of their physical condition and work capacity. Training lessons were elaborated on the basis.

We made use of the following exercises: stationary jogging, squats, push-ups, the Burpee complex exercises, set-ups, dynamic lunges, etc. An interval training was chosen as a main one during the first period; then the circuit training was used as a continuous one.

The boys were offered to participate in football sports club as a part of physical education lessons. The main organizational form of teaching and the educational process was football lessons where 40 % of the time was devoted to football techniques and tactics and 60 % – to physical fitness. In the process of the improvement of students' physical fitness by means of technical and tactical actions, various means of teaching were used (general preparatory and specific preparatory) that promoted an efficient problem–solving of learning, recreational and educational tasks.

The criteria for estimation of efficiency of proposed methodical approaches were the accuracy and rates of the positive changes of the students' physical fitness at the end of the formative experiments.

The analysis of the parameters of the morphofunctional development influenced by experimental methods is given in charts 1–2.

Chart 1. Showsbasic data (BD) and finite data (FD) of the experimental and control groups. Analyzing these data of the morphological parameters it is possible to confirm that during the experiment positive but not significant changes were observed in all parameters as in EG as in CG. But it should be said that some we did not observe any accurate differences between parameters. As an exception, it is possible to mention chest volume parameters in the female EG where FD was higher than BD (t=2,13, при $p \leq 0,05$). The absence of accurate difference between morphological parameters can be explained by ending of the natural physical development but not by the effects of the experimental methods on the quantitative changes which are minimal. We leave open the possibility of qualitative changes such as body mass parameters: those students who participated in sports club activities had fat loss and gain muscle mass without significant changes in their body mass (tabl. 1).

The analysis of paces and overall average rates of the functional shape is presented in chart 2.

In accordance with the data, the accurate difference of the physical fitness growth in EG influenced by the proprietary methodology is observed. Whereas such tendencies are not observed for students in CG. Let's analyze the changes of lung capacity ratio (LCR) in detail.

Table 1

The Dynamics of the Students' Morphological Parameters in the Experimental and Control Groups During the Main Pedagogical Experiment

Parameters	Sex	Stage of the Research	Experimental Groups nFemale = 18; nMale = 16			Control Groups nfemale = 22; nMale = 20		
			Mx ± Smx	%	t, p	Mx ± Smx	%	t, p
Height, *cm*	F	BD	165,1±1,0	0,01	0,07	165,5±0,9	0,01	0,08
		FD	165,2±0,9		≥0,05	165,6±0,8		≥0,05
	M	BD	176,2±1,0	0,28	0,37	175,9±1,1	0,28	0,34
		FD	176,7±0,9		≥0,05	176,4±1,0		≥0,05
Body Mass, *kg*	F	BD	56,74±1,23	0,81	0,28	55,83±1,06	1,19	0,43
		FD	56,28±1,12		≥0,05	56,49±1,14		≥0,05
	M	BD	71,91±0,76	1,98	1,60	69,69±1,34	1,51	0,59
		FD	73,34±0,64		≥0,05	70,74±1,18		≥0,05
Chest Volume, *cm*	F	BD	85,78±0,72	2,41	2,13	86,14±1,02	0,51	0,45
		FD	87,85±0,66		≤0,05	86,58±0,97		≥0,05
	M	BD	92,87±1,14	1,83	1,07	93,45±1,34	1,42	0,72
		FD	94,57±1,12		≥0,05	94,78±1,27		≥0,05

The LCR overall average rate at the beginning of the experiment was 3149±40,8 ml in a female EG whereas at the end – 3423±44,9 ml (growth by 8,7 %). In the female CG the basic data of LCR was 3165±38,7 on average and the finite data – 3056±40,9 ml (reduction by 3,57 %). The similar effect of the experimental method was observed for LCR in the male group. The basic data of LCR was 4140±52,9 ml on average and the finite data – 4386±35,7 ml (growth by 5,94 %). In the male CG, we also observed some

growth of LCR but the changes were considered to be inaccurate. The basic data was 4064±56,4 ml on average and the finite data – 4120±53,2 ml (growth 1,37 %). The accurate difference between BD and FD of LCR was found out only in EG of students (p≤0,01–0,001), whereas in CG – the differences were inaccurate (p≥0,05).

The experimental methods had a positive effect on the handgrip dynamometry (tabl. 2). In both female and male EG, the finite data of this parameter was 31,67±0,48 kg and 38,23±0,42 kg. The growth was by 12,6 % and 5,75 % correspondently.

These results were accurate as to the basic data of the handgrip strength in these groups (p≤0,01–0,001). In CG we observed inaccurate (p≥0,05) reduction of the finite data: the female group from 28,30±0,45 kg up to 28,24±0,40 kg by 0,21 % and inaccurate (p≥0,05) growth as well: the male group from 35,90±0,65 kg up to 36,12±0,60 kg by 0,61 %.

Table 2

The Dynamics of Students' Functional Parameters in the Experimental and Control Groups During the Main Pedagogical Experiment

Parameters	Sex	Stages of the Research	Experimental Groups nFemale = 18;nMale. = 16			Control Groups nFemale = 22; nMale = 20		
			Mx ± Smx	%	t, p	Mx ± Smx	%	t, p
LCR, *ml*	F	BD	3149±40,8	8,70	4,51 ≤0,001	3165±38,7	3,57	1,94 ≥0,05
		FD	3423±44,9			3056±40,9		
	M	BD	4140±52,9	5,94	3,86 ≤0,01	4064±56,4	1,37	0,72 ≥0,05
		FD	4386±35,7			4120±53,2		
Handgrip strength, *kg*	F	BD	28,12±0,43	12,6	5,54 ≤0,001	28,30±0,45	0,21	0,10 ≥0,05
		FD	31,67±0,48			28,24±0,40		
	M	BD	36,15±0,54	5,75	3,06 ≤0,01	35,90±0,65	0,61	0,25 ≥0,05
		FD	38,23±0,42			36,12±0,60		
Heart rate, *beats/min.*	F	BD	70,32±0,54	1,62	1,63 ≥0,05	68,28±0,56	2,17	1,85 ≥0,05
		FD	69,18±0,46			69,76±0,58		
	M	BD	70,40±0,65	5,28	4,83 ≤0,001	69,70±0,62	1,08	0,90 ≥0,05
		FD	66,68±0,41			70,45±0,56		
ABP syst. *mmHg*	F	BD	120,40±0,65	0,17	0,25 ≥0,05	118,94±0,56	1,32	2,03 ≤0,05
		FD	120,20±0,47			120,51±0,54		
	M	BD	120,40±0,76	0,99	1,26 ≥0,05	120,37±0,78	0,41	0,47 ≥0,05
		FD	119,22±0,56			120,86±0,72		
ABP diast. *Mm HG*	F	BD	68,12±0,54	1,00	0,47 ≥0,05	67,78±0,56	0,38	0,34 ≥0,05
		FD	67,78±0,48			68,04±0,52		
	M	BD	70,24±0,66	0,97	0,81 ≥0,05	70,04±0,76	0,48	0,32 ≥0,05
		FD	69,56±0,54			70,38±0,78		

The comparative analysis of the finite data parameters of the cardiovascular system performance in EG and KG allows determining accurate high growth rate only in the male EG in heart rate parameters (p≤0,001) and in the female CG ABP syst. (p≤0,05). Though it is necessary to point out that in the male group we observed an accurate reduction of the heart rate that is a normal phenomenon for adapting to training loads which are natural for football. Whereas in the female CG – the growth of ABP syst. That is unnatural in this age period. All other parameters did not show any statistically significant differences as in EG as in CG (p ≥0,05).

For the unbiased evaluation of the effect of the experimental methods on morphofunctional parameters and on the somatic health parameters, we made a repeated examination by means of H. L. Apanasenko's method.

Chart 3 gives the comparison of the basic data and the finite data in EG and CG where we found out both accurate differences and their absence.

As the data of this chart prove, the experimental training programmes had some positive effect on the somatic health of the students.

According to the height–weight ratio in the female EG, we observed the reduction of an overall average rate by 0,85 % from 343,67±8,42 gr/cm до 340,67±7,24 gr/cm, that is connected with crossfit sports club participation.

In the female CG we, vice versa, we observed some growth of this parameter that is connected with body mass gain within the period of the first and the second examinations. In the female CG an overall average rate was 337,34±8,12 gr/cm, but at the end – 341,12±8,28 gr/cm (growth by 1,12 %) (tabl. 3). As to the male students, we observed height–weight ratio growth within the period of the first and the second examinations in both groups (by 1,67 % – in the male EGand by 1,21 % – in the male CG), though the difference was inaccurate ($p \geq 0,05$).

The clearer picture which can give some positive characteristics to the experimental methods can be seen in the comparative analysis of the functional parameters that show the somatic health: the correlation of lung capacity to body mass, the correlation of handgrip strength to body mass index, Robinson's index and Ruffier's index. Let's take a look at the changes in the correlation of lung capacity to body mass parameters in all groups. The basic data of the correlation of lung capacity to body mass in the female EG was 55,49±1,12 ml/kg on average and the finite data – 60,82±0,87 ml/kg, that was accurate ($p \leq 0,01$). Whereas the finite data in the female CG was even worse than the basic data –by 4,57 % but they were not accurate ($p \geq 0,05$) – 54,09±1,06 ml/kg (BD – 56,68±0,96 ml/kg). As to the male groups, there were some positive and accurate changes ($p \leq 0,05$) only in the male EG (BD – 57,57±0,72 ml/kg, FD– 59,80±0,60 ml/kg, the growth – 3,87 %).

In the male CG, the basic and the finite data were almost at the same level (worse by 0,14 %) (tabl. 3). Thus we can confirm that experimental methods which were used separately in both female and male groups had a positive effect on the correlation of handgrip strength to body mass index.

Table 3

The Dynamics of the Parameters of the Students' Somatic Health of the Experimental and Control Groups During the Main Pedagogical Experiment

Parameters	Sex	Stages of the Research	Experimental Groups nFemale = 18;nMale = 16			Control Groups nFemle = 22; nMale = 20		
			Mx ± Smx	%	t, p	Mx ± Smx	%	t, p
Height-weight ratio, *gr/csm*	F	BD	343,67±8,42	0,87	0,27	337,34±8,12	1,12	0,33
		FD	340,67±7,24		≥0,05	341,12±8,28		≥0,05
	M	BD	408,16±9,14	1,67	0,59	396,24±8,36	1,21	0,37
		FD	415,07±7,07		≥0,05	401,06±9,80		≥0,05
Correlation of lung capacity to body mass, *ml/kg*	F	BD	55,49±1,12	9,61	3,78	56,68±0,96	4,57	1,82
		FD	60,82±0,87		≤0,01	54,09±1,06		≥0,05
	M	BD	57,57±0,72	3,87	2,39	58,32±0,82	0,14	0,07
		FD	59,80±0,60		≤0,05	58,24±0,71		≥0,05
Correlation of handgrip strength to body mass index, *%*	F	BD	49,56±0,86	13,54	5,68	50,69±1,20	1,38	0,43
		FD	56,27±0,82		≤0,001	49,99±1,12		≥0,05
	M	BD	50,27±1,12	3,68	1,11	51,51±0,98	0,87	0,36
		FD	52,12±1,23		≥0,05	51,06±1,19		≥0,05
Robinson's idex, relative value unit(RVU)	F	BD	84,66±1,24	1,78	0,89	81,21±1,17	3,52	1,83
		FD	83,15±1,18		≥0,05	84,07±1,05		≥0,05
	M	BD	84,76±1,37	6,23	2,54	83,90±1,50	1,49	0,55
		FD	79,48±1,58		≤0,05	85,15±1,70		≥0,05
Ruffier's index, *RVU*	F	BD	11,75±0,36	12,85	3,14	11,87±0,41	1,52	0,33
		FD	10,24±0,34		≤0,01	12,05±0,38		≥0,05
	M	BD	11,44±0,32	16,52	4,50	11,55±0,38	1,21	0,24
		FD	9,55±0,29		≤0,001	11,69±0,43		≥0,05

Further, we examine the results of the correlation of handgrip strength to body mass index in EG and CG. We can confirm that the experimental method had a positive effect on the correlation of handgrip strength to body mass index in the female group who practice crossfit. The crossfit programme involves enough amounts of strength and strength-speed exercises. In the female EG, an overall average rate of the correlation of handgrip strength to body mass index was 49,56±0,86 % at the beginning. At the end we found out accurate high rates ($p \leq 0,001$) – 56,27±0,82 % (the growth by 13,54 %). As to the male EG, some

positive changes for the better were observed but the difference of the correlation of handgrip strength to body mass index was inaccurate (p≥0,05). The basic data was 50,27±1,12 % on average and the finite data increased by 3,68 % – 52,12±1,23 %. In CG we observed some reduction of the correlation of handgrip strength to body mass index at the end of the experiment. It could be caused by not enough changes of such parameters of the physical development as handgrip and body mass. The decline was found out at the level of 1,38% for the female students ND 0,87 % for the male students(p≥0,05) (tabl. 3).

Let's look at the parameters of the somatic health which are connected with the functional shape of the cardiovascular system. It is necessary to point out that we observed positive changes in both experimental groups especially clear it can be seen in the male group.

In the female group, the basic data of Robinson's index was 84,66±1,24 RVU on average and the finite data improved by 1,78 % – 83,15±1,18 RVU but the result was inaccurate (p≥0,05). In the male EG, Robinson's index was better and accurate within the period of the beginning and the end of the experiment. Thus, at the beginning of the experiment an average group rate was 84,76±1,37 RVU and at the end, it was better by 6,23 % – 79,48±1,58RVU (p≤0,05).

In CG we observed some decline of Robinson's index between the first and the second examinations. Thus, in the female CG the finite data of the Robinson's index reduced by 3,52 % (from 81,21±1,17 RVU до 84,07±1,05 RVU), and in the male group – by 1,49 % (from 83,90±1,50 RVU до 85,15±1,70 RVU).

The experimental methods had a positive effect on the Ruffier's index (tabl. 3). In the males and females, EG the finite data of this parameter was 10,24±0,34 RVU and 9,55±0,29 RVU on average. The improvement was by 12,85 and 16,52 % correspondently and the result was accurate as to the basic data of the Ruffier's index in these groups (p≤0,01–0,001). In CG we observed inaccurate (p≥0,05) decline of the finite data: in the female group from 11,87±0,41 RVU up to 12,05±0,38 RVU – by 1,52 % and in the male group – from 11,55±0,38 RVU up to 11,69±0,43 RVU – by 1,21 % (tabl. 3.). As to the efficiency of the applied methods for the somatic health improvement, it is necessary to point out that all of them, except height–weight ratio, had a positive effect on the parameters which were researched (p≤0,05–0,001).

Thus, the results of the research on the changes in the somatic health during the formative pedagogical experiment confirm the current hypothesis: female crossfit in a female group and football in a male group as physical education lessons have a positive effect on their physical fitness improvement.

Conclusions and Future Research Direction. Female crossfit sports club participation in the female EG and football sports club participation in the male EG have proved to have a great effect on the physical fitness: they improve the morphofunctional parameters of the physical development and the somatic health level. The performed research does not cover all the problems connected with the modernization of the physical education of students at higher educational institutions. That's why the perspective for further study is to work out and implement innovative approaches to basic models or to combine various forms of physical education; to evaluate their recreational potential.

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SEROLOGICAL MARKERS In THE PROGNOSIS OF THE DEVELOPMENT OF HUMAN SPEED ABILITIES

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Abstract

The article presents data on the study of a correlation between blood groups system AB0 and Rh with the peculiarities of the development of human speed abilities. It identifies a complex of genetic markers and substantiates the possibility of using this complex in the individual prognosis of the development of human motor abilities. The study shows that individuals with 0(I) and A(II) blood groups and Rh+ have a high predisposition to the development of speed abilities.

Key words: blood groups, Rhesus, genetic prognosis, speed abilities.

Валентина Лишевська, Сергій Шаповал. Проблеми генетичної діагностики: серологічні маркери в прогнозі розвитку швидкісних здібностей людини. У статті наведено матеріал про вивчення асоціативних зв'язків між групами крові системи АВ0 та Rh з особливостями розвитку швидкісних здібностей у чоловіків і жінок. Визначено комплекс генетичних маркерів, який можливо використовувати в індивідуальному прогнозі розвитку рухових здібностей людини. Серед них високу прогностичну цінність мають маркери 0(I), А(II) груп крові та позитивний резус-фактор.

Ключові слова: групи крові, резус фактор, генетичний прогноз, швидкісні здібності.

Валентина Лишевская, Сергей Шаповал. Проблемы генетической диагностики: серологические маркеры в прогнозе развития скоростных способностей человека. В статье приведен материал об изучении ассоциативной связи между группами крови системы АВ0 и Rh с особенностями развития скоростных способностей у мужчин и женщин. Выявлен комплекс генетических маркеров, которые можно использовать в индивидуальном прогнозе развития двигательных способностей человека. Среди них высокую предрасположенность к развитию скоростных способностей маркируют 0(I), А(II) группы крови и положительный резус-фактор.

Ключевые слова: группы крови, резус-фактор, генетический прогноз, скоростные способности.

Introduction. Diagnostics (psychological, medical, biological, etc.) is a sphere of knowledge designed to study the measuring methods and criteria of assessment, prediction of individual differences (psychological features, motor abilities, functional capabilities) in human development [2]. The term 'diagnosis' comes from the Greek word *diagnosis* and means «making out», «revealing» [1].

Sport and pedagogical diagnostics is a scientific area, which investigates individual or group differences according to their motor abilities or certain traits contributing to the formation of motor (sport) skills. The prognosis of motor abilities of children and young people is an important constituent of sport and pedagogical diagnostics. In this case, genetic markers can become informative criteria.

Such genetic markers as blood groups and systems, dermatoglyphics, specific features of the structure and color of the iris are informative markers in the genetic prognosis of human individual variability [5; 9]. Dermatoglyphics is the most studied among genetic markers. The rest of them have been studied fragmentarily. That is why we think it is timely to study blood groups and Rhesus factor systems as markers in the system of sport diagnostics.

Research Aim and Tasks; Material and Methods. Recent findings of professor Serhiyenko and his colleagues are concerned with the distribution of blood groups in elite sportsmen engaged in academic rowing, canoe rowing, bullet shooting [2; 5]. They identified the differences in phenotypic manifestation of blood groups in sportsmen of different specialization and performance level.

A relationship between individual motor abilities and blood groups of the AB0 system was examined [4]. Two hundred 17–19-year old female students (every 50 people with a different blood group) took part in a complex investigation of coordination, strength, speed, endurance and joints flexibility. In a more numerous sample of students (999 people, 490 men and 509 women), an association between the development of individual endurance and blood groups together with the rhesus factor system was studied [7, 8]. Later [10],

in a sample of high school students aged 15–17 years (822 individuals), the research identified serological markers (the AB0 and rhesus factor systems) of the development of peculiarities of strength and anaerobic abilities. However, there are insufficient studies of similar kind.

The present study has been undertaken to determine serological markers of the specific features of human speed abilities development.

The study was designed:

To find associations between blood groups and speed abilities in young men and women.

To establish a relationship between human speed abilities and the serological rhesus-factor (Rh) system.

To investigate gender peculiarities of the phenotypes of serological markers of blood groups of the AB0 system and the Rh system.

Research method. Senior high school students were asked to perform the following running tests: a 60–meter sprint for 15–year old boys and girls, and a 100–meter sprint for male and female teenagers (16–17 years). The running began at standing start; the time was recorded to the nearest tenth of a second. The subjects had two trials. The best score was recorded as the test result. In order to create a competitive environment, at least two subjects took part in a race.

The study involved 822 high school students aged 15–17. The classification of subjects according to sex, age and blood group is shown in table 1.

Table 1

The Distribution of Subjects (High School Students) According to Sex, Age and Blood Group

Age, Years	Blood Group				Total
	0(I)	A(II)	B(III)	AB(IV)	
Males					
15	24	21	26	22	93
16	49	45	34	31	159
17	31	29	27	24	111
Total	104	95	87	77	363
Females					
15	18	23	22	19	82
16	47	38	51	34	170
17	55	65	48	39	207
Total	120	126	121	92	459
Total Number	224	221	208	169	822

Research Results and Discussion. The results of the 60m and 100m run for 15–17-year old males and females are listed in Tables 2 and 3. A tendency to lower results of speed tests in males and females at different age is presented in Table 4. As we see, the trend in the phenotypic display of speed abilities in girls and young men is in many ways similar. Subjects with 0(I) и A(II) blood types have the best results; those with AB(IV) and B(III) groups reveal the worst ones. In absolute values of speed abilities, male subjects of all age groups and different blood types were superior to females.

Table 2

Results of the 60 m and 100 m Run Tests for 15–17-Year Old Males Having Different Blood Groups, s

Blood Groups	Statistical Indices	Age, Years		
		15	16	17
0(I)	$\overline{X}$	9,20	14,79	14,47
	±S	0,64	0,44	0,49
	±m	0,13	0,06	0,08
A(II)	$\overline{X}$	9,53	14,80	14,94
	±S	0,57	0,44	0,49
	±m	0,12	0,06	0,09
B(III)	$\overline{X}$	9,63	15,63	15,09
	±S	0,62	0,40	0,46
	±m	0,12	0,06	0,09
AB(IV)	$\overline{X}$	9,77	15,25	15,36
	±S	0,56	0,40	0,59
	±m	0,12	0,07	0,12

Table 3

Results of the 60 m and 100 m Run Tests for 15–17-Year Old Girls Having Different Blood Groups, s

Blood Groups	Statistical Indices	Age, Years		
		15	16	17
0(I)	$\overline{X}$	9,89	16,85	16,31
	±S	0,43	0,29	0,56
	±m	0,10	0,04	0,07
A(II)	$\overline{X}$	9,90	17,11	16,62
	±S	0,39	0,39	0,47
	±m	0,08	0,06	0,05
B(III)	$\overline{X}$	10,14	17,14	16,94
	±S	0,36	0,46	0,50
	±m	0,07	0,06	0,07
AB(IV)	$\overline{X}$	10,03	17,18	17,04
	±S	0,44	0,41	0,45
	±m	0,10	0,07	0,07

Table 4

Tendency to Lower Results of Speed Tests in Teenage Boys and Girls Having Different Blood Groups

Sex	Age, Years	Tendency
Teenage Boys	15	0(I) > A(II) > B(III) > AB(IV)
	16	0(I) = A(II) > AB(IV) > B(III)
	17	0(I) > A(II) > B(III) > AB(IV)
Teenage Girls	15	0(I) = A(II) > AB(IV) > B(III)
	16	0(I) > A(II) > B(III) > AB(IV)
	17	0(I) > A(II) > B(III) > AB(IV)

Physical manifestation of speed abilities in Rh+ and Rh– males in the running test on the 60-meter and 100–meter course is given in Tables 5 and 6 correspondingly. The comparison of the corresponding values in Rh+ and Rh- teenage boys shows that they are higher in Rh+ subjects. Though the differences in the mean values are insignificant ($p > 0,05$), ***t*** values are still more significant in 16-year old teenage boys (see table 5 and table 7). In the subjects with 0(I) and A(II) blood groups compared with young men having AB(IV) and B(III) blood groups, a tendency toward higher results in speed tests remains the same in all ages both for Rh+ and Rh–subjects.

Table 5

Results of the 60 m Run Test for 15–17-Year Old Boys Having Different Blood groups and Rh Factor, s

Blood Groups	Statistical Indices	Rhesus-Factor		t	p
		Rh+	rh–		
0(I)	$\overline{X}$	9,12	9,30	0,668	> 0,05
	±S	0,61	0,69		
	±m	0,17	0,20		
A(II)	$\overline{X}$	9,40	9,70	1,201	> 0,05
	±S	0,56	0,56		
	±m	0,16	0,18		
B(III)	$\overline{X}$	9,80	9,51	1,211	> 0,05
	±S	0,56	0,65		
	±m	0,16	0,17		
AB(IV)	$\overline{X}$	9,73	9,83	0,405	> 0,05
	±S	0,59	0,55		
	±m	0,16	0,18		

Table 6

Results of the Running Test on a 100-Meter Course in 16–17-Year Old Boys With Different Blood Groups and Rh Factor, s

Blood Group	Statistical Indices	Rh+		rh–	
		16 Years	17 Years	16 Years	17 Years
0(I)	$\overline{X}$	14,70	14,40	14,90	14,60
	±S	0,45	0,47	0,40	0,53
	±m	0,08	0,10	0,08	0,16
A(II)	$\overline{X}$	14,67	14,80	14,92	15,10
	±S	0,45	0,55	0,41	0,39
	±m	0,09	0,14	0,08	0,10
B(III)	$\overline{X}$	14,81	15,00	15,03	15,21
	±S	0,42	0,43	0,34	0,50
	±m	0,10	0,11	0,08	0,15
AB(IV)	$\overline{X}$	15,20	15,32	15,30	15,40
	±S	0,38	0,60	0,44	0,60
	±m	0,09	0,16	0,12	0,18

Table 7

Statistical Differences in the Results of the Running Test on a 100-Meter Course in 16–17-Year Old Boys with Different Rh Factor, s

Age, Years	Statistical Indices	Blood Groups			
		0(I)	**A(II)**	**B(III)**	**AB(IV)**
16	t	1,621	1,929	1,654	0,660
	p	> 0,05	> 0,05	> 0,05	> 0,05
17	t	1,033	1,689	1,211	0,323
	p	> 0,05	> 0,05	> 0,05	> 0,05

The phenotypic display of speed abilities in girls with Rh+ and Rh– in the 60m and 100 m sprints is presented in tables 8 and 9. The tendency to differential distinctions in speed abilities in the girls is in most ways similar to the tendency reported in teenage boys. The girls with Rh+ showed a higher level of speed ability development than Rh– subjects. On the 60-meter course, 15-year old girls having B(III) blood group showed significant differences ($p < 0,05$); on the 100-meter course significant differences were reported in blood groups A(II), B(III) and AB(IV) in 16–year old females, and in blood groups A(II) и B(III) in girls aged 17.

Table 8

Results of the 60 m Sprint Test in 15-Year Old Girls Having Different Blood Groups and Rh Factor, s

Blood Groups	Statistical Indices	Rhesus–Factor		t	p
		Rh+	**rh–**		
0(I)	$\overline{X}$	9,81	10,00	0,926	> 0,05
	±S	0,44	0,42		
	±m	0,14	0,15		
A(II)	$\overline{X}$	9,92	9,89	0,186	> 0,05
	±S	0,39	0,40		
	±m	0,11	0,12		
B(III)	$\overline{X}$	10,01	10,30	**2,004**	**< 0,05**
	±S	0,33	0,34		
	±m	0,09	0,10		
AB(IV)	$\overline{X}$	9,90	10,20	1,473	> 0,05
	±S	0,42	0,45		
	±m	0,12	0,15		

Table 9

Results of the Running Test on a 100-Meter Course for 16–17-Year Old Girls Having Different Blood Groups and Rh Factor, s

Blood groups	Statistical indices	Rh+		rh–	
		16 Years	17 Years	16 Years	17 Years
0(I)	$\overline{X}$	16,80	16,25	16,90	16,40
	±S	0,27	0,55	0,30	0,48
	±m	0,05	0,09	0,06	0,12
A(II)	$\overline{X}$	17,00	16,50	17,25	16,77
	±S	0,37	0,46	0,38	0,44
	±m	0,08	0,07	0,09	0,08
B(III)	$\overline{X}$	17,01	16,82	17,30	17,08
	±S	0,41	0,53	0,47	0,45
	±m	0,08	0,10	0,09	0,09
AB(IV)	$\overline{X}$	17,00	17,00	17,41	17,11
	±S	0,30	0,42	0,41	0,51
	±m	0,07	0,08	0,10	0,13

The comparison of differential distinctions of Rh+ and Rh- boys and girls shows that the girls display more significant differences in speed tests results. As to the population as a whole, the most significant differences in the development of speed abilities are observed in the carriers of A(II) and B(III) blood groups. The age of 16 is the age of the most significant differences.

Table 10

Statistical Differences in the Results of the 100 m Running-Based Test in 16–17-Year Old Girls with Different Rh Factor, s

Age, Years	Statistical Indices	Blood Groups			
		0(I)	A(II)	B(III)	AB(IV)
16	t	1,169	**2,022**	**2,337**	**3,181**
	p	> 0,05	**< 0,05**	**< 0,05**	**< 0,01**
17	t	0,944	**2,381**	**2,004**	0,691
	p	> 0,05	**< 0,05**	**< 0,05**	> 0,05

In many respects, the data obtained in this study are consistent with the results of our earlier work [10]. The investigation of serological markers of strength (tests: pulling oneself up on a horizontal bar and push-ups) and anaerobic abilities (tests: sit–ups during 30 s) in one and the same sample group of high school students determined a tendency toward a better phenotypic manifestation of dynamic muscle strength and anaerobic lactate power ability in individuals with 0(I) and A(II) blood groups compared with people having B(III) and AB(IV) blood groups and Rh+. This apparently can be explained by the fact that a number of publications report on a positive correlation between strength and speed abilities. High test results in assessing the development of anaerobic abilities also largely depend on the development of speed abilities.

The regularities described can be used in individual genetic prognosis and sport selection. The assumption that differential distinctions in the manifestation of speed abilities are formed in childhood suggests that children having the 0(I) blood group and Rh+ are more promising for physical activity (or sports) where speed abilities are essential for achieving high performance. Less promising in this case may be children with the AB(IV) blood group.

Conclusions. The study determines associative links between blood groups of the AB0 and Rh systems and the level of human speed abilities development.

It shows that blood groups and the Rh system can be genetic markers of a high predisposition to the development of speed abilities in men and women.

The study identifies a tendency to better phenotypic manifestation of speed abilities in individuals with 0(I) и A(II) blood groups compared with people having AB(IV) and B(III) blood groups. The regularity in a decrease in the predisposition to the development of human speed abilities is as follows: 0(I) > A(II) > B(III) > AB(IV).

Compared with Rh–, the positive Rhesus factor is a genetic marker that allows predicting a higher predisposition to the development of human speed abilities.

The complex of genetic markers of the blood system AB0 and Rh does not have gender differences.

The study provides practical recommendations as to the use of the regularities identified in the system of sport selection.

Prospects for Further Research. Further research may be aimed at determining serological markers of some specific features of the development of coordination abilities and heritability of human joints flexibility.

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MOTOR ACTIVITY IN THE INFORMATIONAL ENVIRONMENT OF HIGH–SCHOOL–AGE STUDENTS

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Abstract

The goal of the research is to reveal the main sources of information on motor activity that affect the information environment of high-school-age students. **Tasks of the study:** find out the frequency of obtaining the information about motor activity by high-school-age students; reveal the main sources from which the information about the motor activity is received by high-school-age students.

The survey was conducted among students of the 10th-11th forms of secondary schools in Lviv, Ternopil, Ivano-Frankivsk and Khmelnytsky. The total number of students was 925 (450 boys and 475 girls).

The frequency of receiving information on motor activity by 15–17-year-old students of secondary schools was determined. The main sources which provide high–school–age students with the information on the motor activity were revealed. The purpose of using one or another source of information by students of the 10th–11th forms was identified. The peculiarities of television and Internet content, which forms the information space of high-school-age students, are determined. The obtained results showed that the main amount of information that comes to students is entertaining one. The main sources of information about the motor activity for high-school-age students are the Internet, friends and peers. The survey data are interpreted taking into account the gender particularities of students.

Key words: motor activity, students, information, Internet.

Андрій Мандюк, Марта Ярошик, Ольга Римар. Рухова активність в інформаційному середовищі учнів старшого шкільного віку. ***Мета дослідження*** – визначити основні джерела інформації про рухову активність, які впливають на інформаційне середовище учнів старшого шкільного віку. ***Завдання статті*** – виявити періодичність отримання інформації про рухову активність учнями старшого шкільного віку; установити основні джерела інформації, із яких отримують відомості про рухову активність учні старшого шкільного віку.

Проведено опитування учнів 10–11 класів загальноосвітніх шкіл міст Львова, Тернополя, Івано-Франківська та Хмельницького. Загальна кількість учнів – 925 осіб, із них 450 – це хлопці й 475 – дівчата.

Визначено періодичність, із якою отримують інформацію про рухову активність учні загальноосвітніх шкіл віком 15–17 років. Виявлені основні джерела, із яких до учнів старшого шкільного віку надходить інформація про рухову активність. Установлено, із якою метою учні 10–11 класів користуються тими чи іншими джерелами інформації. Визначено особливості телевізійного та інтернет контенту, який формує інформаційний простір учнів старшого шкільного віку. Отримані результати засвідчили, що основний об'єм інформації, який надходить до учнів, має розважальне спрямування. Основними джерелами інформації про рухову активність для дітей старшого шкільного віку, є мережа Інтернет, друзі та однолітки. Дані дослідження інтерпретовані з урахуванням гендерних особливостей школярів.

Ключові слова: рухова активність, школярі, інформація, Інтернет.

Андрей Мандюк, Марта Ярошик, Ольга Рымар. Двигательная активность в информационном пространстве учеников старшего школьного возраста. ***Цель исследования*** – определить основные источники информации о двигательной деятельности, которые влияют на информационную среду учеников старшего школьного возраста. ***Задачи исследования*** – определить периодичность получения информации о двигательной деятельности учениками старшего школьного возраста; установить основные источники информации, с которых получают ведомости о двигательной деятельности ученики старшего школьного возраста.

Проведен опрос учеников 10–11 классов общеобразовательных школ городов Львова, Тернополь, Ивано–Франковск и Хмельницкий. Общее количество учеников составило 925 чел., из них 450 – это мальчики и 475 – девочки.

Определена периодичность, с которой ученики общеобразовательных школ в возрасте 15–17 лет получают информацию о двигательной активности. Установлены основные источники, с которых получают информацию о двигательной активности ученики старшего школьного возраста. Определяется, с какой целью ученики 10–11 классов используют те или иные источники информации, а также особенности телевизионного и интернет контента, которые формируют информационное пространство учеников старшего школьного возраста. Полученные данные показали, что основной объём информации, который используют ученики, имеет развлекательную направленность.

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Основными источниками информации о двигательной деятельности для учеников старшего школьного возраста являится сеть Интернет, друзья и сверстники. Данные исследования интерпретированы с учетом гендерных особенностей учеников.

Ключевые слова: двигательная активность, ученики, информация, Интернет.

Formulation of a Research Problem. According to the definition given in the free encyclopedia Wikipedia, the information environment is the world of information around a person and the world of his/her information-related activity.

Information environment of a person is formed by information and communication technologies, the relevance of which is growing in different spheres of life, and also contributes to socio-economic transformations [1]. Information and communication technologies cause and accelerate the processes of obtaining and production of knowledge, promote the modernization of education [10].

In 2003, only 14 % of young people (16 years and over) used cell phones, computers and the Internet. In 2014, more than 85 % of young people had mobile phones, 60 % used the Internet [1].

Modern society presents to the individual a number of requirements, which are usually accompanied by a reduction of free time, including a decrease in the ability to be engaged in motor activity. According to WHO, 1,9 million of deaths are caused worldwide by hypodynamia, and overweight and obesity cause at least 2,6 million deaths each year. The lifestyle of the population of Ukraine, in combination with the state of the sphere of physical culture and sports, caused a serious demographic crisis, which is a serious problem of national importance [4].

The above-mentioned negative factors did not bypass the educational process of secondary schools. The large amount of academic load of high school students leads to a systematic accumulation of fatigue, which negatively affects the overall state of their health [6].

The school does not fully solve the problem of meeting the children's biological need for movement. Physical education lessons only compensate for 15 % of the amount of motor activity necessary for the child's organism. About 60 % of the 10th–11th forms students are not involved in various forms of motor activity during extra–curricular time [2].

Among a number of negative factors that cause such a situation, one of the factors is the information environment of high-school-age students, which determines the priorities of activity of these children.

Today, the problems of physical education should be studied taking into account the requirements of the information society. The research of different approaches to the use of means and methods of physical education should be carried out taking into account such factors as increase of the amount of academic load, ineffective in terms of a healthy lifestyle, organization of the teaching and learning process, lack of motor activity among students of different age groups [4; 11].

Analysis of the Research Into this Problem. Analyzing the results of researches on the chosen subject, first of all, it is necessary to distinguish between the researches devoted to the study of various problems of motor activity and researches that examine the influence of information and communication technologies on modern society.

The problems of the deficit of motor activity of the young generation were considered by S. M. Futornyy in his research paper «Formation of a healthy lifestyle of the young generation in the process of physical education». The author believes that the process of physical education should become an immune protective device for the preservation of an individual's health and contribute to the formation of a healthy lifestyle of the modern young generation [9].

Mykhailo Perehinets studied the problems of high school students motivation to organize the process of physical education in general education institutions of various types. The author also touched upon the problems of organization of the motor activity of students during a school day [7].

M. Y. Yaroshyk, investigating the structure and characteristics of the daily motor activity of students, found that specially organized motor activity is only 2% of the total amount of motor activity [12].

A. Roztoka, who discovered the relationship between a low level of motor activity and morphofunctional disorders in the children's bodies, studied the peculiarities of daily motor activity of schoolchildren of the 5th–6th forms [8].

Current research in the field of information and communication technologies and the possibility of their use in the educational process has become topical in modern science. In particular, Nataliya Oleksiuk [5] studied the possibility of using electronic social networks in social and pedagogical work with students.

To increase the effectiveness of perception of educational material related to motor activity and increase the level of motor activity of youth, N. Chukhlantseva suggests the use of active video games, whose feature is the physical movement of the gamer's body. With this research, the author shows the possibility of integrating modern information technologies into the process of physical education [10].

The problems of spending free time by students of different ages on activities related to using a computer or watching television programs are regularly studied abroad. The authors try to determine the structure of the free time of children of different ages and the place of various activities in it [13; 14].

Despite the fact that motor activity, as a subject of scientific research, is studied by many scientists, there is a lack of researches that examine a problem of motor activity from a perspective of information and communication technologies development. The problems of the place of physical culture and sport in the general information space of the individual are also poorly studied.

