ISSN 2308-7269

PEDAGOGICS PSYCHOLOGY

Medical-Biological Problems of Physical Training and Sports

№02/2014

PEDAGOGICS, PSYCHOLOGY, MEDICAL-BIOLOGICAL PROBLEMS OF PHYSICAL TRAINING AND SPORTS

2014
02

Key title: Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo vihovanna i sportu
Abbreviated key title: Pedagog. psihol. med.-biol. probl. fiz. vihov. sportu
ISSN 1818-9172 (Russian ed. Print), ISSN 1818-9210 (Russian ed. online).

Key title: Pedagogics, psychology, medical-biological problems of physical training and sports
Abbreviated key title: Pedagog. psychol. med.-biol. probl. phys. train. sports
ISSN 2308-7269 (English ed. online)

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

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

Journal is reflected in databases:

Academic Journals Database
http://journaldatabase.org

CORE
http://core.kmi.open.ac.uk

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

Elektronische Zeitschriftenbibliothek
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V.I.Vernadskiy National Library of Ukraine
http://nbuv.gov.ua

Electronic Library of Russia
http://elibrary.ru

Certificate to registration:
KB 15370-3942PR. 06.07.2009.

Frequency - 1 number in a month.

Address of editorial office:
Box 11135, Kharkov-68, 61068, Ukraine,

Tel. 38-097-910-81-12

http://www.sportpedagogy.org.ua

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CONTENTS

APPROACH TO EVALUATING HEALTH LEVEL AND ADAPTATION POSSIBILITIES IN SCHOOLCHILDREN

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Annotation. *Purpose:* substantiate the results of theoretical and practical investigations aimed at improving the health of students. *Material:* the study involved 187 children including 103 boys and 84 girls aged 7-10 years. *Results:* through a rapid assessment of physical health it was found that pupils of primary school age have an average level of the functional state of the organism, with a minimum resistance to risk factors (chronic non-infective diseases, etc.). For the first time, a technique for determining the level of adaptation and reserve capacity of school students proposed by Ukrainian hygienists was used in physical culture and sports practice. *Conclusions:* the technique reveals strain in adaptation mechanisms that corresponds to donozological condition. An idea is proposed that Nordic walking, through the positive impact on the body of aerobic mode of energy supply, is able to increase the reserve-adaptive capabilities of primary school students by improvement of their health as well as to solve the problems of health formation and health care in the physical education of youth.
Keywords: Nordic, walking, schoolchildren, adaptation, health.

Introduction

Generation that was born and is growing now in difficult technology related situation, increased by anthropogenic problems, shall have much more reserve of health for resisting to stressful challenges of society. Junior school age is the period of socialization's completion, when a child adapts to interaction with external factors and, on this base, starts to form internal beliefs. It is not occasional that physical culture specialists determine this age as "dynamic state, characterized by reserve of functions and systems and is the base of individual's fulfillment of his (her) biological and social functions. Integral indicator of reserves of organs' and systems' functions is energetic potential of bio-system (reserve of energy creation)" [6, Pg. 17]. The problem of formation of positive and, what is the most important, efficient attitude of junior schoolchild to valuelogical values of physical culture acquires special importance; here great attention shall be paid to formation of dominant, even biased belief that it is impossible to have good health without own efforts and personal motion functioning. In family and on first school (pre-school) lessons of physical culture it is necessary to educate children's wish to endure physical loads, cognitively supporting it by knowledge about usefulness of such motion functioning.

It is not occasional that foreign specialists call physical inactivity a leading risk factor in global prevalence of diseases [15]. To day not infectious diseases together with hypodynamia are the most serious problem in developed countries of the world, because their after effects undermine the strength of country. Owing to absence of sufficient motion activity of mature people they start suffering from chronic diseases, reducing efficiency of their labor and worsen quality of life. Competitiveness of a person also reduces and adding to this factor mass character of this problem, we receive economic stagnations. Some countries, UN and WHPO understood this fact very well and recent decades they have been investing recommendations and practical measures just in struggle with non infectious diseases.

At ninth European conference of Ministers of health protection, devoted to health protection in countries – members of EU a declaration was adopted, according to which investments in children's health and welfare ensure improvement of results during all life and can reduce the burden, endured now by health protection and social provisioning authorities. It was conditioned by the fact that a lot of physical and social-psychological problems could have been avoided, because their roots are in baby and infant age. [Information about ninth European conference of Ministers of health protection of EU, devoted to health protection problems//Modern pediatrics.– 2011. – № 5(39). – Pg. 13].

However, no positive results are possible without orientating of children on axio-sphere of physical culture [8]. G.L. Apanasenko considers physical loads to be the best mean for increasing of health's reserve potentials [2]. It means that health level, stress-resistance, ability to endure psychic problems depend on charge and quantity of mitochondrion, deposited in the process of physical trainings.

M.M. Bogen, basing on literature data and own practice formulates a hypothesis: "Mitochondrion component of energy generation, ensuring energy supply for life functioning and, consequently, for cells' work in alive organism, - is an essential mechanism of development of general endurance and a form of its manifestation – special endurance" [3, Pg. 71-72.].

Profound foreign researches [9] found that under condition of purposeful (pedagogic) physical loads (with active muscles' work, resulting in tiredness) mitochondrion in tissue of skeleton muscles are quickly and specifically change; owing to this fact mitochondrion volume can reach up to 50% during several weeks and even more in organisms of not trained earlier persons.

Aerobic loads "charge" cells in the best way, creating efficient reserve of health, while practicing of Scandinavian walking is the best way for solution of health related tasks.

doi: 10.6084/m9.figshare.923507

The work has been fulfilled as per combined plan of scientific-research work of Ministry of Ukraine of family, youth and sports for 2011-2015, by topic 3.1. "Improvement of program-normative principles of physical education in educational establishments (state registration number 0111U001733).

Purpose, tasks of the work, material and methods

The purpose of the work – is to determine the level of health and adaptation-reserve abilities of junior schoolchildren and to ground uniqueness of Scandinavian walking in physical education and health strengthening of schoolchildren.

Methods and organization of the research. Theoretical methods: analysis and generalization of scientific literature on topic of the research. Empirical methods: anthropological measurements, express evaluation of somatic health by G.L. Apanasenko, evaluation of adaptation-reserve abilities of children's organisms by S.V. Gozak, O.T. Yelizarova, pedagogic observation.

The research was carried out on base of school №225 in Kiyev with 187 schoolchildren's participation (from them 103 boys and 84 girls).

Results of the research

Objective evaluation of somatic health for medical and physical culture sphere is rather a problematic task and it is conditioned by the fact that physical health's indicators can include quite different characteristics, required for exact characteristic of health. These properties can be both external, which can be measured (anthropological, physical data), and internal – body's sensing of own organism. We used two approaches, which, with combining of indices, can help to determine health level of junior schoolchildren (express evaluation by G.L. Apanasenko) and level of adaptation-reserve abilities of these children (S.V. Gozak, O.T. Yelizarova, 2012). It will permit to analyze in more detail reserve of systems and functions of children's organisms, i.e. their health.

As per express-evaluation of somatic health of junior schoolchildren (see table 1-2) we determined middle level of boys from all forms and of girls from 2nd and 4th forms. The lower than middle level was registered among 9 years old girls (third form) and it was connected with decreased responsiveness of their cardio-vascular systems to physical loads. Evaluation of indices, according to which health level was determined, shows at extremely low functioning of different systems of children's organisms.

Table 1

Level of physical health (according to indicators) of girls from 2 - 4 forms

Indicators	Form (age)								
	2 (8 years)			3 (9 years)			4 (10 years)		
	$\bar{x}$	S	points	$\bar{x}$	S	points	$\bar{x}$	S	points
Vital index	51.8	8.8	2	50.6	10.7	2	50.1	9.1	2
Power index, conv.un.	40.0	10.6	0	45.0	12.6	1	48.2	17.6	2
Robinson's index	85.4	11.9	2	91.1	15.9	1	90.3	12.4	2
Weigh-height correlation (WH index)	Norm		0	Norm		0	Norm		0
Rufiet's index	5.8	3.2	2	10.8	16.3	-1	5.7	3.7	2
Total of points	6			3			8		
Evaluation of physical health	middle			Lower than middle			middle		

Total of boys' points is higher than girls', because their cardio vascular system is more responsive. In contrast to girls, whose best mark for physical workability (Ruffiet's index) was two points (for 8 and 10 years old girls), the same best mark of all age boys (8-10 years old) was 5 points. Only this test with dozed physical load of boys witnesses about optimal responsiveness of cardio-vascular system, while the girls' one was reduced. Then, in rest state, by Robinson's index, both boys and girls showed moderate results of cardio-vascular system's functioning (the best mark was 2 points for girls of 9-10 years old and for 8 year' boys).

Points for respiratory system of all age girls (vital index) witness that its functional level was middle. As per vital index, middle level of boys' functioning was showed only by 9 years old boys, the rest – eight and 10 years old pupils had functional level lower than middle.

Power index of boys of all three age groups was registered as lower than middle. Concerning girls, we registered dynamic of this index and qualitative changes from low level (8 years old girls) to middle (10 years old). Thus, the received by us middle level of functional state of most of junior schoolchildren can be regarded as critical one. It was connected with the fact that "safe level of health" starts from higher than middle level. Concerning 3rd form girls (nine years old), who had health level lower than middle, their functional state is on critical level, which is diseases

hazard. The obtained by us health level permits to affirm that all junior schoolchildren, especially girls of nine years old age, have bents to chronic not infectious diseases and endogenous factors. Energy efficiency of organism with such level of somatic health is sensitive for diseases, because resistance to risk factors is minimal.

Таблиця 2

Рівень фізичного здоров'я (згідно значення індексів) хлопчиків 2-4 класів

Indicators	Form (age)								
	2 (8 years)			3 (9 years)			4 (10 years)		
	$\bar{x}$	S	points	$\bar{x}$	S	points	$\bar{x}$	S	points
Vital index	50.1	8.7	1	50.6	9.1	2	48.0	8.2	1
Power index, conv.un.	45.6	9.4	1	47.3	11.4	1	50.2	19.4	1
Robinson's index	89.6	12.6	2	96.9	13.1	1	90.7	13.7	1
Weigh-height correlation (WH index)	Norm		0	norm		0	norm		0
Rufiet's index	5.2	3.0	5	5.5	3.7	5	5.4	3,3	5
Total of points	9			9			8		
Evaluation of physical health	middle			middle			middle		

B.Kh. Landa remarks that "4th-5th levels of health belong only to those persons, who regularly practice health related trainings (running as a rule). Safe level of somatic (physical) health, which guarantees absence of diseases, belongs only to persons with high level of functional state. Its reduction is followed by progressing of morbidity and reducing of organism's functional reserves up to dangerous level, bordering with pathology" [7, Pg. 96.]. G.L. Apanasenko calls phenomenon of "safe" health level a "scientific base of primary prophylaxix of chronic, non infectious diseases – preventive rehabilitation (turning individual back in "safe" zone of health). Level of safe of Ukrainian population decreased from 8% in 1985 to 1% in 2000. As a result mortality only from cardio-vascular pathologies increased by 21.2% during 1996 – 2000" [2, Pg. 91.].

Basing on obtained "critical" mark of somatic health level of junior schoolchildren, we determined adaptation abilities of these children in order to determine the reserves of their health, stages of adaptation to environmental conditions. For realization of this aim we used new methodic approach to integral evaluation of junior schoolchildren's adaptation-reserve abilities, which was developed on the base of physiological-hygienic researches by specialists of DU "Institute of hygiene and medical ecology, named after O.M. Marzeyev, NAMS of Ukraine" S.V. Gozak and O.T. Yelizarov, 2012 [4, Pg. 291]. In the base of evaluation of organism's adaptation-reserve abilities there are indices, which indirectly characterize aerobic abilities, regulating mechanisms and metabolism, i.e. those processes, which ensure adaptation process: Robinson's index, index of Rorer and Index of Kerdo. Application of this methodic permits to timely find groups of risk concerning possible disorders of adaptation processes, permits to work out individual and collective programs of improvement of pupils' health reserves and to correct factors of school environment, influencing on this indicator.