All mentioned above has determined the choice of the goal of the research. **The goal of the research** is to reveal the main sources of information on motor activity that affect the information environment of high–school–age students.

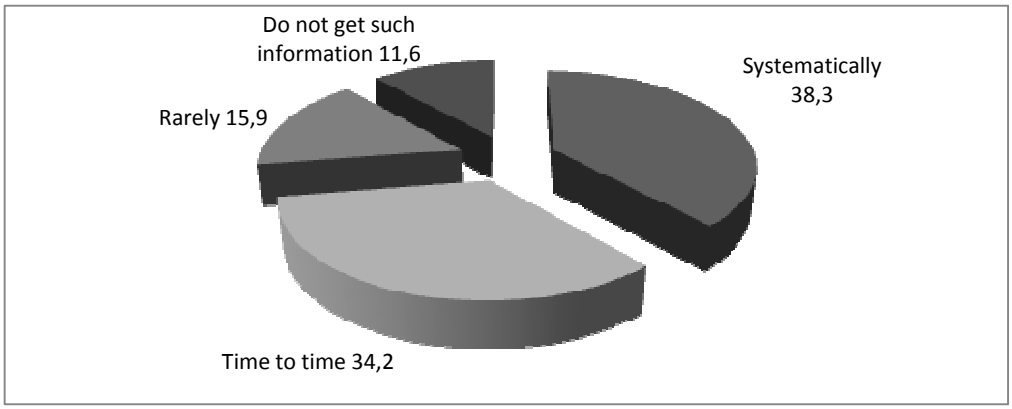
Methods of the Research. Methods of theoretical analysis and synthesis, analysis of scientific and methodological literature and a sociological survey were used in the research. The results of the two surveys are presented, the surveys were conducted among students of the 10th–11th forms of secondary schools in Lviv, Ternopil, Ivano–Frankivsk and Khmelnytsky. The questionnaires were developed by the author.

The first survey was carried out in order to reveal the regularity and main sources of information on the motor activity obtained by high–school–age students. The total number of interviewees was 926 (449 boys and 476 girls).

The goal of the second survey was to characterize the information environment formed by the main sources of information. 846 students took part in the second survey (420 boys, 426 girls).

In both studies, the sample was 6 % of the population. The error of the obtained data is ± 4%.

The results of the Research and Their Discussion. Determining the regularity with which the students of 10–11 forms receive information about motor activity, the respondents were asked to answer the question: «How often do you get information on motor activity?» (pic. 1).



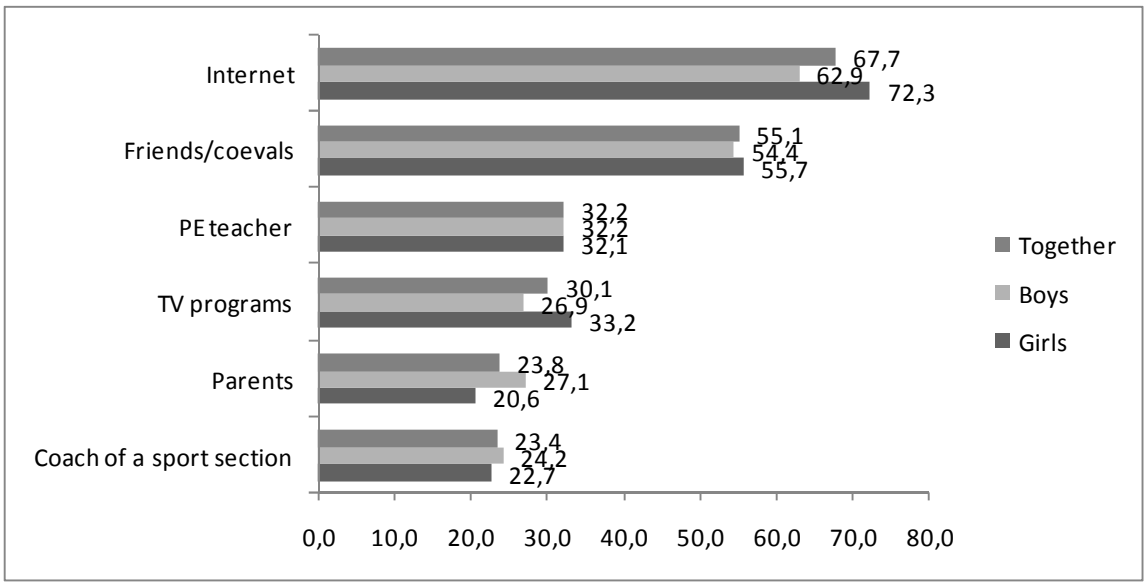
Pic. 1. *Regularity of Receiving Information on Motor Activity by High School Students (%, n = 925)*

The obtained results showed that, in general, 38,3 % of high-school-age students systematically (once a week or more often) receive some information on the motor activity. From time to time (1–3 times a month) this information is received by 34,2 % of the surveyed students of the 10th–11th forms. Once a month or less, information on the motor activity is received by 15,9 % of students. In general, 11,6 % of high-school-age students do not receive information about various aspects of motor activity.

Having carried out a simple mathematical calculation, one can see that, in general, 61,7 % of high-school-age students do not regularly receive information about motor activity. This indicates that such information does not reach them even at the physical culture lesson, which is compulsory and formally must be held at least twice a week. Obviously, this percentage of students is not systematically engaged in sports sections that could be a place for them to get more information about motor activity.

When interpreting the received data, it is necessary to take into account the sources from which the relevant information comes, this certainly affects the quality of this information. That is why, for a better

understanding of the content component of the information that the high-school-age students receive, we have identified the sources of the information on the motor activity (pic. 2). When analyzing the answers to this question, we did not take into account the answers of the 11,6 % of students, which indicated that they did not receive information about motor activity at all.



Pic. 2. *The Main Sources of Receiving Information on Motor Activity by High-School-Age Students (%, n= 846)*

As can be seen from the figure, the main source of information about the motor activity for modern students is the Internet, as indicated by 67,7 % of respondents in total. Among the girls this figure was 72,3 % and it was higher by 9,4 % of the boys' index, which was 62,9 %, respectively.

The second most popular source of information was friends and peers. This was

indicated in a total by 55,1 % of students of the 10th–11th forms.

Almost a third of the interviewed students (32,2 %) receive information about motor activity from the teacher of physical culture. Television programs are the source of this information for 30,1 % of high-school-age students. Concerning this variant of the answer, it turned out to be somewhat more popular among girls (33,2 %), among boys the corresponding figure was 26,9 %.

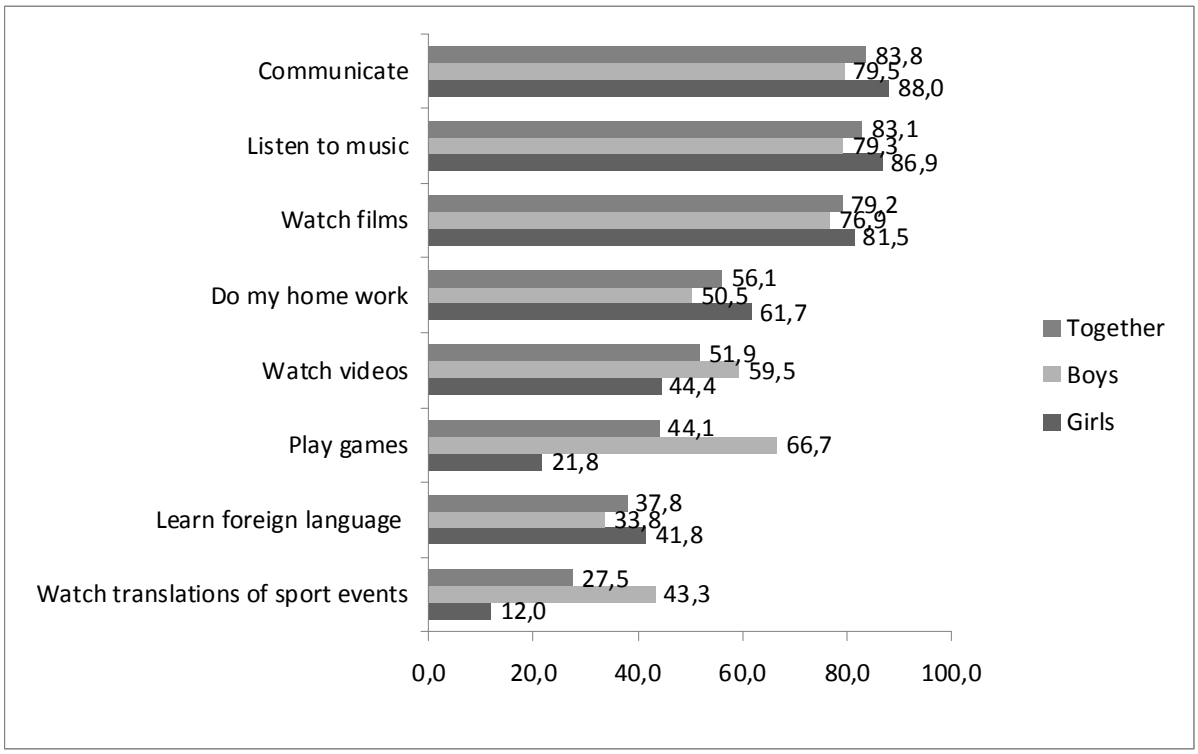
Among the five most common sources of information about motor activity, the high–school–age students also mentioned parents (23,8 %) and the coach of the sports section (23,4 %).

In our opinion, the given data reveal a negative picture of the information space of students of the 10th–11th forms in the context of obtaining information about the peculiarities of motor activity. The point is that the proportion of the objective sources of information, which certainly are the teachers of physical culture and coaches of sports sections, does not exceed 33,3 % in the general information space of high-school-age students. In fact, 2/3 of the students receive information about the motor activity, which may contain a significant proportion of subjective, doubtful or even harmful to health regulations. Specialists in physical education and sport should be those people who properly interpret scientific information, research data, the characteristics of certain techniques and convey the correct information about the motor activity to students.

As it has been mentioned, only two information sources are used by high–school–age students by 50 % or more, they are the Internet and friends or peers. It is obvious that communication and information exchange with peers can not be a way of filling the information space with adequate information that requires objective scientific interpretation. As for the Internet, it's worth mentioning that it contains a large array of information about motor activity, means and methods of physical education. Despite the fact that a large proportion of this information is objective and has a proper scientific justification, it is usually difficult for a potential user to separate it from unnecessary information, advertising and spam.

Taking into account that the Internet was indicated by high–school–age students as the main source of information on motor activity, we further identified some features of involving this group of children in the use of this network. First of all, the mass participation of students aged 15–17 years in the Internet activity was determined. As a result of the study, it was found that, in general, 99.3% of students of this age use the Internet.

In the course of study, three main types of activity were identified, which involve the high-school-age students using the Internet (pic. 3).



Pic. 3. *The Purpose of Spending time on the Internet by High-School-Age Students (%, n= 840)*

It should be noted that the obtained results were analyzed without taking into account the respondents who pointed out that they did not use the Internet. Most often, high-school-age students use the Internet for communication, as indicated by 83,8 % of the respondents. Among the girls, this indicator was very high and was 88 %, which is 8,5 % more than the corresponding indicator among the boys (79,5 %).

«Listening to music» turned out to be a very common activity among the students of the 10th–11th forms. Overall, 83,1 % of the students indicated this. 79,2 % of students generally prefer watching movies as a kind of activity on the Internet.

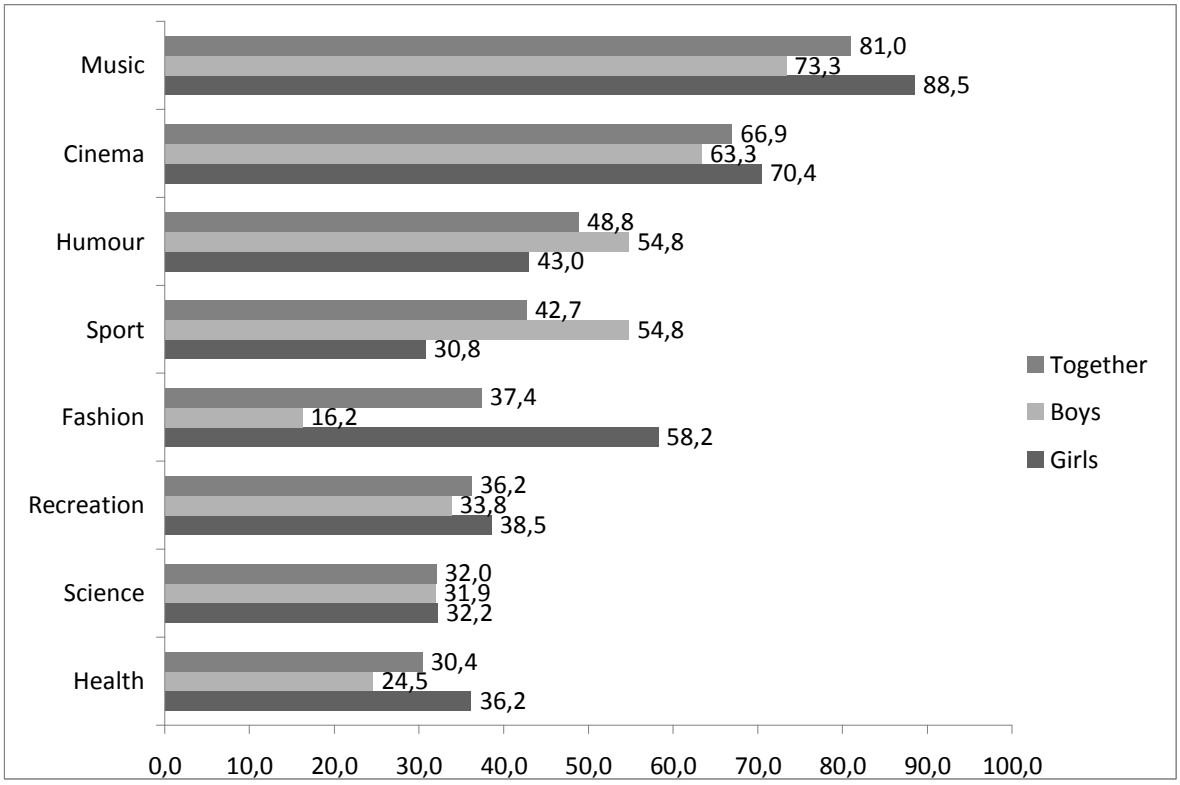
The given data show that the most common types of activities on the Internet among high school students are carried out primarily for entertainment and recreation purposes. The so-called «useful» activities cover a significantly smaller percentage of students. For example, 50,5 % of boys and 61,7 % of girls use the network for their homework. 33,8 % of boys and 41,8 % of girls use the Internet for teaching or studying foreign languages.

Regarding other types of activities, gender differences were the most significant ones in the indicators of high-school-age students who use the network to play various games and watch sports programs. As expected, these indicators were higher among boys. Thus, 66,7 % of boys play games using the Internet, while among girls this indicator is only 21,8 %. 43,3 % of boys use the network to watch broadcasts of sports events. Only 12 % of girls perform a similar activity.

An analysis of the high-school-age students Internet activity is impossible without studying the content of this activity. In other words, it is important to establish a dominant content, which actually determines the relevant activity. To this end, we have found out what information is most often searched for by high-school-age students on the Internet (pic. 4).

As can be seen from the figure, the most needed Internet content for high–school–age students is music (a total of 81 %) and cinema (a total of 66,9 %). Among the girls, these indicators were higher than the overall data and were 88,5 % and 70,4 %, respectively.

Among the male respondents, the next popular types of information were humor and sport. These options have the same indicator, which is 54,8 %. Among the girls the mentioned options were supported at the level of 43 % and 30,8 % respectively.



Pic. 4. *Information Most Often Searched for by High-School-Age Students on the INTERNET (%, n= 840)*

The difference between the answers of girls and boys concerning the information about fashion and style was significant. On the network this information is searched for by 58,2 % of girls, while among boys this figure is only 16,2 %.

In the context of our study it was important to find out the percentage of students searching for information about health on the network. The results of the study showed that, in general, 30,4 % of high-school-age students are interested in this information , including 24,5 % of boys and 36,2 % of girls.

The results of the research show that the information content that accompanies the use of the Internet by high-school-age students is mostly entertaining one. We assume that the information about sport, which high school students are interested in, is of entertaining nature as well, whereas a scientific-cognitive component is significantly lower.

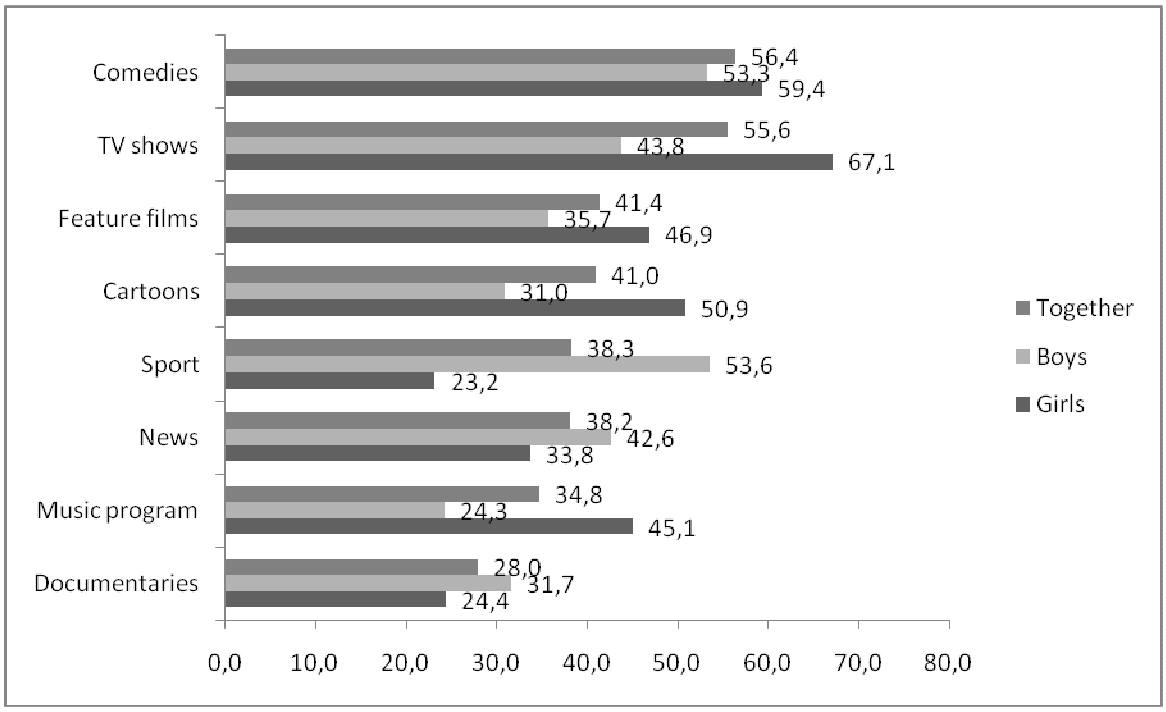
As already mentioned, almost one third of high–school–age students pointed out television as a source of information about motor activity. We have found out what information content is preferred by students of this age when watching certain TV programs. The results are shown in picture 5.

It is obvious that specific TV programs such as sports event broadcasts, sports news, specialized documentary films or programs can contain information about certain aspects of motor activity. It is also clear that the information about motor activity does not have a narrowly focused scientific and methodological bias, and its positive impact can be considered mainly from the point of view of promotion of motor activity.

The data of our research show that, in general, 38,3 % of students of the 10th–11th foms watch sports programs. There is a significant gender difference in indicators: 53,6 % of boys and only 23,2 % of girls watch such programs. The most popular television programs are entertainment programs.

Conclusions. In general, 38,3 % of high-school-age students receive some information about the motor activity once a week or more often. 67,1 % of high-school-age students do not receive information about motor activity on a systematic basis.

The study found that the sources of information about motor activity that are most common among students of the 10th–11th forms can not fully ensure the reliability of the relevant information.



Pic. 5. *Television Content Preferred by High-School-Age Students (%, n= 846)*

It has been established that the Internet is the main source of information about motor activity for students of the 10th–11th forms, as indicated by a total of 67,7 % of respondents. The second most popular source of information is friends and peers. This was indicated by a total of 55,1 % of the 10th–11th forms students. The high-school-age students also mentioned physical education teachers among the three most common sources of information on motor activity, as indicated by 32,2 % of respondents.

It has been revealed that the information which is most often searched for on the Internet by high–school–age students is mostly entertaining one. TV entertaining content is also interesting for the students of the 10th–11th forms.

Prospects for Further Research will be aimed at finding ways to increase the proportion of information on physical culture and sports in the general information space of students of different age categories. The ability to fill the information sources that are most convenient for high-school-age students with the relevant information content also requires further consideration.

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Лікувальна фізична культура, спортивна медицина й фізична реабілітація

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FEATURES OF THE VEGETATIVE REGULATION OF DEMOBABILIZED BATTLE PARTICIPANTS

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Abstract

The data of 50 mobilized participants of the antiterrorist operation (ATO) on the territory of eastern Ukraine, who are undergoing treatment and rehabilitation in the Volyn Regional Hospital of War Veterans, are presented. Due to the data obtained: middle age, period of service in the combat zone, causes of hospitalization, features of local dermographism, a «model» of the ATO participant was formed. The results of the pilot study showed that the average age of the military man was 34,88 ± 9,44 years old (the youngest soldier was 21 years old and the oldest of them was 59 years old). Half (50 %) of the defendants were aged 26–35. The period of the military service is 8,5 ± 4,4 months (from 2 to 16 months). 42 % of the respondents are getting inpatient treatment for the first time, while 58 % of them are undergoing treatment and rehabilitation for the second time. The causes of hospitalization in 56 % of cases were wounds in the ATO area, and in 44 % – deterioration of chronic diseases or primary pathological changes. According to local dermographism, it has been established that more than two thirds of hospitalized participants of the ATO due to the vegetative «passport» are sympathologists and only one third – vagotonics. Among the battle participants, 68 % of the sympathologists and 32 % of the vagotonics were injured. 64 % of the sympathlogists and 36 % of the vagotonics were hospitalized with health deterioration. Taking into account the obtained data, a «model» of a mobilized ATO participant is formed – a young male sympathologist, at the age of 35, has done military service for 8,5 months during which was wounded, undergoes second treatment and rehabilitation.

Key words: ATO participant, vegetative regulation, rehabilitation.

Ольга Андрійчук, Тетяна Масікова, Дорота Ортенбургер, Руслан Ізмаїлов. Особливості вегетативної регуляції демобілізованих учасників бойових дій. Наведено дані 50 мобілізованих учасників антитерористичної операції (АТО) на території Сходу України, які проходять курс лікування та реабілітації у Волинському обласному госпіталі для ветеранів війни. На основі отриманих даних: середній вік, термін перебування в зоні бойових дій, причини госпіталізації, особливостей місцевого дермографізму сформувалася «модель» учасника АТО. Результати пілотного дослідження показали, що середній вік військових становив 34,88±9,44 років (наймолодшому бійцеві – 21 рік; найстаршому – 59). Половина (50 %) з опитаних захисників віком 26–35 років. Термін перебування на військовій службі – 8,5±4,4 міс. (від двох до 16 міс.). 42 % респондентів на стаціонарному лікуванні перебувають уперше, у той час як 58 % повторно проходять курс лікування та реабілітації. Причинами госпіталізації в 56 % випадків були отримані поранення в зоні АТО, а в 44 % – загострення хронічних захворювань або первинні патологічні зміни. За даними місцевого дермографізму, установлено, що понад дві третини госпіталізованих учасників АТО за вегетативним «паспортом» є симпатотониками й лише третина – ваготониками. Серед учасників бойових дій поранення отримали 68 % симпатотоніків і 32 % ваготоніків. Із погіршенням у стані здоров'я госпіталізовано 64 % симпатотоніків і 36 % ваготоніків. Ураховуючи отримані дані, формуємо «модель» мобілізованого учасника АТО – це молодий мужчина-симпатотонік віком 35 років, на військовій службі перебував 8,5 місяця, отримав бойові поранення, повторно проходить курс лікування та реабілітації.

Ключові слова: учасник АТО, вегетативна регуляція, реабілітація.

Ольга Андрийчук, Татьяна Масикова, Дорота Ортенбургер, Руслан Измаилов. Особенности вегетативной регуляции демобилизованных участников боевых действий. Приведены данные 50 мобилизованных участников антитеррористической операции (АТО) на территории Востока Украины, которые проходят курс лечения и реабилитации в Волынском областном госпитале ветеранов войны. На основе полученных данных: средний возраст, срок пребывания в зоне боевых действий, причины госпитализации, особенностей местного дермографизма – сформировалась «модель» участника АТО. Результаты пилотного исследования показали, что средний возраст военных составлял 34,88 ± 9,44 лет (самому молодому бойцу – 21 год; старшему – 59 лет). Половина (50 %) опрошенных защитников имеют возраст 26–35 лет. Срок пребывания на военной службе – 8,5 ± 4,4 мес. (от двух до 16 мес.). 42 % респондентов на стационарном лечении находятся впервые, в то время как 58 % – повторно проходят курс лечения и реабилитации. Причинами госпитализации в 56 % случаев были полученные ранения в зоне АТО, а в 44 % – обострение хронических заболеваний или первичные патологические изменения. По данным местного дермографизма, установлено, что более двух третей госпитализированных участников АТО по вегетативном «паспорте» являются симпатотониками и только треть – ваготониками. Среди участников боевых действий ранения получили 68 % симпатотоников и 32 % ваготоников. С ухудшением в состоянии здоровья госпитализированы 64 % симпатотоников и 36 % ваготоников. Учитывая полученные данные, формируем «модель» мобилизованого участника АТО – это молодой мужчина-симпатотоник в возрасте 35 лет, на военной службе находился 8,5 месяцев, получил боевые ранения, повторно проходит курс лечения и реабилитации.

Ключевые слова: участник АТО, вегетативная регуляция, реабилитация.

Introduction. In recent years, the modern healthcare system has faced the need for a solution of an important issue – the treatment and rehabilitation of patients who participated in the anti–terrorist operation (ATO) in eastern Ukraine. The solution of this problem requires a multi–system approach, as there are unique psychological p perceptions of its new status, the response to a temporary disorder of health, illness, and the surrounding situation in this category of personalities . The nonconstructive changes in behavioral reactions, maladaptive syndrome (A.V. Shvets, A. Yu. Kih, A. M. Volyansky, I. A. Lukianchuk) develop post-traumatic stress and disorder in the military (M. M. Matiash, L. I. Khudenko). According to some researches (V. I. Shevchuk, N. M. Belyaev, O. B. Yavorovenko, I. V. Kurilenko, A. Yu. Galyutin), as a result of combat operations, 59,3 % of victims have post–traumatic lesions of the abdominal cavity, thorax , diseases of the digestive system, respiratory organs, cardiovascular diseases. Most ATO soldiers were recognized as disabled or as people with a certain percentage of permanent disability, and according to scientists: N. M. Belyaeva, O. B. Yavorovenko, I. V. Kurylenko, Yu. A. Danilenko, G. V. Pavlichenko, the causes of disability were not only the consequences of injuries, contusions, injuries, but, also, persistent disorders of the body's function, which led to limitation of life due to diseases that were obtained during military events. All of these requires a particular approach to the planning of treatment tactics and the creation of an individual rehab program, including physical and socio–psychological rehabilitation.

The question of the need for detailed study of the influence of the ATO factors on its participants is raised not only by practicing doctors, rehabilitants, scientists, but also determined by lawmakers at the governmental level. Thus, in the concept of the Government Target program on physical, medical, psychological rehabilitation and social and professional re-adaptation of the participants of the antiterrorist operation for the period up to 2022, it has been stipulated that the experience of the years shows that there is no effective system of rehabilitative services and in the government for those people who took part in the antiterrorist operation. Healthcare institutions, rehabilitation institutions and adaptation centers are not ready for the full implementation of the tasks related to the aforementioned problems.

The purpose of our research is to study and generalize the individual data of ATO participants, the features of their vegetative «passport». This approach, based on a personality–centered approach, will help to predict and create programs for rehab and new treatment.

Methods of research: study and analysis of modern scientific and methodological developments on selected topics; research of local demographics by the method of mechanical irritation and determination of reflex–response of neurovascular skin formations; mathematical processing of data using the Med Stat program.

Research Results. The study involved 50 demobilized ATO participants undergoing treatment and rehabilitation in the Volyn Regional Hospital of Veterans of the War.

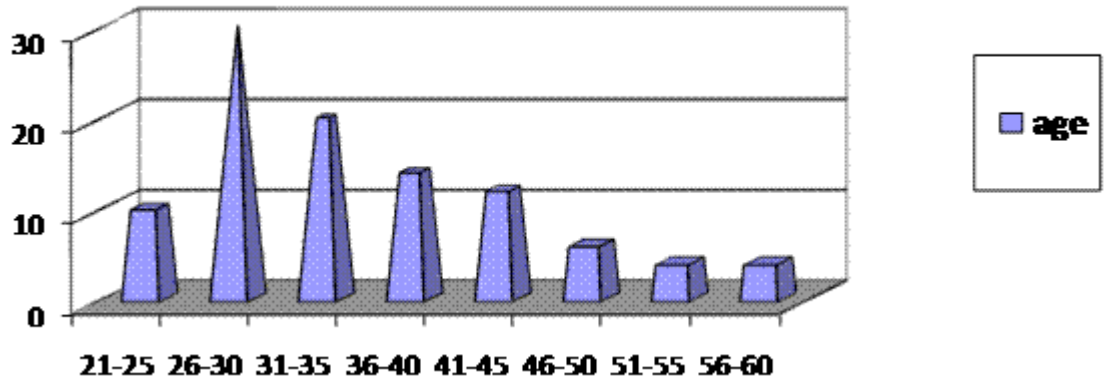
All examined ATO participants agreed to the processing of their data. Questionnaires were conducted anonymously. According to the questionnaire, the average age of the military was 34,88 ± 9,44 years (the youngest soldier was 21 years old and the oldest was 59 years old.) The distribution of patients by age showed the following result: 30 % of men aged 26–30; 20 % of ATO participants aged 31–35 years; 14 % of the military who undergo treatment and rehabilitation at the age of 36–40 years; 12 % – at the age of 41–45; 10 % of boys aged 21–25 years old and 4 % of persons aged 51–55 and 56–60 years old. The data is presented in the table 1 and graphically shown in pic. 1.

Table 1

The Age Distribution of ATO Members who are on Inpatient Treatment and Rehabilitation Phase

Age	n	%
21–25	5	10
26–30	15	30
31–35	10	20
36–40	7	14
41–45	6	12
46–50	3	6
51–55	2	4
56–60	2	4
∑	50	100

Such data show that the largest cohort of our defenders is young men aged 26 to 35 years.



Pic. 1. *The age Distribution of ATO Participants who are in the Stationary Stage of Treatment and Rehabilitation, %*

Among the respondents who participated in the study, 21 people (42 %) entered the hospital for the first time, 29 people (58 %) were undergoing treatment and repeat rehabilitation. People first hospitalized with an average term of stay in the ATO zone was 9,3; 4,6 months (min – 2 months, max – 16 months). Among them, 9 people (43 %) were injured while performing military service, and 12 men (57 %) were hospitalized for the exacerbation of a chronic illness or a temporary deterioration in their health status.

29 soldiers (66 %) who received wounds in the ATO zone and 10 (34 %), who have been diagnosed with primary pathological changes, or recurrence of illness have been referred for re–hospitalization. The average term of military service in them was 7.8 ± 4,3 months (from 2 to 14 months).

Thus, in the inpatient treatment, there are 28 mobilized men (56 %) who received wounds in the ATO zone, and 22 military (44 %) whose exacerbated health is not related to injuries. The terms of stay in the military service is from 2 to 16 months (8,5 ± 4,4 months).

Participation in battle operations is usually a stressful situation for a person, which is reflected in the functioning of the nervous system. The manifestations of such changes depend on the vegetative «passport» of a person: a person vagotonic («owl», «styrian») or sympathologist («lark», «sprinter»). Depending on the predominance of the sympathetic or parasympathetic nervous system, there will be a corresponding human response, a clinical picture of the pathological process, and, as a result, an approach to treatment and rehabilitation will be as well.

A peculiar division of the military into vagotonics and sympathologists, was conducted by Alexander Macedonian. To determine which section of the autonomic nervous system dominates – sympathetic or parasympathetic, he gave a slap to the soldier and observed whether he was reddish or pale. In the first ranks, he put those who were red (sympathetic), and in the latter – those who were pale (vagotonics). As the sympatotonics have a quick reaction, they are ready to fight without hesitation, but they quickly spend their strength. After the exhaustion of the first rows (sympathologists) in the battle come the rear rows of soldiers (vagotonics), which are much hardier and are able to withstand the invasion of the enemy longer.

The study of the autonomic nervous system is an important diagnostic prognosis, since a person cannot control his influence on organs and systems. To determine which section of the autonomic nervous system predominates in ATO participants, we investigated local dermography. Local dermography is a local vasomotor response to a pricked irritation of the skin. Depending on the reaction, it is distinguished: a red dermography with a predominance of the parasympathetic nervous system and a white dermography – with the predominance of the sympathetic nervous system. Such research is only the initial stage of a thorough study of the peculiarities of a vegetative regulation of battle participants.

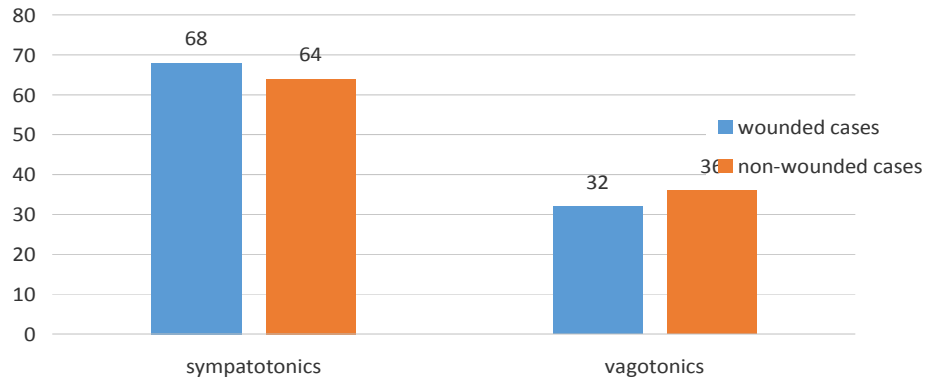
Among sympathologists (due to the dominant influence of the sympathetic nervous system), active and hard-working subjects (especially in the evening) predominate, however, it is noted that they have a decrease in concentration; they are emotionally tense with frequent manifestations of anxiety, hysteria, neurasthenia. Such individuals often overestimate their capabilities.

Vagotonics' (because of the predominance of the parasympathetic nervous system), work efficiency is better in the morning, however, they tend to have depression, indecision, they show no initiative and they manifest asthenization (fatigue or chronic fatigue, weakness). They pessimistically perceive themselves and everything in the environment.

Such psycho-emotional manifestations are due to the fact that the sympathetic section of the autonomic nervous system is responsible for stimulation, and parasympathetic – for relaxation.

Among 28 examined ATO participants who received injuries during battles, 19 people (68 %) have white dermographism, which is a characteristic of sympatotonics, and 9 soldiers (32 %) have red dermographism which is manifested in vagotonics.

Among 22 patients undergoing the treatment and rehabilitation course in non–wounded cases, 14 men (64 %) have white dermographism and 8 people (36 %) have red dermographism. Graphically, the data is shown in pic. 2.



Pic.2. *Distribution of ATO Participants Depending on the Vegetative «passport», %*

Analyzing the distribution data of the ATO participants which depends on the predominance of sympathetic or parasympathetic section of the autonomic nervous system, it appears that the vast majority of people are sympatotonics: 68 % got the injuries during military service, and 64 % had no battle injuries and were hospitalized due to deterioration of health. At the same time, the third part of the ATO participants undergoing treatment and rehabilitation are vagotonics with predominant parasympathetic nervous system dominance.

Basing on the results of research about dominant influence of autonomic nervous system, it is reasonable to include sedative therapy in the complex treatment and rehabilitation of sympatotoniks, and psycho-stimulant therapy for vahotoniks.

Conclusion. Summarizing the obtained data in research, we found that the ATO member who is undergoing treatment and rehabilitation – is a young man aged 26–30 years, hospitalized again, who has some battle injuries received during military service for period of 8,5 months. Depending on the vegetative regulation, the ATO participant is a sympatotoniks with all the effects of the sympathetic nervous system on the mood, readiness for the action, behavior, and current clinic picture.

In further plans of the research, we consider to study the response of the internal organs, depending on the diagnosis and functional characteristics of the autonomic nervous system.

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THE RESEARCH OF TIME PERCEPTION OF CHILDREN WITH HEARING IMPAIRMENTS

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Abstract

The article describes the peculiarities of perception of the length of time periods of children of elementary school age with hearing impairments. It is known that in the characteristics of time sensations the most important role is played by kinetic and auditory sensations. Therefore, the study of perception of time as an integral part of cognitive activity of children with hearing impairment is relevant.

In studies whose purpose was to ***study*** the perception of the time of children with hearing impairment, we were asked to study the data of scientific sources and analyze the results of the pedagogical experiment. The purpose and tasks were realized by ***methods*** of analysis and generalization of scientific and methodological literature and pedagogical experiment.

In investigational participated 24 children (an experimental group consisted of 12 girls with violation of rumor, control – from 12 girls in that a rumor was in a norm). For the study of perception of time in our research we used methodology of measuring of minute interval lot and executing an ccount to 60 after a second.

According to the results of the experiment, it was found that the majority of girls who participated in the study demonstrated a decrease in the length of the individual minute. There was no significant difference between the mean group values of the control and experimental groups in the first and second tests ($p > 0,05$). The analysis of the results showed an ambiguous picture, which can be related to external and internal factors and features of the subjects.

Conclusions. Perception of time is an important characteristic of the mental activity of a child with hearing impairment. It determines the level of orientation of such a child in the world around him and depends on both external factors and the characteristics inherent in the child. It is natural to assume that such an individual characteristic as the perception of time can depend on the nature of the child, the degree and timing of hearing loss, the level of knowledge, the emotional state, and will be the subject of our further research.

Key words: Time, children with hearing impairments, minute interval.

Лілія Гацоєва. Дослідження сприйняття часу дітьми з вадами слуху. У статті досліджено особливості сприйняття тривалості часових періодів дітьми з вадами слуху молодшого шкільного віку. Відомо, що в характеристиках часових відчуттів найбільш важливу роль відіграють кінетичні й слухові відчуття. Тому опанування сприйняття часу як складової частини пізнавальної діяльності дітей із порушенням слуху є актуальним.

У дослідженнях, мета яких полягала у вивченні сприйняття часу дітей із порушенням слуху, нами поставлено ***завдання*** вивчити дані наукових джерел і проаналізувати результати педагогічного експерименту. ***Мета та завдання*** реалізовувалися ***методами*** аналізу й узагальнення науково-методичної літератури та педагогічного експерименту.

У дослідженні взяли участь 24 дитини (експериментальна група складалася з 12 дівчаток із порушенням слуху , контрольна – із 12 досліджуваних, у яких слух був у нормі). Для вивчення сприйняття часу в нашому дослідженні ми використовували методику вимірювання хвилинного інтервалу без лічби й виконуючи рахунок до 60 через секунду.

За результатами експерименту встановлено, що більшість дівчат, які брали участь у дослідженні, продемонстрували зменшення довжини індивідуальної хвилини. Між середньогруповими значеннями контрольної та експериментальної груп у першому й другу тестуванні не виявлено достовірної різниці ($p>0,05$). Аналіз результатів засвідчив неоднозначну картину, що може бути пов'язана із зовнішніми та внутрішніми факторами й особливостями досліджуваних.

Висновки. Сприйняття часу це важлива характеристика психічної діяльності дитини з порушенням слуху. Воно визначає рівень орієнтованості такої дитини в навколишньому світі й залежить як від зовнішніх чинників, так і від особливостей, що властиві самій дитині. Природно припустити, що така індивідуальна характеристика, як сприйняття часу, може залежати від характеру дитини, ступеня та часу втрати слуху, рівня знань, емоційного стану, що й стане предметом наших подальших досліджень.

Ключові слова: час, діти з вадами слуху, хвилинний інтервал.

Лилия Гацоева. Исследование восприятия времени детей с нарушением слуха. В статье рассказывается об особенностях восприятия длительности временных периодов детей с нарушениями слуха младшего школьного возраста. Известно, что в характеристиках временных ощущений наиболее важную роль играют кинетические и

слуховые ощущения. Поэтому исследование восприятия времени как составной части познавательной деятельности детей с нарушением слуха является актуальным.

В исследованиях, цель которых заключалась в изучении восприятия времени детей с нарушением слуха, нами ставились **задачи** изучения данных научных источников и анализа результатов педагогического эксперимента. Цель и задачи реализовывались ***методами*** анализа и обобщения научно-методической литературы и педагогического експеримента.

В исследовании приняли участие 24 ребенка (экспериментальная группа состояла из 12 девочек с нарушением слуха, контрольная – из 12, у которых слух был в норме). Для изучения восприятия времени в нашем исследовании мы использовали методику измерения минутного интервала без счета и выполняя счет до 60, воспроизводя секунду.

По результатам эксперимента установлено, что большинство девочек, которые приняли участие в исследовании, продемонстрировали уменьшение длины индивидуальной минуты. Между среднегрупповыми значениями контрольной и экспериментальной групп в первом и втором тестировании не обнаружено достоверной разницы ($p > 0,05$). Анализ результатов показал неоднозначную картину, которая может быть связана с внешними и внутренними факторами и особенностями испытуемых.

Выводы. Восприятие времени является важной характеристикой психической деятельности ребенка с нарушением слуха. Оно определяет уровень ориентированности такого ребенка в окружающем мире и зависит как от внешних факторов, так и от особенностей, присущих самому ребенку. Естественно предположить, что такая индивидуальная характеристика, как восприятие времени, может зависеть от характера ребенка, степени и времени потери слуха, уровня знаний, эмоционального состояния и станет предметом наших дальнейших исследований.

Ключевые слова: время, дети с нарушениями слуха, минутный интервал.

Introduction. According to experts in the area of psychology, perception is based on sensations. At the time of perception all the sensations are synthesized, creating complete images of objects and phenomena. There is a reproduction of past experience, perceived understanding, feelings and emotions in every perception that is not reducible to a simple sum of sensations. There are several classifications of perception nowadays. At the core of one of them is the object of perception, i.e. the perception of objects, motion, gravity, balance, acceleration of space and time, person etc [1].

Perception of time is a reflection of objective duration, speed and sequence of phenomena. Time is a regulator of social relations, different types of activities, including work, sport, learning etc.

Every period of physical time can only be measured by comparing it with the duration of another interval that is a time standard. But there is no energy in time, that would influence a «receptor time» in the human body. Accordingly, there must exist an indirect mechanism that converts physical intervals into touch sensation.

Conditioned reflexes are physiological basis of the process of time's perception, that are accomplished by the interaction of analyzers, with a help of which we reflect other aspects of the phenomena [11].

Studies on psycho-physiological characteristics of athletes, depending on the specialization on the example of different sports, were done by S. K Holyaka, S. I Stepanyuk [12].

In the perception of time different analyzers are involved, however, the most accurate differentiation of time provides kinesthetic and auditory sensations. The auditory sensations reflect temporary features of the current irritant: its duration, rhythmic nature etc. I. M. Sechenov named the hearing – a measuring instrument of time, and auditory memory – a memory of time [6].

Hearing loss not only hampers the formation of speech and verbal thinking, but also affects the development of cognitive activity in general. Few studies on psychophysiological features of young sportsmen who have disturbance of analyzers, including hearing impairment are known today

The impact of hearing loss on quality characteristics of perception, including the perception of time always remains in the focus of specialists in pedagogy, psychology, sociology, etc.

Analysis of Recent Researches and Publications. Scientists believe that person`s age is of great importance in the perception of time: in childhood, a person feels more bodily sensations (heart palpitation, breathing), therefore, the time is rapidly running out.

Nowadays, according to the results of research in the field of biology and medicine, it is determined that some medications influenced the perception of time (speed up and slow down time). It was also determined that the size of an individual minute largely depends on the nature and quantity of hormones produced in the human body. For the elderly, in the body of which the hormones are less than in people of middle age, time usually stretches more slowly. In people of middle age, an individual minute is the shortest – human hormones are more active.

The latest research has proved that there is a systematic tendency to overestimate time intervals less than one second.

It is also known that the perception of time depends on the mental and physical condition of a person. «Sense of time» is developed and improved under the influence of specially organized physical activities and assimilation of a variety of means of estimating the time. In such cases the perception of time begins to play the role of the activities regulator.

From household observations, it is known that the rate of events is perceived differently in joy and in boredom. Perhaps this has become one of the reasons for the continued attention of researchers to the perception of time to this problem. Determination of the level of time's development perception among children of primary school with hearing loss remains highly relevant today.

Children with hearing impairment have a number of peculiarities in psychophysical development and communication. These peculiarities do not allow them effectively develop, acquire knowledge, life-saving skills and necessary skills fo their age. Many scientists were engaged in search and study of factors influencing the perception of time. The dependence on accuracy of time estimation from the intellectual level development was found out by B. I. Tsukanov. Ability to determine the time of a child is associated with knowledge of numbers. B. I. Tsukanov was also the first in the psychology world who revealed the value of temperament as a fundamental factor in the temporal organization of the individual [10] from temperature of the body and the environment [4; 13]. It is known, that while accelerating the metabolism, the subjective evaluation of time curves: it seems that time flows faster than normal, and vice versa. This effect was firstly described in 1933 by N. Hoagland. He found out that at high temperature, the subjective minute perceived by the patient was shorter than that at low. According to the N. Hoagland hypothesis, the brain has a biological clock that regulates the rate of metabolic processes in the body, which in turn affects the perception of time. Lowering the temperature should have the opposite effect. It should slow down metabolic processes, resulting in an underestimate of time. This assumption was checked for scuba divers on the coast of Wales in March at a water temperature of 4 ° C (Baddeley, 1966).

There is a considerable practical interest in such studies as effect of emotional stress on the accuracy of time estimation [8]. It was also studied the perception of time of such personality types are characterized by a high degree of emotional tension.

Y. M. Komarov together with G. I. Savenkov [3], investigated time perception among deaf individuals of 18–25 years old by comparing their data with the results of persons whose hearing was normal. They found out that during the «measurement of time interval» there were more mistakes among the deaf, than among those ones, who had normal hearing. However, playing back a specified interval, the deaf had fewer mistakes.

According to the study of A. V. Muteva, teenagers at the age of 13–15 who can hear, have better accuracy of the perception of time than the deaf at the same age [5]. Temporal parameters of movements among deaf children explored in their works I. M. Lyahova, O. I. Forstyan and others [3; 9].

But in an accessible scientific, scientific-methodical literature of domestic and foreign authors we have not come across an exhaustive study on the perception of time by children with hearing impairment. This question is of considerable interest, since the revealing of the connections of the perception of time with various factors would allow working out tests for professional suitability of people with hearing impairments in future. The analysis gives grounds to claim that the problem of time perception in the children of primary school age with hearing impairment has not been investigated enough.

The purpose of the study is to identify features of development of time perception among children of primary school age with a hearing disorder.

Material and Methods. According to the purpose our aim was to study and analyze data of scientific sources, concerning problems of time perception among children of primary school age with a hearing disorder. The aim and tasks were implemented by the methods of system analysis and synthesis of scientific and methodological literature on study issues, educational testing, and observation.

The Results of the Research. Discussion. The research involved 24 girls (12 girls with hearing impairment in the experimental group and 12 girls who have normal hearing were in the control group). The study was divided into two stages. At the first stage we investigated the perception of time. At the second stage we carried out mathematical processing of research results and their analysis.

Equipment: stopwatch and table-protocol of the study.

The procedure of the research: the study on time perception was done by two people, one of them was a test subject, while the second – an experimentalist. The study consisted of two experiments. In each experiment, the test subjects were asked to define a certain period of time without counting in the head and using a clock. The experimentalist determined the beginning of an interval by knocking with a pencil. The test subject determined the end of a certain period of time by raisings a hand or giving another signal. The time interval and the actual time that the test subject took for the given. The end of a certain period of time t interval was written in the table (table 1).

Table 1

The Results of the First and Second Testing of Time Perception EG and CG, c

№	Groups			
	The Fist Testing		The Second Testing	
	EG	CG	EG	CG
1.	31	51	57	48
2.	16	44	52	57
3.	31	43	49	49
4.	43	48	56	48
5.	85	45	43	49
6.	26	40	44	48
7.	35	42	48	47
8.	32	48	49	52
9.	44	52	42	54
10.	28	50	55	56
11.	92	48	59	51
12.	30	45	55	49
Mean Value ± σ	41,08±23,31	46,33±3.8	50,75±5,21	50,67±3,07
t	P>0,05		P>0,05	

Each of these groups that participated in the experiment proved to be different in terms of «individual minute». The perception of time was very individual, and during the retesting, these properties were repeated.

The short duration of individual minute by certain individuals, the EG (table 1) in our opinion can explain the emotional stress and the way of thinking of children with hearing impairment. Features of personal sphere of the test subjects (EG), lead to the appearance of a range of communication problems, and through them to increase in emotional intensity. The children of primary school age with hearing impairment are also characterized by the need to control the changes that are taking place around. It reduces the attention during task completing and accelerates individual minute.

We obtained the following results in our research. Due to less critical calculated value of t-criterion, we conclude that the differences between EG and CG that we observed during testing were not statistically significant ($p > 0,05$). According to the results of the first and second tests, significant difference between EG and CG were not identified.

As the table shows us, during the second test, the records of girls' individual minute changed. The girls from EG were able to reproduce more accurately set periods, than the girls from CG. It was also revealed that in the EG and CG dispersion decreased in the second testing.

It is known that the reactions of excitation are of considerable diversity in strength of expression and in contrast to reactions of inhibition. Therefore, we can assume that a larger variability in individual minute in the EG group is connected with the fact of diversity of excitation reactions.

Thus, the obtained experimental results allow us to highlight some peculiarities of time perception, characteristic for children of primary school age with hearing impairment

Conclusions and Perspectives of Further Research. The analysis of scientific sources confirmed that the perception of time is an important characteristic of child's cognitive activity, especially the child with hearing impairment. The child perceives time indirectly and compares time units with his /her activities and phenomena that are constantly repeated in her/his life. More accurate children's imagination is excited on the basis of personal experience. Therefore, the children with hearing impairments during exercises, need to be familiar with time intervals that can be measured and determine the duration, sequence, rhythm.

Each group that participated in the experiment turned out to be different in terms of individual minute. In our opinion, the perception of time depends on both external factors and peculiarities of a child. We assume that such an individual characteristic as the perception of time of a child with hearing impairment may depend on the character, particular qualities of her/his thinking, the degree and time of hearing loss, the level of knowledge and emotional state.

Data from the studies on individual perception of time can be an additional diagnostic criterion for the differentiation of corrective actions.

After studying and analyzing psychological, pedagogical and methodological literature on the research problem, we can make assumptions about the effectiveness of influence properly selected physical exercises on formation of time notion of children with hearing impairments during physical education.

These questions require additional attention, so they will be the subject of our further research.

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QUALITIES OF NEURODYNAMIC AND MENTAL FUNCTIONS OF ATHLETES

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Abstract

Relevance. The research on the correlation between individual-typological qualities of higher nervous activity, sensomotor reaction, memory and attention functions and the achievements in sports could serve a scientific basis for carrying out theoretical and practical tasks for sports orientation and selection. ***The purpose of the research*** is to study the correlation between sports achievements and the qualities of neurodynamic and mental functions of athletes of various qualifications and orientations. ***The Results of the Work.*** It was found out that the qualities of the basic nervous processes correlated with the nature of athlete's sports activity. The highest indices to both functional lability and nervous processes force were observed in the groups of wrestlers and gymnasts, and the lowest indices were in the beginner's group. It was stated that the students with the best skills of the sensomotor reaction of various difficulty, memory and attention functions were those who had masters of sports or masters for sports. The analysis of the indices to the sensomotor reaction in groups of athletes in different sports revealed that the wrestlers were characterized by shorter latent periods of a simple visual-motor reaction while the fighters and representatives of game sports were characterized by complex visual-motor reactions. Due to regular trainings and competitions the athletes of high qualification keep necessary coordination, preserve and improve the level of correlation between different nervous processes that cause the increase in neurodynamic and mental functions. Taking into account the high determination of typological qualities of higher nervous system it is necessary to consider that the high level of the qualities in question of athletes of high qualification may be a result of natural selection that can be typical. ***Conclusions.*** Individual-typological qualities (functional mobility and basic nervous processes force) and the qualities of sensomotor reactivity together with individual mental functions constitute the neurophysiologic basis for the effectiveness of sports activity.

Key words: neurodynamic functions, mental functions, sports qualification.

Микола Макаренко, Сергій Голяка. Властивості нейродинамічних та психічних функцій у спортсменів. ***Актуальність.*** Дослідження залежності між індивідуально-типологічними властивостями вищої нервової діяльності, сенсомоторним реагуванням, функціями пам'яті та уваги з результативністю досягнень у спорті могло б слугувати науковою основою для обґрунтування й розробки теоретичних і практичних завдань спортивної орієнтації та відбору. ***Мета дослідження*** – вивчення зв'язку результативності спортивної діяльності з властивостями нейродинамічних та психічних функцій у спортсменів різної кваліфікації й спрямованості. ***Результати роботи.*** Виявлено, що властивості основних нервових процесів перебувають у відповідному зв'язку з характером спортивної діяльності, у якій тренується спортсмен. Найвищі показники як функціональної рухливості, так і сили нервових процесів виявлено в групах борців і гімнастів, а найнижчі – у групі новачків. Показано, що достовірно кращими показниками сенсомоторного реагування різної складності, функцій пам'яті та уваги характеризувалися студенти, які мали спортивну кваліфікацію майстра чи кандидата в майстри спорту. Під час аналізу показників сенсомоторного реагування в групах спортсменів різної спрямованості з'ясовано, що коротшими латентними періодами простої зорово-моторної реакції характеризувалися борці, а щодо складних зорово-моторних реакцій – борці й представники ігрових видів спорту. У висококваліфікованих спортсменів систематичні тренування та регулярні змагання зберігають необхідну координацію, утримують і підвищують рівень узгодженості різних ланок нервової системи, що виявляється в підвищенні стану властивостей нейродинамічних та психічних функцій. Зважаючи на високу детермінованість типологічних властивостей вищої нервової діяльності і їхньої роль у формуванні нейродинамічних та психічних функцій, слід ураховувати й той факт, що високий рівень досліджуваних властивостей у висококваліфікованих спортсменів може стати результатом природного добору, що також є закономірним. ***Висновки.*** Індивідуально-типологічні властивості (функціональна рухливість і сила основних нервових процесів) та властивості сенсомоторної реактивності разом з окремими психічними функціями становлять нейрофізіологічну основу результативності спортивної діяльності.

Ключові слова: нейродинамічні функції, психічні функції, спортивна кваліфікація.

Николай Макаренко, Сергей Голяка. Свойства нейродинамических и психических функций в спортсменов. ***Актуальность.*** Исследование зависимости между индивидуально-типологическими свойствами

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высшей нервной деятельности, сенсомоторного реагирования, функциями памяти и внимания с результативностью достижений в спорте могло бы служить научной основой для обоснования и разработки теоретических и практических задач спортивной ориентации и отбора. ***Цель исследования*** – изучение связи результативности спортивной деятельности из свойствами нейродинамических и психических функций у спортсменов различной квалификации и направленности. ***Результаты работы.*** Обнаружено, что свойства основных нервных процессов находятся в соответствующей связи с характером спортивной деятельности, в которой тренируется спортсмен. Самые высокие показатели как функциональной подвижности, так и силы нервных процессов обнаружены в группах борцов и гимнастов, а самые низкие – в группе новичков. Показано, что достоверно лучшими показателями сенсомоторного реагирования различной сложности, функций памяти и внимания характеризовались студенты, которые имели спортивную квалификацию мастера или кандидата в мастера спорта. При анализе показателей сенсомоторного реагирования в группах спортсменов различной направленности определили, что коротшими латентными периодами простой зрительно-моторной реакции характеризовались борцы, а относительно сложных зрительно-моторных реакций – борцы и представители игровых видов спорта. У высококвалифицированных спортсменов систематические тренировки и регулярные соревнования сохраняют необходимую координацию, удерживают и повышают уровень согласованности различных звеньев нервной системы, что проявляется в повышении состояния свойств нейродинамических и психических функций. Учитывая высокую детерминированность типологических свойств высшей нервной деятельности и их роль в формировании нейродинамических и психических функций, следует обращать внимание и на тот факт, что высокий уровень исследуемых свойств у высококвалифицированных спортсменов может быть также закономерным результатом естественного отбора. ***Выводы.*** Индивидуально-типологические свойства (функциональная подвижность и сила основных нервных процессов) и свойства сенсомоторной реактивности вместе с отдельными психическими функциями составляют нейрофизиологическую основу результативности спортивной деятельности.

Ключевые слова: нейродинамические функции, психические функции, спортивная квалификация.

Introduction. The study on the correlation between sports achievements and the level of main nervous processes, the nature of the sensomotor reaction, mental functions, etc. is a relevant scientifically-applied problem that is in need of further research [5]. Genetically determined qualities of higher nervous activity (HNA) such as functional lability and nervous processes force are known to play a major role in selecting youth for doing sports in sports clubs [1; 2; 5; 6]. But as a rule, it is done by coach's intuition or questionnaire which does not meet requirements and is invalid. Equipment is of less importance and even those people, who want to apply it, do not have the necessary equipment at their disposal. The determined correlation between individual-typological qualities of HNA, sensomotor reaction, memory and attention functions and sports achievements could be a scientific basis for substantiation and working out theoretical and practical exercises for different sports and selection, etc.

The purpose of the research is to study the correlation between sports achievements and the qualities of neurodynamic and mental functions of athletes for various qualifications and sports.

Materials and Methods of the Research. 96 (ninety-six) students of physical training and sport faculty at Kherson State University and students of Kherson Higher College of Physical Culture participated in the research. They were divided into three groups: the first group included 29 (twenty-nine) athletes who hade a qualification of Master of Sports (MS) or Candidate for Master of Sports (CMS); the second one consisted of 37 (thirty-seven) persons who had I or II classes (the first and the second class athletes); the third one included 30 (thirty) students who started to do sports recently – beginners (B). Besides all qualified athletes of various sports were divided into four groups: the first group consisted of 16 (sixteen) students who practiced gymnastics and trampoline &tumbling (G); the second one consisted of 18 (eighteen) persons who practiced different kinds of wrestling (W); the third one consisted of 15 athletes who did those kinds of sport which required high athletes' endurance (further in the charts it is given as endurance exercises); the fourth one consisted of 17 students who played game sports (GS) – basketball, handball, football. The age of the respondents was 17–19 years old.

The qualities of neurodynamic functions such as lability (L), nervous processes force (NPF) and sensomotor reactions of various difficulty : simple sensory-motor reaction (SSMR), one (CR_{1-3}) and two (CR_{2-3}) choice reaction from three stimuli were studied according to the methodical approaches of professor M. V. Makarenko [3; 4]. Computer programme «Diahnost-1», questionnaire methods were used to determine the short-term memory (STM) span and attention qualities.

Results of the Research. Discussion. The achieved results in lability claim that the respondents who had MS and CMS qualification levels showed higher indices. That group had average index 63,9±0,7 c ($p<0,05–0,01$). The lower sports qualification (SQ) is, the lower lability is. The beginners had the average index 67,8±0,8 c. These results prove that students with higher level of sports qualification have higher level of lability.

Table 1

Average Indices of Lability and NPF for Students with Various Sport Qualifications

Respondents Groups	Lability(s)		%	NPF, Signals/ in 5 min		%
	M±m	σ		M±m	Σ	
MS, KMS (n=29)	63,9±0,7	3,25	100	699,0±9,6	50,8	100
1st, 2nd (1–2) (n=37)	65,8±0,4*	3,34	97,1	670,2±6,8*	48,1	95,8
Beginners (B) (n=30)	67,8±0,8**	3,98	94,1	650,4±10,7*	55,0	92,8

Note. *,**- *p<0,05-0,01 – the difference is accurate as to MS and CMS.*

If the average indices of lability in MS and CMS groups are taken as 100 %, then in the beginners' group they will be 94,1% and in the 1st, 2nd class sportsmen they will be – 97,1 % (tabl. 1).

The analysis of the data of the research on the lability of athletes with various qualifications makes it possible to testify that the persons who do sports and achieve high sports results have better index of lability comparing to the athletes with lower qualifications. It is proved that individual-typological qualities of HNA and namely, lability play an important role in achieving sports results.

The highest indices to NPF, as well as lability indices, were made in MS and CMS groups. The average index for this group was 699,0±9,6 signals/5 min (p<0,05). The lower SQ is the lower NPF is. The beginners had an average index 650,4±10,7 signals/5 min. The difference in NPF of the students with various SQ can be demonstrated by percentage changes of the given parameter (chart 1). The analysis of the results allows making a conclusion that the athletes with a high level of SQ have a higher level of NPF. The persons with a lower level of SQ have a bit lower level of NFP correspondently.

To obtain qualitative and quantitative data of the athletes' qualities in question in five groups by means of a standard deviation method the students were divided into three groups: with «high», «middle», «low» level of lability. The results of such distribution are given in table 2.

Table 2

Distribution and Average Value of Lability for Athletes of Various Sports

Kinds of Sport Orientation	Lability Average Rates	Lability Levels (Seconds)		
		High	Average	Low
		Respondents' Distribution (%)		
Gymnasts (G) (n=16)	64,3±1,1	37,5	37,5	25,0
Wrestlers (W) (n=18)	63,8±0,6	33,3	38,9	27,8
Endurance exercises (E) (n=15)	64,8±1,2	26,7	40,0	33,3
Game sports (GS) (n=17)	65,4±0,9	23,5	35,3	41,2
Beginners (B) (n=30)	67,8±0,8**	13,3	43,3	43,4

Note. *,**- *p<0,05-0,01 – the difference is accurate as to wrestlers, gymnasts, game sports athletes and representatives of endurance sports.*

Due to Chart 2 the majority of the respondents in each group are characterized by the average level of lability. The greater amount of the persons with the high level are among the gymnasts (37,5 %) and wrestlers (33,3 %) and the least – are among the representatives of game sports (23,5 %) and beginners (13,3 %).

We also analyzed the average values of lability in the groups of the respondents with different sports. The best result of lability was achieved among the wrestlers and gymnasts. These respondents had lability indices 63,8±0,6 s and 64,3±0,8 s correspondently.

As far as the average values of NPF qualities are concerned the following results were received. While doing the test the wrestlers handled 690,0±8,5 signals/5 min. A bit fewer signals and hence the lower level of NPF were demonstrated by the gymnasts (672,9±10,8 signals/5min) and the game sports athletes (670,8±8,7 signals/5min). The athletes who practiced the endurance sports were at the level of 668,5±7,4 signals/5min. Making numeric distribution of the athletes according to the level of NPF (standard deviation method was used) it was found out that the greatest amount of the persons with the high level were among the gymnasts (35,3 %) and wrestlers (44,5 %) and the least – among the representatives of the endurance sports (26,7 %) (tabl. 3).

Table 3

Distribution and Average Value of NPF Among Athletes of Different Sports

Nature of Sport Activity	NPF Average Rates	NPF level (Signals /5 min)		
		High	Average	Low
		Respondents' Distribution (%)		
Gymnasts (n=17)	672,9±10,8	35,3	35,3	29,4
Wrestlers (n=18)	690,0±8,5	44,5	33,3	22,2
Endurance exercises (n=15)	668,5±7,4	26,7	40,0	33,3
Game sports (n=17)	670,8±8,7	29,4	35,3	35,3

Note. *,**- *p<0,05 – the difference is accurate as to wrestlers.*

Such phenomena of the qualities of main nervous processes in sports activity are in line with the researches of other authors [2; 5] which show that there is a correlation between these variables. The results of our research have proved that the high level of NPF corresponds to the high sports results in gymnastics and wrestling. The respondents with the high NPF achieve the high sports results in these sports which demand higher standards of speed and coordination (wrestling).

The results of the research of the latent period (LP) on sensory-motor reaction (SMR), while processing the information of various difficulty among the students of different SQ, allow stating that their duration grows depending on the difficulty of the given load in all groups of the respondents (tabl. 4).

The analysis of LP SSMR values showed the absence of accurate differences between these indices in the student groups of various SQ excluding LP SSMR values for the 1st and 2nd class sportsmen and for the beginners where it was longer (worse time) comparing to the MS and CMS groups (p<0,05-0,01). Absolute values of average indices to LP SSMR in the beginners' group were 220,3±4,4 ms, in the 1st and 2nd class sportsmen's group – 215,3±2,5 ms, in MS and CMS – 198,9±5,7 ms (Chart 4).

Studying LP CR_{1-3} values for the respondents of various SQ levels gave the following results. In the MS and CMS groups this index was on average 316,7±4,4 ms, in the 1st and 2nd class sportsmen's group – 341,1±3,4 ms. In the beginners' group LP CR_{1-3} values were equal to 343,9±5,6 ms that was accurately different from the MS and CMS indices (t=3,82, p<0,01) (tabl. 4).

Table 4

LP Average Indices of SMR of Different Difficulty for Students of Various Qualification and Sports (M±m)

Respondents' Groups	Latent Periods of Sensory-Motor Reaction(ms)		
	SSMR	CR_{1-3}	CR_{2-3}
Sport Qualification			
MS and CMS	198,9±5,7	316,7±4,4	399,5±5,2
1st and 2nd class sportsmen's (1–2)	215,3±2,5*	341,1±3,4**	408,9±7,4
Beginners (B)	220,3±4,4**	343,9±5,6**	428,5±6,7**
Sport orientation			
Gymnasts (n=17)	208,6±3,6	333,5±4,9	399,7±5,9
Wrestlers (n=18)	201,8±3,8	322,6±4,9	402,0±5,0
Endurance exercises(n=15)	202,5±5,1	331,9±4,5	406,2±8,9
Game sports (n=17)	205,4±3,4	333,6±4,4	398,2±6,8

Note. * - *p<0,05, **- p<0,01 – the difference is accurate as to MS, CMS.*

The analysis of the research results in LP CR_{2-3} indices allows us to confirm that this index has the similar trends as LP SSMR. Thus the shortest time of reaction was shown by the MS and CMS groups – 399,5±5,2 ms. In the 1st and 2nd class sportsmen's group, the average value of LP CR_{2-3} was 408,9±7,4 ms and the beginners have 428,5±6,7 ms, that is accurately higher (p<0,01) than the MS and CMS indices (tabl. 4).

The analysis of average indices of attention switch shows that the respondents of all groups have increased attention (that is reduced time for processing of a necessary task): B group had 312,9±9,4 s, the 1st and 2nd class sportsmen's group had lower results (became better) up to 303,4±8,7 s, the MS and CMS group had the result equal to 271,0±6,6 s (p<0,01) (tabl. 5).

Table 5

Indices of Psychological Functions in Students with Different Level of SQ and Sports

Sports	Numbers	Switch (s)	Distribution (n)
MS, CMS	7,75±0,17	271,0±6,6	19,6±0,2
1st and 2nd class sportsmen	6,95±0,19**	303,4±8,7**	18,2±0,4**
Beginners (B)	6,59±0,26**	312,9±9,4**	18,9±0,5
Sports			
Gymnastics	7,22±0,33	287,9±7,9	19,3±0,8
Wrestlers	7,09±0,30	290,0±12,2	19,2±0,5
Endurance exercises	7,31±0,21	304,4±9,3	18,8±0,5
Game sports	7,78±0,25	292,9±8,7	18,3±0,5

Note * *– p<0,05,* **- *p<0,01 – the difference is valid to MS, CMS.*

The same picture is observed while analyzing attention allocation qualities: the highest rate is among MS and CMS respondents – 19,6±0,2 signs, the lowest in 1st and 2nd class sportsmen's group – 18,2±0,4 signs (p<0,01) (table 5).

Thus obtained data allow concluding that attention function qualities of the athletes are connected with SQ level: as a rule the higher the level of sports qualification is the better attention qualities are.

According to Chart 5 the highest STM indices are seen in the respondents of game sports – 7,78±0,25 the relative value unit (RVU), in the respondents who practice endurance ports – 7,31±0,21 RVU, in the gymnasts – 7,22±0,33 RVU, among the wrestlers – 7,09±0,30 RVU, and we can observe the lowest results – 6,59±0,26 RVU in the beginners.

The analysis of the results in attention switch qualities has showed that the athletes of the sports where the high level of endurance is typical, had average index 304,4±9,3 s, the game sports respondents had 292,9±8,7c, the wrestlers – 290,0±12,2 s, the gymnasts – 287,9±7,9 s. Analyzing attention allocation indices the highest rate was found out among the respondents of the gymnast's group – 19,3±0,8 signs, the lowest – among the respondents in game sports group – 18,3±0,5 signs. But there is no accurate difference among the results of attention allocation qualities in all groups (table 5).

Thus obtained results show that there are differences between specific qualities of attention and between specific types of memorizing information among the respondents with various sports.

Besides we studied correlation between the lability values and LP SMR; among lability, memory and attention functions of athletes. The correlation analysis didn't show any connection between LP SSMR and lability in all the respondents' groups except the beginners. The correlation analysis proved the relationship between the qualities of main nervous processes and LP CR_{2-3} in all groups of SQ and sports.

Such a correlation between typological qualities of the nervous system and LP CR_{2-3} points out that high brain divisions are involved in performing a difficult task. The correlation between them is provided by lability and nervous processes force.

Carrying out the correlation analysis for studying the dependence between lability indices, STM span and attention qualities indices we found out that only in the beginner's group there was some accurate correlation between main nervous processes qualities on the one hand and memory span for numbers on the other hand (p<0,05). No correlation was observed in other groups. There was a correlation between attention allocation indices and lability in the MS and CMS group and in the 1st and 2nd class sportsmen group (p<0,05–0,01). We also found out accurate correlation between the lability indices on the one hand and attention allocation indices on the other hand (p<0,05).

Summarizing obtained experimental data it is necessary to point out the important role of the qualities of neurodynamic and mental functions for achieving high sports results. Regular trainings and competitions help the athletes of high qualification keep necessary coordination, preserve and improve the level of coordination inside one division of the nervous system, between some divisions of the nervous system and in the peripheral divisions of the nervous systems that are revealed in increasing neurodynamic and mental functions. The athletes who have low qualification are likely to have poor sequence and coherence of different divisions of the central nervous system and as a result – the low level of sports perfection and hence relatively low level of the qualities of neurodynamic and mental functions.

Taking into account the high determination of typological qualities of the high nervous activity and its role in forming neurodynamic and mental functions it is necessary to take into consideration that the high level of qualities in question which the athletes of high qualification possess, may be a result of natural selection that is typical [5].

Conclusions and Prospects for Future Research. It is found out that the qualities of main nervous processes are in line with an athlete's sports activity. The highest indices, both NRF and SDR, are found in the groups of wrestlers and gymnasts, and the lowest in the group of beginners. The valid indices of sensory-motor reaction of various difficulties, mental functions are typical of the students who have a master of sport or a candidate for master qualifications. The analysis of the indices of sensory-motor reaction in sports groups of different sports has revealed that the shortest latent periods of simple sensory-motor reaction are typical of the wrestlers; and complex sensory-motor reaction – for the wrestlers and game sports athletes. The individual typological qualities (lability and main nervous processes force) and the qualities of sensory-motor reaction together with some specific mental functions form the neurophysiologic background for sports activity.

The research done does not cover all the problems of psychophysiology in sports activity. The prospects for future research lie in implementing the achieved results in the system of sports selection, in preventing negative psychophysiological states and their corrections in athletes.

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PHYSICAL REHABILITATION OF ADOLESCENTS WITH MINOR STRUCTURAL CARDIAC ABNORMALITIES

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Abstract

Topicality. The article shows the method of physical rehabilitation of adolescents with minor structural cardiac abnormalities. Minor structural cardiac abnormalities is a large group of cardiovascular anomalies, characterized by the presence of a variety of anatomical and morphological deviations from the norm of the heart structures that make up the undifferentiated connective tissue dysplasia. The most common cardiac manifestations of connective tissue dysplasia syndrome are mitral valve prolapse and abnormal chords of the left ventricle of the heart. Diagnosis of this pathology in adolescents has significantly increased with the development of ultrasound examination of the heart, while the technique of physical rehabilitation has not been sufficiently developed to date. ***The aim of the research is*** to study the effect of rationally dose-related physical exertion on the severity of the main symptoms of the disease and the physical condition of adolescents with minor structural cardiac abnormalities. ***Methods of Work.*** Questionnaire to identify a subjective assessment of the severity of the main symptoms of the disease, the definition of exercise tolerance and the index of the physical state of adolescents according to the methodology of Professor O. Shchepin. ***Results of Work.*** Physical rehabilitation was carried out in three stages, general strengthening exercises of aerobic and anaerobic power, exercises on simulators, sports-applied exercises, outdoor games, respiratory gymnastics, special exercises to increase the stability of the vestibular apparatus, orthostatic firmness, the formation of correct posture and flatfoot prevention. The loads were dosed individually, taking into account the results of determining the tolerance to physical activity. ***Conclusion.*** As a result of the rehabilitation actions the general conditions of the adolescents were improved, the symptoms of the disease began to disturb them less often and disappear. The index of physical condition increased for boys from an average of 0,52 ± 0,007 to an above average of 0,70 ± 0,001, and for girls from the lower limit of the average 0,51 ± 0,006 to the upper one and was 0,69 ± 0,004.

Key words: physical rehabilitation, minor structural cardiac abnormalities, index of physical condition.

Сергій Возний, Юрій Ромаскевич, Петро Годлевський. Фізична реабілітація підлітків із малими структурними аномаліями серця. Актуальність. У статті наведено методику фізичної реабілітації підлітків із малими структурними аномаліями серця. Малі структурні аномалії серця – це велика група аномалій розвитку серцево-судинної системи, яка характеризується наявністю різноманітних анатомічних і морфологічних відхилень від норми структур серця, що входять до складу недиференційованої дисплазії сполучної тканини. Найбільш поширені кардіальні прояви синдрому дисплазії сполучної тканини – пролапс мітрального клапана й аномальні хорди лівого шлуночка серця. Діагностика цієї патології в підлітків значно зросла з розвитком ультразвукового дослідження серця, у той час як методика фізичної реабілітації до сьогодні розроблена недостатньо. ***Завдання роботи*** – вивчення впливу раціонально дозованих фізичних навантажень на перебіг основних симптомів захворювання та фізичний стан підлітків із малими структурними аномаліями серця. ***Методи проведення роботи*** – анкетування виявлення суб'єктивної оцінки основних симптомів захворювання, визначення толерантності до фізичних навантажень та індексу фізичного стану за методикою професора О. П. Щепіна. ***Результати роботи.*** Фізична реабілітація проводилась у три етапи, використовувалися загальнозміцнювальні вправи аеробно-анаеробної потужності, вправи на тренажерах, спортивно-прикладні вправи, рухливі ігри, дихальна гімнастика, спеціальні вправи на підвищення стійкості вестибулярного апарату, ортостатичної стійкості, формування правильної постави й профілактику плоскостопості. Дозувалися навантаження індивідуально з урахуванням результатів визначення толерантності до фізичного навантаження. ***Висновки.*** У результаті проведених реабілітаційних заходів у підлітків покращився загальний стан, симптоми хвороби стали їх турбувати рідше, протікати легше й швидше зникати. Індекс фізичного стану підвищився в хлопців із середнього (0,52 ± 0,007) до вищого за середній (0,70 ± 0,001), а в дівчат – із нижньої межі середнього (0,51 ± 0,006) до верхньої (0,69 ± 0,004).