As per scale of evaluation of adaptation-reserve abilities of junior schoolchildren we determined some tension of adaptation mechanisms, which correspond to pre-nosological state (see table 3). Functional abilities of organism in state of rest are not reduced, nevertheless, we recommended examination with functional tests with loads, monitoring of adaptation-reserve abilities 2-3 times a year as well as working out of individual and collective program for preservation of health and increasing of its level. Thus, both approaches lead to one: junior schoolchildren are in group of risk, they are balancing on the edge of disease, their adaptation reserves are minimal that requires proper attention to them and their physical fitness.

Researches, fulfilled by S.V. Gozak and O.T. Yelizarova also prove the level of ARA (adaptation reserve abilities) depends on "conditions of organization of physical education at school -10,3 % ($p \leq 0.05$), level and distribution of academic load – 13.6 % ($p \leq 0.05$), quality of physical culture lesson– 15.8 % ($p \leq 0.05$)» [4, Pg. 291].

So, scientists again prove that potential of physical culture influences on health level of population, formation of adaptation reserves of human organism. In case with pupils physical culture lessons are especially important: their correct organization influences on formation of health related technology and creation of individual settings for healthy active future life. As far as the best influence on health strengthening and improvement of organism's adaptation-reserve abilities is rendered by aerobic means, we experimentally implemented Scandinavian walking in physical education of junior schoolchildren.

Interest to this kind of motion functioning recent decade has significantly grown and it is proved by appropriate scientific publications, which elucidate energetic losses during walking with sticks, influence on different organism's

functions and systems, on operation of appropriate muscular groups [1,10-15]. From it we can make conclusion that there is a process of re-understanding and turning to the most effective means – natural locomotion. Modern young generation is more particular, concerning forms and means of physical education, it choose non standard approaches in building of trainings. Scandinavian walking practiced with junior schoolchildren is just such not ordinary mean that permits to involve pupils in motion activity and for teacher to solve health related tasks in educational process.

Table 3

Junior schoolchildren's adaptation-reserve abilities, evaluated by indices

Indicators	Form											
	2 form				3 form				4 form			
	boys (n=31)		girls (n=30)		boys (n=32)		girls (n=26)		boys (n=40)		girls (n=28)	
	result	points	result	points	result	points	result	points	result	points	result	points
Rorer's index	12.3	3	12.4	3	12.7	3	12.5	3	12.8	3	12.1	3
Robinson's index	89.6	1	85.4	1	96.9	1	91.1	1	90.7	1	90.3	1
Kerdo's index	21	1	20	3	20	3	24	1	23	1	21	1
∑ points	5		7		7		5		5		5	
Points	1.67		2.33		2.33		1.67		1.67		1.67	
Evaluative of ARA indicator	middle		middle		middle		middle		middle		middle	

Conclusions:

Thus, one of main tasks of teaching process in educational establishment is strengthening of pupils' health, education of children's culture of health, personality's qualities, which would facilitate health preservation and improvement, formation of healthy life style principles. However, recent years there have been noticed low effectiveness of health related orientation of educational process, which is characterized by increasing of number of children with reduced organism's resistivity, with too early tiredness and vegetative-vascular disorders, i.e. with reduced adaptation-reserve organism's abilities. As a result of our researches it was determined that junior schoolchildren show reduction of organism's functional abilities and regulating mechanisms; there were not found pupils with high level of health and ARA that requires special attention to pupils and correcting of quality and conditions of organization of physical education at school. For increasing of effectiveness of junior schoolchildren's physical education we offered program of trainings of Scandinavian walking as commonly accessible, highly effective, emotional system of targeted trainings, which permits to upgrade traditional methodic, programs, to increase schoolchildren's interest to regular motion functioning, which would facilitate solution of health related tasks of educational process.

The prospects of further researches will be oriented on implementation of recreational-health related program of Scandinavian walking in physical education process and evaluation of its effectiveness.

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Cite this article as: Andrieieva O.V., Sainchuk O.M. Approach to evaluating health level and adaptation possibilities in schoolchildren. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 3-8. doi:10.6084/m9.figshare.923507

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

Received: 11.12.2013
Published: 28.12.2013

MASTERING THE TECHNIQUE OF TAKING A REBOUND ON OPPONENT'S SHIELD BY BASKETBALL PLAYERS OF INITIAL LEVEL OF SPECIALIZATION

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Annotation. *Purpose:* to prove the effectiveness of the use of training program aimed at improving the skill execution of tackling the ball at the opponent's shield attack in basketball specialized base preparation phase. *Material:* 30 sportsmen of 13-14 years old took part in the test. They were mostly from CYSS (Children and Youth Sports School). *Results:* low level of efficiency in the fight for the ball bounces in the attack was appeared to take place both in competitive activity in basketball and in performing the control exercises aimed to master the technique of tackling the ball. It was shown that the most important about the mastering of the technique of a rebound taking in the attack is motion. It was found that the use of simple technical actions as for the selection of the ball led to significant success in three control exercises approximately on 52.7% by improving the quality (accuracy, speed) of performing the technique mentioned in the training program. Moreover the factor of effectiveness of the fight for a ball increased on 28.9% (P <0, 05) in competitive activity. *Conclusions:* to recommend the use of exercises which include four possibilities of moving after being blocked by the opponent: direct output, fainted moving with further escape, turn, one step back. This is needed in order to improve the technique of taking a rebound on the shield of the opponent and also to accelerate the formation of skills formation in competitive activity.
Key words: basketball, tackling, selection, attack, technique, effectiveness.

Introduction

Analyzing structure of competition functioning in team kinds of sports, specialists note that to the largest extent sportsmanship is influenced by technical tactic fitness of players and team [2, 5, 8, 14, 21, 25]. Researches showed that technical-tactic fitness evolves to the largest extent in the process of team kinds of sports' development and in this direction constant searching of new technical elements and actions, tactical variants, schemas and models of game is carrying out. With it successfulness of sportsmen's training in modern conditions depends on effectiveness of organization, management and control, rational application of modern technologies in training process, consideration of individual, age and morphological features of organism [3, 6, 7].

One of main tasks of basketball players' training process is mastering of rational technique and education of ability to apply it for reaching of high and stable results. Improvement of technique shall be accentuated on mastering of muscular sense, visual perception, sensing of space and other special qualities, which are manifested in specialized motion responses (sense of distance, sense of adversary, moment for beginning of actions and etc.). Thus, training methodic for improvement of basketball techniques shall be oriented on rising of quality of specific movements and reliability of control over them.

Regarding problem of training process's optimization in system of junior sportsmen's preparation it is necessary to state the fact that the most negative characteristics of junior basketball are: constraint in manipulation with ball; insufficient mobility of players' technique; "narrowing" of actions with fulfilling technical elements from static positions, untimely execution of main techniques, insufficient power and speed power fitness [1, 26]. Arsenal of sportsmen's techniques is not wide, but at the same time at their age they should master maximal quantity of techniques; with it age of 13-15 years old is the most favorable for formation of technical sportsmanship of junior sportsmen [8, 9, 15]. At stages of initial and profound specialization sportsmen shall gradually master bio-mechanical structure of motion skills in the mode, which is required in competition functioning that is ensured by most rational combination and targeted variation of different means, oriented on improvement of sport-technical fitness of junior sportsmen. That is why content of training shall ensure prevailing orientation on effectiveness of basic training and create favorable pre-conditions for achievement of high results [12, 16].

Perfection of sportsmanship and achievement of sports results are determined to large extent by systemic and effective using of technical-tactic actions, especially in attack. One of main components of game in modern basketball is fight for catching of dapped ball. As per statistic, in average for one game about 50% of all throws result in daps from backboard or basket. Therefore, successful mastering of catching ball dapped from own backboard, increases team's chances for favorable results of game [13]. However, effectiveness of this indicator in defense and in attack is different: defenders catch 70-75% of all dapped balls; in attack the best teams catch 25-30% of balls. Concerning adult players, this game component is based, mainly, on experience and intuition; in junior teams low effectiveness, probably, is connected with absence of appropriate fitness [10, 11]. Coaches pay much time to training of players to catching of ball, dapped from own backboard, to blocking of adversary and so on, but they rely on personal initiative of a player and his luck in catching of dapped ball in attack. Existing programs of JSS envisage starting of training of ball's catching in attack only from 4th year of training, since 15-16 years old age. Special observations and researches showed that it is possible to start stage-by stage mastering of specific techniques much earlier [13, 15].

doi: 10.6084/m9.figshare.923508

Modern special literature has accumulated a lot of data about different sides of effective fulfillment of different game techniques [3, 5, 20, 23, 24]. Nevertheless, studying of structural components, included in conception of effectiveness of ball's catch in attack, methodic of training and improvement have not been elucidated sufficiently in methodic and scientific literature. Practical insufficiency of this question's studying can not but initiate further researches, which would be carried out in compliance with plan of scientific and research works of Tavricheskiy national university, named after V.I. Vernadskiy.

Purpose, tasks of the work, material and methods

The purpose of the research is increasing of sportsmanship in ball's catch in attack at the stage of basketball players' specialized basic training.

The following *tasks* were to be solved in the research:

1. Using the data of special literature to select methodic techniques and work out training program, oriented on mastering of rational technique of catching ball, dapped from adversary's backboard.

2. To ground effectiveness of training program, oriented on rising of effectiveness of catching of ball, dapped from adversary's backboard at the stage of basketball players' specialized basic training.

Methods and organization of the research. For solution of our tasks we used the following methods of research: analysis and generalization of literature sources; pedagogic observation; pedagogic experiment; control testing; methods of mathematical statistic.

In experiment 30 basketball players of 13-14 years old age took part. All they were pupils of JSS and trained at stage of specialized basic training. The research envisaged several interconnected stages of our work. At first stage we analyzed literature sources in order to work out training program; researches of the second stage included carrying out pedagogic experiment as well as analysis of competition functioning with registration of basketball players' actions in fight for ball dapped from ring before and after research. Training process in control and experimental groups was conducted in compliance with JSS program and included practical trainings, characteristic for the stage of specialized basic preparation.

Program of experiment envisaged four methods of player's travelling in adversaries block: direct releasing, dummy, followed by releasing from block, turn and step back (see fig.1).

Evaluation criteria for program's effectiveness were indicators of competition functioning with registration of daps' quantity and calculation of effectiveness coefficient for player's actions in fight for ball, dapped in attack [17], as well as level of effectiveness of ball catch in attack in three exercises: catch in attack "one against two"; soft throw to backboard; ball catches with circular changes of functions [4].

Process of formation of specific fighting for dapped ball skills in attack shall be oriented, mainly, on mastering of techniques and variations of theses skills because basketball players' motion skills are realized continuously in varying game situations, resulted in appropriate changes of motion tasks. Successful mastering of catching of ball dapped from adversary's backboard increases team's potential chances on favorable result of game. Catching of ball after not accurate throws happens oftener than in any other way. With catching of ball, dapped from basket, players use techniques, which include a number of indicators, not dependent on each other. With finishing throw basketball player shall pay attention to the following: choice of place; calculation; quickness of jump; keeping arms upward; maximal efforts; work of hands and fingers; dummies; constant readiness [13, 18, 22]. As far as success of ball catch depends on chosen inside position in relation to adversary and following the ball, while the most frequent defense tactic is blocking of forward [4, 19], then key to ball catch in attack is movement. If a player is blocked, it is necessary to use any effort to release from this block. That is why this phase shall be paid as much attention as possible. In experiment, for formation of motion skills to fulfill technical-tactic actions for ball's catching at attack of backboard, we used the following conditions: relatively standard, unchanged (formation of correct skills and training of them up to automatic level). Main methodic requirement was execution as much techniques and their combinations as possible, increasing their quickness and accuracy as well as fulfillment of a little changeable techniques, oriented on mastering of choosing of actions, on acquiring of initial skills of game functioning. We selected main training means, considering four methods of player's movement in block: direct releasing, dummy and releasing, turn, step back [4]. In our research we put the main question: if program of training sportsmanship oriented on catching ball in attacking of adversary's backboard by basketball players at the stage of specialized basic training influences positively. In order to prove validity of the chosen approach we carried out comparison of effectiveness of fight for dapped ball in attacks (n=5) before and after experiment (n =5); also we determined rating of success in control exercises on ball's catching in attacks. The obtained data showed that training program, oriented on mastering of technique of ball's catching at adversary's backboard, facilitated increasing of quantity of ball's catching in experimental group; coefficient of effectiveness of players' actions directed on catching of ball, dapped from ring, increased by 28.9% ($P<0.05$). Increasing of basketball players' effectiveness happened against the background of improvement of skills of ball's catching in block: in exercises 1 (catching in attack "one against two" – by 77% ($P<0.001$); in exercise 2 (soft throw in backboard) – by 50% ($P<0.01$); and in exercise 3 (ball's catching with circular change of functions) – by 31% ($P<0.01$), changes in control group were much less expressive (see fig.2).

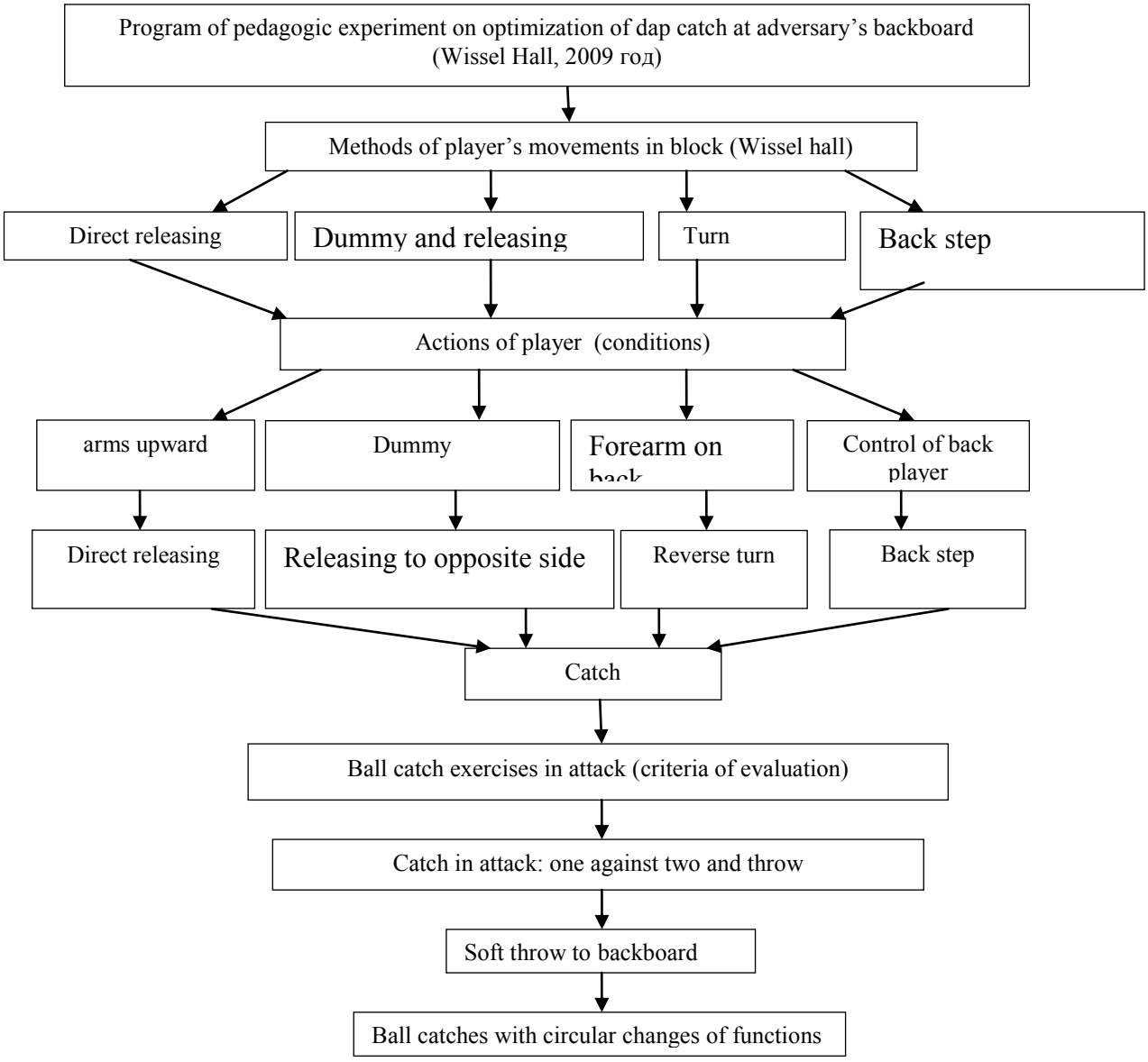

Fig.1. Program dap catch optimization at adversary's backboard at stage of basketball players' specialized basic training

Thus, application of our training program ensured intensification of basketball players' actions, optimization of scope of exercises in training; unity of technical and tactic fitness of players with accent on mastering of individual techniques (choosing of position, application of dummies for releasing from "care" of adversary's backs, timely approaching backboard). Application of not difficult for fulfillment of ball's catching in attack by basketball players, including four methods of blocked players movement, facilitated improvement of accuracy and quickness of the executed technique as well as formation of skill of its fulfillment in game conditions.

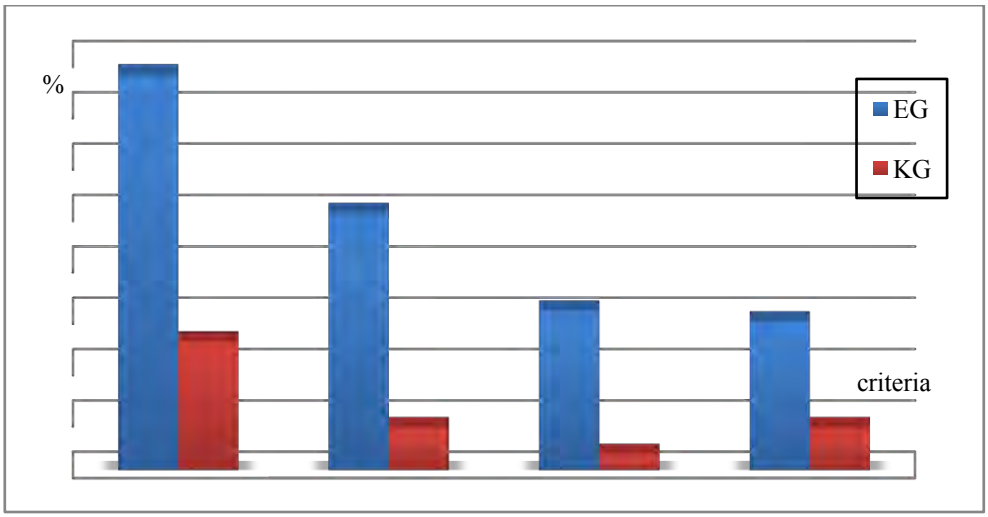

Fig.2. Comparative characteristics of change of effectiveness indicators of ball's catching in attack, fulfilled by experimental group (EG) basketball players and control (KG) group players after experiment:

% - percentage of change of effectiveness indicators of ball's catching in attack; criteria – evaluation criteria for effectiveness of dap catching. 1– exercise for ball's catching in attack "one against two" and throw; 2 –exercise "soft throw in backboard"; 3 – exercise "circular change of functions'; 4 –coefficient of effectiveness of ball's catching in attack.

Conclusions:

1. Analysis of scientific-methodic literature witnesses about insufficient quantity, variants and intensity of technical tactic techniques, fulfilled by junior basketball players in course of trainings that result in weak technical fitness of sportsmen.

2. Mastering of catching of dapped ball at adversary's backboard it is purposeful to fulfill with the help of special exercises, widening arsenal of individual technical abilities to be applied in the following conditions: relatively standard, unchanged, which ensure formation of skills and training of them up to automatic level and a little changeable ones, oriented on mastering of choice of action and initial game skills.

3. For three months of special training, based on application of training means, considering four methods of blocked players' movement (direct releasing, dummy and releasing, turn, back step), oriented on optimization of ball's catching in attack, effectiveness coefficient of basketball players in fight for dapped from ring ball in attack increased by 28. 9% (P <0. 05), with it increasing of effectiveness happened against the background of skills of ball's catching by blocked player: in exercise 1 (catching in attack "one against two and throw") – by 77%, in exercise 2 (soft throw in backboard) – by 50% (P<0. 01); and in exercise 3 (ball's catching with circular change of functions) – by 31% (P <0. 01), changes in control group were much less expressive.

4. Application of not difficult for fulfillment of ball's catching in attack by basketball players, including four methods of blocked players movement, facilitated improvement of accuracy and quickness of the executed technique as well as formation of skill of its fulfillment in game conditions.

5. The offered by us program for optimization of catching of dapped from adversary's backboard ball can be used by coaches for implementation into training process at stage of preliminary basic training.

The further researches are implied to be conducted in direction of searching of new reserves for increasing of effectiveness of training and competition functioning of junior basketball players. In our opinion, in the base of this process there is working out of methodic techniques, ensuring intensification and higher effectiveness of training process.

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Cite this article as: Bukova L.M., Gordienko I.A., Krovyakov V.F., Mironenko Y. I. Mastering the technique of taking a rebound on opponent's shield by basketball players of initial level of specialization. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 9-14. doi:10.6084/m9.figshare.923508

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

Received: 17.01.2014
Published: 28.12.2013

PROSPECTS OF FORMING HEALTH-SAVING EDUCATIONAL ENVIRONMENT OF ELEMENTARY SCHOOL

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Annotation. *Purpose*: to present the results of a special study group of primary school teachers of Poltava region. To substantiate the conditions of formation of health saving educational field of elementary school. *Material*: the study involved 78 teachers from 14 schools of the Poltava region. *Results*: is investigated the effect of the educational field on the health of primary school children, are highlighted the essential characteristics of health saving educational field. On the basis of analysis of the data by the research team are considered: the components of the field which affect on the health of students, the development trends of health saving educational field of elementary school. *Conclusions*: the prospects for development of health saving educational field should be a transformation class-lesson system, the creation of multifunctional educational field, the use of health saving learning technologies, change of the evaluation system of personal students` achievements, the use of integrated assessment of the junior schoolboy emotional sphere, the development of new forms of cooperation between the teacher and the students.
Key words: educational, environment, health saving, safe, emotional, well-being.

Introduction

Among the key areas of the national education policy defined by the National Strategy of Education Development in Ukraine until 2021, there is formation of the health saving environment. The large-scale international projects and programs such as InnoSchool (http://innoschool.tkk.fi/), TALIS (Teaching and Learning International Survey) (http://www.oecd.org/edu/talis), «Child-Friendly Schools» (UNICEF) (http://www.unicef.org/education/index_focus_schools.html) etc. are dedicated to search for the best school environment, which a person is needed, healthy, happy and feels protected and secure in. The results of national and international research proved as follows: new pedagogical concepts of the educational milieu are required [3, 10]; schools must act in the interests of children, ensuring pupils' safety and health [1, 9, 13, 15]; teachers have got to be ready to design and implement new models of environments [4, 8, 16].

Scientific researches by O. Ye. Antonova, V. F. Bazarny, M. V. Hrynyova, V. M. Yefimova, N. D. Karapuzova and others have been dedicated to formation of the health saving educational milieu. I. O. Bayeva, D. V. Ivanov, V. I. Panov, Ye. V. Rybak, S. Sergeyev, V. I. Slobodchikov, A. N. Tubelsky have been engaged in modeling of a health friendly educational milieu. Researchers have studied issue of creating the conditions [13], under which an educational milieu would be psychologically safe, analyzed the role of social factors in the personality formation process [12], explored the influence of the educational milieu on the formation of children's emotional resilience of, and substantiated the health saving activities in schools [1, 9].

The younger generation health issues mean solving problems of arranging child's living space. The school's role consists in optimal organization of the educational process, creation of the development conditions meeting the children's needs.

In view of the above, it is necessary to solve the contradictions between: ever-increasing demands of society to ensure the children's health maintenance conditions during their learning and the teachers' reluctance to modeling the health saving educational milieu; a large number of studies on the pupil health and lack of scientific and methodological support of primary school teachers.