Ключові слова: фізична реабілітація, малі структурні аномалії серця, індекс фізичного стану.

Сергей Возный, Юрий Ромаскевич, Петр Годлевский. Физическая реабилитация подростков с малыми структурными аномалиями сердца. ***Актуальность.*** В статье приводится методика физической реабилитации подростков с малыми структурными аномалиями сердца. Малые структурные аномалии сердца –

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это большая группа аномалий развития сердечно-сосудистой системы, характеризующаяся наличием разнообразных анатомических и морфологических отклонений от нормы структур сердца, входящих в состав недифференцированной дисплазии соединительной ткани. Наиболее распространенные кардиальные проявления синдрома дисплазии соединительной ткани – пролапс митрального клапана и аномальные хорды левого желудочка сердца. Диагностика данной патологии у подростков значительно возросла с развитием ультразвукового исследования сердца, в то время как методика физической реабилитации до настоящего времени разработана недостаточно. ***Цель исследования*** – изучение влияния рационально дозированных физических нагрузок на выраженность основных симптомов заболевания и физическое состояние подростков с малыми структурными аномалиями сердца. ***Методы работы*** – анкетирование на выявление субъективной оценки выраженности основных симптомов заболевания, определение толерантности к физической нагрузке и индекса физического состояния подростков по методике профессора О. П. Щепина. ***Результаты работы***. Физическая реабилитация проводилась в три этапа, использовались общеукрепляющие упражнения аэробно-анаэробной мощности, упражнения на тренажерах, спортивно-прикладные упражнения, подвижные игры, дыхательная гимнастика, специальные упражнения на повышение устойчивости вестибулярного аппарата, ортостатической стойкости, формирование правильной осанки и профилактику плоскостопия. Дозировались нагрузки индивидуально с учетом результатов определения толерантности к физической нагрузке. ***Выводы***. В результате проведенных реабилитационных мероприятий у подростов улучшилось общее состояние, симптомы болезни стали их беспокоить реже, легче протекать и быстрее исчезать. Индекс физического состояния повысился у мальчиков со среднего 0,52 ± 0,007 до выше среднего 0,70 ± 0,001, а у девочек – с нижней границы среднего 0,51 ± 0,006 до верхней и составил 0,69 ± 0,004.

Ключевые слова: физическая реабилитация, малые структурные аномалии сердца, индекс физического состояния.

Introduction. Minor structural cardiac abnormalities (MSCA) – is a large heterogeneous group of anomalies in the development of the cardiovascular system, characterized by the presence of various anatomical and morphological abnormalities of the heart structures and is a part of the undifferentiated connective tissue dysplasia. The most common cardiac manifestations of the connective tissue dysplasia syndrome are the mitral valve prolapse (MVP) and abnormal left ventricular chord (ALVC), which as isolated pathology make up to 93–95 % of all MSCA [4; 8]. Diagnosis of this pathology has increased significantly with the development of ultrasonic examination of the heart.

Mitral valve prolapse is the flexing of valve cusp to the left atrium cavity during the ventricular contraction of the heart.

Abnormal left ventricular chord is additional formation in the ventricular cavity having the form of a thin stranded string. This inherited anomaly is 92 % transmitted from maternal lineage, irrespective of patients age, abnormal chord is more often detected in men (17–71 %) than in women (17–30 %). The pathology is more common in young people and adolescents than in middle–aged people [1]. The emergence of MSCA can be ascribed to genetic pathology of connective tissue (Marfan syndrome, Ehlers–Danlos syndrome, etc.) and be inherited [4; 5; 8].

As a rule the structure of the entire connective tissue is changed in children. Therefore, they have a number of features and signs of connective tissue dysplasia: myopia, flatulence, increased mobility of small joints, postures, very elastic skin, dislocation of hip joints, hernia. Usually the children are of asthenic physique, thin and graceful, with weak muscles, often of high stature. Pathology is often accompanied by panic attacks and other psycho-emotional disorders. The majority of children complain of chest pain, palpitations, tachycardia, feelings of heart failure, short breath, dizziness, general weakness, headache, rapid fatigability. Usually such complaints arise due to emotional stress and accompanied by various vegetative reactions (unstable mood, anxiety and fear, extremity coldness, palpitations, sweating, decrease or increase in pressure, headache, etc.), the symptoms subside spontaneously or after taking tincture of valerian, valocordin [5; 8].

Among patients of young age with a syndrome of minor structural anomalies of the heart there are persons with different combinations of anomalies. However in most adolescents the leading clinical signs are social maladaptation and reduced tolerance to physical activities. Almost in all cases there are complaints of cardialgia and a feeling of interruptions heart function [4].

Most scientists and medical doctors along with medication recommend also the use of a healthy lifestyle with limited physical activity, however, the method of using physical exercises to improve the physical condition of adolescents is not sufficiently developed.

The Aim of the Research is to study the effect of rationally dose-related physical exertion on the severity of the main symptoms of the disease and the physical condition of adolescents with minor structural cardiac abnormalities.

Study Material and the Methods of Work. The research was conducted at the laboratory of biomedical basis of physical education and sport, which is based on the Kherson Regional Center for Health and Sports Medicine.

During the 2016–2017 years 36 teenagers (20 boys and 16 girls) aged 14–15 years were physically rehabilitated. The occurrence of MSCA was confirmed by echocardiographic research and clinical implications of the disease.

Before the beginning of rehabilitation measures, a questionnaire was conducted for patients. The aim was to identify a subjective assessment of clinical manifestations of the disease on a five-point scale, to determine the tolerance to physical activity with bicycle ergometry and the index of physical condition (IPC) according to Professor O. P. Schepin. The somatic index (SI), pulmonary-somatic (PSI), cardio-somatic (CSI) and additionally podometry indices (PI) [2] were determined.

Fundamentally in determining the somatic index is the establishment of the degree of physical development of the individual by comparing his anthropometric characteristics (height, weight, chest circumference) with the gender constitution standard: I degree – good (or harmonious) physical condition; II degree – deteriorated (or disharmonious) physical condition; III degree – bad (or sharply disharmonious) physical condition. The somatic index was determined by converting the degree of physical condition into its index value in accordance with the table of genotype standards of physical condition: I degree – 1,0; II degree – 0,5; III degree – 0,25.

The pulmonary –somatic index was defined as the ratio of the vital capacity (VC) to the proper vital capacity (PVC) and was expressed with the numbers from 0 to 1. Where the real values (VC)/(PVC) more than 1, by default PSI = 1.

The proper vital capacity can be calculated using the regression equation:

PVC, (ml) = (40 × height in cm) + (30 × weight in kg) – 4400 (men); (1)

PVC, (ml) = (40 × height in cm) + (10 × weight in kg) – 3800 (women). (2)

Cardio–somatic index (CMI). The starting data for its calculation are the pulse rate and arterial pressure at rest, the individual's chronologic age and its anthropometric indices. It can be calculated using the regression equation:

$$CMI = \frac{700 - 3 \times PR - 0{,}8333 \times SBP - 1{,}6667 \times DBP - 2{,}7 \times CA + 0{,}28 \times BW.}{350 - 2{,}6 \times CA + 0{,}21 \times H}; \quad (3)$$

Where: PR – is pulse rate, beats per minute, CA – is chronologic age, years; SBP – systolic blood pressure, mm of mercury; DBP – diastolic blood pressure, mm of mercury; BW – body weight, kg.; H – height, cm.

The cardio–somatic index has a set of values ranging from 0 to 1. With real values of KSI less than 1, KSI = 0, and with real values of KSI, greater than 1, KSI = 1.

The podometry index (PI) was calculated using a formula: $PI = \frac{h \times 100}{L}$; (4)

Where h – is pile height – the distance from the floor to the upper surface of the navicular bone at 1,5 cm in front of the ankle joint, mm. L – is foot length – distance from the tip of the toe to the back of the heel, mm. The index of the normal arch of foot is in the range from 31 to 29, the mionectic arch of foot has a border from 29 to 25 and indicates flattening, and a value less than 25 characterizes a significant flat foot. Index values were converted to a similar value for other indexes from 0 to 1.

Then modified formula for determining the index of physical condition of adolescents was used:

PCI = 0,1 × SI + 0,2 × PI + 0,3 × PSI + 0,4 × CSI; (5)

The values of the PCI from 0 to 1 were determined by 5 levels of physical condition: low (0–0,29), below average (0,3–0,49), average (0,5–0,69), above average (0,7–0,89) high (0,9–1,0) [2; 3].

The results obtained during the study were processed by methods of mathematical statistics.

During the course of physical rehabilitation of adolescents with MSCA the following means of physical education were used: general exercises of aerobic-anaerobic power capacity, including the usage of training devices; sports and applied exercises; action-oriented games; respiratory gymnastics; special physical exercises aimed at training the vestibular apparatus and orthostatic resistance; exercises on the formation and maintenance of correct posture and prevention of flat feet; quenching. It was highly recommended to do

morning hygienic gymnastics, special breathing exercises, procedures that promote hardening, autogenous training, self-massage on a daily basis. Once or twice a week at the day free from classes the dosed walking was recommended.

Aerobic-anaerobic physical activity was dosed individually, taking into account a certain tolerance to physical activity.

The method of physical rehabilitation of adolescents with MSCA consisted of three stages, each lasting from three to four months.

At the first stage of rehabilitation lasting 12–16 weeks, physical exercises of aerobic power were used mainly for group support with music background, duration and intensity of exercises contributed to the gradual retraction and adaptation of the body to dosed aerobic exercises.

These classes were held four times a week, the total duration of classes was 35–40 minutes, 40–50 % motor density was recommended. The control of the intensity of physical activity was carried out by the heart rate monitoring. The recommended heart rate was 45–50 % of the individually recommended heart rate, the average was 55–60 % and peak reached 70 %, but it was not recommended to exceed this threshold. At the end of the lesson, after the completion of the final part, the heart rate was calculated within five minutes of the recovery period. For determining the tolerance to physical activity the staged control was carried out at the end of the milestone.

At the second stage of physical rehabilitation, which lasted 12–16 weeks, the means and forms of influence on the painful process remained unchanged, but exercises on the simulators were added. Duration of classes was 40 minutes, motor integrity was 55–60 %. The gradual increase in the intensity of aerobic physical activity continued, the threshold heart rate equaled 50–55 % of the individually recommended heart rate, the average corresponded to 60–65 % and peak reached 80 %, but it was not recommended to exceed this threshold.

In the course of the training veloergometer exercises were applied, during which the load gradually increased until the heart rate peak was reached and maintained at that level for 3–5 minutes. Then the level of heart rate average gradually decreased, the total time of training on bicycle ergometer lasted 10–12 minutes.

At the end of the second stage, another milestone review of patients was conducted. On the basis of the results of the medical examination data on the functional state of the cardiopulmonary system and the evaluation of subjective manifestations of the disease, physical activity was planned at the third – the final stage of physical rehabilitation.

At the third stage, the duration of the class remains – 40 minutes, motor integrity was 60–65 %.

Physical exercises at the third stage of physical rehabilitation were even more intense, during the aerobic workout the threshold heart rate equaled 60 % of the individual recommended maximum, heart rate average was 70 %, and peak reached 80–90 %. In order to gradually adapt the body of patients to anaerobic stress during exercise on a cycling machine after reaching peak heart rate, adolescents maintained this intensity for 4–5 minutes. After that the load was reduced by 25 % and the patients performed spurt (pedaling with the maximum possible speed), the duration of which gradually increased from 5–8 seconds to 20–25 s [6].

At the end of the third stage of physical rehabilitation, a survey was conducted to identify subjective evaluation of the manifestations of the disease and in–depth medical examination with the definition of parameters of physical development, functional state of the cardiopulmonary resuscitation system, and the index of physical condition. To optimize individual exercises, adolescents were given individual «health recipes» that contained specific recommendations for observing rational motor regimes and healthy lifestyles [7]. The results of the study are shown in table 1.

At the beginning of rehabilitation index of the physical condition of boys and girls is defined as average, the boys' index is – 0,52 ± 0,007 and the girls – 0,51 ± 0,006. After completing the course of physical rehabilitation, the index of physical condition increased up to 0,70 ± 0,001 for boys, which corresponds to the indicator above the average, and to 0,69 ± 0,004 for girls and is on the upper limit of the average index of physical condition. The analysis of the results showed that the increase in the index of physical condition occurred primarily due to an increase in pulmonary and somatic and cardio-somatic indexes, the increase of which is statistically significant.

Table 1

Dynamics of Indicators of Physical Condition of Adolescents with Minor Structural Cardiac Abnormalities

Physical Condition of Adolescents	Year 2016	Year 2017	t	ρ
	Boys n=20			
Somatic index	0,67 ± 0,07	0,70 ± 0,06	0,61	> 0,05
Podometry index	0,61 ± 0,11	0,72 ± 0,01	1,38	> 0,05
Pulmonary–somatic index	0,50 ± 0,12	0,70 ± 0,11	2,12	< 0,05
Cardio–somatic index	0,45 ± 0,12	0,70 ± 0,10	2.09	< 0,05
Physical condition index	0,52 ± 0,007	0,70 ± 0,001	18,68	< 0,001
Subjective evaluation of manifestation of the disease	1,95 ± 0,13	3,15 ± 0,21	6,81	< 0,001
	girls n=16			
Somatic index	0,65 ± 0,09	0,68 ± 0,08	1,42	> 0,05
Podometry index	0,56 ± 0,11	0,59 ± 0,10	0,97	> 0,05
Pulmonary–somatic index	0,44 ± 0,13	0,69 ± 0,12	2,16	< 0,05
Cardio–somatic index	0,50 ± 0,13	0,75 ± 11	2,17	< 0,05
Physical condition index	0,51 ± 0,006	0,69 ± 0,004	38,1	< 0,001
Subjective evaluation of manifestation of the disease	2,37 ± 0,16	3,0 ± 0,19	4,84	< 0,001

Conclusions and Perspectives of Further Research. Rationally planned and carried out measures of the physical rehabilitation of adolescents with minor structural cardiac abnormalities bring a vast improvement to the functional state of the cardiorespiratory system, reduce the severity and reduce the duration of the clinical symptoms of the disease. Prospects for further research we see in the development of methods of physical rehabilitation of children of junior school age, and adapted to the age of «recipes of health».

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STRENGTH PREPAREDNESS OF YOUNG SPORTSMEN PREDISPOSITIONED TO SPRINTER AND STAYER DISTANCES

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Abstract

The article asserts the necessity to improve the sport training of swimmers, sprinters and stayers. The dynamics of strength preparedness indices of young swimmers belonging to experimental and control groups under the influence of training loads is studied. The influence of the main training aids on the indices of strength preparedness among young athletes aged 12–13 is defined. The divided strength preparedness of sprinters and stayers contributes to the realization of the capabilities of athletes in the competitive process.

Key words: swimming, strength preparedness, sprinters, stayers, training process.

Володимир Давидов, Анна Манкевич, Ольга Морозова. Силова підготовленість юних спортсменів, схильних до спринтерських і стаєрських дистанцій. У статті відзначено потребу вдосконалення спортивної підготовки плавців-спринтерів і стаєрів. Вивчено динаміку показників силової підготовленості юних плавців експериментальної й контрольної груп під впливом тренувальних навантажень. Визначено вплив основних тренувальних засобів на показники силової підготовленості юних спортсменів 12–13 років. Розділена силова підготовленість спринтерів і стаєрів сприяє реалізації можливостей спортсменів у процесі змагальної діяльності.

Ключові слова: плавання, силова підготовленість, спринтери, стаєри, тренувальний процес.

Владимир Давыдов, Анна Манкевич, **Ольга Морозова. Силовая подготовленность юных спортсменов, предрасположенных к спринтерским и стайерским дистанциям.** В данной статье представлена необходимость совершенствования спортивной подготовки пловцов-спринтеров и стайеров. Изучена динамика показателей силовой подготовленности юных пловцов экспериментальной и контрольной групп под воздействием тренировочных нагрузок. Определяется воздействие основных тренировочных средств на показатели силовой подготовленности юных спортсменов 12–13 лет. Разделенная силовая подготовленность спринтеров и стайеров способствует реализации возможностей спортсменов в процессе соревновательной деятельности.

Ключевые слова: плавание, силовая подготовленность, спринтеры, стайеры, тренировочный процесс.

Introduction. The preparation of a full-fledged sports reserve in swimming involves the introduction of sports training in accordance with the objective laws of the sportsmanship formation (Balakshi T. M., 1996; Davydov V. Yu., 2002; Morozov S. N., 1989; Platonov V. N., Sahnovsky K., 1988, Platonov V. N., 2004, etc.) [1–5]. In this case, the irrational is the position at which the swimmers of various specialization, significantly different in terms of sportsmanship formation, athletic condition, structure and content of competitive activity, readiness, individual indicators of physical development, undergo the same training (Sahnovsky K. P, 1990) [7].

This item is entirely related to the technique of swimmers training: sprinters and stayers, who have great differences in the timing of achieving sports results. Separate training of young swimmers predisposed to anaerobic and aerobic work is quite significant [2].

Taking into account the urgency of this issue, the theoretical data and normative documents were analyzed, the best trainers' experience was summarized, and the experimental program for training young swimmers based on the obtained data was compiled. It formed the basis of our study.

Organization and Research Methods. Sixteen swimmers aged 12–13 took part in the study. Young athletes were divided into four groups. Two groups are experimental: sprinters and stayers and two groups are of control: sprinters and stayers.

Training load when swimming as well as exercises of special physical preparedness on land were as close in their direction as possible in all groups and corresponded to the tasks of this preparation phase. The difference between the training programs consisted only in the fact that the experimental groups were trained according to the program compiled by us (Makarenko L. P., Shirkovets E. A., 1992) [3].

The control over the strength training dynamics of young swimmers was carried out according to the following indicators: imitation of the rowing effort on the land, in the mid–stroke phase (with both hands, right and left); maximum pulling force in water (when floating in full coordination, when passing by hand, when swimming with the help of feet); the time of passing 50 and 3000 meters by freestyle was determined; the level of explosive power was estimated by the results of a jump upwards from the place, the coefficient of power endurance was determined. The coefficient of strength capabilities use and the coordination coefficient were also calculated.

The Main Material and Justification of the Research Results. During the training process of young swimmers–sprinters belonging to the control and experimental groups the parameters of the readiness for mesocycles were changed. The preparatory period is characterized by a certain decline in the level of strength preparedness for all studied indicators in all groups, which is characteristic for this period.

The comparative analysis indicates significant changes in all indicators, both in the control and experimental groups (table 1).

Table 1

Dynamics of the Indicators of Strength Preparedness and Speed of Sprinters Swimming During the Training Macrocycle (M±õ)

Indicators		Experimental Group		Control Group	
		Start of the Study	End of the Study	Start of the Study	End of the Study
		M1±õ1	M2±õ2	M3±õ3	M4±õ4
Vpassage sailing 50 min/sec.		1,89±0,03	1,65±0,05	1,64±0,03	1,66±0,04
Vpassage sailing 3000 min/sec.		1,28±0,02	1,58±0,03	1,25±0,04	1,28±0,03
Absol. F traction on land	right hand	10,9±0,84	15,5±1,24	11,1±0,94	14,0±0,95
	left hand	10,9±0,73	15,4±1,81	10,3±0,44	13,8±0,88
	both hands	19,6±0,99	26,8±1,44	19,6±0,88	24,5±1,35
Traction force in water	on feet	5,2±1,31	2,4±0,81	5,3±1,21	6,5±0,22
	on hands	10,6±0,61	13,4±0,90	10,3±0,61	13,5±0,72
	in full coordination	12,6±0,65	17,4±0,97	12,3±0,65	15,5±0,92
Height of jump upwards, cm		47,8±0,52	51,9±3,76	47,1±0,53	47,9±0,88
Coefficient of coordination (KK)		77,8±3,69	85,0±1,32	77,8±3,06	82,0±1,29
Coefficient of strength capabilities use (CSCU)		61,1±1,34	67,0±1,02	61,8±1,06	64,8±1,11
Strength endurance		57,8±2,62	61,9±3,14	57,9±2,51	61,9±2,08

With a relatively equal increase in the level of strength endurance (100,6 %), the swimming speed of 3000 meters (99,2 %), the differences are not reliable P> 0,05; (108,9 %), as for the maximum force in water, in full coordination (112,5 %), jump height (108,4 %), the differences are relatively significant (p <0,05). The swimmers of the experimental group significantly exceed the data of the swimmers belonging to the control group.

The sprinters of the experimental group showed a higher degree of the strength potential in water: the coefficient of the strength capabilities use increased by 3,2 % in comparison with the control group, and the coordination factor by 2,7 %, the difference was statistically significant (p <0,05). With the same initial level, the sprinters of the experimental group achieved the average swimming speed of the 50 m distance – 1,89 m /s, which is 6,8 % more than the control group swimmers did, the difference is statistically significant (p <0,05).

The increase of this indicator is predetermined by the force factors that characterize sprinter qualities. The sprinters' strength preparedness of the experimental group, based on the accentuated development of force in relation to sprint distances, made it possible to achieve better results.

The results of the stayers strength training of the experimental and control groups are multidirectional in nature (table 2).

Table 2

Dynamics of the Indicators of Strength Preparedness and Speed of Stayers Swimming During the Training Macrocycle (M±õ)

Indicators		Experimental Group		Control Group	
		Start of the Study	End of the Study	Start of the Study	End of the Study
		M1±õ1	M2±õ2	M3±õ3	M4±õ4
Vpassage sailing 50 min/sec.		1,76±0,09	1,63±0,05	1,64±0,07	1,75±0,07
Vpassage sailing 3000 min/sec.		1,26±0,68	1,36±0,05	1,26±1,33	1,31±0,05
Absol.F traction on land	right hand	9,9±0,80	12,8±0,55	9,6±0,44	12,7±0,91
	left hand	9,4±1,22	12,8±0,77	9,0±1,44	12,8±0,60
	both hands	19,4±1,59	24,8±0,74	19,6±1,78	23,8±1,05
Traction force in water	on feet	5,0±0,90	6,4±0,41	4,9±0,68	5,9±0,52
	on hands	10,2±0,81	13,6±0,77	10,1±0,41	12,5±0,52
	in full coordination	12,0±0,69	16,9±1,03	11,9±0,75	14,9±0,92
Height of jump upwards, cm		46,8±2,34	48,0±2,65	47,3±2,45	47,4±2,18
Coefficient of coordination (KK)		78,9±2,59	84,9±1,82	79,5±2,43	81,7±1,99
Coefficient of strength capabilities use (CSCU)		61,8±1,25	68,1±1,39	61,0±1,99	62,8±1,41
Strength endurance		58,7±1,33	67,7±1,84	59,2±1,77	63,2±1,97

At the end of the first mesocycle, characterized by a large amount of training work, the stayers of the control group had a decrease in the traction strength on the land and in water, strength endurance and speed of navigation at the distance of 50 and 3000 meters.

In the experimental group, the changes in the strength preparedness are more balanced and temperate. Due to the suitability of the strength training and the structure of competitive exercises, the swimmers of the experimental group had no decrease in the level of strength capabilities despite the large volume of strength orientation.

One of the integral indicators of the stayers strength preparedness is the strength endurance, which, after the first mesocycle in the experimental group, remained at the same level, while in the control group, the strength endurance decreased from 59,2 ± 1,71 to 57,3 ± 1,58, the differences are not significant ($p > 0.05$).

At the end of the study the strength endurance increased from 58,7 ± 1,33 to 67,7 ± 1,84 in the experimental group, the difference is statistically significant ($p < 0,05$), and, from 59,2 ± 1,77 to 63,2 ± 1,97 in the control group, the difference is not significant ($p > 0,05$). Also there were significant changes in those indices that determine the specificity of the stayer swimming in the experimental group (table 2). The obtained data contribute to a higher achievement of the average speed at the distance of 3,000 meters which influences the results in the stayer swimming.

Conclusions. The ongoing unidirectional process of strength training of sprinters and stayers is not effective enough.

The differentiated strength training of sprinters and stayers, taking into account the structure and content of competitive activities, individual characteristics, accentuated use of means and methods of training, contributes to the effective manifestation of sportsmen strength in competitive distances.

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TECHNICAL TRAINING JUNIOR TENNIS PLAYERS AGED 8–9 AS A CONSTITUENT PART OF SUCCESSFUL PLAYING ACTIVITY

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Abstract

This article is dedicated to the issue of determining technical aptitude for playing activities in junior tennis players during the beginner stage of their sports training. ***The research aim*** is to determine the aptitude of junior tennis players aged 8–9 to proceed to the «green» level as the result of technical aptitude and competitive activities analysis. ***Work Results.*** The level of training junior tennis players has been analyzed, which consists of 3 levels (red, orange and green), each of them having their specifics in playing activities. This promotes gradual training junior tennis players for technical and tactical training. The average indices of technical training junior tennis players are determined and the correlation between technical training and competitive activity in junior tennis players are analyzed. The analysis of the correlation between the results of technical training and competitive activity has confirmed that all the criteria of technical training have the positive correlation which indicates the direct proportionality in the determined factors. ***Conclusions.*** As a result of our experimental research, based on the analysis of technical training and competitive activity of the junior tennis players, we have determined that the junior tennis players aged between 8 and 9 are ready to proceed to the «green» level of tennis.

Key words: tennis, technical training, competitive activity, junior tennis players.

Інна Городинська, Юрій Грабовський, Світлана Степанюк, Олег Кузнєцов. Технічна підготовленість юних тенісистів 8–9 років як складова частина успішності ведення ігрових дій. У статті розкрито проблему перевірки технічної готовності юних тенісистів до ведення ігрових дій на перших етапах спортивної підготовки. ***Мета дослідження*** – визначити готовність юних тенісистів 8–9 років до переходу на «зелений» рівень на підставі аналізу результатів технічної підготовленості та змагальної діяльності. ***Результати роботи.*** Під час дослідження проаналізовано ступеневу підготовку юних тенісистів, що складається з трьох рівнів (червоний, помаранчевий і зелений), кожен із яких має свої особливості ведення ігрових дій, що дає змогу поступово підготувати спортсменів до техніко-тактичних дій в тенісі. Визначено середні показники технічної підготовленості юних тенісистів, проаналізовано взаємозв'язок між їхніми технічною підготовленістю й змагальною діяльністю. Аналіз кореляційного зв'язку результатів технічної підготовленості зі змагальною діяльністю засвідчив, що всі показники технічної підготовленості мають позитивний кореляційний зв'язок, що вказує на прямо пропорційні відносини факторів, що визначались. ***Висновки.*** Отже, проведене експериментальне дослідження на підставі аналізу технічної підготовленості та змагальної діяльності юних тенісистів. визначило готовність юних спортсменів 8–9 років до переходу на «зелений» рівень гри в теніс.

Ключові слова: теніс, технічна підготовленість, змагальна діяльність, юні тенісисти.

Инна Городинская, Юрий Грабовский, Светлана Степанюк, Олег Кузнецов. Техническая подготовленность юных теннисистов 8–9 лет как составляющая успешности ведения игровых действий. В статье исследуется проблема проверки технической готовности юных теннисистов к ведению игровых действий на первых этапах спортивной подготовки. ***Цель исследования –*** определить готовность юных теннисистов 8–9 лет к переходу на «зеленый» уровень на основании анализа результатов технической подготовленности и соревновательной деятельности. ***Результаты работы.*** В статье проанализированы этапы подготовки юных теннисистов (красный, оранжевый, зеленый), каждый из которых имеет свои особенности технико-тактических действий, что позволяет постепенно подготовить юных спортсменов к ведению технико-тактических действий. Определяются средние показатели технической подготовленности юных теннисистов, анализируется взаимосвязь между технической подготовленностью и соревновательной деятельностью. Анализ корреляционной связи результатов технической подготовленности с соревновательной деятельностью показал, что все показатели технической подготовленности имеют положительную корреляционную связь, что указывает на прямо пропорциональные отношения определяющих факторов. ***Выводы.*** Проведенное экспериментальное исследование на основании анализа технической подготовленности и соревновательной деятельности юных теннисистов определяет готовность юных спортсменов 8–9 лет к переходу на «зеленый» уровень игры в теннис.

Ключевые слова: теннис, техническая подготовленность, соревновательная деятельность, юные теннисисты.

Introduction. Tennis is one of the complicated and high-pitched sports games of the contemporary world [4]. High proficiency actions of a tennis player require exclusive standards from all aspects of their training.

The issue of athletes' sports training was investigated by such scientists as L. Volkov, L. Matveev, V. Platonov, A. Ter-Ovanesian and others in various training periods. The issue of advanced technical training was reseached by S. Belits-Geyman, V. Guba, M. Ibraimova, O. Lazarchuk, S. Sav, S. Trachuk and others during different training periods

Technical training in tennis is one of the most important parts of physical training at the initial stage of exercise, as this is the formation period for fundamental technical and tactical activities for achieving top scores in professional sports.

V. Platonov's definition of technical training is the degree of athletes' prowess in the system of movements, certain distinguishing characteristics of this kind of sport which are aimed at achieving top scores in professional sports. Due to the scientist's conclusion, the more methods and actions have sportsmen mastered the better they are ready for solving complex tactic problems arising in the competition process [3].

Tennis techniques represent the vast array of complex coordination methods which is the reason for juniors not really to be interested in this long lasting process. That is why during the first years of training the issue of mastering tennis techniques by young athletes arises taking into account their age specifications and the level of prowess without neglecting the competition results [5].

In this case, the junior tennis players can achieve a higher level of game proficiency in the initial stages of exercise, which develops the successful enhancement of their skills in further training.

A very significant change in the rules for physical training of junior tennis players has been introduced by International Tennis Federation since 2012 for 10-year-olds, which prohibits the use of standard tennis balls at the competitions and implies reconsideration for the introduction of professional systems at running the competition for junior tennis players [1].

This allows 6–10-year-old children to get accustomed to the game methods in contemporary tennis earlier, in particular, to form the necessary fundamental technical and tactical performance, to acquire vital movement skills, to develop tactical thinking and as a result to commence their playing activity.

Consequently, technical and tactical training the junior tennis players is of significant importance right from the start of their exercise and the issue of controlling the junior tennis players' technical aptitude for competitive activities is as relevant as ever.

The research aim is to determine the aptitude of the junior tennis players aged 8–9 to proceed to the «green» level as the result of technical aptitude and competitive activities analysis.

The research methods are as follows: the theoretical analysis of academic and methodic literature concerning the issue; the educational observations; the pedagogical testing; the methods of mathematical statistics.

Results and Discussion. The analysis of written sources indicated that sportsmen's training is the process of reasonable incorporation of the whole range of factors allowing to influence the development of the sportsmen directly and to provide the necessary level of their aptitude for sporting achievements. The composite system of sportsmen training includes the sports drills, sports competitions and the utilization of factors raising effectiveness of training and competitive activities.

The training objective in tennis is the athletes' physical development, mastering the system of technical and tactical skills in tennis, achieving strong sports performance. Sports performance consists of learning and performing according to the classification standard as well as competing in multiple categories in Tennis Federation of Ukraine (2, 1, A), and competing in ITF, ATP, WTA, Fed Cup, Davis Cup, Grand Slam tournament [5].

The analysis of the programme "Tennis for Children Under 10" is significant for the formation of the learning and training process in beginners' group. This programme includes three levels of a tennis game in colour codes, which are red, orange and green, with making use of mini tennis equipment as well as playing activities [6].

The specifications for each level in tennis are shown in table 1.

Table 1

Characteristics, Objectives and Playing Activities Administering for Beginner Tennis Players

	Red Level (Ages 5–8)	**Orange Level (Ages 8–10)**	**Green Level (Ages 9–10)**
Stages Characteristics	Initial stage of learning when the basic knowledge, skills and methods of tennis game are learned	Second stage when the basic skills and different elements of technical and tactical training are being formed	Preparation stage before transition to training with standard yellow ball
Training Objectives	Formation of interest in tennis, promotion of physical development, learning the basics of technical skills	Further development of technical and tactical skills, formation of play activities on bigger tennis courts with quicker balls	Reinforcing of the technical and tactical skills acquired before on standard tennis courts, utilisation of an array of technical skills in varied game situations
Introduction to Game Play	Tie-breaks with score 7–10 or short tie-breaks. Matches of 3 tie-breaks scoring to 7. Matches limited to 15 minutes	Matches of 3 tie-breaks or a short set of up to 4 games	Matches of 1 short set up to 4 games or 3 short sets

Therefore, the level training of the junior tennis players consists of 3 levels (red, orange, green), each one of them having their own peculiarities in terms of play activities and this allows to gradually prepare the children for technical and tactical activities and increase their interest in tennis.

To determine the purpose of the research we conducted a series of pedagogical tests. Experimental work was performed in junior sports tennis school in Kherson Region, organisation FST "Ukraine" in October-December 2016. We tested 8 students in the beginners group of the second year of training. 2. They had sports training 3 times a week and competed in May-October every week on Saturdays or Sundays, and 1 or 2 times a month during winter season. Starting from November 2016 they competed in sets up to 4 on standard tennis court performing three serves of any type in every square.

To determine the junior players' level of preparation we suggested the complex of movement test such as: exactness of cut with a forehand or backhand bound ball in the determined square, the exactness of serve, holding the ball in the game. We identified the average level of technical skills in the junior tennis players by means of mathematical statistic methods (table 2).

Table 2

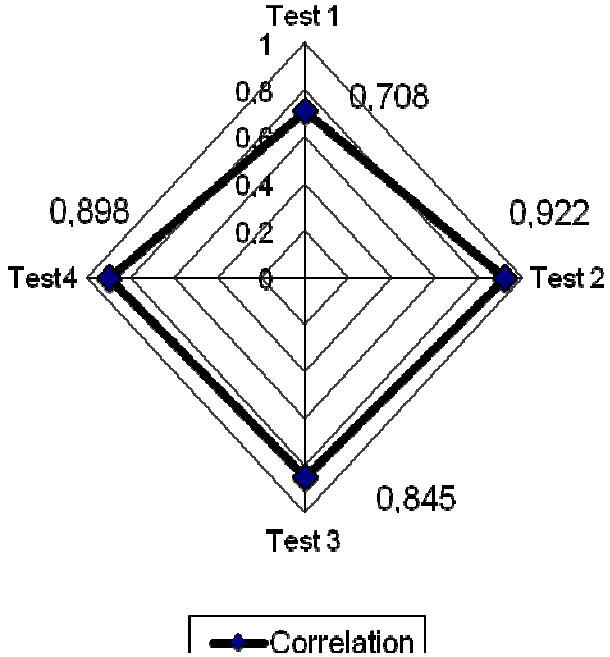
The Average Level of Basic Technical Elements in Technical Training Junior Tennis Players Aged 8–9

Test / **Mathematical Index**	**Test 1 Approach From Forehand in the Determined Square (Times)**	**Test 2 Approach From Backhand in the Determined Square (Times)**	**Test 3 Serve 10 Shots (Times)**	**Test 4 Holding the Ball with a Sparring Partner (Coach) (Times)**
X	6.5	6.125	4.25	12.875
M	1.41	1.24	1.035	2.29

Hereby, analyzing the results of the test performed, we observe that serving 10 times overhand is characterized by the least effective index and equals 4,25±1,035. This can be linked to the fact that this technical element was introduced to children in September 2016 and the learning process was aimed at learning the effective technique, not the serve accuracy. The index for holding the ball with a sparring partner test is 12,875±2,29 and is rather high which shows that students can hold the ball in the court for a prolonged period, so they will be able to perform game activities.

To determine the correlation between technical training and general activity we arranged technical training and competitive activity indices. Analyzing three test-training competitions where all junior tennis players performed, we determined the position of each player at every competition. The competition was held according to the mixed system, firstly in groups, then in the play-off. The champion received the protocol for the competition stating his victory which motivated him for further sports achievement.

The correlation between technical training and competitive activity of the junior tennis players was determined with the help of Spearman index of rank correlation (pic.1). The results of correlation are presented in picture 1.



Pic. 1. *Correlation (According to Spearman) in the Results of Technical Training and Competitive Activity*

Analysing the correlation (according to Spearman) in the results of technical training and competitive activity, we confirmed that all the criteria of technical training have the positive correlation which indicates the direct proportionality in the determined factors.

We determined the level of competence before the transition to the «green» level for junior tennis players according to the summarised rating of «Champion Index» (table 3).

Table 3

Summarised Ranking Index of Basic Technical Elements in Technical Training and Competitive Activity for Junior Tennis Players Aged 8–9

Test and Ranks	**Junior Tennis Players**							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
General Rank of Technical Training	4	1	2	6	5	3	8	7
General Rank of Competitive Activity	4	3	1	5	6	2	8	7
«Champion Index»	**8**	**4**	**3**	**11**	**11**	**5**	**16**	**14**

According to this index the junior tennis players № 2, № 3 have confirmed the top results in the group; № 1, № 4, № 5, № 6 are ready for the transition to the next level according to their indices of technical training and competitive activity; № 7, № 8 players require more substantial training and individual approach in order to proceed to the «green» level at the end of the school year.

The summarized ranking index of basic technical elements in technical training and competitive activity for the junior tennis players aged 8–9 has confirmed that 6 out of 8 junior tennis players are ready to proceed to the next, «green», level, which equals 70 %.

Conclusion and Prospects of Further Research. As a result of our experimental research, based on the analysis of technical training and competitive activity of the junior tennis players, we have determined that the junior tennis players aged between 8 and 9 are ready to proceed to the «green» level of tennis.

The research undertaken by our group does not solve all the aspects of the given issue. We can foresee further research prospects in a more detailed approach to determining the junior tennis players' aptitude in the form of standard movement tests and their assessment criteria.

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BIOMECHANICAL STRUCTURE SPECIFICS OF THE JAVELIN THROWING TECHNIQUE OFELITE ATHLETES

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Abstract

The relevance of the research. At the current stage of sports science development , the most promising direction for increasing sport results is that focuses on the maximum usage of the qualitative training process characteristics , reserves search of athletes' technical skill improvement , methods and means of technical training, maximal realization of individual congenital and acquired inclinations of athletes. ***Statement of the Problem.*** The highest quality in the tmotor actions technique improvement is achieved through the usage of biomechanical analysis which is based on the studying of biomechanical structures using modern electrooptical systems of registration and analysis of movements with the subsequent development of model indicators. ***The Purpose and Methods of Research.*** The aim of this work is to analyze the peculiarities of the biomechanical structure of the javelin throwing technique by elite athletes. Research methods : analysis of scientific and methodical literature, video, biomechanical analysis and methods of mathematical statistics. ***Results and Key Conclusions.*** The analysis of the javelin throwing technique of highly qualified athletes is carried out. In the experiment four javelineers participated – masters of sport of the international class. With the help of video shooting and biomechanical analysis quantitative characteristics of the biomechanical structure of the throwing javelins technique of highly qualified athletes are obtained. The indexes that influence the javelin flight range in the phases of the previous run, final run and final effort are studied. The temporal, spatial and spatial-temporal characteristics of the technique of motor activity is analyzed. The obtained data is planned to be used for constructing models of the biomechanical structure of the javelin throwing technique. The indicators of the biomechanical structure of the javelin throwing technique discovered by highly qualified athletes can be used as sample models for athletes of lower qualification. Prospects for further research are the study of the biomechanical structure of the equipment of qualified athletes and the discriminatory features revealed in the technique of athletes of different qualifications, with the aim of further improving the javelin throwing technique of the qualified athletes.

Key words: javelin throwing, technique, elite athletes, biomechanical structure.

Олександр Клімашевський. Особливості біомеханічної структури техніки метання спису висококваліфікованими спортсменами. ***Актуальність теми дослідження.*** На сучасному етапі розвитку спортивної науки, найперспективнішим напрямом підвищення спортивного результату є той, що орієнтує на максимальне використання якісних характеристик тренувального процесу, пошук резервів удосконалення технічної майстерності спортсменів, методів і засобів технічної підготовки, максимальної реалізації індивідуальних вроджених та набутих задатків атлетів. ***Постановка проблеми.*** Найвища якість під час удосконалення техніки рухових дій досягається за рахунок використання біомеханічного аналізу, в основу якого покладено дослідження біомеханічної структури за допомогою застосування сучасних оптико-електронних систем реєстрації й аналізу рухів із подальшою розробкою модельних показників. ***Мета й методи дослідження.*** Мета роботи – проаналізувати особливості біомеханічної структури техніки метання списа спортсменами високої кваліфікації. Методи досліджень – аналіз науково-методичної літератури, відеозйомка, біомеханічний аналіз, методи математичної статистики. ***Результати та ключові висновки.*** Проведено аналіз техніки метання списа висококваліфікованими спортсменами. В експерименті брали участь чотири метальники списа – майстри спорту міжнародного класу. За допомогою відеозйомки й біомеханічного аналізу отримано кількісні характеристики біомеханічної структури техніки метання списа висококваліфікованими спортсменами. Досліджено показники, які найбільшою мірою впливають на дальність польоту списа у фазах попереднього розбігу, завершального розбігу та фінального зусилля. Проаналізовано часові, просторові й просторово-часові характеристики техніки рухових дій. Отримані дані планується використати для побудови моделей біомеханічної структури техніки метання списа. Виявлені нами показники біомеханічної структури техніки метання списа висококваліфікованими спортсменами можуть бути використані, як зразки – моделі для спортсменів нижчої кваліфікації. Перспективи подальшого дослідження вбачаємо у вивчені біомеханічної структури техніки кваліфікованих спортсменів та виявленні дискримінативних ознак у техніці спортсменів різної кваліфікації з метою подальшого вдосконалення техніки метання списа кваліфікованими спортсменами.

Ключові слова: метання списа, техніка, висококваліфіковані спортсмени, біомеханічна структура.

Александр Климашевский. Особенности биомеханической структуры техники метания копья высококвалифицированными спортсменами. ***Актуальность темы исследования.*** На современном этапе развития спортивной науки перспективным направлением повышения спортивного результата является то, что ориентирует на максимальное использование качественных характеристик тренировочного процесса, поиск резервов совершенствования технического мастерства спортсменов, методов и средств технической подготовки, максимальной реализации индивидуальных врожденных и приобретенных задатков атлетов. ***Постановка проблемы.*** Высочайшее качество при совершенствовании техники двигательных действий достигается за счет использования биомеханического анализа, в основе которого лежит исследование биомеханической структуры посредством использования современных оптико-электронных систем регистрации и анализа движений с последующей разработкой модельных показателей. ***Цель и методы исследования.*** Цель работы – проанализировать особенности биомеханической структуры техники метания копья спортсменами высокой квалификации. Методы исследований – анализ научно-методической литературы, видеосъемка, биомеханический анализ, методы математической статистики. **Результаты и ключевые выводы**. Проведен анализ техники метания копья высококвалифицированными спортсменами. В эксперименте участвовали четыре метателя копья – мастера спорта международного класса. При помощи видеосъемки и биомеханического анализа получены количественные характеристики биомеханической структуры техники метания копья высококвалифицированными спортсменами. Исследованы показатели, которые в наибольшей степени влияют на дальность полета копья в фазах предварительного разбега, заключительного разбега и финального усилия. Проанализированы временные, пространственные и пространственно-временные характеристики техники двигательных действий. Полученные данные планируется использовать для построения моделей биомеханической структуры техники метания копья. Обнаруженные нами показатели биомеханической структуры техники метания копья высококвалифицированными спортсменами могут быть использованы как образцы – модели для спортсменов низкой квалификации. Перспективы дальнейшего исследования заключаются в изучении биомеханической структуры техники квалифицированных спортсменов и выявлении дискриминативных признаков в технике спортсменов различной квалификации с целью дальнейшего совершенствования техники метания копья квалифицированными спортсменами.

Ключевые слова: метание копья, техника, высококвалифицированные спортсмены, биомеханическая структура.

Introduction. At the current stage of sports science development, the most promising direction for increasing sport results is that focuses on the maximum usage of the qualitative training process characteristics, reserves search of athletes' technical skill improvement, methods and means of technical training, maximal realization of individual congenital and acquired inclinations of athletes [5]. In the javelin throwing, one of the ways to increase athletic performance is improvingthe javelin thrower' s motor action. The high level of proficiency ofrational motor actions allows to show stable and high results for the whole season, so currently one of the main problems in preparation of javelinthrowing athletes is – improving of motor actions technique [1].

The Analysis of Researches. Many authors considered that the highest quality in the motor actionstechnique improvement [2; 5], is achieved through the usage of biomechanical analysis which is based on the investigation of biomechanical structuresusing modern and electrooptical systems of registration and analysis of movements with the subsequent model parameters development [4]. Nowadays , most published works are devoted to the studying of the javelin throwing technique and analyzing the world's leading athletes technique. Mainly they are focused on individual characteristics of the exercise, but in most cases all major characteristics of the technique are not analyzed [3; 6].

The aim of this work is to analyze the peculiarities of the biomechanical structure of javelin throwing technique of elite athletes.

Material and methods of research – analysis of scientific and methodical literature, video, biomechanical analysis and methods of mathematical statistics. In order to identify benchmarks of javelin throwingtechnology, 20 attempts of 4 W*orldmasters of sports* were analyzed . All the attempts performed by athletes in trainings were filmed, butonly 5 attempts of each athlete with the best results have been selected.

The Results of the Study. Discussion. The range of the projectile is the main aim that reflects the sport results . That's why the terms of the spear range have been analyzed at first. The results of the studied attempts in the javelin throwing showed 73,8 perm, S=2,4 m in average, maximum of 76,8 m, and the minimum 72,4 m. Having analyzed the results of attempts, we concluded that the experimental group is homogeneous according to the rate range of the spears, the low value of the coefficient of variation (V=3,2 %) and close to each other on the average, mode and median was proved (x=73,8, Mo=73,4; Me=73,6). According to the data we came to the cnonclusion that the indicators of the biomechanicalstructure of javelin throwingtechnique can be analyzed by the indicator of average values.

We have analyzed the preliminary part of the running approach by javelin thrower. The research shows that dynamics and the maximum value of acceleration of the projectile and body of the thrower in the

previous part of the running approach depends on his physical training and the development of swidle power qualities mainly compearing with the technique of movements. Therefore, we analyzed only the integralcharacteristics of the preliminary part of the running approach: length of running approach, timeof running approach, amount of steps, the average running stride length, the speed of the overallcenter of body weight of the athlete at the end of the running approach.

Biomechanical parameters of the technique in preliminary running approach of elite javelinthrowers are presented in the table 1.

Table 1

Biomechanical Parameters of the Kinematic Structure Technique Inthe Preliminary Part of a Running Approachshowed by Elite Javelin Thrower (n = 20)

Measured Parameter	*x*	S
Length of the running approach, *m*	16,28	0,84
Time of running approach, *s*	2,32	0,19
Number of steps	13,2	0,97
Average running stride length, *m*	1,26	0,12
Speed CCM of the athlete's body at the end of the running approach, $m \cdot s^{1}$	7,98	0,66

The main criterion for the preliminary running approach is speed CCM of the athlete's body at the end of the run. Speed at the end of the preliminary running approach reaches 7,98m•s–1, S=0,66 m·s–1. The acceleration is achieved mainly due to the increasing in running pace and not via increasing the length of the steps.It is proved by the characteristics of the average length of the running stride during the preliminary running approach,which is 1,26 m while the standard deviation is 0,12 m. So the length ofthe steps is almost the same.

Indicators of the spatiotemporal structure of the javelin throwing technique of elite athletes in the phase of the final part of the running approach are presented in the table 2.

Table 2

Spatio-Temporal Indicators of Elite Javelin Throwers in the Final Part of the Running Approach (n= 20)

The Name of the Phase		Measured Parameter			
			CCM Movement, *m*	CCM Speed, $m \cdot s^{-1}$	CCM Acceleration, $m \cdot s^{-2}$
The first springing stride	The reference phase	***x***	**0,12**	**8,08**	**2,5**
		S	0,01	0,77	0,16
	Phase of flight	***x***	**1,76**	**8,22**	**0,90**
		S	0,15	0,72	0,06
The second springing stride	The reference phase	***x***	**0,14**	**8,52**	**1,25**
		S	0,02	0,66	0,11
	Phase of flight	***x***	**1,48**	**8,66**	**0,75**
		S	0,14	0,82	0,03
The third springing stride	The reference phase	***x***	**0,12**	**8,78**	**1,05**
		S	0,01	0,71	0,05
	Phase of flight	***x***	**1,89**	**8,82**	**0,66**
		S	0,17	0,77	0,06
The fourth springing stride	The reference phase	***x***	**0,18**	**8,94**	**0,78**
		S	0,02	0,66	0,02
	Phase of flight	***x***	**1,41**	**8,96**	**0,50**
		S	0,14	0,55	0,05

In the final part of the running approach, all athletes performed four springing strides. In this phase ofthe movement we have analyzed the indicators of the spatiotemporal technique ofjavelin throwing structure: displacement of velocity and acceleration of CCG(common center of gravity) of the athlete's body.

We should pay specialattention at the spatial and temporal characteristics of the movement CCG of skilled javelin thrower. Moving CCG athlete's body occurs in the support phase and the phase of flight. In the support phase CCG moved to 0,12–0,18 m, and in a phase of flight to 1,41–1,89 metres. However, in the

support phase the athlete has a greater speed boost than in the the phases of flight. The reason is the next: athlete applies propulsive force to the supportin reference phase. Speed CCG of highly skilled javelin throwers body in the phase of the final part of the running approach isincreasing, and acceleration is positive, which indicates efficient performance of motor actions.

The indicators of the main parameters of the javelin throwing by elite throwers are presented in the table 3.

Table 3

Main Parameters of the Javelin Throwing by Elite Throwers (n = 20)

Measured Parameter	*x*	S
The range of a spear, *m*	**73,8**	2,4
The path length of the final acceleration of a spear, *m*	**1,88**	0,12
Launching speed of a spear, *m•s-1*	**27,6**	1,21
CCM speed of a sportsman's body at the moment of launching, $m \cdot s^{-1}$	**10,24**	0,97
The angle of the torso is vertical at the moment of launching, °	**35**	2,9
The angle of the spear launching, °	**36**	2,9
The height of the flight of the spear, m	**2,04**	31,2

As thefinal effort is the culminationof javelin throwingtechniques, it requires the most detailed studying. We have studied the indicators which influence on the range of a spear.

The rate of launching of the elite spear throwers is 27,6 m•s–1, the path length of the final acceleration of a projectile of 1,88 m, the more the value of these indicators, the better sports result. Speed CCG of the athlete's body at the moment of launching made up 10,24 m•s–1, whereas at the end of the final phase of the running approach this indicatorwas of 8,96 m•s–1. Thus, we observe the increase in the CCM during the entire throwing, which is an indicator of proper exercise.

We have identified the parameters of the biomechanical structure of the javelin

throwing technique of elite athletes which can be used as sample models for the athletes of lower qualification.

Conclusions and Prospects for Further Research. The high level of technical and possessional skill of a rational javelin throwing technique has a significant impact on athletic performance throwers. Biomechanical structure of the javelinthrowing technique of elite athletes was identified and analyzed by using temporal, spatial and spatio-temporal-related characteristics of motor actions. We haveidentified the indicators of biomechanical structureof the javelin throwingtechnique by elite athletes which can be used as sample models for the athletes of lowerqualification.

Further researches are based on the studying of the biomechanical structure of the skilled athletes technique and identifying discriminating signs in the athletes with different skills, for improvingthe art of throwing spears by skilled athletes.

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INFLUENCE OF STRENGTH–BUILDING ACTIVITIES ON COMPETITIVE RESULTS OF ATHLETES IN Workout

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Abstract

Relevance of the investigation is caused by regularities of the origin and development of Workout as one of the directions of strength gymnastics, to achieve results in which the level of the development of strength qualities plays an important role. Analysis of the up-to-date studies on Workout development points out the need to draw attention to peculiarities in the organization and methods of providing training sessions. The necessary physical preparation and high sports results can be achieved by taking in consideration all factors and the rational structure of training process. ***The purpose of investigation*** – to work out a method of strength training in Workout and to check it up in competition activities. ***Results of investigation.*** A modern trend of strength-building acrobatics «Street workout» appeared as the variety of bodybuilding and is based on gymnastic exercises. Workout – English-American term is translated as «training» and composed of the complex of physical exercises directed to the improvement of strength, strength endurance and body shape. Therefore, exercises in speed-and-strength moves and methods of static and isometric exercises are used in special training. The trainings that are provided in different regimens and give significant results are considered as special methods of the development of strength, in which the variety of the regulations of tension in different regimens of their work, namely, isometric, concentric, eccentric, is of great importance. The article claims that the most effective ways and methods of strength development in Workout are varieties of exercises «Finger-tip push-up» (press-ups), method of isometric and static tensions, Tabat's protocol. The analysis of our experimental findings has proven that the developed methods of strength training of athletes-workouters provide the most significant increase in the results of control exercises «Horizontal backward hang», «Muscle–up on horizontal bar», «Push-ups from the floor» and «Arm balance». In the process of the investigation, a direct correlation between strength preparedness and the results of competitions in the exercise «Chest Dips with additional weight»; between strength preparedness and the final results of competitions in Workout was established. The obtained data are confirmed by the results of sportsmen's participation in regional competitions in Street Workout.

Key words: workout, strength, competitions, isometric exercises, push–ups, Tabat's protocol.

Ірина Маляренко, Юрій Ромаскевич, Ольга Кольцова, Катерина Юськів. Вплив силової підготовки на змагальний результат спортсменів у Workout. Актуальність дослідження зумовлена закономірностями виникнення та розвитку Workout як одного з напрямів силової гімнастики, у якому для досягнення результатів важливу роль відіграє рівень розвитку силових якостей. Аналіз передових досліджень із розвитку Workout указує на потребу звернути увагу на особливості організації та методики проведення тренувальних занять. Тільки з урахуванням усіх факторів і раціональної побудови структури тренувального процесу можна досягти необхідної фізичної підготовки та високих спортивних результатів. ***Мета дослідження*** – розробити методику силової підготовки у Workout і перевірити її ефективність у змагальній діяльності. ***Результати дослідження.*** Сучасний напрям силової акробатики «Street workout» виник як різновид атлетичної гімнастики й ґрунтується на гімнастичних вправах. Workout – англо-американський термін, перекладається як «тренування» та складається з комплексу фізичних вправ, спрямованих на вдосконалення сили, силової витривалості й форми тіла. Тому в спеціальній підготовці використовують вправи, де застосовують швидкісно-силові рухи та методи статичних й ізометричних вправ. Тренування, що проводяться в різних режимах і дають вагомі результати, правомірно вважати спеціальними методами розвитку сили, у яких потрібно урізноманітнювати регуляцію напруги в різних режимах їхньої роботи: ізометричному, концентричному, ексцентричному. У статті зазначено, що найбільш ефективними засобами й методами розвитку сили у Workout є різновиди вправи «Згинання та розгинання рук в упорі лежачи» (віджимання), метод ізометричних і статичних напруг, протокол Табата. Аналіз власних експериментальних даних дав підставу визначити, що розроблена методика силової підготовки спортсменів-воркаутців дає найбільш значимі прирости результату у контрольних вправах «Горизонтальний вис ззаду», «Підйом силою на поперечені», «Віджимання від підлоги» та «Стійка на руках». У процесі дослідження встановлено прямий кореляційний зв'язок між силовою підготовленістю та результатами змагань у вправі «Віджимання на брусах із додатковою вагою»; силовою підготовленістю й підсумковими результатами змагань із Workout. Отримані дані підтверджуються результатами виступів спортсменів на обласних змаганнях із Street Workout.

Ключові слова: воркаут, сила, змагання, ізометричні вправи, віджимання, протокол Табата.

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Ирина Маляренко, Юрий Ромаскевич, Ольга Кольцова, Екатерина Юськив. Влияние силовой подготовки на соревновательный результат спортсменов в Workout. Актуальность исследования обусловлена закономерностями возникновения и развития Workout как одного из направлений силовой гимнастики, в котором для достижения результатов важную роль играет уровень развития силовых качеств. Анализ передовых исследований по развитию Workout указывает на необходимость обратить внимание на особенности организации и методики проведения тренировочных занятий. Только с учетом всех факторов и рационального построения структуры тренировочного процесса можно достичь необходимой физической подготовки и высоких спортивных результатов. ***Цель исследования*** – разработать методику силовой подготовки в Workout и проверить ее эффективность в соревновательной деятельности. ***Результаты исследования.*** Современное направление силовой акробатики «Street workout» возникло как разновидность атлетической гимнастики и базируется на гимнастических упражнениях. Workout – англо-американский термин, что переводится как «тренировка» и состоит из комплекса физических упражнений, направленных на совершенствование силы, силовой выносливости и формы тела. Исходя из этого, в специальной подготовке используют упражнения, где выполняются скоростно-силовые движения и используются методы статических и изометрических упражнений. Тренировки, проводимые в различных режимах, дают весомые результаты, а поэтому их правомерно считать специальными методами развития силы, в которых необходимо разнообразить регуляцию напряжения в различных режимах их работы: изометрическом, концентрическом, эксцентричном. В статье указывается, что наиболее эффективные средства и методы развития силы в Workout – разновидности упражнения «Сгибание и разгибание рук в упоре лежа» (отжимание), метод изометрических и статических напряжений, протокол Табата. Анализ собственных экспериментальных данных дал основание определить, что разработанная методика силовой подготовки спортсменов-воркаутцив дает наиболее значимые приросты результата в контрольных упражнениях «Горизонтальный вис сзади», «Подъем силой на перекладине», «Отжимание от пола» и «Стойка на руках». В процессе исследования установлена прямая корреляционная связь между силовой подготовленностью и результатами соревнований в упражнении «Отжимание на брусьях с дополнительным весом»; силовой подготовленностью и итоговыми результатами соревнований по Workout. Полученные данные подтверждаются результатами выступлений спортсменов на областных соревнованиях по Street Workout.

Ключевые слова: воркаут, сила, соревнование, изометрические упражнения, отжимание, протокол Табата.

Introduction. Modern reality of technogenic environment causes the acute need in renovation of physical and spiritual strength that a human being loses in the process of labor activities and everyday communication. Recreation as an activity is directed to the realization of the needs in renovation and development of physical and spiritual strength of a man, his intellectual perfection.

A contradiction in the system of values in modern socio-cultural situation leads to the fact that young people lose the ability to withstand the influence of negative tendencies that have already formed in the system of youth permissibility. In this connection, it seems particularly timely to study new needs and values that are being formed within permissibility and its separate types, to determine the role and place of permissibility in the life of modern youth.

The actualization of the problems of youth permissibility is caused by the fact that young generation in accordance with its socio-cultural needs, devotes spare time mostly, to communication in the companies of youth, groups of the same age, where a peculiar young sub-culture is being formed that has its own impact on the formation of young personality.

A. Abdulkarimov, C. Guskov, O. Kirilenko, A. Rodionov state that the most important function of sport is health-improvement, recreation and culture. The problem to engage youth in sport as the most effective way to change alarming tendency of decreasing the level of motor activity and health is urgent at present, because only 5-8% of children leave secondary school without health problems in Ukraine.

Sport includes various social forms. It exists as a certain activity connected with body practices; as a game coordinated by rules; as an entertaining show; and as a variety of professional human activities.

Strength gymnastics – Workout proposes a complex of physical exercises, directed to the improvement of strength, endurance and body shape. In addition, it is based on physical exercises, gymnastics, strength exercises, acrobatics and therefore it is like a spectacular display. The up-to-date workout promotes a healthy way of life, struggle with drug addiction, alcoholism, smoking, computer addiction, etc. As the alternative to the above listed, the youth is given training. Thus, our investigation is rather actual [3].

Purpose of investigation – to work out a method of strength training in Workout and to check up its effectiveness at the competitions.

Material and Methods of Investigation. The investigation was carried out with athletes aged 15–17, who were engaged in Workout. 13 participants took part in it. A pedagogical experiment lasted from 2015 to 2017. In the course of the investigation, the following methods were used: *theoretical* – analysis of research-

and-methodical literature on the problem of the investigation; generalization of theoretical and empirical data; *empirical* – diagnostic (pedagogical monitoring, pedagogical experiment, method of control tests); *methods of mathematic statistics* – for interpretation and processing the results of the investigation.

Results of Investigation. Discussion. Nowadays, the desire of young men and girls to become strong and harmoniously developed is natural, but it can be achieved only by the way of systematic physical exercises and sport. The popularity of body-building among teenagers, young men and girls facilitates harmonious development of the whole body, proportions and musculature, formation of proper posture, strength and agility, flexibility and other physical and moral-volitional qualities..

L. Eiunz defines a «body-building» as the system of exercises with regulated support directed to comprehensive physical training and formation of outward body shape; strengthening joints, tendons and ligaments; increase in functional abilities of people who are engaged in recreation exercises, etc [1].

L. Dvorkin, L. Eiunz and others note that there are many exercises in athletic sports, which are different in their motion structure, ways of performance and energy supply. They can be used to make up complexes to solve a lot of health-improvement, cultural and educational tasks. In addition, each exercise depending on the method of its application can be multifunctional [1; 4].

Research of scientists [2; 5] allows to state that the fundamental principle of physical training is strength-building activities. One of the most important physical qualities in athletic sports is strength.

Non-traditional methods of strength development are isometric exercises. A. Smirnov states that unlike the method of static training, method of isometric tensions is intended for a development of maximal strength abilities [6].

Investigators of the method of isometric tensions (A. Smirnov, I. Zakirov and V. Pluzhnick, V. Tsymbalyuk et al.) are based on the fact that the strength is manifested according to the value of resistance: the greater the resistance is, the greater the efforts to overcome it are. The resistance that is impossible to overcome with a muscular effort is considered to be the greatest. Under conditions, when possibility of motion is excluded, a sportsman must gradually, with a strong–willed effort, bring the tension to maximal and hold it for 5–6 sec.

A. Smirnov singles out the following advantages of isometric exercises:

• possibility to achieve a maximal muscular contraction in contrast to isotonic exercise, also known as strength training;

• training occurs much faster; it is necessary to hold the position for each exercise from 6 to 8 seconds and to make 5–10 sets in the exercise.

• it is possible to increase strength values [6].

Thus, with the help of isometric exercises, an athlete is able to work on each part of his body with a high quality wasting a minute or so.

But, there are certain shortcomings in this method: decrease in muscular endurance, uniformity of exercise performance, and increase in arterial pressure. Therefore, in the process of athletes training for Workout, one should use this method in complex with other generally adopted methods.

On the basis of the analysis of scientific-and-methodical literature, pedagogical monitoring, questioning leading specialists, we have worked out a special complex of physical exercises, aiming at the development of strength qualities for the athletes engaged in Workout, including different types of push-ups; isometric exercise: «angle on the sticks with a drawn tight braid», «airplane on the floor», «heaving exercises with counteraction», «Parallel bar dips with counter action»; static exercises: backward hang, front hang, horizontal with feet apart, free front balance on bent hands, bent suspension, arm balance.

Verification of effectiveness of this method was carried out during regional competitions in Workout (Kherson city, 01.06.2017).

Method of Strength-Building Activities in Workout

Strength-building activities of workouters were perfomed according to the following directions

– development of dynamic strength;

– development of static strength;

– development of strength endurance;

– development of flexibility;

In the process of the development of strength qualities, we took into account the following methodical issues:

– presence of complex exercises of the dynamic and static nature;

– taking into account one's own strength in determination of the amount of loading in one set;

– duration of static exercises makes up 10–30 seconds, with tension that is gradually increases to a maximal;

– complex of strength exercises is included in the second part of training.

Push-ups as the Basic Way of Strength Development in Workout

The problem of use of physical exercises – «stoop and stretch in prone position» (hereinafter, push-ups) is deeply studied by scientists L. Matveev, V. Platonov, T. Krutsevich, A. Ter-Ovanesyan et al. They note that stoop and stretch in prone position (push-ups) is the basic exercise that is done from a facedown position, and directed to the development of human strength. It is useful for support of joints mobility and tonicity of shoulder girdle muscles (triceps, brachial and deltoid muscles), all muscles of the thorax and trunk as a whole.

Push-ups are one of the main directions of training in Workout. They are used to develop strength, endurance, rapidity, dexterity and other physical qualities as well as basic elements in competitions, where their variability depends on sportsman's creative approach, understanding and level of physical training [3].

In sports push-ups are most often used in a preparatory part during a warming-up, since it permits to warm all groups of muscles and to get the organism ready for the more heavy loads.

According to variations of push-ups, in the process of workouters' training, we distinguish the following types of them: basic push-ups with one's own weight; complex coordination push-ups; push-ups with additional outfitting; plyometric push-ups. In accordance with the above types, we have developed a classification of push-ups that is used in the process of workouters' strength-building activities.

1. *Basic push–ups with one's own weight* – they are generally available, basic moves that do not require auxiliary equipment or other auxiliary means while performing exercises and can be accompanied by additional change of grip and its configuration and width.

2. *Complex coordination push-ups* – directed to the development of not only strength, but rapidity as well. Push-ups are performed with a complex-coordination complication that may be an arm balance, acrobatic element as well as balance elements.

3. *Push-ups with additional outfitting* help to vary the technique of exercise performance and to increase the depth of motion. For example, the use of some objects above the floor (benches, chairs), wall, weights and auxiliary objects.

4. *Plyometric push-ups* (from English word «plyometrics»– multiply, grow) – effective exercises that include rapid, explosive muscular body moves (jumps). They include many explosive body movements that not only improve muscular coordination, but functions of nervous system as well. In order to activate different groups of muscles, hands can be placed in various positions (a wide placement of arms increases the load and engages muscles of the external part of the chest; a narrow arrangement – shifts the accent to the internal part of thoracic muscles). In push-ups, one can turn hands with fingers to the middle or outwards. Different variants of support enable to develop various groups of muscles [4; 21].

Isometric Exercises that Were Used in the Process of the Workouters' Strength-Building Activities

Angle on the sticks with a braid – a braid is drawn tight between two long sticks and a sportsman performs the angle with straight arms, trying to lift legs as higher as possible.

Airplane on the floor – an athlete lying in the facedown position with straight arms tries to press on the support. In doing so, the arms are a little wider than shoulders. Bring a tension to a maximum using not only the muscles of arms but dorsal muscles should also participate. This posture is kept from 5 to 10 sec. While performing this exercise breathing is moderate. The number of sets is 5–10. The period of rest is no more than 10 sec.

Heaving exercises with a counteraction – an athlete hanging on the horizontal bar performs heaving exercises, in so doing he is kept by the legs not giving him to perform the exercise completely. This exercise can also be performed with bent elbows where the angle is 90°.

Parallel bar Dips with a counteraction – an athlete standing on bent arms in support on parallel bars, angle 90°, tries to straighten his elbows. In this case, a counteraction is performed with his opponent.

Static Exercises that Were Used in the Process of the Workouters' Strength-Building Activities

Backward hang – horizontal hang, in which the body is a horizontal backward position.

Front hang – horizontal hang, in which the body is in the horizontal position.

Horizontal (feet apart) – the trunk is in the horizontal position on straight arms.

Horizontal support on bent arms – the trunk is in the horizontal position on bent arms.

Hang on bent arms – a hang on horizontal bar on bent arms, where the angle makes up 90°.

Arm balance – a vertical position of an athlete is upside down, in which he supports himself with straight arms on the floor or gymnastic apparatus.

Scheme of Workouters' Trainings According to Tabat's Protocol

While developing this method of training, we have used Tabat's method. Trainings in accordance with Tabat's protocol consists of three phases:

• Warming-up (5 min.) is necessary to warm up muscles and to prepare for intensive performance of exercises.

• Cycle of exercises according to Tabat's protocol – 8 sets by 20 seconds, interval for rest – 10 sec. In this regime of work for 20 seconds of active phase, first, ATP-mechanisms of energy supply start to act and by the end of the phase glycolytic mechanisms are connected.

• Final part (2 min.) – brisk walking, gradually reducing tempo.

According to the above mentioned, we have developed a scheme of trainings for workouters in accordance with Tabat's protocol. The basic difference of the method, we have developed, is that after each exercise, which is performed with maximal intensity for 20 sec, one more exercise has to be done for 10 sec as slowly as possible. Thus, we develop not only strength endurance but slow dynamic force as well, that substantially affects the development of maximal strength. The duration of such training is 4 min (6 sets by 20 seconds of intensive performance of the exercise and by 10 seconds of slow performance of each exercise).

The effectiveness of the method is understood as final impact on the development of physical qualities of sportsmen that was verified with the help of output and final testing according to the existing methods and normative requirements.

The average obtained results of testing and changes in these indices and their increase are given in table 1. It is noted that in the course of conducting the first and second testing and the generalization of the data received, we have used the same methods of processing and analyzing the obtained results.

As it is evident from the results given in table 1, the greatest increase in strength was observed with the exercise «Horizontal backward hang» (65 %). The second place by the result of increase took the test «Muscle–up on horizontal bar» (25 %). Rather high indices of increase were made in testing of «Push-ups from the floor» (21,1 %) and «Arm balance» (20,6 %). Somewhat lower indices were done in other tests however; it is worthy to note that changes in the results were also positive.

Table 1

Results of Investigation of Workouters' Strength-Building Activities

No	Test	I test		II test		Increase			P
		Result	Score	Result	Score	Result	Score	%	
1	Angle, *sec*	17±11,3	6,6	18±8,7	7,6	+1	+1	5,6	P□0.05 t = 1,01
2	Horizontal backward hang, *sec*	4,27±2,51	1,8	12,2±7,1	5,9	+7,93	+4,1	65	P□0,01 t = 3,74
3	Horizontal feet apart, *sec*	8,7±4,05	7,7	9,41±3,21	8,5	+0,71	+0,8	7.5	P□0,05 t = 0,91
4	Arm balance, *sec*	11,2±9,5	5,7±	14,1±9,95	6,1	+2,9	+0,4	20,6	P□0,01 t = 3,20
5	Horizontal front hang, *sec*	3±1,41	1,4	3,7±1,6	1,8	+0,7	+0,4	9	P□0,05 t = 2,51
6	Muscle–up on horizontal bar, *times*	6±1,9	3,5	8±2,4	4,1	+2	+0,6	25	P□0,01 t = 4,52
7	Parallel bar dips, *times*	34±6,88	6,8	37±5,56	7,5	+3	+0,7	8,1	P□0,05 t = 2,69
8	Heaving exercises, *times*	16±3,5	5,5	18±3,55	6,2	+2	+0,7	11,1	P□0,01 t = 3,87
9	Pushups, *times*	60±8,72	6	76±10,33	7,6	+16	+1,6	21,1	P□0,01 t = 6,35

To carry out a more detailed analysis of individual results of workouters' strength-building activities, we made use of a battery of tests, according to which a sportsman received a final sum of scores by nine indices. Changes of workouters' individual results in the course of pedagogical experiment are given in table 2.

Table 2

Changes of Individual Results of Workouters's Strength-Building Activities in the Course of Pedagogical Experiment

Test	Number of the Beginner (by Protocol)												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1 test	64,2	32,8	47,6	38	33,8	45,5	50,8	54,9	56,8	25,4	50,2	51,6	48,1
2 test	72,1	44,9	63,6	57,3	43,9	50,8	56,9	69	61,5	33,5	59,2	63,6	51,5
Increase	+7,9	+12,1	+16	+19,3	+10,1	+5,3	+6,1	+14,1	+4,7	+8,1	+9	+12	+3,4

The analysis of the results allowed to determine the individual level of workouters' strength-building activities according to a battery of tests.

After the implementation of the developed method of strength-building activities, the sportsmen's indices and their rating in the group, relative to the results obtained, somewhat changed. This proves the effectiveness of the application of the developed method of strength-building activities with the use of Tabat's protocol, various push-ups, static and isometric exercises in the system of workouters' training.

To exert the influence of the level of strength-building activities on the result received in competitions, we have analyzed the indices of performances of the sportsmen–workouters during regional competitions in Street Workout (Kherson, 01.06.2017).

Competing, the sportsmen participated in two types of exercises freestyle and parallel bar dips with additional loads (45 % of sportsman's bodyweight). For each exercise, the sportsmen received a certain number of scores that were later summed up in order to determine the absolute winner of competitions. It should be pointed out that in the estimation of the exercise «Freestyle», the technique of performance of static, dynamic, complex-coordination and additional (according to sportsman's choice) exercises were taken into account. The analysis of results of the competitions showed that the winners of the competitions became sportsmen from Kherson who were trained in accordance with the elaborated method. We should like to underline that out of 13 sportsmen of the group, 10 sportsmen by the results of competitions were placed among the best ten in various forms of the program.

To determine the correlation between the level of strength-building activities and the results of performance in competitions in Workout, a correlation analysis was carried out between these indices. Significant direct correlations were found out between:

– strength-building activities and results of competitions in the exercise «Chest Dips with additional weight» ($r = 0,75$);

– strength-building activities and final results of competitions in Workout ($r = 0,72$).

The average direct correlation was determined between:

– strength-building activities and results of competitions in the exercise «Freestyle» ($r = 0,39$).

Summing up the results of the testing, competitions and correlation analysis, we can state that the developed method can be recommended for training workouters for competitions of different levels.

Conclusions and Perspectives of Further Investigations. We have established that the most effective means and methods of strength development in Workout are varieties of the exercise «Bending and extension of arms in (push-ups), method of isometric and static strains, Tabat's protocol».

Analyzing the results of strength–building activities with the use of the developed method, we have confirmed that the most significant increases in the result are received in control exercises «Horizontal backward hang» – 65 % ($P<0,01$); «Muscle-up on horizontal bar» – 25 % ($P<0,01$); «Push-ups from the floor» – 21,1 % ($P<0,05$) and «Arm balance» – 20,6 % of previous result ($P<0,01$).

In the process of the investigation, the direct correlation between strength–building activities and the results of competitions in the exercise «Chest Dips with additional weight»; between strength–building activities and final results of competitions in Workout was established.

Perspectives of further investigations lie in the determination of the most significant components of strength-building training for further improving the Workout sports training system.

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METHODICAL CONDITIONS FOR INCREASING THE INDICATORS OF TECHNIQUE ON THE BASIS OF SPECIAL PHYSICAL TRAINING OF YOUNG SQUASH PLAYERS

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Abstract

Current physical and technical preparation of young squash players and their coordination were evaluated during formative experiment. Experimental study was carried out from September 2016 to May 2017. Twelve squash players of 9–11 years old (4 young squash players of 9 years old, 10 years old and 11 years old, respectively) participated in the studies, which were conducted on the basis of Fitness club «Sport-Life» in Kherson. All squash players belonged to the main medical group.

For the purpose of qualitative organization of experimental research, we chose a method of analysis and synthesis of scientific and methodological data, special and informative sources, methods of monitoring the organization of training process, methods of pedagogical testing, and methods of mathematical statistics (calculated methods of average and false values, percent values, and method of correlation analysis).

Results of the previous research on preparation of young athletes, conducted by us at the beginning of preparatory period, allowed indicating characteristic indices for the majority of young athletes that were below middle level. The number of athletes with the middle level of physical and technical preparation increased considerably after the formative experiment. Due to the obtained data it was possible to state high efficiency in elaborated by us program for training session at the stage of initial preparation of young squash players. The analysis made does not cover all aspects of solving the problem in question.

Further study presupposes the investigation of the influence of squash training on various indicators of the physical condition of squash players, the analysis of the indicators of training and competitive activity of squash players, in the context of revealing their leading and indifferent physical qualities.

Key words: squash, young squash players, physical and technical prepareation.