The study has been carried out in the framework of research "Models of Interrelation between Research and Educational Practices in the Conditions of Transformation of Ukrainian Society" by M. V. Ostrogradsky Poltava Regional In-Service Teacher Training Institute (National Registration Number: 0110U004628).

Aim, task, material and methods.

Aim of the research is to summarize the experience of the task group of primary school teachers in Poltava region on impact of educational milieu on the health of primary school children. The outlined goal has predetermined solving problems in the relationship between theory and educational practice. Theoretically, substantiating the conditions of formation of the health saving educational milieu of elementary school; practically, analyzing the operating results of the task group and specifying the development prospects of the primary school educational milieu.

Results.

The pupils' health maintenance problem impelled Poltava region teachers to search for paths of creating the health saving educational milieu in primary schools. The task group of the primary school teachers operated on *Primary School Educational Milieu: Problems and Prospects for Development* at M. V. Ostrogradsky Poltava Regional In-Service Teacher Training Institute (supervisor – T. V. Vodolazska). The objectives to be achieved were reviewing the conditions of formation and features of functioning an educational milieu in pedagogical theory and practice, substantiating the educational milieu model appropriate to the needs of children; developing a performance "scorecard" of elementary school educational milieu.

doi: 10.6084/m9.figshare.923509

Primary school teachers from 14 secondary schools in Poltava region (total of 78 people) participated in work of the task group. The research was conducted during 2009 to 2012. Research methods: theoretical ones are analysis of scientific psychology-and-pedagogical literature on the matter; empirical ones are survey of teachers, study of school experience, observation.

The findings of the task group were discussed and piloted during district-level and regional seminars, the International Research Conference "Theoretical and Methodological Foundations of Health Saving Educational Milieu of Secondary Schools and Universities" (April 14, 2011, Poltava), Nationwide Research Conference "Psychological and Didactic Principles of Forming The Educational Environment of Educational and Research Activities of Children" (April 24-25, 2012, Kirovohrad), Nationwide Research Conference "Formation and Development of The Professional Competence of Primary School Teachers in The Conditions of Implementing State Standard of Primary Education" (April 24-25, 2013, Kharkiv), were reported in periodicals such as "Postmetodyka", "Imidzh Suchasnoho Pedahoha", "Osvita Poltavshchiny".

A poll of 156 trainees at M. V. Ostrogradsky Poltava Regional In-Service Teacher Training Institute found that 98.6% of respondents defined creating secure and health saving conditions of learning to be the prime objective facing the school. However, only 43.4% of teachers considered themselves prepared to model the educational environment.

Analysis of the poll results (see the table) showed that teachers were aware of the relevance and necessity of forming the health saving educational milieu but did not have the theoretical and methodological basis for the practical implementation of that objective.

Table

Indicators of influence on the process of forming the health saving educational milieu by teachers

Reasons for the teachers' unpreparedness to model the health saving educational milieu of primary school	**Percentage of respondents**
Poor knowledge on modeling the health saving educational milieu of primary school	12.83
Lack of work experience based on the milieu approach	44.88
Lack of initiative and desire to change anything	30.76
Existence of interference from the school administration, representatives of education authorities	11.53

The aforesaid prompted the task group to thoroughly examine the impact of the educational milieu on children's health, search for ways of modeling the health saving educational milieu of elementary school.

The first step was exploration of scientific psycho-pedagogical and methodological literature on the issue, identifying the factors that affect the quality of the educational milieu of primary school.

Analysis of the literature has shown that many scholars (I. Bayeva, D. Ivanov, N. Rassokha, V. Slobodchikov and others) treat safety as the key characteristics of educational school milieu, and a psychologically safe educational milieu as a condition for positive personal growth of its members.

A safe educational milieu of school is where most of the participants have a positive attitude to it, high-level need satisfaction index and that of the protection from psychological abuse. The psychologically safe educational milieu serves as an effective interpersonal interaction that promotes emotional well-being of pupils and teachers, development of the mental health, personal growth, and harmonizing a personality.

The health saving educational milieu is defined by scientists as a set of pedagogical conditions, the physiological components promoting the implementation of adaptive abilities of pupils, and the factors affecting the maintenance and development of their health (http://nauka-pedagogika.com).

According to V. M. Yefimova, the health saving educational milieu is a pupil's environment, existing or virtual, which there are interconnected educational, social, cultural, psychological, hygienic conditions conducive to physical and personal learners' development and corresponding the pupils' age, sex, psychophysiological features, patterns of growth and development of the children in (http://archive.nbuv.gov.ua/portal/soc_gum/znpbdpu/Ped/2011_2/Efimo.pdf).

Resorting to the milieu approach theory [12] made it possible to specify the main provisions: achievement of personhood is realized due to the influence of the environment that a person is in; the environment is by a teacher's hands converts into a means of managing the achievement of personhood; the environment is seen as a set of dynamic and static components.

If we determine child's health as a pedagogical aim, and educational environment as a means to achieve this aim, we can identify the system of the actions aimed at building the health saving educational milieu with the environment.

State of comfort, safety, security, positive world perception and interest is what is indispensable to the effective educational activities in elementary school. A child who is in uncomfortable condition for some reason or another can not fully engage in the learning process, it means that schooling does not reach its goal.

Among the factors affecting the child's health, the task group has distinguished the following:

- discrepancy between training and assessment methods and techniques and the pupils' age peculiarities;
- intensifying the training process, which is reflected in the increase of educational material;
- low physical activity, predominant "sitting-listening pedagogy" leading a child to physical immaturity and spiritual nonage;

- authoritarian style of pedagogy accounting for fatigue and neuroticism;
- low level of teachers' knowledge on developmental physiology, psychology, pupils' healthcare.

A modern primary school teacher builds up the educational process taking into account not only the age peculiarities but also specific features of an individual body development, physiological and psychical processes, extensively using any information on maintenance and promotion of the health. That's what encouraged teachers from Karlivka district, Poltava region, to study the skill formation of writing in a single-line copybook. The classroom experience has shown that writing in a single-line copybook not only promotes calligraphy and writing literacy in primary school children, but also provides the health saving effect: maintaining optimal functional condition of the body, stable level of child's work capacity [11]. A question to be resolved was what should be the primary school children tools to be able to write during 4 to 5 lessons. According to the teachers' observations, using a ballpoint pen causes unpleasant tactile sensation, fast fatigue and neurosis of the pupils.

Survey of the teachers has showed the primary school reform taking place now in Ukraine should be attributed primarily to the transformation of class lesson system, of "sitting and listening pedagogy", forms of teacher-pupil interaction, changes in the personal achievements evaluation system. The numerous data suggest the educational milieu exactly is now the source of a large number of "didactogen" factors that contribute to deviations in the children's health and development. According to the Russian scientist V. Bazarny, these include: closed rooms and limited spaces, scarcity in natural sensory stimuli, growing amount of abstract information, and more.

Learning in elementary school should not be limited to the walls of the classroom. In order to "balance" different ways of opening up and interpretation of the life lessons are held in the workshops, studios, laboratories, in the open [5, p.29]. As proved by the scientists, landscape of the area that a child lives in, architecture and design of the buildings, specificity of the environment organization significantly influences the child's formation [4, p.56].

The schools that had chosen the model of the educational milieu according to V. Bazarny enabled a free movement of the children as lack of physical activity causes morbidity of the pupils. Fundamental changes related to the school furniture. Stand-up desks came to be in the classrooms, which allowed the pupils to work in various poses, with various levels of physical activity. The teachers noted the opportunity to change the posture several times for the lesson reduced fatigue and helped hyperactive children. Under these work conditions, the children could easier concentrate, showed the higher level of performance, self-control and discipline. In order to maintain and strengthen the health of children in schools, outdoor lessons have been introduced [7, p.46].

Studying the foreign experience [14] urged the teachers to examine emotional well-being of the primary school children. The teachers' work was aimed at developing an effective model of the educational environment, which is meant to develop forming the primary school children's emotional well-being [6, p. 36]. Emotional and personal characteristics of the educational process agents were taken as criteria of the educational milieu quality: self-actualization, an individual's orientation in communication, index of centration on oneself and others, level of emotional tension.

The level of emotional well-being of our pupils is often much lower than their physical health, and the evaluation process is due in no small part to it. Given the negative influence of the evaluation on the primary school children's health, we need "technology of safe evaluation" [2, p.209].

The emotional well-being of an individual is directly linked to self-evaluation: only with self-acceptance and positive attitude to themselves, people can experience a state of psychological comfort and confidence. Success in school, at work, in life is more dependent on the subjective view of their capabilities than the actual level of the capability.

The emotional discomfort in the form of feelings of emotional tension, dissatisfaction with oneself, anxiety, and suspense may be a risk factor that disturbs personality development. Therefore, the teachers of Karlivka secondary school No 4 have selected "Schools without Tears" model, where sets for prediction of success and positive attitude to their own experiences have been formed in a child since the first days of the teaching.

Developmental effects of the educational milieu were examined by the teachers from the specialized educational complexes Nos. 10, 26 ("Step by Step"). Particular attention was given to creation of a multipurpose room for primary schoolchildren with a division into independent learning centers, which enables to unite, form interest groups, and satisfy needs for communication.

The experience has shown that the creation of the learning centers in elementary schools can solve the problem of child aggression [3, p.14]. Availability of the centers in elementary school grades, their variability and occupancy promotes rapid child's adaptation to school, serves as a precautionary measure of the child aggression. Educational challenge of emotional relaxation, removal of the emotional tension is solved in the area of physical activity of children, in playing rooms and Research Corners. Children usually sense intuitively where exactly and in what ways they can relieve the internal stress and anger without hurting others, that means where the subject-social environment is organized according to certain rules [5, p.28].

A recreation (relaxation) center helps a child to mentally and physically relieve. This is where children master how to switch to rest. Optimally organized, diverse educational milieu encourages a lively cognitive activity in children, mobilizes the processes of thinking, has a positive influence on the emotional sphere, and provides the health saving effect.

One of the important factors in the development of a healthy child is to provide an essential need for communication based on trust. The research has established that dissatisfaction of the need is one of the reasons of

emotional imbalance, aggressiveness, destructive behavior in children. Psychological conditions for a free communication between a teacher and a child can be created by abolition of the teaching department that is a mandatory attribute of the traditional school. Rejection of teacher's table is an external manifestation of the transition to the collaboration between teacher and pupils who feel equal participants in the learning process in this situation.

It is equally important for the environment to give a sense of stability and security to a child. Certain guaranty to meet a child's need of security is availability of accustomed daily routines in environment, order. If there are no regulations and discipline in a child's environment, it feels vulnerable to the external environment, begins to look for a more stable living area. So some children become uncontrolled, impulsive, hyperactive, embittered, aggressive or anxious. The feeling of security is associated with recurrent events, daily rotation of which results in stability and certainty.

While modeling the educational milieu for primary school children, we can not forget about playing and its therapeutic properties. The main goal of play therapy is to make children aware of interpretation of their personal actions and conflicts through the play situations created. It's impossible to overestimate the importance of play in the emotional development of the younger pupils. However, you ought to teach children not only to feel, but also realize modality and intensity of these feelings. Special classes (sketches, staging, exercises) aimed at developing and correcting various aspects of a child's psyche are helpful in the primary school teachers' work.

Unfortunately, current State Sanitary Regulations and Standards do not allow a teacher to radically modify the educational environment. The class-and-lesson system techniques still prevail in education.

Issue of modeling the educational milieu of primary school must be solved at the national level by reviewing the relevant requirements for school buildings, classrooms, equipment and facilities. There must be up-to-date requirements for equipment of the primary school classrooms that variable furniture, retreat centers, play corners, mini-labs etc. will be provided in.

Conclusions.

School with the health saving educational milieu is an educational institution that provides the balance between adaptive abilities of a child's body and the constantly changing environment. This is the educational system there are methods of psychological, medical and social support for the pupils at each age, continuous diagnostics and health measures for promoting healthy schoolchildren's lifestyles, methods of involving them in the health saving activities, ways of forming the personal health concepts, developing the skills related to self-regulation of emotional states, self-control in stressful situations.

Special requirements are applied to teachers who must be sincere, honest in their dealings with the pupils, have a positive attitude to the children and empathy. In this regard, it becomes important to specially organize training the educators to teach them to model the educational milieu where all participants in the educational process feel protected, have emotional comfort, satisfaction of basic needs, maintain and strengthen their health.

Prospects for follow-up studies are seen by us in the development of scientific and methodological support of preparation of the primary school teachers for modeling the educational milieu, improving the quality of teacher training in the in-service teacher training system.

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Cite this article as: Vodolazska T.V. Prospects of forming health-saving educational environment of elementary school. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2014, vol.2, pp. 15-19. doi:10.6084/m9.figshare.923509

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

Received: 02.12.2013
Published: 28.12.2013

HEALTH AS A VALUE IN THE FORMATION OF STUDENT-CENTERED MOTIVATION OF STUDENTS TO PHYSICAL EDUCATION

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Annotation. *Purpose:* definition of motivational value to the health needs of students, due to the region of residence. *Material*: the study involved 780 students: girls – 522, boys - 258. Motivational needs for personal health were determined by questionnaire. Taken into account location and ethnic features. *Results*: it was proved that the majority of students have a low level of physical health. Defined regulatory role of personal motivation of students in relation to health. She said the motive of the desire to be healthy, uncertainty as to personal health, motivated desire to bad habits. The girls of the main regions of the Crimea was a state of uncertainty to personal health. In the ethnic group of girls - the pursuit of better health. The young men of the Crimean regions and ethnic groups dominant motif found desire for personal health. *Conclusions*: it was determined that the training sessions with the inclusion of elements ethnopedagogical orientation changed motivational needs of young people. Significantly increased motivation need to be healthy, it became less of students with an uncertain attitude towards personal health, decreased motivation to bad habits.

Keywords: students, regions, ethnic groups, physical education, health, motives.

Introduction

In modern physical education of students determination of students' motivational demands is rather important, considering regional, national priorities, specificities of physical loads and kinds of motion functioning. Studying of any functioning (educational or health related) is connected, first of all, with studying of targets and motives, of significance of this functioning for a personality [9].

Real solution of this problem is development of complex approach, which should envisage single requirements in system of comprehensive physical education on the base not only of agreed forms, mean and methods of influence on student's personality but also considering influence of previous regional, ethnic characteristics of residence. Also in the base of personality oriented training in physical education there must be principle of humanitarian direction [7] In order for physical education to become an efficient factor in personality-oriented education it is necessary to form positive motives for systemic trainings of physical exercises, value attitude to health that shall be the basis of youth's life functioning.

It has been proved that great number of modern students, who enter higher educational establishments, have insufficient physical fitness and low level of somatic health as far as insufficient motion functioning negatively influences on most of organism's functions and causes different diseases [2, 13-15].

At the same time, strive for rational foundation of demand in physical trainings, in healthy life style of youth environment points at denying of this principle by most of students. It does not mean that students do not understand theoretical significance of physical culture or do not understand harm of smoking, taking alcohol and drugs. Just it is difficult for them to overcome destructive standards of immobile way of life, which are formed in teen- agrees and young age [8]. In opinion of Ye.P. Ilyin [5 pg. 164] "mechanisms of harmful habits are connected with the fact that addiction to alcohol, smoking and etc. Is realized at cell, bio-chemical level. Habit is not an action but consume: person, for example, addict to smoke not because he (she) wants to have a cigarette in mouth, but because he (she) has a demand in nicotine, dependence on it. These habits show clearly their motivation role. Human actions already are connected not with motivational setting but with motive". It should be noted that in modern systems of students' physical education there exists a firm thesis about application of worked out complexes of exercises in combination with forces of nature and hygienic factors for formation of motion skills, special knowledge, education of physical qualities and comprehensive morphological-functional improvement of organism in compliance with requirements of society. Though it is not sufficient and, as V.N. Irkhin [6] thinks, it is necessary to mark out factors, which facilitate formation of students' positive motives for studying, which could be used in physical education, in understanding of theoretical and practical significance of mastered knowledge that, in its turn, would facilitate strengthening of health.

Student's age is characteristic also by optimal physical and mental abilities. But often, at the same time, there exist "scissors" between these optimums and their actual realization. It is undoubted that rising creativity, mental development, but not always rising physical condition, which are accompanied by development of handsome appearance, have some concealed illusions that these process will be endless, that ahead is still better life and more perfect health. Though non-motivated risk, inability to foresee after effects of own actions, which could sometimes have indignant motive, can cause in the future negative after effects in health [10].

Thus, researches in the field of students' physical education continue to point at deficit of students' motion functioning, owing to which there appear problems with students' health. Authors want to solve this problem with the help of formation of interest and demands in systemic physical trainings, education of healthy life style in favor of student's personality and society. To the largest extent it concerns deported peoples, who inhabit territory of Crimea.

doi: 10.6084/m9.figshare.926506

Researches of N.D. Sultanova, F.A. Chernyshova [11] witness that migration sharpens health problems, create state of discomfort, increased emotional tension. It is characteristic that there are practically no researches, which would elucidate personality-oriented motivation of students in ethnic groups for physical education at HEE as health related mean.

The work has been fulfilled as per plan of SRW of Crimea economical institute of CNEU, named after V. Getman.

Purpose, tasks of the work, material and methods

The purpose of this article is determination of motivational demands for students' health, conditioned by region of residence.

Results of the researches

Motivational demands in personal health were determined by questioning of 1st, 3rd years students, considering place of residence and ethnic characteristics, in compliance with administrative-territorial division of AR Crimea. &80 students took part in the research: 522 girls and 258 – of boys.

Basing on recommendations of V.I. Tropnikov [12], we adapted and worked out methodic for determination of different circumstances, which forced students to mark reasons of own health.

Results of the conducted questioning, which determined students' attitude to own health, permitted to find motives of 1st and 3rd year students' demand in being healthy. Thus, we determined main motives, which characterize students desire to have good health. Importance of these motives is in the fact that main task of physical education is strengthening of youth's health as well as orientation of physical trainings on achievement of appropriate physical standards, which form attitude to health as to value. In this connection, in students' answers we determined the following motives:

Motive for being healthy means, first of all, care of own health, wish to receive high mark of own health from surrounding people, life and habits to be subordinated to support and preservation of health, not to act for harm of health, realize HLS, i.e. to be self-esteemed owing to good health.

Uncertainty in attitude to own health was noticed in uncertain answers, in compromise decisions, in not understanding of health improvement, i.e. demand in being healthy was absent.

Motive of harmful habits is characterized by absence of care of own health, desire to entertain with life, damaging health, by which to do everything, even if it is harmful for health; this motive was not denied; the questioned did not want to follow HLS.

Analysis of girl students' questioning resulted in the fact that the most frequents was uncertainty in attitude to personal health. In 1st, 2nd years' girl students it dominates in the following way accordingly: from little towns of Crimea (47.9%; 44.6%), from Simferopol (43.1%; 46.4%), from countryside (46.0%; 41.3%), girls from Ukraine (45.4%; 37.8%), ethnic group (39.2%; 39.8%).

For 1st, 2nd years' girl students the second by importance was motive of health strengthening. Accordingly: from little towns of Crimea (32.3%;36.4%) from Simferopol (41.2%; 39.3%), from ethnic group (43.4%; 46.1%) and the lowest – girls from countryside (34.3%; 34.7%).

At the same time 1st, 2nd years' girl students manifested demand in harmful habits (sub culture), which distributed in the following sequence: from little towns of Crimea (19.8%; 19.0%), from Simferopol (15.7%; 14.3%), from countryside (18.7%; 24.0%), girls from Ukraine (16.6%; 20.0%), ethnic group (17.4%; 14.1%).

So attitude of 1st, 2nd years' girl students to own health did not become a dominating motive and it witnesses about unsatisfactory knowledge about factors, which form value of health in young age.

1st and 3rd year boy students showed the following attitude to personal health. Dominating motive fro them was demand in good health (self esteem). It was proved in the following way: from little towns of Crimea (45.4%; 41.9%), from Simferopol (47.8%; 49.8), from countryside (40.4%; 43.9%), students from Ukraine (43.1%; 44.4 %), ethnic group (46.4%; 42.3%).

The following was determination of uncertain attitude to own health; it was as follows: from little towns of Crimea (32.0%; 42.6%), from Simferopol (30.7%; 22.4), from countryside (41.1%; 29.3%), students from Ukraine (27.6%; 32.3 %), ethnic group (15.6%; 33.1%).

Motive of harmful habits attracted 1st and 3rd year boy students was as follows: it was as follows: from little towns of Crimea (22.6%; 15.5%), from Simferopol (21.5%; 24.8).), from countryside (18.5%; 26.8%), students from Ukraine (29.3%; 23.3 %), ethnic group (38.0%; 24.6%).

Thus, we determined presence of dominating motives and state concerning personal health of 1st and 3rd year boy students.

In process of analysis of answers we found regularity, which implies the fact that boys and girls have certain demands in personal health. At the same time we observe possibility of negative and even harmful habits among some part of students, especially those, who were uncertain how to preserve and strengthen health. Besides, literature sources permit to affirm that the best mean for formation of positive motivation for health strengthening is physical education means.

Basing on one of main physical education's principles – health related orientation, which ensures orientation of physical exercises on achievement of high level of health – we observed formation of students' motivation to personal health. In this connection at physical education trainings we used pedagogic technology, which had a number of qualification characteristics, determining main components of positive motivation's formation to systematic physical

exercises' practicing. They would have been worked out on the base of implementation of the following: tasks-targets, foundation of educational procedures; special preparation of students and teachers; realization of inter-disciplinary links,; application of sub-system of current and operative monitoring of physical-culture, health related, educational and mental achievements of students as well as by mean of implementation of new pedagogic technologies, built on the base of ethnic pedagogic.

After implementation of those characteristics as well as physical exercises, oriented on health's strengthening, motivation demands in personal health of 1st year girl students noticeably changed in the following way: from little towns of Crimea by 27.4%; from Simferopol by 11.0%; from countryside by 18.7%; girls from Ukraine by 29.7%; ethnic group – by 29.6%.

State of uncertainty in attitude to own health of 1st year girl students reduced as follows: from little towns of Crimea by 19.7%; from Simferopol by 11.0%; from countryside by 18.7%; girls from Ukraine by 20.6%; ethnic group – by 20.2%.

Motivation demands to harmful habits of 1st year girl students reduced as follows: from little towns of Crimea by 9.5%; from Simferopol by 20.9%; from countryside by 34.8%; girls from Ukraine by 24.7%; ethnic group – by 26.7%.

State of uncertainty in attitude to own health of 3rd year girl students reduced as follows: from little towns of Crimea by 14.4%, from Simferopol by 12.7%; from countryside by 21.0%; girls from Ukraine by 19.4%; ethnic group – by 22.2%.

As a result of application of health related means as well as lectures, personal talks we reduced motivation demands to harmful habits of girl students in the following way: from little towns of Crimea by 9.3%; from Simferopol by 7.2%; from countryside by 13.8%; girls from Ukraine by 5.3%; ethnic group – by 6.5%.

Analysis of boys' motivational demands to personal health showed the following improvement: from little towns of Crimea by 22.8%, from Simferopol by 17.2%, from countryside- by 28.8%, students from Ukraine - by 36.6%, ethnic group – by 29.8%.

Results, which characterized state of uncertainty in attitude to own health, also decreased. This reduction was as follows: boys from little towns of Crimea by 13.8%, from Simferopol by 8.7%, from countryside- by 20.6%, students from Ukraine - by 18.8%, ethnic group – by 5.3%. We implemented in educational process methodic, which stipulated orientation of pedagogic technologies on guaranteed achievement of educational targets on formation of individual conception – stimulation of value orientations on preservation and perfection of personal health. For example, after implementation of these pedagogic technologies motivational demand of 1st year boy students reduced as follows: boys from little towns of Crimea by 9.0%, from Simferopol by 6.7%, from countryside- by 8.3%, students from Ukraine - by 17.8%, ethnic group – by 24.5%.