Артемій Перун, Регіна Андреєва, Вікторія Коваль, Оксана Швець. Методичні умови підвищення показників техніки на основі спеціальної фізичної підготовки юних сквошистів. У статті подано оцінку фізичної й технічної підготовленості юних сквошистів, а також їх взаємозв'язок у ході формувального експерименту. Експериментальну роботу проведено із вересня 2016 р. до травня 2017 р. У дослідженнях на базі фітнес-клубу «Спорт-Лайф» м. Херсона взяли участь 12 сквошистів 9–11 років (по чотири юних сквошисти 9-, 10- та 11-річних відповідно). Усі спортсмени належали до основної медичної групи.

Задля якісної організації експериментально-дослідної роботи нами обрано метод аналізу й синтезу даних науково-методичних, спеціальних та інформаційних джерел, методи спостереження за організацією навчально-тренувального процесу, методи педагогічного тестування, математичної статистики (розрахункові методи середніх і помилкових величин, відсоткових значень, метод кореляційного аналізу).

Результати попереднього дослідження підготовленості юних спортсменів, проведеного нами на початку підготовчого періоду, дали підставу встановити, що для більшості юних спортсменів властиві показники нижчого за середній рівня. Після формувального експерименту значно збільшилася чисельність спортсменів із середнім рівнем фізичної й технічної підготовленості. Відтак можна констатувати високу ефективність запропонованої нами програми тренувальних занять на етапі початкової підготовки юних сквошистів. Проведений аналіз результатів експериментальної роботи не вичерпує розв'язання всіх аспектів означеної проблеми.

Подальшого вивчення потребує вплив занять сквошем на різні показники фізичного стану спотрсменів, аналіз показників тренувальної й змагальної діяльності юних сквошистів у контексті виявлення провідних та індиферентних фізичних якостей, що і є перспективою подальших досліджень у цьому напрямі.

Ключові слова: сквош, юні сквошисти, фізична та технічна підготовленість.

Артемий Перун, Регина Андреева, Виктория Коваль, Оксана Швец. Методические условия повышения показателей техники на основе специальной физической подготовки юных сквошистов. В статье дается оценка физической и технической подготовленности юных сквошистов, а также раскрывается их взаимосвязь в ходе формирующего эксперимента. Экспериментальная работа проводилась с сентября 2016 г. до мая 2017 г. В

исследованиях на базе-фитнес клуба «Спорт-Лайф» г. Херсона приняло участие 12 сквошистов 9–11 лет (по четыре юных сквошиста 9-, 10- и 11-ти лет соответственно). Все сквошисты относились к основной медицинской группе.

С целью качественной организации экспериментально-исследовательской работы нами избраны метод анализа и синтеза данных научно-методических, специальных и информационных источников, методы наблюдения за организацией учебно-тренировочного процесса, методы педагогического тестирования, математической статистики (расчетные методы средних и ошибочных величин, процентных значений, метод корреляционного анализа).

Результаты предварительного исследования подготовленности юных спортсменов, проведенного нами в начале подготовительного периода, позволили установить, что для большинства юных спортсменов характерны показатели ниже среднего уровня. После формирующего эксперимента значительно увеличилось количество спортсменов со средним уровнем физической и технической подготовленности. В связи с представленными данными, можно констатировать высокую эффективность предложенной нами программы тренировочных занятий на этапе начальной подготовки юных спортсменов. Проведенный анализ результатов экспериментальной работы не исчерпывает решение всех аспектов этой проблемы.

Дальнейшего изучения требует влияние занятий сквошем на различные показатели физического состояния спортсменов, анализ показателей тренировочной и соревновательной деятельности юных сквошистов, в контексте выявления ведущих и индифферентных физических качеств, что и является перспективой дальнейших исследований в данном направлении.

Ключевые слова: сквош, юные сквошисты, физическая и техническая подготовленность.

Introduction. One of the most actual problems of modern sport is the preparation of sport reserve. It is actual and valuable nowadays to choose training methods that correspond to the elementary level of young athletes training, to conduct rational training lessons. All peculiarities and regularities are of great importance for young athletes.

Squash – is a sport game, played with a racket and a ball. This game is characterized by speed staying power, fast reaction and coordination. Complex approach for the developing of these abilities requires a wide range of training methods. At the same time, there are a great number of questions about the development of the basic physical abilities of the young squash players that need to be investigated and substantiated.

Squash is considered to be one of the most demanding kinds of sport. According to the latest reports of one of the most authoritative magazines, «Forbes», squash is proved to be the kind of sport that has different demands for the physical training of sportsmen. At the same time, specifics of different kinds of sport requires concentration on definite peculiarities of physical training, for example, marathon runners need to have aerobic training, squash players need both aerobic and non–aerobic training, power training, speed training, mobility exercises, etc., thus it has a complex nature [5; 6; 7; 8].

Nowadays, to master squash technique, one needs to have various motor skills, excellent coordination movements in combination with pinpoint arm actions. Young sportsmen at the age of 9–10 years old are able to demonstrate difficult exercises that absolutely correspond to the elementary level of physical training. There still exist some difficulties because of the steady increase in the proficiency of players. One of the indispensable conditions is to improve methods of young athletes training.

The experience of prominent coaches reveals the contradictions of the approaches to the elementary training level of the young squash players. Famous coach Philip Yarrow claims, that beginner sportsmen should pay special attention to the overall physical skills training [7]. Besides, it is important to learn the abilities of the development of the endurance in combination with speed training. On the one hand, some specialists focus on the importance of the development of aerobic endurance [2; 4]. Other specialists on the other hand claim that a big amount of constant exercises decreases the value of the elementary training level of children sport. That gives satisfaction in movements and emotional comfort of children [3; 8].

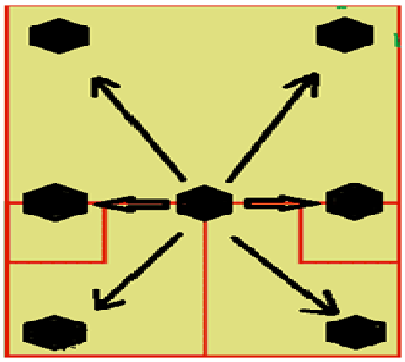
At the same time another famous coach Ian McKenzie claims, that on the elementary training level of young squash players, one needs to pay more attention to the technique of mastering specific elements [5]. The stated above peculiarities are controversial as far as the choice of effective methods of sport training of young squash players on the level in question is concerned. The development of modern squash training techniques is still not enough investigated.

The task of the research is to work out the methods of increasing physical proficiency of young squash players and to test experimentally their efficiency and influence on the technique training proficiency.

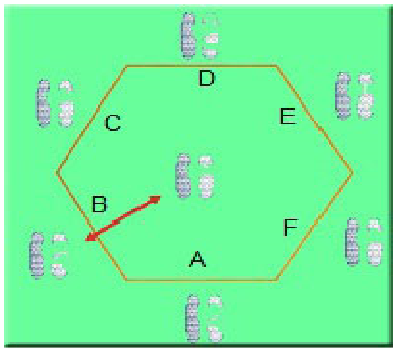
Preparation and Methods of the Research. Experimental testing was held from September 2016 till March 2017 in fitness club «Sport life» in Kherson. The participants were 12 squash players aged from 9 till 11 (4 squash players from each age group). The same participants took part in the formative experiment. All squash players belonged to the main medical group.

To provide a qualitative experimental testing, such methods were used: method of analysis and synthesis of research, methodological, special and informational sources; the method of observing the educational–training process, the method of pedagogical testing, and the methods of mathematical statistics (computational methods of average and erroneous, percentage, correlation analysis).

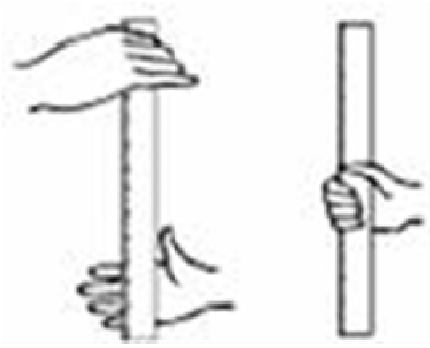
Pedagogical testing comprised a complex of tests to reveal the level of special physical skills and the quality of technical elements, made by the young squash players. The following tests were implemented (the specifics of the exercises is demonstrated in the picture 1): 1) shuttle run «6 points», movement coordination jumps (Hexagon Test); a grip of a falling stick. In order to prove the efficiency of the program, the young squash players were tested in right and left drive. Squash players make 10 right and 10 left drive-heats. One gets a score for hitting the ball onto the playable surfaces of the front wall of the court; scores are also rewarded for the length of the ball rebound and hitting the ball into a special area. The result – is the total of all scores for all successful hits.



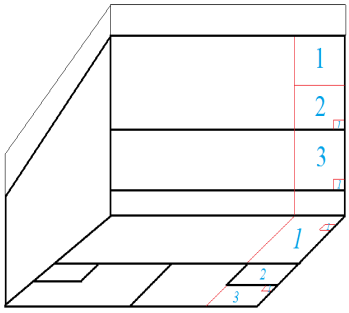
Test «6 Points»



Hexagon Test



Grab of a Falling Stick



The Technique Level Evaluation Test

Pic. 1. *Characteristics of Pedagogical Testing of Physical and Technique Training Skills of Young Squash Players*

Investigation. The results of the experiment, held at the beginning of the preparatory period, revealed, that the young squash players had the intermediate level of the physical training condition. It demonstrates that children, who do not go in for any kind of sports, have an intermediate level of overall physical training skills.

The calculation of the results of physical and technique training of the young squash players and their characteristics are demonstrated in table 1.

The analysis of the results of special physical abilities of the squash players shows, that 65 percent of the young sportsmen have an intermediate level of the development of dexterity (the results of the test «shuttle run with 6 points»). The low level of the physical development is revealed after the coordination movement test «Hexagon Test» (80 %).The results of the test «a grip of a falling stick» also show a low level of the physical development of a fast motor reaction – 75 % of all tested squash players.

As the results of the test demonstrate, most young squash players have a low level of physical training. Most their hits are of two score zone of the front wall and one score for the length of the rebound. None has managed to hit a ball onto a special zone. All these results reveal the necessity to improve the stated above results.

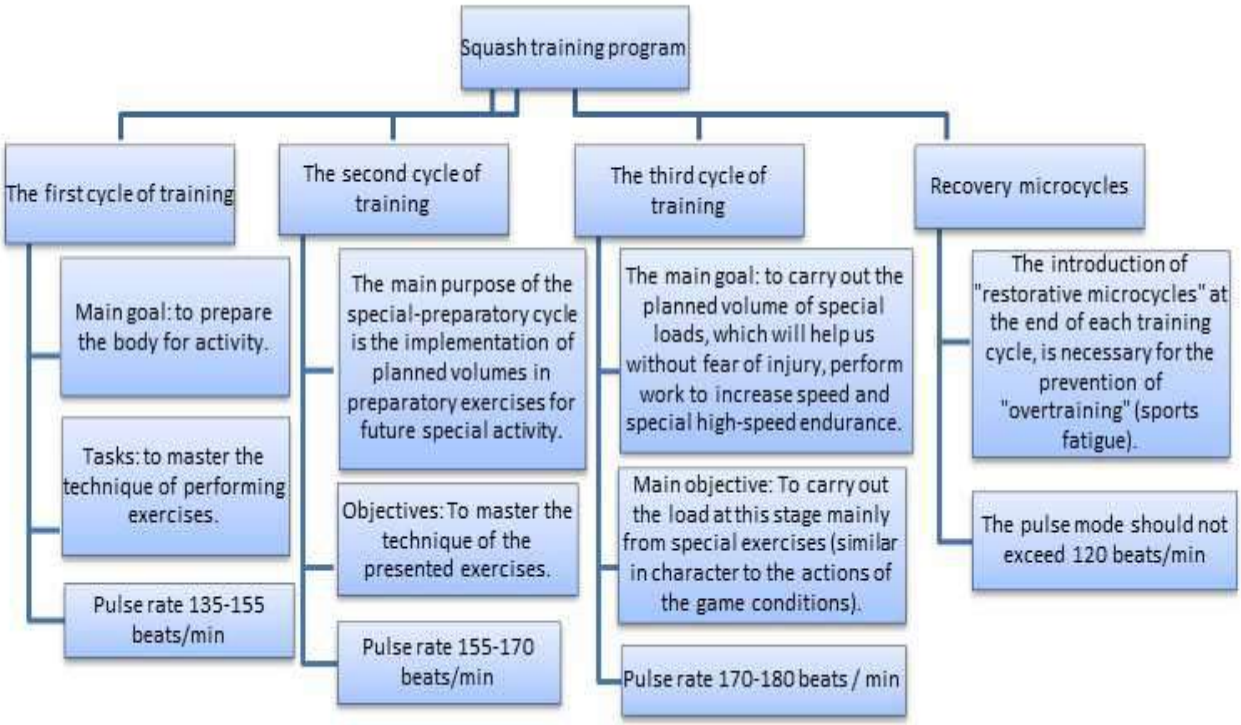
Table 1

Quantitative and Qualitative Characteristics of Special Physical and Technique Training Skills of Young Squash Players During the Ascertaining Experiment

№	Control testing	Sportsman Number												
		1	2	3	4	5	6	7	8	9	10	11	12	$X \pm Sm x$
Index of Special Training Skills														
1	**Shuttle run «6 points», *c***	17,2 н	16,9 с	17,0 н	16,8 с	16,5 с	17,1 н	16,4 с	16,3 с	16,5 с	17,3 н	16,4 с	16,5 с	16,7±0,1
2	**Grip of a falling stick, *см***	9 н	11 н	10 н	15 н	12 н	9 н	5 в	6 с	5 в	9 н	11 н	10 н	9,0±0,84
3	**Hexagon Test**	22 н	20 н	21 н	18 с	19 н	21 н	20 н	22 н	21 н	18 с	19 н	21 н	20,0±0,41
Index of Special Training Skills														
4	**Right Drive Hit**	35 н	32 н	32 н	34 н	33 н	30 н	30 н	31 н	31 н	31 н	34 н	30 н	32±0,47
5	**Left Drive Hit**	30 н	31 н	32 н	32 н	30 н	30 н	31 н	33 н	30 н	30 н	31 н	32 н	31±0,32

Note: *numeration – quantitative results, denomination – qualitative (н – low, с – middle, в – high)*

For these purpose we have used the experience of the prominent specialists and developed the training program for young squash players. This program enables to develop special physical skills of young squash players by means of game method with the help of set of exercises for the overall physical training. It has three cycles (4–6 weeks each), which are split into microcycles (one microcycle is one week of training). Each microcycle, except the cycle of recovery, has 3–4 trainings a week. The training week is focused on the development of the physical skills in such a way: Monday – basic callisthenic exercises; Tuesday – first support auxiliary training; Wednesday – second main training; Thursday – rest from general physical training; Friday – second support auxiliary training; Saturday and Sunday are a tournament or a holiday. Schematically, the content of the training program is presented in pic. 2.



Pic. 2. *The Physical Training of Young Squash Players*

All the results, got after the implementation of the experimental methods of increasing physical and technique training of the young squash players, are demonstrated in table 2.

Table 2

Quantitative and Qualitative Characteristics of Special Physical and Technique Training Skills of Young Squash Players During the Formative Experiment

№	Control Testing	Sportsman Number												
		1	2	3	4	5	6	7	8	9	10	11	12	*X±Smx*
Index of Special Training Skills														
1	**Shuttle run «6 points», *c***	17,0 н	16,5 с	16,7 с	16,4 с	16,0 в	17,0 н	16,1 с	16,5 с	16,3 с	17,0 н	16,0 в	16,1 с	16,4±0,03
2	**Grip of a falling Stick, *см***	8 с	12 н	7 с	10 н	13 н	8 с	5 в	6 с	5 в	9 н	9 н	8 с	8,3±0,72
3	**Hexagon Test**	20 н	17 с	20 н	15 с	15 с	22 н	21 н	19 н	18 н	16 с	17 с	22 н	18,5±0,73
Index of Special Training Skills														
4	**Right Drive Hit**	49 с	47 с	50 с	51 с	48 с	42 с	41 с	39 н	45 с	43 с	44 с	42 с	45±1,12
5	**Left Drive Hit**	45 с	49 с	45 с	43 с	44 с	42 с	36 н	39 н	49 с	44 с	41 с	41 с	43±1,09

Note: *numeration – quantitative results, denomination – qualitative (н – low, с – middle, в – high)*

The results of the research of the special physical skills and technique elements, demonstrated in table 2, confirm positive changes in physical skills of the young squash players. During the experiment, 75 % of the young squash players achieved the intermediate level of special exercise shuttle run «6 points», in comparison with 66 % of the squash players, who had such results at the beginning. The test «grip of a falling stick» demonstrated that 58 % of the squash players, who took part in the experiment, had intermediate level of the development of speed reaction, that proves the increasing effectiveness, that is 50 % , of this exercise of each squash player (at the beginning of the experiment 75 % of the young squash players had a low level of this quality). The same effectiveness was proved by the special Hexagon Test: 75 % of the examined sportsmen had below the average level of coordination abilities, thus, at the beginning of the test, 80 % of squash players had a low level.

As for the results of the technique proficiency of the young squash players, one can observe a positive dynamics of the technique of special exercises. During the formative experiment 91,7 and 83,3 % of the young squash players achieved the intermediate level of implementing technical elements in two testing exercises. At the same time, during the ascertaining experiment the results of most examined sportsmen were low. At the beginning of the experiment, most hits were of two–score zone of the central wall and one–score was given for the length of the rebound. One could observe no hits onto the special zone. Final results demonstrated the increasing number of hits onto the two–score zone, improvement of the length of the rebound (a three–score zone), pinpoint hits into special zones, for which additional score was awarded.

Absolute and relative changes in the process of the young squash players' training are demonstrated in table 3.

Considerable improvement between initial and final results of the young squash players' experimental testing was revealed in special physical training (table 3): the effectiveness of doing testing exercises in dexterity increased by 0,3, the effectiveness of Hexagon Test – by 1,5 c, what in percentage is 1,83 and 8,11 % ($p < 0,05 \div 0,01$)

Absolute positive changes in test "grip of a falling stick" reached 0,7 cm. Thus, the compared initial and final results didn't reveal any considerable divergence. According to our assumption, the development of the young squash players' special coordination skills should positively influence the process of teaching the technique of scoring main hits in a squash game.

Such methodological approach helped to achieve positive changes in the development of technique elements of the squash players of the experimental group – the effectiveness of right and left drive hits increased by 40,63 та 38,71 % ($P < 0,001$).

Table 3

Changes of the Researched Indices of Young Squash Players

№	Control Testing	The stage of investigation	Result	Absolute Change	increasing in %	t	P
Index of physical training skills							
1	**Shuttle run «6 points», *c***	ВД КД	16,7±0,1 16,4±0,03	0,3	1,83	3,0	< 0,01
2	**Grip of a Falling Stick, *см***	ВД КД	9,0±0,84 8,3±0,72	0,7	8,43	0,63	> 0,05
3	**Hexagon Test**	ВД КД	20,0±0,41 18,5±0,73	1,5	8,11	1,8	< 0,05
Technique index							
4	**Right Drive Hit**	ВД КД	32±0,47 45±1,12	13,0	40,63	10,8	< 0,001
5	**Left Drive Hit**	ВД КД	31±0,32 43±1,09	12,0	38,71	10,5	< 0,001

To prove the objective conclusion about the efficiency of the experimental methodology, we have established the interconnection of the level of special physical training and technique elements (table 4).

Table 4

Interconnection Between the Level of Special Training Skills and Technique Skills

Index of Physical Training Skills	Index of Technique Training Skills	
	Right Drive Hit	Left Drive Hit
Coordination skills	0,72	0,77
Fast reaction	0,55	0,61
Dexterity Shuttle run «6 points»	0,52	0,65

The correlation analysis of general and special physical and technique training skills indices proved to have close interconnection:

– coordination skills of the young squash players have a high coefficient of interconnection with all the researched elements of the technique training skills from r = 0,72 till 0,77;

– the same results we observe in the interconnection of the speed reaction with the elements of technique training skills, but their interconnection corresponds to such a level from r = 0,55 till 0,61;

– a high and medium level of correlation between dexterity and young squash players' technique elements (r = 0,52–0,65);

The correlation analysis between the indices of technical and special physical training skills proved once more the hypothesis of our research: optimization of special physical training skills of young squash players has a positive influence on the quality of their performance of the technique of exercises.

Conclusion and Perspectives. The results, achieved during the formative experiment, proved, that at the starting period of the young squash players' physical training, the author's program positively influenced the increase in the level of special physical skills development, it improved the level of technique training skills of the young squash players.

The analysis of the results of the experimental testing does not solve all the questions of the researched issue. The influence of squash trainings on different indices of physical condition of squash players, the analysis of indices of training and competitive activities in the context of revealing leading and indifferent physical qualities need further research. It constitutes the perspective of further researches.

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THE ROLE OF PSYCHOLOGICAL QUALITIES IN THE PROCESS OF THE FORMATION OF SPORTS SKILL OF YOUNG BASKETBALL PLAYERS

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Abstract

Purpose: to determine the level of the development of indices of the influence of the important psychological qualities and the personality characteristics that defines the effectiveness of the competitive activity of young basketball players in the process of sports skill. ***Material:*** the study involved basketball players of the first category and beginners athletes of the 2nd and 3rd categories. ***Research methods:*** analysis of scientific and methodological literature, interview of leading trainers, pedagogical observations, pedagogical experiment, pedagogical testing, psychological testing, methods of mathematical statistics. ***Results:*** Significant psychological qualities and personality characteristics are established which contribute to increasing the level of competitive activity. ***Conclusions:*** the conducted research contributed to increasing the importance in the optimal level of development and manifestation of psychological qualities and personality traits in enhancing athletic skill. As a result of the research important psychological qualities and personality traits are established that contribute to the increase in the level of competitive activity.

Key words: psychological preparation, basketball players, competitive activity.

Анатолій Ровний, Владлена Пасько. Роль психологічних якостей у процесі становлення спортивної майстерності юних баскетболістів Мета – визначення показників рівня розвитку впливу важливих психологічних якостей та властивостей особистості, які визначають ефективність змагальної діяльності юних баскетболістів у процесі становлення спортивної майстерності. ***Матеріал.*** У дослідженні брали участь баскетболісти першого розряду й початкуючі спортсмени 2- та 3-го розрядів. ***Методи дослідження*** – аналіз науково-методичної літератури, опитування провідних тренерів, педагогічні спостереження, педагогічний експеримент, педагогічне тестування, психологічне тестування, методи математичної статистики. ***Результати.*** Установлено значимі психологічні якості та властивості особистості, які сприяють підвищенню показників рівня змагальної діяльності. ***Висновки.*** Проведене дослідження сприяло підвищенню значимості оптимального рівня розвитку й прояву психологічних якостей та властивостей особистості в підвищенні спортивної майстерності. У результаті досліджень установлено важливі психологічні якості й властивості особистості, які сприяють підвищенню рівня змагальної діяльності.

Ключові слова: психологічна підготовка, баскетболісти, змагальна діяльність.

Анатолий Ровный, Владлена Пасько. Роль психологических качеств в процессе становления спортивного мастерства юных баскетболистов. ***Цель*** – определение показателей уровня развития влияния важных психологических качеств и свойств личности, определяющих эффективность соревновательной деятельности юных баскетболистов в процессе становлення спортивного мастерства**.** ***Материал.*** В исследовании приняли участие баскетболисты первого разряда и начинающие спортсмены 2- и 3-го разрядов. ***Методы исследования*** – анализ научно-методической литературы, опрос ведущих тренеров, педагогические наблюдения, педагогический эксперимент, педагогическое тестирование, психологическое тестирование, методы математической статистики. ***Результаты.*** Установлены значимые психологические качества и свойства личности, способствующие повышению показателей уровня соревновательной деятельности. ***Выводы.*** Проведенное исследование способствовало повышению значимости оптимального уровня развития и проявления психологических качеств и свойств личности в повышении спортивного мастерства. В результате исследований установлены важные психологические качества и свойства личности, способствующие повышению уровня соревновательной деятельности.

Ключевые слова: психологическая подготовка, баскетболисты, соревновательная деятельность.

At each stage of improving physical, technical, tactical and especially psychological preparedness, the patterns of the preceding and subsequent stages of the training process should be taken into account [7; 9; 11; 15].

Considering the general psychological preparation as a pedagogical process, the leading psychologists of sports indicate that due to the purposeful formation of the psychic properties of the personality the process of development of special motor skills is accelerated and the system of competitive readiness is improved [1; 2].

At the same time, the ground for structuring the psychological preparation of young athletes is based on the use of psychological regularities in improving sports skill that will ensure the optimization of the training of athletes and determine the means and methods.

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The purpose of the study is to determine the level of development the importance of psychological qualities and personality traits that determine the effectiveness of the competitive activity of young basketball players in the process of improving sports athletes' skill.

Research objectives:

1. To identify the psychological qualities and personality traits of young athletes, which contribute to the development of sports skills in basketball.

2. To establish the correlation between the revealed psychological qualities and personality traits of athletes with the indicators of the effectiveness of the competitive activity of young basketball players.

Materials and Methods of Research. To solve the tasks set such research methods were used: analysis of scientific and methodological literature, interview of leading trainers, pedagogical observations, pedagogical experiment, pedagogical testing, psychological testing, and methods of mathematical statistics. The study was conducted in the preparatory period for the basketball players of the first category and beginners athletes of the 2nd and 3rd categories.

Results of the Study and tr̀heir Discussion. To establish the psychological qualities and personality properties that influence the development of the sporting skills of young basketball players, the survey of leading trainers was conducted, as well as the analysis of scientific literature on the psychology of sports and sports games [3; 5; 12; 16; 17]. This made it possible to establish the parameters of psychological qualities that provide mobilization and psycho-functional stability in the experimental conditions of competitive activity. It is especially important to establish psychological qualities and personality traits which are the most stable and therefore most significant for the formation of the stability of competitive activities.

In the present study, typological features of the nervous system, features of gnostic processes of sport thinking, perception, short-term memory, attention, self-control, volitional qualities, rapid evaluation of the emerged situations, and the degree of self-esteem are established.

In order to study the influence of the established psychological qualities and personality properties, a correlation analysis was made, which makes it possible to establish the level of correlation with the indicators of competitive activity.

Beginners basketball players have 10 psychological indicators that have reliable correlation with the indicators of competitive activity ($p<0,02$): resolution, time of operational and tactical thinking, generalization and expressiveness of willed qualities of perseverance, self-control, endurance, mobility of nervous processes, perception of temporary intervals (15 and 30 seconds). The presented indicators have one reliable connection with the indicators of pedagogical testing. Only the indicator of the accuracy of perception of the time interval of 15 seconds has two reliable links: the number of hits into the basket during the game ($r=0,65$) and the result of penalty throws ($r=0,56$).

The highest correlation in the beginners basketball players is established between the indices of hits of the ball into the basket during the game and volitional perseverance ($r=0,72$). The time indicator of operational thinking correlates with the accuracy of penalty throws ($r=0,68$). The same level of correlation has a time indicator of tactical thinking and an indicator of accuracy of throwing the ball into the basket during the game ($r=0,68$).

Thus, based on the materials of the research, it is established that the beginners basketball players have 10 established psychological qualities and personality traits that are the basis for the development of sports skills of the beginners basketball players [4; 6; 10; 14].

In the group of the basketball players of the second sports category, a reliable relationship of 22 psychological indicators with the results of pedagogical testing ($p<0,05$) was established: confidence in everyday life and resolution; time tactical thinking; time of visual-motor reaction; the accuracy of the response of the choice of two and three factors; braking efficiency; balance of nervous processes; accuracy of movement; concentration of attention; volume and errors of information processing; memory efficiency; self-confidence; self-guidance; self-perception; internal conflict; perception of time to 10 from 18 presented factors correlate with the test score «run 8x28». The indicator «protective moves» does not have a reliable connection with the psychological qualities and personality traits. Four indicators of psychological qualities are established, which have 2 reliable links with the indicators of such pedagogical tests: «penalty throws» and «running 8x28». This is an indicator of memorization ($r=0,69$ and $r=0,77$); stability of attention ($r=0,68$ and $r=0,61$); visual-motor reaction ($r=0,79$ and $r=0,58$); time tactical thinking ($r=0,59$ and $r= 0,71$).

The highest correlation was established between self-confidence and the result of the «run 8x28 « test ($r=0,78$). Of particular interest is the fact that all indicators of the properties of attention have reliable links with pedagogical tests: the effectiveness of attention with the indicator of the ball hitting the basket during the game ($r=0,68$); accuracy and error of attention with the indicator «8x28 run» ($r=0,65$) and ($r=0,67$). In addition out of all 12 indicators of specialized perception of time 10 deal with accuracy of throwing into the basket ($r=0,65$). This is an indicator of specialized perception of the time 10 sec. with a throwing accuracy into the basket ($r=-0,66$). The presented research materials testify that with increasing level of preparedness (2nd category) for the psychological factors play a more significant role in raising the level of special preparedness of athletes [7; 8; 13].

With the increase in sportsmanship (1st category), the indicators of psychological qualities and properties play a more significant role in achieving the result. A more significant level of correlation was established in the range from r=0,55 to r=0,87. It is typical that the indicator of expressiveness of strong-willed qualities, initiative and independence has significant differences with the indicators of «penalty throws» (r=0.67); «running 8x28» (r=-0.72); «defense movements» (r=0,78).

The highest correlation dependence is established between the type of perception and the test «defense movements» (r=0,84).

The results of the research showed that, except of operational thinking, all indicators have reliable links with indicators of athletic preparedness. So, for example, we consider confidence from 3 positions: the first – the confidence in extreme competitive conditions correlates with the accuracy of the ball throwing into the ring (r=0,72); the second – the confidence in everyday life correlates with the test «running 8x28» (r=0,69); the third – the resolution correlates with the «penalty throws» test (r=0,68). On the basis of the interrelation between the psychological qualities and traits of the athletes' personality, the foundations of the special sports activity of basketball players are formed.

Conclusions:

As a result of the research, significant psychological qualities and personality traits are established that contribute to the increase in the level of competitive activity.

Gradual increase in the number of psychological qualities and personality traits indicates:

– increase in the importance of psychological training of basketball players at the initial stage of the development of sportsmanship;

– increase in the importance of the optimal level of development and manifestation of the psychological qualities and properties of the individual in improving skills.

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THE MOST IMPORTANT MOTOR COORDINATION SKILLS IN THE GOALKEEPERS' TRAINING

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Abstract

The conducted studies were aimed at identifying the most important coordination motor skills (CMS) among junior footballers playing as the goalkeepers as well as defining the impact of physical activity on young players' CMS. In this study there were used seven tests, which were able to asses in comprehensive and objective way seven most important CMS of football players.

The studies were conducted with the participation of 26 goalkeepers form the Polish leagues of the first, second and third league, who played in junior teams in the 2015/2016 season. Statistica 10.1 PL program was used in statistical calculations as well as discriminative function analysis and one-way analysis of variance (ANOVA). The dominant CMS in young footballers playing as goalkeepers were: spatial orientation, coupled motion, adaptation and displacement of movement actions as well as, to a lesser extent, kinesthetic differentiation of movements. The highest level of CMS the goalkeepers achieved in the main part of training in the situation of the highest training load. It should be continued to monitor the level of CMS of goalkeepers, taking into account the type of exercise that focuses on developing particular motor skills.

Key words: coordination of motor skills, football, goalkeepers.

Анджей Сорока. Найважливіші навички рухової координації під час підготовки голкіперів. Проведені дослідження спрямовано на виявлення найважливіших координаційних рухових навичок (КРН) футболістів-юніорів, які є голкіперами, а також визначення впливу фізичної активності CMS футболістів-юніорів. Застосовано сім тестів, за допомогою яких об'єктивно оцінено сім найважливіших КРН футболістів-юніорів.

Дослідження проводили за участю 26 голкіперів збірних Польщі першої, другої та третьої ліг, які грали в командах-юніорів у сезоні 2015/2016 рр. Застосовано статистику 10.1 програми PL для статистичних розрахунків, а також для аналізу дискримінаційних функцій та одностороннього аналізу дисперсії (ANOVA). Домінуючими КРН футболістів-юніорів, виступаючих у ролі голкіперів, були просторова орієнтація, спарений рух, адаптація та зміщення дій під час руху, а також меншою мірою кінестетична диференціація рухів. Найвищий рівень КРН у голкіперів досягається в основній частині тренувань у ситуації з найвищим тренувальним навантаженням. Потрібно продовжувати стежити за рівнем КРН у голкіперів, ураховуючи ті види фізичних вправ, що зосереджені на розвитку певних рухових навичок.

Ключові слова: координація рухових навичок, футбол, воротарі.

Анджей Сорока. Важнейшие навыки двигательной координации при подготовке голкиперов. Проведенные исследования направлены на выявление важнейших координационных двигательных навыков (КДН) футболистов-юниоров, которые являются голкиперами, а также определение влияния физической активности КДН футболистов-юниоров. В этом исследовании применено семь тестов, с помощью которых объективно оценены семь важнейших КДН футболистов-юниоров.

Исследования проводили с участием 26 голкиперов сборных Польши первой, второй и третьей лиг, которые играли в командах-юниоров в сезоне 2015/2016 гг. Примененная статистика 10.1 программы PL для статистических расчетов, а также для анализа дискриминационных функций и одностороннего анализа дисперсии (ANOVA). Доминирующими КНД футболистов-юниоров, выступающих в роли голкиперов, были пространственная ориентация, спаренное движение, адаптация и смещение действий во время движения, а также, в меньшей степени, кинестетическая дифференциация движений. Самый высокий уровень КДН в голкиперов достигается в основной части тренировок в ситуации с высоким тренировочным нагрузкам. Нужно продолжать следить за уровнем КДН в голкиперов, учитывая виды физических упражнений, которые сосредоточены на развитии определенных двигательных навыков.

Ключевые слова: координация двигательных навыков, футбол, вратари.

Introduction. Identification of young football talents has always aroused and still arouses great interest of people associated with this sport discipline. The primary goal of monitoring the development of young football players is to predict future results and forecast development processes aimed at achieving success in adult competition (Reilly and others 2000).

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In order to distinguish talented players, in addition to observation and analysis of technical and tactical skills that are very essential in football, there are also studied anthropometric, physical and motor features, including CMS (Buchheit et al. 2012).

Long-term forecasting of future sport results of young players is a complicated task due to the need to use multivariate indicators (Carling et al. 2009). It is believed that at the stage of the forecast of development, special attention should be paid to the physical activity of future players at the age of 6–12. Players who perform different physical activities at a later stage of development need less time for specialized training, which directly affects the high sport level (Baker et al. 2003). A comprehensive training, rather than early specialization, has an influence on the development of motor skills that embrace perceptual and physical factors (Cote et al. 2009), including general motor coordination so important in football, spatial orientation, body balance and other control mechanisms of body posture (Bobbio and others 2009).

There are numerous studies verifying football skills, which provide evidence that the world's elite football players are characterized by excellent physical and motor skills (Reilly, 2003), technical ones (Bradley et al. 2013) as well as unique features of perception, which is directly related to making fast and accurate decisions (Roca et al. 2013; Sarmento et al. 2014; Furley and Memmert 2015). It has been shown that high physical and motor activity of players even to a higher degree increases their ability to predict and react to various situations during the game, including those difficult ones (Bishop et al. 2013; Wallace and Norton 2014).

It has become common to publish characteristics of professional players (Barros et al. 2007; Bloomfield et al. 2007; Bradley et al. 2009; Dellal et al. 2011; Di Salvo et al. 2007; Rampinini et al 2007; Wong et al. 2008), whereas studies assessing different characteristics of young players are significantly limited, showing deficiencies in systematic recording, what affects the proper tracking of player's development (Gil et al. 2007; Le Gall et al. 2010; Malina et al. 2004).

Therefore, it is becoming more and more important to conduct studies, which aim at analyzing various parameters related to the development of young players at different stages of their careers. These studies would help to identify and, consequently, help in model development.

The aim of this work was to identify seven most important CMS among junior footballers, playing on the position of goalkeeper. The purpose of these studies was also to determine the impact of physical effort, applied to young players in the form of specialized aerobic training of high intensity, on their CMS.

Material and Methods. In this work there was used a battery of tests developed by Ljach and Witkowski (2004), which provide a comprehensive and objective assessment of seven most important CMS of football players. Out of 23 most reliable tests and indicators for assessing the leading CMS in football, for the purpose of this study there were used one test for each of seven coordination skills: 1. Test that assesses the ability to sense the rhythm of movement which consists in rolling the ball on time with a leading foot. 2. Test assessing the ability to maintain the balance, which consists of standing on one foot with keeping the ball on the other leg. 3. Test assessing the ability to kinetic differentiation of movements, consisting in hitting the ball to the goal. 4. Test assesses the ability to adjust and switch movement activities, involving running with circling the poles while running the ball. 5. Test assessing the ability to combine (coupling) the movements, which is a slalom between the poles with running two balls at the same time. 6. Test assessing the ability of fast reaction that consists on stopping the rolling ball with the foot. 7. Test to assess the ability of spatial orientation, which consists in running to numbered balls.

There were examined 26 footballers, playing on the position of goalkeepers in the first, second and third league. The studies were conducted in the 2015/2016 season. The average age of examined players was 17,21 ± 3,21 years old, the body height was 183,22 ± 4,20, the body weight 72,54 ± 3,34, and professional internship with specialization in goalkeeper position 5.28 ± 2.76.

There were conducted three test samples. Before the first test sample, goalkeepers were subjected to a short warm-up, which consisted of a short low-intensity run, gymnastic exercises and stretching exercises. The warm-up aimed at preparing players to test samples as well as preventing injuries.The goalkeepers made their first test after the warm-up and short (up to 5 minutes) rest time. The second test was conducted after 60 minutes of intensive training, which consisted of defending shots to the goal with a fall and without it in series of 10 shots with intervals between series that did not allow for full rest. The third sample test took place after another 20 minutes of oxygen training and 10 minutes of regenerative training with elements of stretching exercises.