Concerning 3rd year boy students, indicators of desire to be healthy improved in the following way: boys from little towns of Crimea by 24.5%, from Simferopol by 12.2%, from countryside- by17.1%, students from Ukraine - by 22.9%, ethnic group – by 21.4%.

State of uncertainty to own health of 3rd year boy students reduced as follows: boys from little towns of Crimea by 16.7%, from Simferopol by 7.7%, from countryside- by 7.6%, students from Ukraine - by 11.9%, ethnic group – by 12.7%.

At academic classes we offered methodic oriented on rejecting of harmful habits' motive and accepting of motive of health preservation and its existence in system of personal motives. This methodic facilitated decreasing of 3rd year boy students' harmful habits in the following way: boys from little towns of Crimea by 7.8%, from Simferopol and countryside- by 9.5%, students from Ukraine - by 11.0%, ethnic group – by 8.7%.

So results of the research demonstrated that theoretically grounded and practically determined pedagogic conditions facilitated activation of formation of students' personal orientations for own health owing to physical education.

Conclusions:

Thus, organization of educational process on physical training with included methodic techniques, which form motivation demands in students' personal health create conditions for construction of required logical chain through realization of demands in health perfection; through involving of students in active physical exercises' training. Direct pedagogic influence on students creates conditions for positive strive for systemic physical exercises' trainings; for formation of knowledge, skills and desire to use physical culture means and methods for physical and mental perfection, transforming knowledge about motion functioning into motives of functioning, oriented on support of life activity and health.

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Cite this article as: Gruzhevsky V.A. Health as a value in the formation of student-centered motivation of students to physical education. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2014, vol.2, pp. 20-24. doi:10.6084/m9.figshare.926506

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

Received: 13.12.2013
Published: 28.12.2013

THE METHOD OF APPLICATION OF HEALTH SYSTEMS BODYFLEX AND PILATES IN PHYSICAL EDUCATION OF STUDENTS

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Annotation. *Purpose*: to justify the use of a new technique for complex Bodyflex and Pilates using information and communication technologies. *Material*: the study involved 46 students. Conducted teacher testing: lean body forward from a sitting position (flexibility test), shuttle run, standing long jump seats, running 100m, lifting the body from a prone position in the saddle (the number of times for 1 min), flexion-extension in the hands of the emphasis lying, running 2000 and 3000m. *Results*: the effect of the integrated application of this technique to the level of physical fitness of students. A system for applying the Bodyflex Pilates and using information and communication technologies. The system consists of the author's modification Bodyflex and Pilates, and use their mutual coupling copyright information technology. Internet blog created as a social group called "Sport and motivation." In a blog posted motivational pictures, practical tips for healthy and dietetic nutrition, information on healthy lifestyle, music for workouts. The blog highlights some fitness techniques open threads (discussion) for on-line communication between users. A significant increase in the results of educational tests of physical fitness among students. *Conclusions*: the technique of complex applications Bodyflex and Pilates using information and communication technologies has shown a positive effect of complex application of this technique to the level of physical fitness of students.
Keywords: students, preparedness, information, communication, education, culture, health, technology, communication, Bodyflex, Pilates.

Introduction

Recent years many researches have been paying attention to development of students' motion abilities in the process of physical education and to increasing of students' health related trainings' effectiveness [1, 7, 8, 9, 14, 15], as far as nearly 90% of students have deviations from normal state and more than 50% - low level of physical fitness [17, 20, 21, 25, 26, 27]. In opinion of a number of authors [9, 28, 29, 30, 31, 32], most of students have no demand in taking care of own health, they have no wish to practice physical exercises, including sphere of leisure [22, 23, 24, 33]. Students are indifferent to content of compulsory classes in physical education [8, 9].

The problem of students' heals is remaining still more urgent in connection with difficulties of social-economic character [8]. Reduction of students' motion functioning is explained by low level of physical culture knowledge, weal organizational-methodic and material provision of academic process, disadvantages of physical education's organization [1].

In this connection implementation of new methodic of motion abilities' training in students' physical education, with the help of modern informational-communication technologies, is urgent and timely.

The research has been fulfilled in compliance with combined plan of scientific-research works for 2011-2015 as per topic 2.4 "Theoretical-methodic principles of individualization in physical education and sports" (state registration number: 0112U002001) and by scientific work, financed from budget of Ministry of education and science for 2013-2014 "Theoretical-methodic principles of application of information, pedagogic and ,medical-biological technologies for formation of healthy life style" (state registration number 0113U002003).

Purpose, tasks of the work, material and methods

The purpose of the research is to work out methodic of complex application of bodyflex and pilates with the help of informational and communication technologies and to determine influence of complex application of such methodic on students' physical fitness.

The methods of the research: pedagogic testing: forward torso bent from sitting position (test for flexibility, shuttle run, long jump from the spot, 100 meter' run, torso rising from lying position into sitting (quantity of times per 1 minute) pressing ups, 2000/3000 meters' run.

In the research 46 students of Kharkov national pedagogic university, named by G.S. Skovoroda, took part; from them control group included 24 students and experimental group consisted of 22 students.

Results of the research

In organization of physical education classes by authors' methodic with 1-3rd year students of KNPU, named after G.S. Skovoroda, we based on the fact that for ensuring of motion functioning, which would correspond by form and content to health, intellectual and mental characteristics of the mentioned contingent, it was necessary to create conditions for relatively comfort state of supporting motor system, of energy losses at high level, of development of students' physical qualities, functional abilities and creation of Body&Mind integrity atmosphere, atmosphere of self cognition, not standard and not ordinary structure.

doi: 10.6084/m9.figshare.923510

As an experimental program of physical education, we worked out system of bodyflex and pilates application with the help of informational-communication technologies.

This system consists of authors' modification of bodyflex and pilates, their combination and authors' informational technologies purposed for health related fitness.

In this connection with necessity in increasing of students' knowledge of physical culture problems [2, 3, 4, 5, 6, 16, 19] we created internet blog on server "In contact" as a social group, named "Sports and motivation. Nothing personal" (http://vk.com/club13486191), on which we located motivating photos, practical recommendations on correct diets, information about healthy life style, music for trainings; in blog we elucidate some fitness methodic, open topics for on-line discussions. With the help of information-communicational technologies students, as participants of physical education process, can be "experimentalists over themselves" be their determining of dynamic of physical indicators' change, resulted from trainings by offered methodic; on this base students could independently correct development of motion abilities both during academic classes and in independent trainings. The created internet blogs are effective mean for perception of material by students (users), which permit to quickly and with maximal comfort receive required information on physical education and human physical culture, practical skills in independent trainings and correct information about prophylaxis and treatment methods of fitness, to carry out self testing of the mastered material and participate in on-line discussions, devoted to urgent problems of human health. Internet blog is a convenient, effective and reliable in usage and has simple and clear interface.

One of aspects of our internet blog was elucidating of problems, connected with application of modern health related technologies, such as bodyflex and pilates.

As per official version bodyflex was created in 80-s of 20^{th} century by Grir Childers (http://pererojdenie.info/sport/dyxatelnaya-gimnastika, http://lib.rus.ec/b/180845/read). Bodyflex was known even 5000 years ago. Practically all breathing methodic, including bodyflex, are based on Yoga breathing. In yoga there is such concept as "uddiyana-bandha. Word "uddiyana" means in Sanskrit "lifting, flight", the word "bandha" is translated as "lock, blocking", but as a rule, the word "bandha" is not translated in Russian. Uddiyana is a basic technique of ha-tha yoga. Yogis say that fulfillment of uddiyana-bandha correctly and regularly can cure any disease [34].

People have been using breathing exercises since ancient time. In different ages attitude to such exercises changed, but interest to them has never decayed. Specialists from different countries consider breathing gymnastic to be efficient factor, which facilitates health improvement and increasing of human organism' resistance to different diseases.

Oxy-size is a breathing methodic, which has no counter indications. Oxy-size differs from bodyflex by easier breathing technique and simplified exercises. Load varies depending on individual characteristics (http://pererojdenie.info/sport/dyxatelnaya-gimnastika).

Difference of authors' methodic from classic bodyflex and oxy-size implies in the following:

- period of training is 60 minutes, instead 15-20 minutes;
- breathing exercises combine with general physical exercises;
- quantity of exercises is increased from 15 basic exercises to 120 exercises;
- exercises not only facilitate reduction of body mass, but also development of such qualities as strength, flexibility, coordination;
- the authors created separate complexes for men and women;
- exercises are fulfilled not only statically but also dynamically on breathing pause;
- training programs have been developed not only for fulfillment in gym but also for outdoors conditions.

Pilates is a complex of exercises for all body. Based on combination of oriental and western forms of training (yoga, meditation, oriental martial arts, Graeco-Roman wrestling and boxing), which help to develop, first of all, flexibility and mobility. Pilates system regards all body as a unity [24, 33]. It involves in movement absolutely all body. Coordination adds graciousness to movements.

It should be noted that idea of exercises' construction on the base of natural smooth alternating is noticed also in works by Zh.L. Kozina, V.Yu. Kozina [10-13, 16]. The authors offered methodic of gymnastics for pregnant women, newly born and infants as well as for children of age from 1 to 7 years old. For example gymnastic for pregnant is characterized by the following principles:

1. Movements are fulfilled by all body along lines of flux of human energetic field [10, 13, 16]. They are the most rational and energetically saving from the points of view of bio-mechanic and physiology of movement. In every movement all parts of body participate consequently up to finger tips by principle of dynamic wave. Trajectories of movement, with it, are tied to the so-called "lines of flux" or "circle" of human energetic field.

Conception "line flux" was introduced by oriental medicine [13], based on knowledge about energy motion along meridians, which pass both inside human body and out of it, forming the so-called energetic sphere of a man. To say simpler, energetic sphere resembles lines of flux of magnetic field, which are located in circular form around magnet and pass through poles inside magnet.

All physiological processes in organism also go in circular way: feedback in central nervous system (CNS), reflex arch and reflex ring, big and little circles of blood circulation and so on. Besides, vio mechanical motions also go mainly in circular way by main planes (horizontal, vertical sagittal) [13].

Highly coordinated movements of sportsmen also are circular in their basis. Similar to sportsmen's movements, giving birth process shall be coordinated on all levels: molecular, bio-mechanical, physiological. That is

why circular movements, passing through "main planes" of human body, are the basis of our method. Such form of movements is the most rational bio-mechanically and energetically and causes minimum of tiredness [13, 16].

2. Waving backbone's movements prevail in our gymnastic and improve blood circulation, influence on organism as a system; they are similar to waving movements of smooth muscles and body movements during strains.

3. Our gymnastic is constructed as a dance, in which one movement gradually comes from the previous that develops saving character and plasticity of movements and is required for natural giving birth.

4. To every movement of complex a line of verse about nature corresponds. It is directed on activation of "cellar memory" about harmonious processes and normal deliveries, as far as in nature the process of delivery has been "trained" excellently for million years of evolution.

The offered in our research bodyflex and pilates methodic is a continuation and expansion of pilates system, a supplement of system of Zh.L. Kozina et al. [10-13, 16].

As a result of application of health related pilates's and bodyflex's system in authors' modification in students' physical education during 2 semesters we observed confident increasing of pedagogic tests' results (for physical fitness) of experimental group's students, which was trained by our methodic (see fig. 1, 2).

Confident changes of physical fitness indicators were registered in tests "long jump from the spot" (1.85±0.27m before experiment and 2.05±0.19 m after experiment (t=3.59, p<0.001) for boys and 1.65±0.20 m before experiment and 1.82±0.14 m after experiment (t=9.75, p<0.001) for girls (see fig. 1, 2) while in control group changes of such tests' indicators were not confident (p>0.05) (fig. 1, 2). Besides, we obtained confident changes of results in test "Pressing ups, quantity of times" in experimental groups, both of boys and girls (35.28±6.32 times before experiment and 41.00±5.1 times after experiment (t=3.1, p<0.001) for boys and 15.23±7.57times before experiment and 21.00±5.90 times after experiment (t=2.90, p<0.05) for girls) that convincingly shows purposefulness of bodyflex and pilates in authors' modification application in students' physical education. In control groups such changes were not confident (p>0.05) and in some cases have trend to worsening among girls.

The same results were received in test "rising from lying position into sitting, q-ty of times during q minute": in experimental group of boys results increased from 37.6±7.34 times to 49.8±6.16times (t=4.87, p<0.001) (see fig.1) while in control group such changes were not confident (see fig.1).

In girls' group, in results of this text there were also confident changes: from 32.5±8.62 times to 42.25±5.21 times (t=4.69, p<0.001); in control group such changes were not confident (p>0.05) (see fig.2).

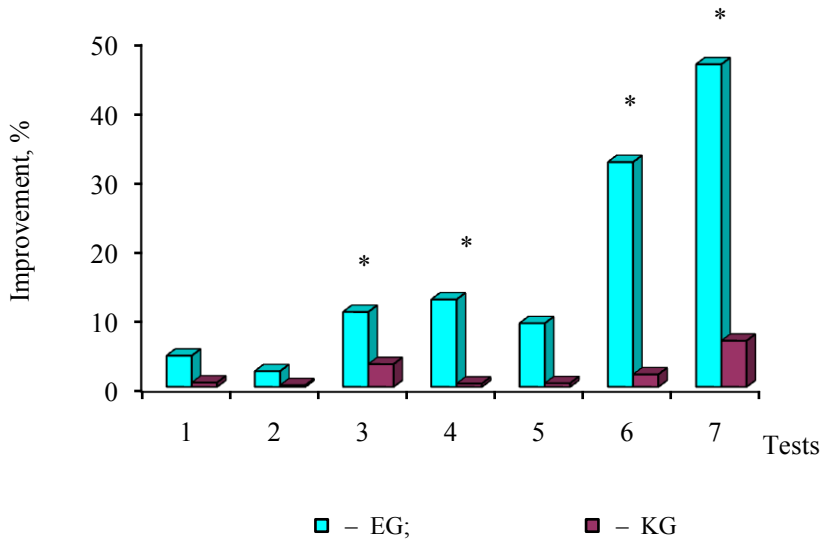

Fig.1. Change of physical fitness of control group students (n=24) and experimental group students (n=22) before and after experiment:

1 –100 meters' run, sec;
2 –2000 meters' run, min;
3 – Long jump from the spot, m;
4 – Pressing ups, q-ty of times;
5 – Shuttle run, sec;
6 – Rising of torso from lying into sitting position, q-ty of times for 1 minute;
7 – Test for backbone flexibility, cm;
* – differences are confident with p<0.05;
EG – experimental group;
KG – control group.

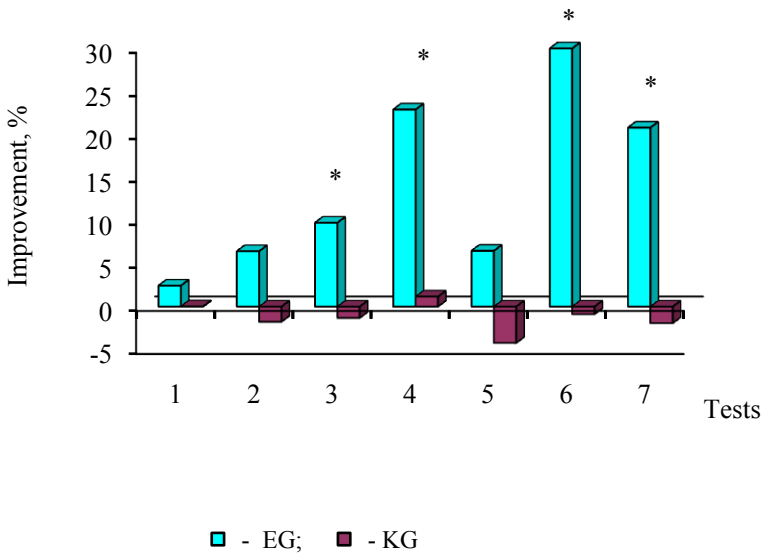

Fig.2. Change of physical fitness of control group girl students (n=24) and experimental group students (n=22) before and after experiment:

1 –100 meters' run, sec;
2 –2000 meters' run, min;
3 – Long jump from the spot, m;
4 – Pressing ups, q-ty of times;
5 – Shuttle run, sec;
6 – Rising of torso from lying into sitting position, q-ty of times for 1 minute;
7 – Test for backbone flexibility, cm;
* – differences are confident with $p<0.05$;
EG – experimental group;
KG – control group.

It should be noted that test "rising of torso from lying position into sitting, q-ty of times for 1 minutes" shows strength of abdomen muscles, i.e. the muscles, to development of which pilates system is oriented and that is why confident changes in results of this test, registered in experimental group, witness about purposefulness of this methodic for strengthening of abdomen muscles.

The described above tests show mainly strength of girdle muscles, abdomen muscles and speed-power abilities, which were expressed in increasing of results in tests "long jump from the spot". It should be noted that there was noticed a trend to results' increasing in 100 meters' run, registered in experimental group of boys, though changes were not confident ($p>0.05$). We think that with combination of our methodic with running exercises, positive results would be more expressive.

Positive influence of bodyflex and pilates systems are witnessed also by confident increasing of backbone flexibility's indicators: in boys' experimental group from 10.00±2.13 cm to14.65±2.25 cm ($t=2.78$, $p<0.05$) (fig.1) and from 14.00±4,23 cm to16.92±3.68 cm ($t=2.50$, $p<0.05$) in girls' experimental group (see fig.2). In control groups such changes were not confident ($p>0.05$) (see fig. 1, 2).

After experiment control and experimental groups, which did not differ confidently before experiment ($p>0.05$) became confidently different after experiment ($t=2.99$, $p<0.05$) (see fig.2).

Thus, application of our system of bodyflex and pilates health related technologies facilitates increasing of power and speed-power fitness indicators as well indicators of flexibility that is an important aspect of students' physical education.

Conclusions:

1. We have developed system of application of bodyflex and pilates methodic with the help of information-communicational technologies. The system consists of authors' modification of bodyflex and pilates, thir combination and authors' information technologies. We have created internet blog on server "In contact" in the form of social group, named "Sports and motivation", in which we located motivating photos, practical recommendations on diets, information on healthy life style, music for training; in blog some fitness methodic are elucidated, on-line discussions are open.

2. We have determined that as a result of application of health related pilates and bodyflex systems in authors' modification in students' physical education during 2 semesters we registered confident improvement of pedagogic tests results for experimental group students' physical fitness. In control groups such changes were not confident and in some cases (in girls' group) have trend to worsening.

In the future we plan to improve health related technologies' system oriented on development of students' motion abilities.

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Cite this article as: Ilnitskaya A.S. Kozina Zh.L., Korobejnik V.A., Ilnickiy S.V., Cieślicka Mirosława, Stankiewicz Błażej, Pilewska Wiesława. The method of application of health systems Bodyflex and Pilates in physical education of students. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 25-32. doi:10.6084/m9.figshare.923510

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

Received: 28.12.2013
Published: 28.12.2013

INDIVIDUALIZATION IN SWIMMING AND A WAY OF PREPARATION FOR OLYMPIC GAMES

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Annotation. *Purpose:* to analyze the high-end training swimmers who specialize in complex navigation. *Material*: Ukraine national team members from different years of training, swimmers high class of 50 people. A review of questionnaires and coaches of the national team of Ukraine to the XXVIII Olympic Games in Athens. *Results* found that athletes training and competitive activities differ in structure and content compared to previous preparation for the Olympic Games. In the 2004 Olympic champion set, the largest amount of work is 2520 km with the largest number of events in that year. It is indicated that the athlete in the first 4 years of preparation for his first Olympics gradually increasing annual volume and intensity of training loads. Over the next 4 years - the number of competitions, including commercial. An important factor in this stage is moral and strong-willed and psychological preparation. *Conclusions*: preparing athletes for major competitions at the stage of conservation achievements is narrowly focused specialized nature, depending on the age of the athlete, his specialization, gender, duration of phase conservation achievements.
Key words: training, swimmers, national team, Olympic Games.

Introduction

Success in sportsmen's training in modern conditions depends on effectiveness of methods of organization and control, rational application of modern technologies in training process, on consideration of individual, age and morphological-functional characteristics of organism.

Methodology of researches was based on studying of individual peculiarities of special physical fitness, general scope of load in kilometers per year during Olympic cycle of training, on intensity in percentage correlation of sportsmen-swimmers, on the base of questioning and CV data. As per opinion of advanced specialists in the field of theory and methodic of Olympic sportsmen's trainings [9,10,13,14] essential is not only difference in system of sportsmen's training at different stages of many years perfection, stage that ensures reaching higher level of achievements and stage, which ensures long term maintenance of sportsmanship, but also in system of sportsman's training in different Olympic cycles.

Thus, if content of Olympic training cycle at stage of maximal realization of individual abilities is oriented on creation of conditions for achievement of best sport results with the help of means and methods, stimulating adaptation processes, while planning and total training work scopes have reached their maximum, followed by increasing of competition practice, volume of special tactic, mental and integral preparation, then content of Olympic cycle at stage of maintenance of achievements is characterized only by individual approach.

Inevitable reduction of organism's functional and adaptation potentials to large extent was conditioned by high level of load at previous stage and often it does not only prohibit increasing of load but also hinders maintenance of results at achieved level. It requires to search individual reserves of sportsmanship's growing, of increasing qualitative characteristics of training process, using of non standard means of stimulation of workability and motion effectiveness and so on [1,3]. Besides, main characteristic of training process's construction in Olympic cycle is that structure and quantitative parameters of training and competition loads, their correlation, change of character, means and methods of training significantly differ not only in Olympic cycle, as in separate, holistic formation, but also in separate years of four years' training process [9,10,13]. The character of these distinctions to large extent is determined by knowledge of individual features of sportsmen, degree of exhaustion of their adaptation resources and about presence of reserves.

Sports practice shows that a lot of talented athletes left sports without complete opening their abilities because they were trained in standard way, without consideration properly their individual potentials, functional reserves, adaptation abilities. In cases, when specialists realized strictly individual program, sportsmen achieved as a rule outstanding and stable results [7].

Purpose, tasks of the work, material and methods

The purpose of the research is improvement of training of highly qualified swimmers in annual periods of four years Olympic cycle, considering structure and content of training process as well as individual features and reserve abilities of every sportsman. Also we strived to determine characteristic specificities of many years training, which permit for sportsmen to demonstrate high sport results for long period of time.

Organization and methods of the research: analysis of special literature, analysis of competitions' records, records of Ukrainian coaches, analysis of diaries and registers of training work, questioning of swimmers of Ukrainian combined team and reserve of Ukrainian combined team, sociological research, statistical processing of data.

Results of the research

In the course of the research we received the following results: for all contingent of the tested) swimmers of combined team) training and competition functioning differ by structure and content of swimmers' training for their second and next Olympic games, depending on sex, specialization, age, period of maintaining of achievements. If young sportsman, training for his first Olympics gradually increases annual scope and intensity of loads, the, training

doi: 10.6084/m9.figshare.923511

for second or third Games he needs in changing of structure of training and competition functioning, in increasing of quantity of competitions, including commercial, in which a sportsman receives financial award for prize places from competitions' sponsors that is one of important factors in sportsman's moral-will and mental preparation.

Studying records and coaches questionings we analyzed process of Ukrainian combined team's training for 28th Olympic games in Athens. We compared data of targeted complex training program (see table 1) with data of training of Svitlana Kopchikova (see table 2) and Yana Klochkova (see table 3), who specialize in distance of 200 meters, complex swimming.