Statistica 10.1 PL was used for statistical analysis and discriminant function analysis. There was applied a classification function in the form of calculation of coefficients that were defined for each formed group.

Prior to conduct analysis, there was examined multivariate normality by checking each variable for normal distribution. It was assumed that the matrixes of variables' variances were homogeneous in groups. Prior to the use of one-way analysis of variance (ANOVA), the normality of distribution of variables and homogeneity of variances were checked.There was used a test from the Post – hoc group of Tukey's HSD (Honestly Significant Difference) tests. It was appliedin order to check between which averages appeared significant differences. Statistically significant were differences of averages, of which probability of randomness was less than 0,05.

Study Results. In the created model there were found four of seven proposed to the analysis tests determining particular coordination skills: spatial orientation, movement coupling, adaptation and displacement of movement activities and kinesthetic differentiation of movements. Beyond the model there were tests that assessed coordination skills such as sense of rhythm of movement, dynamic and static balance as well as speed of reaction by trying to stop the rolling ball with the foot.

The created model showed high discriminatory value, what proves the validity and legitimacy of using these tests that assess coordination skills for goalkeepers. Wilks's Lambda value for this model amounted to 0,201, whereas in the case of particular coordination skills tested, it did not exceed 0,300.

The created model of discriminative function indicated that the most important coordination skill among examined goalkeepers was spatial orientation. The test consisted of running to numbered balls, where what counted was the time of running the test with maintaining the rules set. The value of classification function was significantly the highest at p = 0,005 in the case of a third test sample completed after the entire goalkeepers' training, compared to the previous test samples, which amounted to respectively 191,35 for the first test and 187,19 for the second test. The results of table 2 indicate that the shortest time (10,46 sec) of covered distance, at p<0,001, was achieved in the case of the second test sample performed after the main part of the specialized training of goalkeepers, while in the first test sample it was 10,91 sec. and 10,94 sec. in the third test sample.

Also the high values of classification function were demonstrated in the case ofcoordinationskillsuch as combining movements. The test consisted of a slalom between the poles with running two balls at the same time. There was assessed the time, specified in the test, that was necessary to cover the distance with subject to its correctness. Similarly to the previous examined coordination skill, also while determining the importance of combining movements, the highest significant value,at p=0,022, was obtained in the case of the third test sample (127,85), as compared to the first test sample (134,09) and the third one (136,35). This was also reflected in the average time needed to cover particular test samples, where significantly the shortest time was achieved by players in the second sample (5,16 sec) at p=0,008, while in the first sample it was 5,49 sec and in the third 5,76 sec.

The third most important in terms of classification function were coordination skills related to the assessment of the ability to adapt and displace movement actions, involving circling the poles while running the ball with the foot. In the case of this test, there were no significant differences in the size of classification function between individual samples, although the mean lengths of time were significantly higher in the case of the second sample (9,62 sec) and the first one (9,67 sec) at p=0,015 , in relation to the third sample (10,28 sec).

In the model there were also found coordination skills such as kinesthetic differentiation of movements (ball feeling) that were assessed by hitting the ball to the goal, and the result was the sum of points obtained from 10 ball hits with the leading foot. The players obtained significantly higher values of classification function at p=0,014 in the second test sample (3,98) and the first one (3,59), comparing to the third test 1,71. There were also significant differences in the average point value, at p<0.001, which the players performed in the first (4,46) and the second (4,39) test sample, comparing to the third one (2,18).

Summary. The conducted studies allowed to identify the most important CMS among junior footballers who play on the position of the goalkeeper. It was shown that out of seven leading CMS, spatial orientation appeared to be the most important. It seems that this test is most closely related to behaviors of goalkeepers on the field, during the match and training. In this test, the shortest execution time has occurred in the second test sample, which may indicate that displaying these coordination skills to the highest extent appear immediately after physical effort of high intensity that is in the culmination phase of training. The importance of this CMS is related to the behavior of the player on the pitch as during the game there are required, especially in the case of goalkeepers, outstanding abilities of spatial orientation. These are related to tracking the ball during the game, while moving and changing position of players of the own and opposite teams as well as to the speed of perception of dynamically changing situations on the pitch and the position of player's body in moments of goalkeeper's interventions.

Table 1

Tests for the Leading Coordination Skills of Football Players

Tests Assessing the Leading Coordination Skills	Wilks' Lambda Discriminant Function Model: 0,201; F=5,718; p<0,001			Classification Function Order of Conducted Tests		
	Wilks' Lambda	F Value	P Value	I Sample p=0,333	II Sample p=0,333	III Sample p=0,333
Kinesthetic differentiation of movements (feeling the ball)	0,273	4,952	0,014*	3,59	3,98	1,71
Spatial orientation	0,295	6,516	0,005*	191,35	187,19	197,45
Combining (coupling) movements	0,265	4,343	0,022*	134,09	127,85	136,35
Adaptation and displacement of movement activities	0,225	1,639	1,639	22,30	22,30	24,57
Constant				1332,6	1285,6	1422,9

**– level of significant difference at p <0.050*

Table 2

Average Values of Selected Tests Performed in three Consecutive Tests

Tests Assessing the Leading Coordination Skills	F	p	Order of Conducted Tests		
			I ($\bar{x}$)	II ($\bar{x}$)	III ($\bar{x}$)
Kinesthetic Differentiation of Movements (Feeling the Ball)	16,727	0,001*	4,46	4,39	2,18
Spatial Orientation	10,221	0,001*	10,91	10,46	10,94
Combining (Coupling) Movements	5,533	0,008*	5,49	5,16	5,76
Adaptation and Displacement of Movement activities displacement of movement activities ch	4,712	0,015*	9,67	9,62	10,28

**– level of significant difference at p <0,050.*

The assessment ofcombining movements examined using a test consisted of a slalom between the poles with running two balls at the same time is one of the most difficult from the proposed battery of 23 tests. It requires lots of physical and emotional involvement as well as outstandingskills of perception and orientationin space. Coupling of movements appear mostly in the case of goalkeepers due to their ability touse the upper and lower limbs and in the game there are often used other parts of the body.

Additionally, as in the spatial orientation test, also while examining the combining of movements the second sample achieved the shortest time in the test, what can be interpreted as a disclosure of skills at the moment of the highest load of the player during the game.The third sample that is at the end of the training,conducted these two tests at the longest time, which is equivalent to the lowest exposure of examined CMS.

A test that assesses the adaptation and displacement of movement actions, that has proved to be important in conducted studies, also belongs to quite complex in the sense of execution. It is another proof that in the case of goalkeepers very important are the abilities related to movement, with complicated and physically demanding interventions, involving many parts of the body as well as senses related to vision, sense of space and precision of movement. Also in the case of this test, the lowest values occurred just after the training, when players were tired due to conducted training classes. This may indicate that the goalkeeper achieves the highest level of coordination skill in the culmination phase of training, that is at the moment of the highest physical activity. After such physical effort, longer rest does not have a positive influence on coordination behaviors, especially on those with complicated structure.

The results of the study on one hand pointed to the importance of particular CMS of young goalkeepers' training, but also forced to consider whether obtained results did not come from the specificity of goalkeeper's training, aimed at developing those abilities that were exposed in the studies. This is the reason why there is a need for further studies that will include the orientation and quality of goalkeepers' training. It would be reasonable to compare the results of conducted tests with the results of tests conducted on players from other positions on the pitch.

Conclusions

1. In the case of goalkeepers the dominant CMS were: spatial orientation, movement coupling, adaptation and displacement of movement activities and kinesthetic differentiation of movements.
2. The goalkeepers achieved the highest level of CMS in the main part of training in the situation of the highest training load. After the end of training, the level of coordination skills decreased significantly and there were even lower than those achieved by players immediately after the warm up prior to training.
3. There should be systematic monitoring of the level of goalkeepers' CMS, also including the type of performed exercises that aim at developing individual CMS.

Application Conclusions

1. The exercises that enhance coordination skills of goalkeepers should be performed in the culmination stage of training, in the situation of the highest motor activity of the players.
2. In the training focused on CMS there should be paid particular attention to exercises that develop spatial orientation, movement coupling, adaptation and displacement of movement activities and kinesthetic differentiation of movements.

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INTELLECTUAL ABILITIES OF HIGH–END HANDBALL PLAYERS OF DIFFERENT PLAYING ROLES

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Abstract

The article presents the results of the study of the intellectual abilities of high-end handball players of various gaming roles. It was revealed that the playing players of the Dniproanka team (Kherson) had a high level of intellectual potential (113,3 points), goalkeepers – a level lower (80,3 points). The level of intellectual potential of players in other game roles did not differ significantly and was on average 107 points. By the same method, the goalkeepers of Lviv's Galichanka (98,5 points) scored less points, linear players showed a score of 110,5 points. The intellectual potential of the welterweight, angular and playing players was high and averaged 120,2 points. It is established that the angular players of handball team «Dniproanka» had the highest IQ (according to Eysenck's method) among players of other gaming roles, which was 108,4 points. In the team «Galichanka» the best ratio among the playing players (114 points), in contrast to them at the goalkeepers, he was 103,5 points. Players of other game roles on average scored 107,5 points. The higher level of intellectual abilities of playing players in both teams can be explained by the peculiarities of the playing role, which are the «conductors» of the game.

Key words: handball, team, game role, intellect, ability, potential, competition.

Євгеній Стрикаленко, Ігор Жосан, Олег Шалар. Інтелектуальні здібності гандболісток високого класу різного ігрового амплуа. У статті наведено результати дослідження інтелектуальних здібностей гандболісток високого класу різного ігрового амплуа. Виявлено, що розігруюч гравці команди «Дніпрянка» (Херсон) мали найвищий рівень інтелектуального потенціалу (113,3 бала), у воротарів виявився рівень нижчий (80,3 бала). Рівень інтелектуального потенціалу гравців інших ігрових амплуа суттєво не відрізнявся й перебував на середньому на рівні (107 балів). За цією ж методикою найменше балів набрали воротарі львівської «Галичанки» (98,5 бала), лінійні гравці показали результат у 110,5 бала. Інтелектуальний потенціал півсередніх, кутових і розігруючих гравців перебував на найвищому рівні й у середньому складав 120,2 бала. Установлено, що кутові гравці гандбольної команди «Дніпрянка» мали найвищий коефіцієнт інтелекту (за методикою Айзенка) серед гравців інших ігрових амплуа (108,4 бали). У команді «Галичанка» найкращий коефіцієнт у розігруючих гравців (114 балів). На відміну від них, у воротарів він складав 103,5 бала. Гравці інших ігрових амплуа в середньому набрали 107,5 бала. Більш високий рівень інтелектуальних здібностей розігруючих гравців в обох командах можна пояснити особливостями ігрового амплуа, які є «диригентами» гри.

Ключові слова: гандбол, команда, ігрове амплуа, інтелект, здібності, потенціал, змагання.

Евгений Стрикаленко Игорь Жосан Олег Шалару. Интеллектуальные способности гандболисток высокого класса различного игрового амплуа. В статье приведены результаты исследования интеллектуальных способностей гандболисток высокого класса различного игрового амплуа. Выявлено, что разыгрывающие игроки команды «Днепрянка» (Херсон) имели высокий уровень интеллектуального потенциала (113,3 балла), у вратарей он оказался на уровень ниже и составлял 80,3 балла. Уровень интеллектуального потенциала игроков других игровых амплуа существенно не отличался и находился в среднем на уровне (107 баллов). По этой же методике меньше баллов набрали вратари львовской «Галичанки» (98,5 баллов), линейные игроки показали результат в 110,5 баллов. Интеллектуальный потенциал полусредних, угловых и разыгрывающих игроков находился на высоком уровне и в среднем составлял 120,2 балла. Установлено, что угловые игроки гандбольной команды «Днепрянка» имели самый высокий коэффициент интеллекта (по методике Айзенка) среди игроков других игровых амплуа, который составлял 108,4 балла. В команде «Галичанка» лучший коэффициент в разыгрывающих игроков (114 баллов), в отличие от них у вратарей он составлял 103,5 балла. Игроки других игровых амплуа в среднем набрали 107.5 балла. Более высокий уровень интеллектуальных способностей разыгрывающих игроков в обеих командах можно объяснить особенностями игрового амплуа, которые являются «дирижерами» игры.

Ключевые слова: гандбол, команда, игровое амплуа, интеллект, способности, потенциал, соревнования.

Introduction. Only athletes that have complex of specific abilities and psychophysical indicators achieve the highest level of mastery in modern sport. It is necessary to have certain skills to orient on the playground and to find an appropriate solution according to the situation in sport games. There are special

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methodologies to define and mark the psychophysical indicators of athletes, but they do not give full and reliable information about thinking process development of athletes during the game.

Intellectual abilities are the part of mastery of sportsman in sport according to the theory. Methodology of sport and intellectual abilities are included to the tactical preparation. According to the theory of phychologist D. Harre, tactical act as a product of difficult psychomotor processes is successful and compatible. He accents on three stages of realization of the psychomotor processes. He states that perception and analysis of the situation are on the first place and are followed by mental process of solution of the special tactical problem. The main point of this problem is memory. He points that tactical problem is solved first mentally and then physically.

Interrelation of athletes intellect and competitive activity in the sport games is the leading component of science directions. They are related with questions of improving ofefficiency of playing competitive activity and preparation of future teachers of physical culture, coaches, judges, instructors and managers.

Purpose of Research: to learn the level of intellectual abilities of high–levelhandball players.

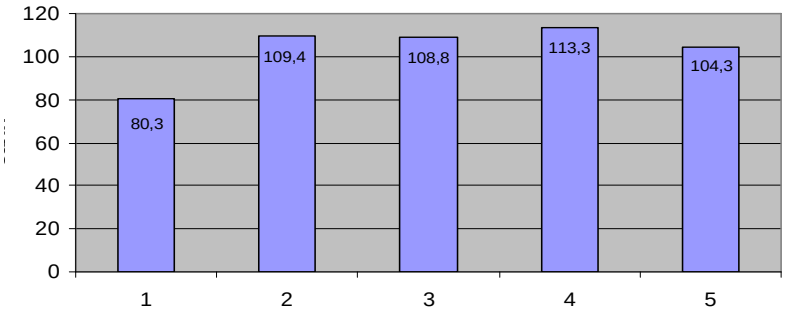
Material and Research Methods. This research is related to the definition of intellectual abilities of high–level handball players, typology characteristics, structure and features of playing activity. Thesubjects of research were such women's handball teams as the winners of the championship of Ukraine «Dniper» city Kherson and «Galician» city Lviv .The research was held in 2015–2017. Twenty four handball players took part in this research (12 in every team).

During carrying out the control of the level of players intellectual abilities Handball Super League teams «Dniper» and «Galician» were used methodologies for getting specific result with the purpose of definition of intellectual abilities.

Testing methods included the following tests: P. Rzhichan's test on detection of intellectual potential, Aisenck's test – IQ test and Raven's test – progressive matrices.

Method of assessment of the efficiency of competitive activities, which we used during the experiment, was developed by coaches of handball team «Dniprianka». (Method is approved and tested by council), was actively used during competitive process.

Research Results. On the base of processed data, according to Rzhichan's method, it was found that players of «Dniprianka» team have the highest level of intellectual potential (the result is 113,3), while the goalkeepers have low level, it is 80,3. Level of intellectual potential of players of other playing positions do not significantly differ and it was on the level 107 on average.



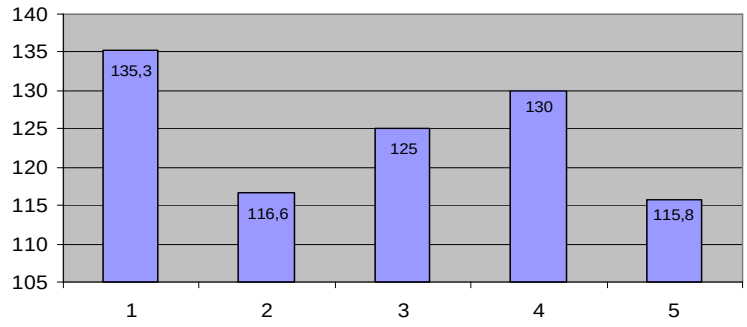
1 – Goalkeeper; 2 – left and right back players; 3 – left and right wingers; 4 – centre backs; 5 – circle runners

Pic. 1. *Indexes of Intellectual Potential of Handball Players of Different Playing Positions in «Dniprianka» Team. (According to Rzhichan)*

According to the test result, all field players have significantly better level of intellectual abilities. In our opinion, it is explained by Rzhichan's method, which provides setting the sequence (one right variant of attack development), field players have themanifestation of intellectual abilities during competition.

Conducted research allows us to suppose that there is the connection between the level of intellectual abilities and features of implementation of different playing functions, which is caused by features of competitive activity.

The next step in our research is to determine coefficient of intellectual abilities according to Aisenck's method. Results of conducted testing and comparison between players of different positions are showed on the picture 2.



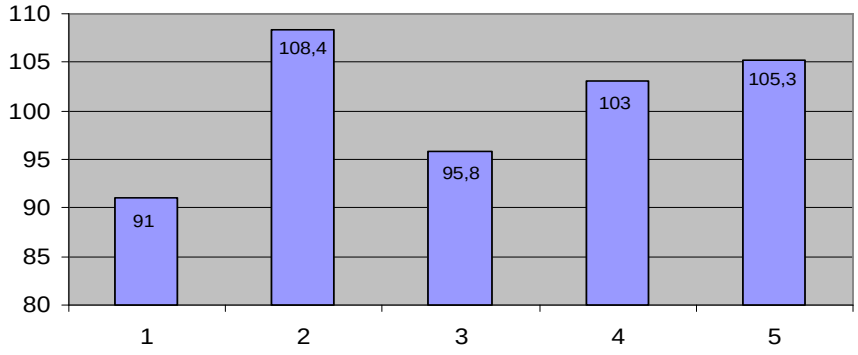
1 – Goalkeeper; 2 – left and right back players; 3 – left and right wingers; 4 – center backs; 5 – circle runners

Pic. 2. *Indexes of the Intelligence of the Dniprianka Team (According to Aisenck's Method)*

Aisenck**'**s test is a collecting test, which is made for total estimation of intellectual abilities with using verbal, digital and graphic material in different ways of task formulation. For example, if handball player copes with verbal tasks well, but solves arithmetic tasks bad, he neither get any advantages, nor find himself in disadvantageous situation, because of two types of tasks that are introduced in the tests approximately equally.

During processing the results of the testing thecoefficient of intellectual abilities according to Aisenck**'**s method it was found that the highest level of intellectual abilities have goalkeepers (the result is 135,3), center players (130) and left and right wingers (125). The level of intellectual abilities of circle runners andleft and right back players is approximately 116.

The next step of research was detection of intellectual abilities, according to Raven**'**s method, in which it was necessary to choose right images and put it into the main matrix. The results of the research are showed on the third picture, which are introduced in the points.

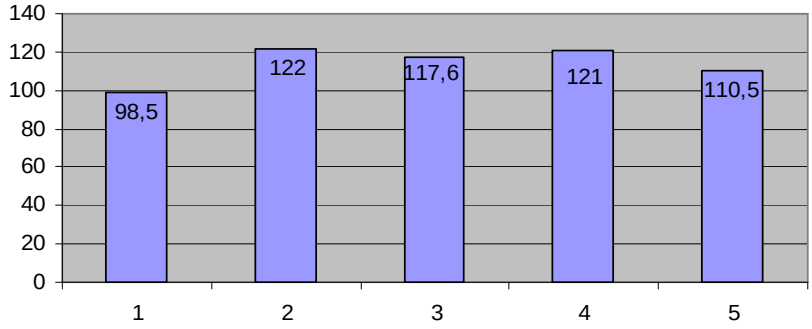


Pic. 3. *Indicators of Intellectual Abilities of the Handball Team «Dniprianka» (According to Raven's Method)*

According to the Raven's method, it was found out, that the corner playersof the handball team «Dniprianka», have the highest score among the players in other game roles, which is 108,4 points. Although the level of intellectual potential of circle runnerandcentre back do not differ significantly from the highest point of theleft and right back playersand on average was 104 points. Left and right wingers scored in comparison less points (95,8 points), and the goalkeepers had the lowers result with 91 points. According to the scale of mental abilities, we can make a conclusion, that goalkeepers and left and right wingers were of an average intelligence, while left and right back players**,** centre backs and circle runners were above average.

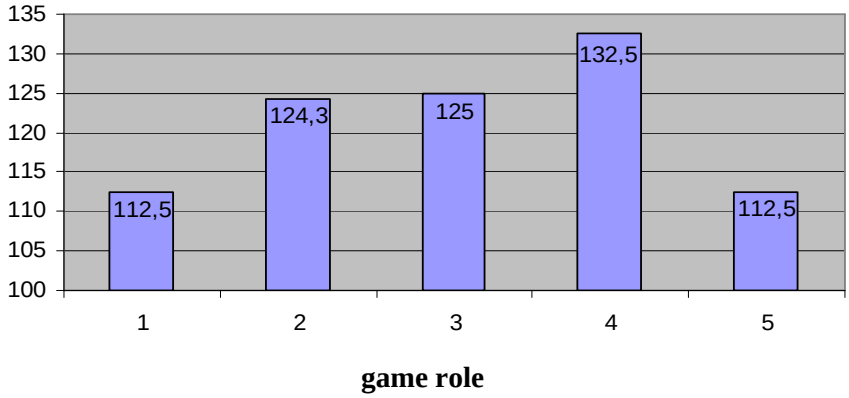
The second stage of our testing was concentrated on Lviv team «Galychanka» and three above mentioned methods were used.

The results of the assessment of the level of intellectual potential according to Rzhichan's method is showed on Picture 4. We found that circle runners showed a result of 110,5 points and goalkeepers scored the least goals (98.5 points). The highest level of intellectual potential of left and right wingers, left and right backs and centre backs was on average 120,2 points.



Pic. 4. *Indexes of Intellectual Potential of Handball Players of Different Game Roles of the Team «Galychanka» (According to Rzhichan)*

The next step in our study was to determine the coefficient of intellectual abilities according to the G. Eysenck's method. The results of testing and comparison between players with different game roles are shown on Picture 5.



Pic. 5. *Indexes of the Intelligence Coefficient of the team «Galychanka» (According to Eysenck's Method)*

During processing the results of the coefficient of intelligence according to the Eysenck's method, it was found that the highest score was received by the centre backs (132,5 points), left and right backs players and left and right wingers scored on average 124.7 points. The goalkeepers and circle runners scored the lowest amount of points (112,5).

The next step in the study was to identify intellectual abilities according to the Raven's method, in which it was necessary to choose the correct image and put it in the main matrix. The results of the study are shown on Picture 6, which are presented in points.

Pic. 6. *Indexes of Intellectual Abilities of the Handball Team «Galychanka» (According to Raven's Method)*

During processing the results of identifying the intellectual abilities according to the Raven's method, we found that the most points were scored by the centre backs (114 points), in comparison to the goalkeepers, who scored the lowest points (103,5). Players of other game roles scored on average 107,5 points.

Conclusion. In our research we used three methods: Rzhichan's test for the determination of intellectual potential, the Eysenck's test – the coefficient of intelligence and the Raven's test – the progressive matrices. They helped us to identify the intellectual abilities of high-level handball players of different game roles (goalkeepers, left and right backs, left and right wingers, circle runnersandcentre backs).

According to the results of the first methodology it was found, that centre backs of the team «Dnipryanka» have the highest level of intellectual potential (the result is 113,3 points), while the goalkeepers had a low level of 80,3 points. The level of intellectual potential of players of other game roles did not differ significantly and on average was 107 points. According to the same method, goalkeepers of the Lviv team «Galychanka» scored the least points (98,5 points), circle runners showed a result of 110,5 points. The intellectual potential of left and right wingers**,** left andright backs and centre backs was on the highest level with an average of 120,2 points.

According to the second method, it was revealed that the highest level of intellectual abilities had the goalkeepers of the team «Dnipryanka» (the result was 135,3 points), centre backs (130 points) and left and right wingers (125 points). The level of intellectual potential of left and right back playersand circle runners was approximately 116 points. In the team «Galychanka» the center backs received the highest score (132,5 points), theleft and right backs players and the left and right wingers scored 124,7 points. The lowest amount of points was scored by the goalkeepers and thecircle runners, which is 112,5 points.

According to the indicators of the third method, it was found that the corner players of the handball team «Dnipryanka» have the highest index of intellectual potential among the players of other game roles, which was 108,4 points. Although the level of intellectual potential of circle runners and centre backs did not differ significantly from the highest point of the left and right backs players and on average was 104 points. Left and right wingers scored less points (95,8), and the lowest result had the goalkeepers (91 points). The highest amount of points in the team «Galychanka» was scored by the centre backs (114 points), in comparison to the lowest score of the goalkeepers (103,5 points). Players in other game roles on average scored 107,5 points.

Probably, the higher level of intellectual abilities of players in both teams can be explained by the features of the game's role, which are «directors» of the game.

The prospect of further research is the comparison of intellectual abilities with the effectiveness of competitive activities of handball players of various game roles.

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USING INFORMATIONAL TECHNOLOGIES IN THE TRAINING PROCESS OF QUALIFIED ATHLETES

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Abstract

From year to year, the level of athlete's outcomes in different kinds of sports increases to an extremely high level. Taking into account this fact and the rapid development of information technologies in the world, there is an urgent problem of the review of modern computer programs and monitoring systems that can be used in sports, in particular in athletics. The purpose of our work was to analyze modern computer programs and monitoring systems that can be used in the training process of qualified athletes. The task of the work was to determine the peculiarities of the application of information and computer technologies in track and field athletics. The analysis of modern computer programs and monitoring systems in the field of physical culture and sports was carried out, their brief characteristics (Polar – «ProTrainer 5», Dartfish – «Dartfish Connect 5,5», Qualistys video computing complex, Fusion Smartspeed software package, Opto electronic system Opto-Gate (Jump), IMOOV three-dimensional evaluation system, SportKat 650TS simulator of stability and equilibrium, Quintic Biomechanics, Simi – Simi Matchix, Activio Sport monitoring system, Monokra 840E Monoker 840E, Myotest system). As a result of the task accomplished, modern computer technologies have been identified that provide real-time data on the functional state and the level of physical development of athletes, as well as the prevention of injuries and the preservation of health. The presented analysis of computer programs is used to obtain indicators of the level of development of physical qualities and the main characteristics of the technique of performing exercises through the use of a 3D optical-optical image. It has been established that modern research of sports equipment indicators is carried out using video-computer programs that analyze the athlete's movements. Individual computer programs use their capabilities to rehabilitate athletes.

Key words: educational and training process, functionality, computer technology, athletics.

Ярослав Свищ, Ольга Павлось, Руслан Павлось, Алла Хохла, Тетяна Дух. Використання інформаційних технологій у навчально-тренувальному процесі кваліфікованих легкоатлетів. Із року в рік рівень результатів спортсменів у різних видах спорту зростає. Зважаючи на цей факт та стрімкий розвиток інформаційних технологій у сучасному світі, постає актуальна проблема огляду сучасних комп'ютерних програм і системи моніторингу, які можуть бути використані в спорті, зокрема в легкій атлетиці. ***Мета нашої роботи*** – проаналізувати сучасні комп'ютерні програми та системи моніторингу, які можливо використовувати в навчально-тренувальному процесі кваліфікованих легкоатлетів. ***Завдання роботи*** – визначити особливості застосування інформаційних та комп'ютерних технологій у легкій атлетиці. У роботі проведено аналіз сучасних комп'ютерних програм і систем моніторингу в галузі фізичної культури й спорту, наведено їхні короткі характеристики (Polar «ProTrainer 5», Dartfish-«Dartfish Connect 5,5», відеокомп'ютерний комплекс «Qualisys», програмний пакет «Fusion Smartspeed», оптико-електронну систему Opto-Gate (Jump), систему тривимірної оцінки IMOOV, тренажер стійкості та рівноваги SportKat 650TS, Quintic – «Quintic Biomechanics», Simi – «Simi Matchix», систему моніторингу Activio Sport, Велоергометри ножні Monark 894E, Monark 828E, система Myotest). У результаті виконання поставленого завдання визначено сучасні комп'ютерні технології, які надають дані в режимі реального часу про функціональний стан і рівень фізичного розвитку спортсменів, а також забезпечують профілактику травматизму та збереження здоров'я. Представлений аналіз комп'ютерних програм, які використовуються для отримання показників рівня розвитку фізичних якостей і основних характеристик техніки виконання вправ із допомогою використання тривимірного світло-оптичного зображення. Установлено, що сучасні дослідження показників спортивної техніки виконуються за допомогою відеокомп'ютерних програм, що аналізують рух спортсмена. Окремі комп'ютерні програми за своїми можливостями використовують у реабілітації спортсменів.

Ключові слова: навчально-тренувальний процес, функціональні можливості, комп'ютерні технології, легка атлетика.

Ярослав Свищ, Ольга Павлось, Руслан Павлось, Алла Хохла, Татьяна Дух. Использование информационных технологий в учебно-тренировочном процессе квалифицированных легкоатлетов. Из года в год уровень результатов спортсменов в различных видах спорта растет. Учитывая этот факт и стремительное развитие

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информационных технологий в мире, возникает актуальная проблема обзора современных компьютерных программ и систем мониторинга, которые могут быть использованы в спорте, в частности в легкой атлетике. ***Целью нашей работы*** был анализ современных компьютерных программ и систем мониторинга, которые возможно использовать в учебно-тренировочном процессе квалифицированных легкоатлетов. ***Задачей работы*** было определить особенности применения информационных и компьютерных технологий в легкой атлетике. В работе проведен анализ современных компьютерных программ и систем мониторинга в области физической культуры и спорта, приведены их краткие характеристики (Polar – «ProTrainer 5», Dartfish – «Dartfish Connect 5,5», видеокомпьютерный комплекс «Qualisys», программный пакет «Fusion Smartspeed», оптико-электронную систему Opto-Gate (Jump), систему трехмерной оценки IMOOV, тренажер устойчивости и равновесия SportKat 650TS, Quintic – «Quintic Biomechanics», Simi – «Simi Matchix», систему мониторинга Activio Sport, Велоэргометры ножные Monark 894E, Monark 828E, систему Myotest). У результате выполнения поставленной задачи определены современные компьютерные технологии, которые предоставляют данные в режиме реального времени о функциональном состоянии и уровень физического развития спортсменов, а также обеспечивают профилактику травматизма и сохранения здоровья. Представленный анализ компьютерных программ, используется для получения показателей уровня развития физических качеств и основных характеристик техники выполнения упражнений за счет использования трехмерного светло-оптического изображения. Установлено, что современные исследования показателей спортивной техники выполняются с помощью видеокомпьютерных программ, которые анализируют движения спортсмена. Отдельные компьютерные программы по своим возможностям используют в реабилитации спортсменов.

Ключевые слова: учебно-тренировочный процесс, функциональные возможности, компьютерные технологии, легкая атлетика.

The Definition of Scientific Issue and Analysis of Researches. The level of results in a modern sport is high, specifically in the field of athletics. In speed and power types of track and field events the volumes and intensity of competitive and training load that is performed by athletes reaches its maximum permissible limit. The initial level of rationally organized training process depends on the level of theoretical and practical knowledge of specialists that implement the process of realization and optimization of functional body potential and improvement of physical and technical training of athletes.

Fundamental scientific investigations in speed and power types of track and field focus on solving problems related with a permanent improvement in traditional methods of athletes trainings in conjunction with using additional unconventional methods and means, that are directed on expansion of functional organism`s reserves and betterment of physical and technical preparation.

Technical preparation of athletes in many ways is determined by the ultimate goal that is reached by corresponding movements. Technique of performing in speed and power types of track and field is related with creation of prerequisites for development of maximum index of power and effective using of body reserves, external forces and inertia.

While studying techniques for mastering complex movements in recent years widely used visual methods that allow an athlete operatively to receive information about kinematical and dynamical movement characteristics and on this basis to correct technique of performing actions and optimize the whole process in general. For instance, there are laboratories equipped with special diagnostic complexes that allow in maximally close to competitional conditions to register different biomechanical indexes in order to characterize the effectiveness of technique of an athlete.

The Goal and Tasks of the Article. To analyze modern computer programs and systems of monitoring with a possibility of using in training process of professional athletes.

Presentation of the Main Material and the Substantiation of the Results. These days video analysis of training with a system of movement registration and further computer processing, numeral and graphical demonstration of important elements of technique (parameters of initial reaction, demonstration of efforts, time of overcoming separate areas and a distance in general) are getting more popular in sport. Along with a detailed analysis of technique of performing the exercise there are programs with a possibility to register indexes of functional systems and indexes of work of the organism (cardiovascular system, respiratory system, etc).

In sport, specifically in track and field events, there are used programs focused on solving general tasks or programs with narrow specialization that take into account all the features of training and competitive activity. Basic functionality is represented by products such companies as Polar – «ProTrainer 5», Dartfish – «Dartfish Connect 5,5». Specialized computational programs: video complex Qualisys, software package Fusion Smartspeed, optical electronic system Opto-Gate (Jump), system of three-dimensional evaluation IMOOV, the simulator of stability and balance SpotKat 650TS, Quintic – «Quintic Biomechanics», Simi – «Simi Matchix», the system of monitoring Activio Sport, veloergometers Monark 894E, Monark 828E, Myotest.

Dartfish is a software package for video analysis of tactical and technical actions of an athlete or a team that allow to improve a feedback between a coach and a team, optimize the process of training with a possibility of correction of an athlete's technique.

Software Package Dartfish give an opportunity:

– to divide an integral exercise into parts with its further detailed description, the whole statistical data about separate elements (for instance, in track and field events – relay race).

– to register and process of training results;

– to demonstrate information about training course in on-line mode;

– to print out information that is received through the training course;

– to juxtapose video pictures of a sportsman with some pictures of another one;

– to make a storyboard of sportsman`s movements;

– to compare 4 video recordings simultaneously;

– to highlight key moments of technique (picture-in-picture);

– to make a video analysis of tactical and technical actions of athletes;

– to have graphical tools for analysis of technique and tactics of an athlete, etc.

The advantage of the software Dartfish is the availability in use. This technology do not require large financial expenses (a modern video camera and a personal computer are needed), there is an opportunity to carry out all researches in the field (in the stadium, in the arena and in the field). For both a trainer and an athlete the program gives a lot of information about technical preparation immediately during the training process with an opportunity of further correction. During competitions it provides a trainer with indexes about the performance of actions. For instance, in jumping the program shows the quantity of steps during the running start, the length of step in different parts of the run-up, etc. In throwing – different time measurements of rotational movements and the time of the final effort. In running sports it gives an opportunity to analyze the length and the frequency of steps on the different sections and parts of competitional distances, in races with hurdles – to analyze the intervals of time between hurdles, the attack and finishing of the hurdle. It is important that this program is used also for forming and preparation of the national team in relay races.

Fusion Smartspeed is a wireless automatic system of the testing of athletes. The system allows automatically identify sportsmen and determine the time of performing exercises.

The software Fusion Smartspeed gives an opportunity:

– to determine the speed capabilities with time fixation for recuperation of athletes;

– to fix automatically the time of overcoming the segments;

– to fix automatically the time of overcoming the distance with the division into segments in any sequence (for example, shuttle run);

• to determine the reaction time for start (with different stimuli);

• to determine the maximum speed;

• to fix the time of overcoming the segments with the given time;

• to fix and to display results in real time;

• to fix the current time, the time of overcoming the segments and the difference in overcoming.

The Fusion Smartspeed software provides an opportunity to evaluate athletes' high-speed capabilities. It is advisable to use this software in the training process and during the competition. However, for working with Fusion, Smartspeed requires additional variety of special equipment.

System of three-dimensional assessment and correction of the asymmetry of the muscle system IMOOV.

This device (simulator) is a mobile platform with eccentric movement, which provides simulation of various kinds of sports, performing power exercises, development of the coordination of movements, intensive balance training and sensory-motor coordination.

It is actively used for injuries of joints, tendons and ligaments. One of the main features of this device is that the athlete can train a separate group of muscles with relatively small energy costs.

This system is effective in the preparation of throwers, jumpers and other difficult coordination sports, it provides an opportunity to improve individual groups of muscles. However, the system of three-dimensional assessment and correction of the asymmetry of the development of the muscular system may be used exclusively in the training process in the laboratory conditions.

The bicycle ergometers for legs Monark 894E, Monark 828E. These kinds of cycling simulators provide the following opportunities:

• a variety of training programs;

• synchronization with a personal computer;

• keeping a «diary» of classes;

• determining the functional state of the athlete (ECG determination, recovery time, heart rate, blood pressure, etc.).

All this gives the possibility of an individual selection of training loads in terms of volume and intensity, taking into account the peculiarities of the athlete's body, the level of his training and health. However, bicycle ergometers are used solely in the training process in laboratory conditions.

Test system for the strength and speed-power capabilities of athletes The Opto-Gate (Jump) is designed to analyze the motion and functional assessment of the athlete's condition.

The Opto-Gate system (Jump) gives an opportunity to:

• assess the general physical condition of the athlete;

• identify disadvantages, posture problems and data-based asymmetry;

• develop and apply rehabilitation programs;

• prevent injuries;

• develop individual recovery programs for an athlete;

• to make fast and affordable comparison of test data conducted at different times;

• to connect the pulse meter to display the ECG during work.

The Opto-Gate (Jump) system is equipped with optical sensors to detect appropriate time and space parameters for walking, running, jumping, throwing. The advantage of this system is in mobility (ease of installation - the installation on the perimeter of pits for jumping, the sector for pushing and throwing, and the treadmill). It is advisable to use this program, both in the training process and during the competitions.

The Myotest system is a mobile complex that allows coaches to determine and analyze the athletes' strength, as well as to determine the optimal load of the training process.

The system allows to determine the following indicators:

• power;

• strength;

• speed;

• jump height;

• contact time with the support;

• stiffness of the leg;

• the dynamics of changes in athlete's performance, depending on the number of repetitions;

• comparison of test results with one or more athletes;

• athlete's race analysis: step length, number of steps per minute, time of contact with the ground, angle of positioning, kickback angle, running asymmetry, etc.

The use of the Myotest system helps to provide the right advice on determining the optimal load for a specific athlete, as well as the ability to compare the results of tests of one or more athletes in the run analysis.

The system for functional analysis of human musculoskeletal system Diers Famus is the system for optical-optical 3D analysis of the spine and posture.

This system is aimed at measuring such indicators of athletes as instability of the body, pelvic displacement, pelvic angle, pelvic rotation, angle of kyphosis, angle of lordosis, angle of scoliosis, vertebral rotation and lateral deflection.

The Diers Famus system is used in laboratory conditions, recommended for trainers at various stages of selection and selection, and in determining the narrow specialization of athletes.

The wireless monitoring system Activio Sport is a wireless heart rate monitoring system in real-time mode.

The advantages of the system are the range of action (+200 m, the update of information per second), battery life (1000 hours), automatic information storage, convenient software, drawing up current reports. It makes possible to determine the functional data of the body of the athlete directly, both in the competitions, and during the training process.

Conclusions. It is established that in order to increase the efficiency of the training process of athletes, trainers increasingly use specialized computer software and monitoring systems such as Polar – “ProTrainer 5”, Dartfish - «Dartfish Connect 5.5», video complex Qualisys, software package Fusion Smartspeed, Opto-Gate (Optical) optoelectronic system (Jump), IMOOV three-dimensional evaluation system, SportKat 650TS simulator, Quintic Biomechanics Simi, Simi Matchix, Activio Sport monitoring system, Monocular bike scanner Monark 894E, Monark 828E, Myotest system, Myotest system. They provide real-time data on the functional status and level of physical development of athletes, as well as provide prevention of injuries and health preservation.

Prospects for Further Research. In future studies it is planned to check the possibilities of using computer technology data in a competitive process.

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THE MAIN TRENDS IN THE DEVELOPMENT OF SPORTS CHOREOGRAPHY AND THE AREAS OF ITS IMPROVEMENT IN TECHNICAL-AESTHETIC SPORTS

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Abstract

The objective of the study – to determine relevant areas of choreographic training in sport. ***Research methods –*** desk review and synthesis of scientific information, literature study, induction and deduction and a systematic approach. ***Research resultsan*** applied problem was identified, that is related to the existence of choreography training,considered to be a relatively distinct training aspect in the system of the long-standing athletes' improvement and the absence of its justification in science and methodologies. ***Findings.*** The methods of choreography training's improvement are determined: creation of adequate approaches which provide the desirable variability of certain aspects of the training processdepending on the athlete's state of condition, activities area andthe stage of the training macrocycle; an examination of the regulations; specific nature, development of a kind of sport and rules of the competition are taken into account; improvement of the expressiveness.

Key words: choreography training, technical-aesthetic sports, methods of improvement and the system of the athletes' training.

Валентина Тодорова. Основні тенденції розвитку спортивної хореографії та напрями її вдосконалення в техніко-естетичних видах спорту. ***Мета дослідження*** – визначити актуальні напрями хореографічної підготовки в спорті. ***Методи дослідження*** – теоретичний аналіз та узагальнення наукових джерел, вивчення документальних матеріалів, індукції й дедукції, системний підхід. ***Результати дослідження*** – виокремлено актуальну науково-прикладну проблему, пов'язану з існуванням хореографічної підготовки як відносно самостійної сторони підготовки в системі багаторічного вдосконалення спортсменів та відсутності її належного науково-методологічного обгрунтування. ***Висновки.*** Визначено способи вдосконалення хореографічної підготовки: створення адекватних методик, які передбачають бажану варіативність окремих параметрів тренувального процесу залежно від стану організму спортсменів, ділянки діяльності та етапу тренувального макроциклу; перегляд нормативних документів; урахування специфіки й розвитку виду спорту та правил змагань; удосконалення виразності.

Ключові слова: хореографічна підготовка, техніко-естетичні види спорту, способи вдосконалення, система підготовки спортсменів.

Валентина Тодорова. Основные тенденции развития спортивной хореографии и направления ее совершенствования в технико-эстетических видах спорта. ***Цель исследования*** – определить актуальные направления хореографической подготовки в спорте. ***Методы исследования*** – теоретический анализ и обобщение научных источников, изучение документальных материалов, индукции и дедукции, системный подход. ***Результаты исследования*** – выделено актуальную научно-прикладную проблему, связанную с существованием хореографической подготовки как относительно самостоятельной стороны подготовки в системе многолетнего совершенствования спортсменов и отсутствия ее надлежащего научно-методологического обоснования. ***Выводы.*** Определяются пути совершенствования хореографической подготовки: создание адекватных методик, предусматривающих желаемую вариативность отдельных параметров тренировочного процесса в зависимости от состояния организма спортсменов; участки деятельности и этапа тренировочного макроцикла; пересмотр нормативных документов; учет специфики и развития вида спорта и правил соревнований; совершенствование выразительности.

Ключевые слова: хореографическая подготовка, технико-эстетические виды спорта, пути совершенствования, система подготовки спортсменов.

Problem Statement and Analysis of the Latter Research Results. During a very difficult period of Ukraine's European Integration of there arises an important issue the formation of a country-image, the main factors of which include the results of athletes on the international sports stageand the system of the athletes' training [1; 10]. Since the renaissance of the Olympic movement, fundamental scientific knowledge of the system of athletic training has been significantly improved due to the main trends of sport development [5; 11]. Today

new terms of the international competitive activities, which have emerged over the past decades, should be taken into account within sport practice.The sophistication of the competitive programs, the rules of competition, increased demands for the technique of exercise performance and the emergence of new choreography elements are covered.

Performance improvement during technical-aesthetic sport competitions is a complicated long-lasting process, the results of which, are determined by a high rate of orientation in space and time and the proportionality of motor movements; explicit replication of varied movements with a differing complexity and the level of skills of the rational motor rhythm and also other conditions and factors.

Choreography training has a multidimensional nature, and is an upbringing and physical component, as well as an important aspect of aesthetic upbringing. The development of the athletes' creative abilities, improvement of their functional capacity, and their necessary physical qualities all play a significant role in technical training. General choreography training in sports facilities requires further development under the present circumstances.

Connection of work with a scientific approach: «A Theoretical and methodological framework of controlling the training process and competitive activities in The Olympics, professional and adaptive sports» according to the LDUFK plan for 2016-2020 (State Registration Number: 0116U003167).

Analysis of the Latter Research and Publications. Overall, the increasing results in technical-aesthetic sports and the improvement in the system of athletes' training have contributed to an allocation of the relatively distinct and, at the same time, closely related subdivisions towards the athletes' enhancement process and their improvement [1; 2; 5; 11]. A considerable number of basic research concerning the system of athletes' long-standing training in different kinds of sports has been conducted [1; 5; 10]. Similarly, many scholars have stressed the role of choreography training towards an implementation of both distinct and integrated tasks in athletes' long-standing training system [9; 12; 13; 14].

A number of contradictions have been indicated due to the degree of theoretical and methodological justification of choreography training in the athletes' long-standing training system. Foremost of which are:

– the feasibility of introducing the current results of basic research concerning choreographic training into the system of athletes' training as well as the fragmentary and unsystematic nature of knowledge acquired from research of the relevant issue;

– the necessity for the development of a cultural identity of athletes in their long-standing training process as well as lack of focus towards the development of their aesthetic needs while doing physical exercises or personal improvement;

– the necessity to control and self-monitor choreographic training as well as the insufficiency of forms and objective monitoring methods;

– the specific training orientation as well as the lack of a comprehensive system of the athletes' choreographic training;

– the need for popularization and entertainment of the sport as well as a lack of the beauty of motion and skillful performance of the competitive exercises.

The objective of the study – to determine relevant areas of choreographic training in sport.

Research methods – desk review and synthesis of scientific information, literature study and induction, deduction and a systematic approach.

Research Results and their Discussion. The main principles of the implementation of choreographic elements, the specific principles of sports training as well as didactic and general pedagogical principles underpin choreographic training. Obviously, all the specific aspects mentioned above play a significant role in the clarification of objectives and contents of choreographic training in sports. With a view to determine the methods of choreographic training's for the improvement of athletes in technical-aesthetic sports, experts have always focused on a specific nature of choreography training as a complex system, considering competitive activities as a part of this system. Thus, in order to identify the areas of choreography training for performance improvement, one should consider the specific trends of sport development.

The modern system of athletic training has developed according to the main trends of sport evolution [3; 7; 9; 12]. Indeed, each sport has its own specific trends, however, some general, typical trends for the majority of sports may be outlined for the increase of competitiveness on the world stage; increase of geographical membership; a considerable increase in the amount and intensity of the training load. This trend is also typical of the modern choreographic art. In additions a constant increase in the amount of competitions of a narrow specialization of sports training and the overall training process with an improvement of the exercising

techniques and an increased demand for the athletes' functional training, dramatic sports rejuvenation and especially of ones involving complex coordination will contribute to a more modern system of training.

Accordingly, the main areas of improvement of the sports training systemmay be considered an expansion of the innovative means of training (electrical stimulation, stretching, mode of development of physical qualities,methods of relaxation, eastern techniques, etc. should be considered. A creation of special climatic, geographical and other conditions while practicing for competitions with a well-balanced resting and load mode as well as nutrition and a means of restoration and stimulation efficiency with an increase in the number of days of competition in order to enhance the operational reserves of the body. A consideration of the amount and intensity of the load in order to preserve the health of athlete is necessary. While a specific training system due to the demands of each kind of sport and maximum focus on individual abilities and characteristics of athletes is paramount. The training of athletes should be based on model characteristics: physical and mental qualities as well as a standard of health.

All the elements mentioned above are typical of choreography also, as a specific nature of choreography training as well as its focus, which doesn't change the logic, and contents of a special training.

An interpretation of experts' workshasmade it possible to identify the methods of improving the system of choreography training, which can arise in the following areas:

– ***the Creation of adequate approaches, which provide the desirable variability of certain aspects of the training process,*** depend on the athlete's state of body, activities', and the stage of the training macro cycle. According to this aspect, P. M. Kyzim, together with seven cosponsors, recommend having a clear picture of the link between structural components, which refer to different aspects of training, while designing the structure of training.It is necessary to focus on figures, which attest to the quality and distinctiveness of the competitive activities as well as functionalities of the main systems of the athletes' preparation. One technique has been proposed to enhance the choreography training of gymnasts aged 10 to 12. This technique consists of exercises, which develop flexibility as well as the mobility of the joints. Moreover, they are adapted to a specific nature of specific sports and are combined in systems of varying degrees of complexity. The degree of complexity depends on the techniques of the performance as well as the relevant level of the gymnasts' physical preparation.However, we consider it is necessary to improve choreography training,not only at a stage close to the maximum realization of individual potential, but also the creation of an appropriate functional base at the early stages of long-term training;

– ***the Improvement of Regulatory Documents.*** According to the works of modern authors, experts in sports choreography, in many cases choreography training has a non-systematic, often fragmentary character and does not receive proper regulatory legal support [12, 13]. In spite of the formal fragmentation and non-necessity of choreography classes in the athletes' training regime, the trainers and the athletes of high qualification are interested in the means of choreography training. Programs of complex coordination usually involve the implementation of programmatic exercises. That is, the program performed by the athletes is pre-compiled, studied and does not change in the course of the competition. This fact allows the athletes to study the exercise carefully and to improve the technique of their individual performance elements, expressiveness, artistry and purity for years. Of course, in the process of technique improvement athletes make some adjustments related to changes in complexity, competition rules, and raising skill level. According to V. Sosina [12], in the updating of training programs, it is necessary to understand the general, objective elements dictated by age demand; and subjective components faced by a particular athlete depending on his individual potential capabilities and skills in the context of these objective requirements. Otherwise, the author assumes that the sport, in which children participate, can have a positive and negative impact on them. We believe that we must develop recommendations on the conformity of choreography exercises to the of the child's age and his level of preparedness. Drawing up programs for different stages of long-term sports training should be based on the following factors: the average length of regular training required to achieve higher sportsmanship, the age at which the highest results are routinely reached, the level of preparedness and natural talent of the athlete and the age when special training began;

– ***Taking into Account the Specificity and Development of the Sport.*** Competition at the international sports level impliesthat those athletes who can combine the structural complexity in extraordinary compositions with virtuoso performances and special expressiveness, emotionality, and artistry will attain the championship.Increasing of the technique requirements and the appearance of new choreographic elements are caused by demands of the programs.For example, dancing couples in figure skating in which new elements are included demand challenges that require originality.According to the rules of the competition, the second dance lift performed by the partners in whicha complicated positions is added. This fact motivates modern specialists and

trainers to find new approaches to building a training regimen by applying individual methods of choreography training.L. S. Lutsenko [8] suggests the opportunity of improving the quality of choreography training in aerobic gymnastics in the use of aerobic choreographic compounds aimed at training basic and additional aerobic steps combined with hand movements. The ability to combine choreographic movements with high and low shock loads in full matching with music, with a creative interpretation of its dynamics and rhythm, as well as the quality of choreographic performance of exercises in order to develop coordination, flexibility and leg strength.We agree with the author's opinion that the idea of developing complexes and choreographic tasks that are used in training sessions to meet the competitive program demands and to intensify the training process is promising;

– ***Improving Competition Rules.*** Maintaining their authenticity, the competition rules inhibit the development of content – new elements and types of training [2].In 1960, Yu. N. Shishkareva offered to differentiate the judges' duties during the process of assessment of the quality of composition and the quality of performance in artistic gymnastics.Only 40 years later (in 2001), according to the rules of competition, the judging was divided into three groups in order to bring the criteria for evaluating the exercises to a higher level.The question of improving the objectivity of the judicial system in technical-aesthetic sports was considered in gymnastics, figure skating, synchronized swimming, etc. This is due to the fact that judges, posting points, express their attitude to the athlete'sperformance. To avoid subjectivity in these kinds of sports, it is necessary to search for ways to objectify the criteria for exercises. Simultaneously with the change of the main regulatory document, basic requirements imposed on athletes become more complicated. New rules produce the development of complexity, saturating technical-aesthetic sports with dynamics, elements of risk andtricks. It is impossible to alter this direction; it will continue to evolve in a spiral of progress. The implementation of new changes requires a scientific, methodological and practical solution;

– ***Improvement of Expressiveness.*** In modern scientific-methodical literature, to this time, there is no clear definition of the concepts of «motor expressiveness» and «emotional expressiveness». In the definition of «artistry», the authors use such concepts as «expressive gesture», «expressive drawing», and so forth [6; 9]. The methods of training the expressiveness of athletes' movements in those sports, where the adherence of their performance to the requirements of aesthetics, artistry and expressiveness, constitutes a significant portion of the judge's assessment, remains problematic. Authors note that in complex coordination sports the expressiveness depends primarily on the nature and content of the musical work, and on the extent to which the performer understood and interpreted it [7; 10; 13]. Some studies point to the interconnection between a sports technique as a balanced way of performing movements and expressiveness, since an imperfect technique will not be able to manifest expressiveness to the fullest extent and to focus on a figurative resolution of both individual elements and composition in general [12]. Training of expressiveness in sports is one of the most difficult tasks of the performing skills category, which is defined as the ability to display the physical and technical capabilities of the athlete, as well as to incorporate them into an artistically designed composition. S. I. Borisenko [4] elaborated a method of training of motor-plastic expressiveness, consisting of the following components: musical-rhythmic training, mastering the skills of expressive movement and choreography training. The study of the elements of folk and ballroom dance, which has contributed to a significant improvement in the amplitude and precision of movements, the quality of the accompanying movements through dynamism, speed, intensity, harmony all contribute to a higher level of performance. An emotional connection with music, choreography, artistic and vibrant movements of gymnasts, as well as plasticity, musicality and creating an artistic image in general are necessary for this level of performance.

Expressiveness and technique are interconnected. According to T. S. Lisitskaya [9], technique, a biomechanically correct and coherent execution is the necessary basis on which expressiveness is constructed. An imperfect technique does not allow athletes to move confidently, or to focus on figuratively solving individual elements, connections, and combinations as a whole, or to introduce «decorative elements». Developing motor skills to a certain degree of automatism is a prerequisite for expressiveness.

Conclusions. The analysis of the scientific works showed that improving the structure and content of the general system of athletic training in technical-aesthetic sports is one of the main problems of the theory and methodology of training athletes.The current level of world achievements in technical-aesthetic sports requires Ukrainian specialists to develop new and effective technologies for the mastering of a large number of diverse and complicated structural movements during the long-term sports training.

The topical trends of choreography training in sports are established. They are related to the need to create an effective basis for the process of perfecting athletic skills at various stages of the long-term training of athletes. It is necessary to promote a harmonious development of the athlete's personality through the

elimination of the unfavorable consideration of choreography training by specialists in the field of physical education and sports.The removal of the existing contradiction between choreography training, as a relatively independent training element and the absence of a reflection of this in the sports curriculum needs to be addressed through the development of proper scientific and methodical validation of choreography training in sport.

Prospects for further research are in the definition of the concept of choreography training of athletes in technical-aesthetic sports.

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Рецензії, хроніки та персоналії

Східноєвропейський національний університет імені Лесі Українки
(м. Луцьк, Україна)
Академія імені Яна Длугоша в Ченстохові (Польща)

Шановні пані й панове!

ЗАПРОШУЄМО ВАС

до участі в ІІ Міжнародній науково-практичній конференції
«ФІЗИЧНА АКТИВНІСТЬ І ЯКІСТЬ ЖИТТЯ ЛЮДИНИ»,
яка відбудеться **21–23 травня 2018 року** в Східноєвропейському національному університеті імені Лесі Українки та ***на базі табору практик «Гарт» (с. Світязь, Шацький р-н., Волинська обл.).***

Місія конференції – залучити науковців до обґрунтування місця й значення фізичної активності в поліпшенні якості життя людини.

Науковий комітет

Анатолій Цьось − доктор наук з фізичного виховання і спорту, професор (Східноєвропейський національний університет імені Лесі Українки) – **голова комітету;**
Яцек Вонщік – доктор габілітований, професор Академії імені Яна Длугоша (Академія імені Яна Длугоша в Ченстохові) – **заступник голови комітету;**
Наталія Бєлікова – доктор педагогічних наук, професор (Східноєвропейський національний університет імені Лесі Українки);
Елігіуш Малолєпши − доктор габілітований, професор Академії імені Яна Длугоша (Академія імені Яна Длугоша в Ченстохові);
Алла Альошина − доктор наук з фізичного виховання і спорту, професор (Східноєвропейський національний університет імені Лесі Українки);
Ольга Андрійчук – доктор наук з фізичного виховання і спорту, професор (Східноєвропейський національний університет імені Лесі Українки);
Едуард Вільчковський – доктор педагогічних наук, професор, член-кореспондент АПН України (Східноєвропейський національний університет імені Лесі Українки);
Юрій Лях – доктор біологічних наук, професор (Східноєвропейський національний університет імені Лесі Українки);
Аркадіуш Мажец – доктор габілітований, професор Академії імені Яна Длугоша (Академія імені Яна Длугоша в Ченстохові);
Вєслав Піліс – доктор габілітований, профессор (Академія імені Яна Длугоша в Ченстохові);
Анджей Сорока – доктор, ад'юнкт кафедри туризму та рекреації (Інститут наук про здоров'я Університету природничо-гуманітарних наук у м. Седльце);
Андрій Ягенський – доктор медичних наук, професор (Волинський обласний центр кардіоваскулярної патології та тромболізису).

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Організаційний комітет

Олександр Бичук − кандидат наук з фізичного виховання і спорту, доцент (Східноєвропейський національний університет імені Лесі Українки);
Яцек Вонщік – доктор габілітований, професор Академії імені Яна Длугоша (Академія імені Яна Длугоша в Ченстохові);
Олена Томащук – кандидат педагогічних наук, доцент (Східноєвропейський національний університет імені Лесі Українки);
Світлана Подубінська – магістр (Східноєвропейський національний університет імені Лесі Українки).

Напрями роботи конференції:

1. Генезис понять «фізична активність», «якість життя» людини.
2. Компоненти якості життя людини.
3. Фізична активність і здоров'я.
4. Фізична активність у способі життя людини.
5. Програми фізичної активності.
6. Фізична активність як чинник якості життя людини.
7. Фізична активність у фізичній реабілітації та соціальній адаптації.

У програмі конференції – пленарні та секційні засідання, обговорення доповідей, майстер-класи, екскурсії.

У межах конференції буде проведено **Міжнародний семінар-тренінг «Nordic Walking»** (скандинавська ходьба), організований Міжнародною федерацією з «Nordic Walking». Ведучі семінару – ***Мартін Шульц*** – Президент Nordic Walking (Польща), ***Лукаш Вітчук*** – міжнародний інструктор, багаторазовий чемпіон Європи та Польщі зі скандинавської ходьби на різних дистанціях (Польща).

За результатами семінару всі учасники отримають міжнародний двомовний сертифікат про професійну підготовку інструктора зі скандинавської ходьби, який дає право навчати й проводити заняття зі скандинавської ходьби як в Україні, так і за її межами. Сертифікат також засвідчує підвищення кваліфікації науково-педагогічних працівників вищих навчальних закладів, тренерів, фітнес-інструкторів.

Умови участі в конференції:

- ***до 01 квітня 2018 р.*** зареєструватися **й** подати тези доповідей **(**українською або польською, англійською, російською мовами) на сайт за адресою http://conferences.eenu.edu.ua або надіслати ці документи на електронну скриньку olena.tomaschuk@eenu.edu.ua (зразок додано). Ім'я файла повинно включати прізвище автора й порядковий номер бажаного напряму конференції (*приклад*: Шевченко_3);
- ***до 15 квітня 2018 р.*** надіслати статті (англійською мовою);
- ***до 01 травня 2018 р.*** перерахувати кошти в розмірі 1250 гривень (оплата включає харчування та проживання учасників конференції). Вартість укладання тез і друк статті становить 1000 гривень. Вартість навчання в рамках семінару, яке проводять фахівці Міжнародної федерації «Nordic Walking» (Польща), та отримання сертифіката складає 90 дол. США.

Видання праць конференції

Тези наукових доповідей будуть опубліковані в електронному збірнику матеріалів, що розміщуватимуться за адресою: http://conferences.eenu.edu.ua

Робочі мови конференції – усі європейські мови. Обсяг – одна сторінка, 2000–2500 друкованих знаків без пробілів. ***Текст*** набирати в редакторі Microsoft Word for Windows; шрифт тексту – Times New Roman, 12 pt, інтервал – 1. Параметри сторінки такі: ліве поле – 30 мм, праве – 15 мм, верхнє – 20 мм, нижнє – 20 мм.

Структура. Перший рядок – назва (великими літерами, шрифт – жирний, вирівнювання по центру). Другий рядок – ім'я та прізвище автора (авторів) (шрифт – жирний, вирівнювання по центру). Третій рядок – науковий ступінь, учене звання, посада автора, повна назва вищого навчального закладу (наукової установи), у якому працює (навчається) учасник конференції, електронна адреса (шрифт – курсив, вирівнювання по ширині сторінки). Далі розміщуємо текст, вирівняний по ширині сторінки (абзац – 0,75 см), який повинен містити такі ***обов'язкові елементи: вступ, методи дослідження, результати дослідження, висновки.***

Відповідальність за зміст поданих матеріалів покладається на авторів. Оргкомітет залишає за собою право відхиляти тези, котрі не відповідають зазначеним вимогам.

Статті друкуватимуться у журналах «Фізичне виховання, спорт і культура здоров'я у сучасному суспільстві» http://sport.eenu.edu.ua (Україна); «Physical Activity Review» http://www.physactiv.ajd.czest.pl (Польща) і «Prace Naukowe Akademii im. Jana Długosza w Częstochowie Kultura Fizyczna» http://www.wp.ajd.czest.pl/kultura-fizyczna (Польща). ***Вимоги до статей (керівництво для авторів) подано на сайтах журналів.***

Після рецензування статей повідомлення про прийняття до друку (чи відхилення) будуть надіслані авторові ***лише на електронну адресу.*** За умови позитивної рецензії статті автор здійснює ***оплату*** *(для громадян України – поповнення карткового рахунку ПриватБанку за номером 5168757319057404, одержувач Томащук О. Г.)* ***і надсилає копію квитанції про оплату*** на e-mail: olena.tomaschuk@eenu.edu.ua

Адреса оргкомітету:
43021, Волинська обл., м. Луцьк, вул. Винниченка, 30, ауд.116.
Координатор – Томащук Олена Григорівна.
Контакти: м. т. +38(050)1815896; e-mail: olena.tomaschuk@eenu.edu.ua

ЗАЯВКА
на участь у ІІ Міжнародній науково-практичній конференції
«Фізична активність і якість життя людини»

Країна _____
Повна назва вищого навчального закладу _____
Прізвище, ім'я, по батькові, науковий ступінь, учене звання_____
Рік навчання (для магістрів, аспірантів) _____
Назва доповіді _____
Напрям (секція) _____
Контактні телефони _____
E-mail **(ОБОВ'ЯЗКОВО):** _____

ЗАЯВКА
на участь у Міжнародному семінарі-тренінгу
«Nordic Walking» (скандинавська ходьба)

Країна _____
Місце роботи (навчання), посада_____
Прізвище, ім'я, по батькові _____
Контактні телефони _____
E-mail **(ОБОВ'ЯЗКОВО):**_____
Примітка: для заповнення бланку сертифіката міжнародного зразка заявку потрібно подати українською та англійською мовами.

Оргкомітет конференції бажає творчих успіхів!

ІНФОРМАЦІЯ ДЛЯ АВТОРІВ

Наукове видання «Фізичне виховання, спорт і культура здоров'я у сучасному суспільстві» містить такі рубрики:

- ✓ Історичні, філософські, правові й кадрові проблеми фізичної культури та спорту.
- ✓ Технології навчання фізичної культури.
- ✓ Фізична культура, фізичне виховання різних груп населення.
- ✓ Лікувальна фізична культура, спортивна медицина й фізична реабілітація.
- ✓ Олімпійський і професійний спорт.

Щоб мати можливість подавати рукописи в журнал та перевіряти їх поточний статус, потрібно зареєструватися на сайті (http://sport.eenu.edu.ua) або надіслати матеріали на e-mail: sport@eenu.edu.ua

Матеріал публікації повинен відповідати тематиці журналу.

Журнал приймає до розгляду наукові статті за умови, що робота:

- не була опублікована раніше в іншому журналі;
- не перебуває на розгляді в іншому журналі;
- усі співавтори згодні з публікацією статті.

Статті приймаються тільки з оригінальним авторським текстом, запозичення в обсязі не більше 10 % повинні бути оформлені із зазначенням посилань на джерела.

Подаючи статтю в журнал, автор тим самим:

- висловлює згоду на розміщення повного її тексту в мережі Інтернет;
- погоджується з рекомендаціями Всесвітньої асоціації медичних редакторів і стандартів COPE відповідно до принципів етики наукових публікацій. (https://publicationethics.org/files/International%20standards_authors_for%20website_11_Nov_2011.pdf)

Автори дають згоду на збір й обробку персональних даних із метою їх уключення в базу даних згідно із Законом України № 2297-VI «Про захист персональних даних» від 01.06.2010. Імена та електронні адреси, які вказуються користувачами сайта цього видання, використовуватимуться виключно для виконання внутрішніх технічних завдань; вони не поширюватимуться та не передаватимуться стороннім особам.

Мова рукопису – українська, російська, англійська, польська.

ЗАГАЛЬНІ ВИМОГИ ДО ОФОРМЛЕННЯ РУКОПИСІВ

Стаття повинна супроводжуватися анотацією, ключовими словами й містити пристатейний список використаних джерел.

Файл рукопису повинен містити:

- ✓ індекс УДК статті (верхній лівий кут)
- ✓ назву статті (до12 слів прописними літерами) ;
- ✓ прізвище, ім'я автора (-ів), афіліацію (науковий ступінь, вчене звання, посада, місце роботи або навчання, місто, країна);
- ✓ e-mail контактного автора;
- ✓ анотацію (230–250 слів, структуровану таким чином (із виділенням підзаголовків напівжирним шрифтом): актуальність теми дослідження, мета й методи або методологія дослідження, результати роботи та ключові висновки; ключові слова (5–6 слів або стійких словосполучень, за якими надалі виконуватиметься пошук статті), які відображають специфіку теми, об'єкт і результати дослідження та жодне з яких не дублює слова з назви статті.
- ✓ текст статті;
- ✓ висловлення вдячності (за необхідності);
- ✓ джерела та література.

Метадані (анотації) подаються мовою оригіналу статті та англійською (якщо мова статті англійська, то метадані – англійською й українською/російською).

Використання комп'ютерного перекладу не допускається.

Неприпустимим є використання нерозшифрованих абревіатур і вперше введених термінів. Усі абревіатури повинні бути розшифровані при першому вживанні. Якщо абревіатур багато, то можна зробити список із розшифровкою кожної з них перед текстом статті.

Текст статті повинен відповідати формату IMRAD (Introduction, Methods, Results, Discussion), тобто потрібно виділити такі розділи: вступ; мета дослідження; матеріал і методи дослідження; результати дослідження; висновки.

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Вступ (*постановка наукової проблеми та її зв'язок із важливими науковими чи практичними завданнями, аналіз досліджень, у яких започатковано розв'язання цієї проблеми й на які спирається автор; виокремлення не розв'язаних раніше частин загальної проблеми, які розкриває означена стаття*).

Мета дослідження (*метою повинно бути розв'язання проблеми або отримання знань щодо неї. Мета дослідження орієнтує на його кінцевий результат, завдання формулюють питання, на які потрібно отримати відповідь для реалізації мети дослідження. Для формулювання мети бажано використовувати слова* ***встановити***, ***виявити, розробити, довести*** *та ін.)*

Матеріал і методи дослідження. Цей розділ повинен бути короткими, але достатнім, щоб дати змогу іншим дослідникам повторити дослідження, та містити три підрозділи (*можна додати інші підрозділи, якщо є така потреба*)

(1) Учасники:

Указати кількість учасників, вік, спортивну кваліфікацію досліджуваних. Відзначити, що від усіх учасників отримано інформовану згоду на участь у цьому експерименті.

(2) Організація дослідження:

Це резюме повинно бути коротким, точним і логічним (*коротка інформація про кожен крок виконання досліджень, тривалість і послідовність проведення експерименту*). Указати використовувані прилади, обладнання, тести.

(3) Статистичний аналіз:

У підзаголовку «Статистичний аналіз» автори повинні пояснити, які статистичні методи використано під час аналізу представлених даних у розділі «Результати дослідження», та обґрунтувати їх застосування. Статистичні методи повинні бути описані детально, щоб забезпечити перевірку представлених результатів. Статистичні значення мають бути показані разом із даними в тексті, а також у таблицях і малюнках. У кінці статистичного аналізу автори повинні вказувати рівень значущості та використані статистичні програми.

Звертаємо увагу авторів, що просте перерахування використаних методів дослідження редакцією не приймається.

Протокол збору даних, процедури, досліджувані параметри, методи вимірювань й апаратура повинні бути описані досить докладно, щоб дати змогу іншим ученим відтворити результати. Мають бути представлені посилання на використовувані методи. Маловідомі та істотно модифіковані методи повинні бути описані докладно, назви використаних пристроїв – супроводжуватись інформацією про виробника (*назва, місто й країна*), зазначеного в дужках.

Надання інформації про учасників експериментів (пацієнтів) вимагає наявності їхньої офіційної згоди. Дослідження пацієнтів і добровольців вимагають усвідомленої згоди, документованої в тексті рукопису. За участі дітей в експериментах потрібно мати отриману письмову згоду їхніх батьків, про що зазначаємо в цьому розділі. У звітах щодо експериментів на людях має бути зазначено, чи проводилася процедура відповідно до етичних стандартів відповідального комітету з прав (*експериментів або інституційного регіонального*) або Гельсинської декларації 2008 року.

Редакція залишає за собою право запросити будь-які вихідні дані від авторів на будь-якій стадії в процесі розгляду або публікації, у тому числі після публікації. Відмова від надання запитуваної інформації може призвести до затримки публікації або скасування прийому.

Результати дослідження. Виклад основного матеріалу дослідження з повним обґрунтуванням отриманих наукових результатів (*результати досліджень з обов'язковою статистичною обробкою даних потрібно подавати у вигляді таблиць, графіків, діаграм. Дані, які відображаються в таблицях, мають бути суттєвими, повними, достовірними. Заголовок таблиці, назва графіка або діаграми повинні відповідати їхньому змісту. Переказувати словами дані таблиць і графіків неприпустимо. Результати дослідження мають бути обов'язково проаналізовані. Варто провести паралелі з даними, отриманими іншими вітчизняними й закордонними вченими.*

Дискусія. Цей розділ повинен містити інтерпретацію результатів дослідження, а також результати, розглянуті в контексті підсумків в інших дослідженнях науковців, котрі займаються вивченням цієї проблеми. Потрібно включити в дискусію питання, що випливають із висновків, а також зазначити, яким чином дослідження інших авторів підтверджують правомірність Вашого дослідження. Слід виділити новизну Ваших результатів.

Висновки та перспективи подальших досліджень у цьому напрямі (*подається коротке формулювання результатів дослідження, осмислення та узагальнення теми, а також перспективи для майбутніх досліджень. Висновки повинні бути лаконічними, конкретними, обґрунтованими, відповідати меті дослідження та випливати з основного змісту роботи).*

Після тексту статті повинен міститися пристатейний список використаних джерел.

Усі джерела зі списку літератури повинні бути процитовані в тексті статті, в іншому випадку відповідний елемент має бути вилучений. Якщо стаття, на яку є посилання, має цифровий ідентифікатор doi (http://www.doi.org/index.html), його обов'язково потрібно вказувати.

Список літератури повинен містити достатню кількість сучасних (за останні п'ять років) джерел за проблемою дослідження.

До списку потрібно включати наукові статті українських і зарубіжних авторів.

Допускається посилання на власні роботи авторів статті (самоцитування), але не більше ніж 25 % від загальної кількості джерел.

Якщо текст статті українською/російською мовою, то **список літератури повинен складатися з двох частин: «Джерела та література»** і **«References»**.

Перелік посилань **«Джерела та література» –** це бібліографічний опис джерел, використаних під час підготовки статті, виконаний мовою оригіналу та оформлений відповідно до ДСТУ 8302:2015: Бібліографічне посилання. Загальні положення та правила складання (http://lib.pu.if.ua/files/dstu-8302-2015.pdf).

При цьому, якщо в переліку використано джерела іноземною мовою, їх не потрібно перекладати українською/російською.

«References» – це дубльований перелік посилань **«Джерела та література»**, оформлений за стандартом APA (http://www.apastyle.org/). англійською мовою (та/або із застосуванням транслітерації).

Назви кириличних джерел транслітеруються, далі у квадратних дужках розміщується переклад.

Он-лайн-конвертер: http://translit.kh.ua/#passport (Паспортний КМУ 2010).

Для створення бібліографічних записів посилань для переліку **«References»** скористайтеся ресурсом:

Міжнародні правила цитування та посилання в наукових роботах : методичні рекомендації / автори-укладачі : О. Боженко, Ю. Корян, М. Федорець ; редкол. : В. С. Пашкова, О. В. Воскобойнікова-Гузєва, Я. Є. Сошинська, О. М. Бруй ; Науково- технічна бібліотека ім. Г. І. Денисенка Національного технічного університету України «Київський політехнічний інститут імені Ігоря Сікорського» ; Українська бібліотечна асоціація. – Київ : УБА, 2016. – Електрон. вид. – 1 електрон. опт. диск (CD-ROM). – 117 с. – ISBN 978-966-97569-2-3.

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1. Обсяг основного тексту статті – 8–15 сторінок.

2. Текстові матеріали повинні бути підготовлені в редакторі MS Word (*.doc).

3. Параметри сторінки:

формат – А4, поля – зліва – 3 см, справа – 1 см, зверху й знизу – 2 см, без колонтитулів та нумерації сторінок.

4. Шрифт основного тексту – Times New Roman, розмір символа (кегель) – 14, звичайний, рядки без переносів.

5. Параметри абзацу:

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Кількість табличного матеріалу та ілюстрацій повинна бути доречною. Цифровий матеріал подається в таблиці, що має порядковий номер, вирівнювання по правому краю (наприклад: *Таблиця 1*) і назву (друкується над таблицею посередині жирним шрифтом, наприклад: **Розподіл студентів за рівнем фізичної активності**). Текст таблиці подається шрифтом Times New Roman, кегль 12, інтервал 1. Формат таблиць – лише книжковий.

Рисунок повинен бути єдиним графічним об'єктом (тобто згрупованим). Для рисунків, виконаних у програмі Excel, потрібно додатково до статті відправити файл Excel (97-2003).

Ілюстрації також слід нумерувати; вони повинні мати назви, які вказуються поза згрупованим графічним об'єктом (наприклад: **Рис. 1.** *Динаміка фізичної працезд$_{199–202}$ і*). Ілюстративний матеріал обов'язково повинен бути контрастним чорно-білим, спосіб заливки в діаграмах – штриховий).

Формули (зі стандартною нумерацією) виконуються в редакторі Microsoft Equation. Підписи рисунків та формул повинні бути доступні для редагування. Усі графічні об'єкти не повинні бути сканованими.

Вимоги до статей, останні випуски журналу, архів номерів, різна інформація – на сайті видання: http://sport.eenu.edu.ua.

Якщо стаття не відповідає вищезазначеним вимогам або її науковий рівень недостатній, то редакційна рада не приймає працю для публікації.

Стосовно інших питань за консультацією просимо звертатися до відповідального секретаря Індики Світлани Ярославівни (сл.тел. 0332-24-21-78; моб. тел. (066)-48-30-600).

Для своєчасної інформації просимо Вас надсилати авторську довідку (див. нижче).

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