Table 1

Total scope and intensity in % from "max" of targeted complex program of Ukrainian combined swimming team's training for 28th Olympic games of 2004

Total scope per year, km	2500 km
1 intensity zone, 40 % від max	35 % -875 km
2 intensity zone, 70 % від max	30 % - 750 km
3 intensity zone, 85 % від max	25 % - 625 km
4 intensity zone, 95 % від max	5% - 125 km
5 intensity zone, 100 % від max	5 % - 125 km

Table 2

Total scope and intensity in % from "max" of S. Kopchikova

Indicators	1980-1981	1981-1982	1982-1983	1983-1984
Total scope per year, km	1689.9	1770.2	1733.2	1980
1 intensity zone,	245.6	108.0	198.8	190.5
2 intensity zone,	816.0	623.1	778.3	753.2
3 intensity zone,	490.0	854.1	577.0	1012.0
4 intensity zone,	121.4	85.7	118.9	127.4
5 intensity zone,	58.5	45.4	58.7	87

Table 3

Total scope and intensity in % from "max" of Ya. Klochkova

Indicators	2000-2001	2001-2002	2002-2003	2003-2004
Total scope per year, km	2258	2470	2395	2520
1 intensity zone,	1671	1715	1775	1750
2 intensity zone,	390	440	440	488
3 intensity zone,	155	160	200	220
4 intensity zone,	48	55	60	65
5 intensity zone,	15	15	20	20

Comparing total scope and intensity of targeted complex program with training of Yana Klochkova and Svitlana Kopchikova we registered difference in scopes and intensity of training loads. Total scope of Yana Klochkova in first year after Olympics is by 112 km less than in next, 2002, and by 242 km less than in plan of targeted program. In 2002 total scope is less than plan of targeted problem only by 30 km. In 2003 it reduced insignificantly, comparing with 2002 and reduced by 105 km in comparison with targeted program. The highest scope 2520 km was in Olympic 2004 year with the biggest quantity of competitions in the same years (see fig.1).

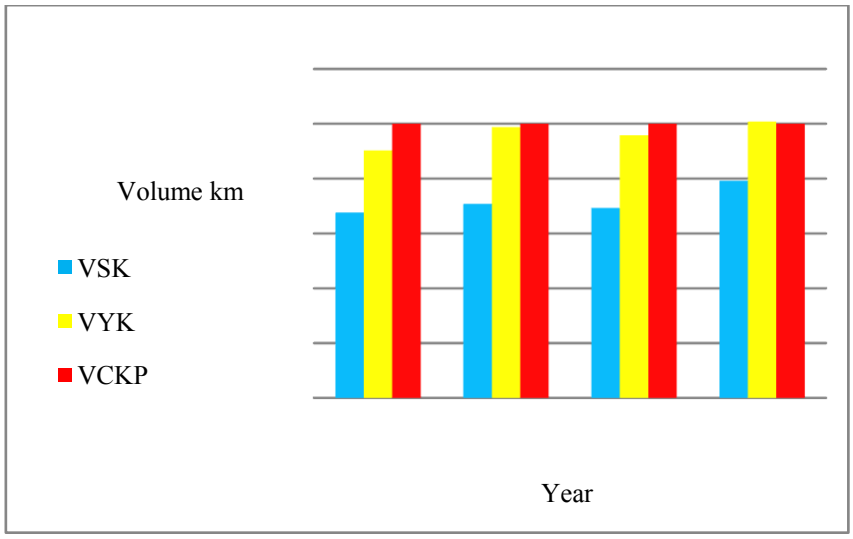

Fig.1. Correlation of total scope of training work in water (km) of Ya. Klochkoca and S. Kopchikova and targeted program of combined swimming Ukrainian team:

V – volume (scope) of training in water (km); Y – years of training; 1 y – 1st year of training; 2 y – 2nd year of training; 3 y – 3rd year of training; 4 y –4th year of training; VSK – total scope of S. Kopchikova; VYK – total scope of Ya. Klochkova; VCKP – total volume of works by targeted complex program.

Total volume of Svitlana Kopchikova in first year after Olympics (1981) was 1690 km with plan of targeted program – 2500 km. Then, in 1982 load of Sviltlana Kopchikova was by 730 km less than targeted plan of complex program. In 1983 this difference was 767 km. In Olympic year her total volume of load was 1980 km with plan – 2500 km.

Conclusions:

Preparation of sportsmen for main competitions of year at the stage of maintenance of achievements shall be of narrow specialized character, depending on sportsman's age, sex, duration of the stage.

In the future, the researches will be oriented on studying of structure of highly qualified sportsmen's training and competition functioning; the sportsmen, who during long time continue to demonstrate high sport results.

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Cite this article as: Kopchikova S.G. Individualization in swimming and a way of preparation for Olympic Games. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 33-36. doi:10.6084/m9.figshare.923511

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

Received: 02.12.2013
Published: 28.12.2013

DIRECTION FOR OPTIMIZATION OF THE TRAINING PROCESS IN JUNIOR HOCKEY

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Annotation. *Purpose:* to consider the possible directions of optimization of training activity in youth hockey and offer practical advice. *Material*: study analyzed data from the literature and the latest achievements in the practice of training the player's domestic and foreign authors on training in youth sports. *Results*: innovative approaches are considered in the initial stages of training sports perfection, as well as various areas of optimization of the training process in the initial stages of hockey and preliminary basic training. The examples of the training process in the North American and European hockey schools. The questions concerning the construction and orientation of training process at the initial stages and pre- basic training. *Conclusions*: highlighted promising areas for optimization of the training process of young hockey players in the initial stages of sports perfection.
Keywords: hockey, training, junior, training, process, optimization.

Introduction

Modern development of hockey sets to player's training increasing requirements. Correctly formed basis in junior hockey is a favorable pre-condition for progressing in sports of highest achievements. First of all it depends on correctly built training process and its orientation. Hockey is not only one of the quickest and the most possessed team kind of sports. In its essence, hockey is one of rinds of sports with the most complex coordination. In the process of game player shall adequately response to movements of adversaries, actions of partners, apply techniques with bandy, apply power techniques in counter-actions, quickly change direction of movement, dartingly analyze changes in game's situations, correctly move within played tactic schema. And all these actions are fulfilled on narrow footing of skates and under constant adversary's power pressure. Mistake in any decision, incorrect evaluation of situation, inadequate technical tactic technique can result in losing both of certain game moment and game in general.

At present time player can not compete owing to development of only one side of fitness with moderate indicators of other players [3, 16, 17,]. Player shall be first of all developed harmoniously. This is the task of a coach – to educate a high class player, considering his features and bent to one or other game style. But, as it often happens in domestic hockey, years of training transform talented beginner into firm middle class player, who is not able to compete in sports of highest achievements. In Soviet Union development of innovative methods of hockey players was at high level [1, 8, 13], great attention was paid to junior hockey as a reserve for clubs and combined team. A lot of works of domest6ic specialists were devoted to this problem [21, 22, 23], and materials were accessible both to coaches and their disciples.

Modern works in the field of hockey set high requirements to level of theoretical knowledge and fitness of hockey coaches. However, presence of high scope of information often is a deluding factor in choosing of strategy of training and selection of training means. It pre-determined problematic of our theoretical work.

Purpose, tasks of the work, material and methods

The purpose of the present work is to offer directions of optimization of training process in children and junior hockey.

Material and methods of the research: analysis of literature sources and advanced domestic and foreign works, devoted to hockey training at initial stages of sport perfection.

Results of the research

At post-Soviet space state of theory and methodic can be evaluated as satisfactory [1, 8, 12, 15, 17]. There constantly appear new methodic and innovations in theory of players' training, based on actual material of training and competition functioning. However, the trends in sport training are under influence of different hockey schools. Conventionally they can be divided into North-American (Canada, USA) and European (Russia, Czech Republic, Slovakia, Sweden, Finland, Ukraine).

Main distinction of these schools is different organization of training process. North American school accentuates individualization of training process [7, 9, 20, http://www.elitehockeycamps.com/]. That is, from child's entering hockey circle he is being trained to the fact that he would prepare for game season, choose coach and profiles of training independently [7, 20]. In European school team approach to training process is the main; this trend is especially spread on territory of late USSR, in particular in Ukraine.

Application of group methods [8, 13, 15, 22, 23], permits to intensify training process, increase density of one training; however in most cases it is an insuperable barrier for talented individuals on their way to professional hockey. In our case the problem is a system of training's building and selection of players. In domestic hockey children's group is usually supervises by 2 coaches, who shall train children to technique of skating, handling of bandy, passes and basics of tactic actions. As a result, at stages of initial training and preliminary basic training coaches often prefer those children, who "quickly stand on skates and catch material". In most cases at such stages team is left by promising players with good potential, but who could not manage to show themselves owing to insufficient attention from

doi: 10.6084/m9.figshare.923512

supervisor or to wrong construction of training process. But even in this case, if beginning player does not leave training hockey, there appears next factor, which could be called "passion of a coach". That means that disciples are able to move on skates and manipulate with puck, know basis of tactics and coach starts to press out from his disciples everything possible in order to win championships, matches. With it in practice there are many example, when coaches blame disciples in insufficient level of technical tactic fitness, forgetting that they deal with beginners and their training is only on 1st and 2nd stages of sport perfection and forgetting that main task of a coach on these stages is just to teach and create pre conditions for future perfection, but not to collect as much caps as possible at such far from professional level..To avoid such negative factor, scientific popular literature was very accessible in the USSR [5, 21, 22, 23], which permitted for amateurs not only to have knowledge about methodic of hockey players' training but also use it as a kind of self teaching guide for training. At present time in Ukraine there is no such practice.

For North American school such trend is not characteristic. Because, starting from children level from 2 to 4 specialists supervise one group [http://www.elitehockeycamps.com/, http:// www.icevault.com/indexb.php]. Besides there exist summer training camps, in which rising sportsmen can not only recreate but also to continue perfection of their technical-tactic skills. Such approach is more preferable because percentage of leavers is lower. Coaches do not strive for victories, but desire to increase quality of training process, understanding that the stronger is base the more successful their disciple will be in professional sport.

And naturally, application of this approach to training results in higher quantity of players, promising to be professionals; consequently competitiveness and show character of games as well as club's profit are higher.

Individual approach, sport training camps in separate kinds of sports [http://www.skinnerhockey.com/, http://www.laurastamm.com/], approved themselves in USA, Canada, Czech, Finland and Sweden. After finishing of game season player chooses by himself what sides of fitness he shall improve [http://www.skinnerhockey.com/, http://www.laurastamm.com/]. Having decided this he addresses appropriate training center, in which he trains individually under supervision of specialist. Player himself is responsible for training of his functional abilities and technical tactic skills. Individualization of pre-season training permits to qualitatively rise level of hockey player's fitness and permits for him to develop his natural bents for successful progressing. It should be noted that it is characteristic not only for final stages of sport perfection, but for initial stages as well. Considering such trends we can conclude that individualization of training process in Ukraine is a direction of priority for further researching. Otherwise, such methodic would have been practiced more often in training process of Ukrainian hockey players and would have been elucidated in literature.

Orientation of hockey player's training process is conditioned by requirements of competition functioning. Match lasts for 3 periods, 20 minutes each, plus overtime is possible. Hockey player spends on ice about 30-90 seconds. Total time of being on site during game varies from 16 to 25 minutes. During this time hockey player fulfills from 30 to50 accelerations at distance from10 to 15 meters, executes from 10 to 20 brakeage, followed by starts and new accelerations, carries out from 5 to 15 power techniques [1, 4, 20]. Mean quantity of player's replacements also varies from 16 to 25 replacements. Every period of time on ice requires from player great tension. Heat beats rate during being on ice is 170-190 b.p.m. Consumption of oxygen is 48.9 – 53.6 ml.per min. per kg, concentration of lactate is 78-132 mg %, and oxygen debt is 8.5 – 9.6 liters [4, 6]. Time on ice is spent in anaerobic, alactate, anaerobic hlycolitic mode; transition to aerobic mode happens after replacement, during rest at bench. Total (up to 2/3) switching in of muscular systems and alternating rhythm of work from moderate to maximal intensity, depending on situation on ice field should also be noted. The above presented examples set very high requirements to special physical fitness (SPF).

In this connection individual approach to training is more purposeful that team approach. Training program, built with consideration of functional abilities of both: separate player and group of players permits to prepare team for match at higher level of functional fitness. In this connection orientation of training activity, selection of means and methods shall ensure adaptation responses, which would provide effective competition functioning. As it was mentioned above, in USA and in Canada, main coach of club does not spend training time for improvement of players' functional abilities. He works at training of definite tactic schemas for future matches. Functional abilities are trained by a player with personal coach on physical (skating, technical) training individually.

In domestic school of hockey, in contrast to North American school up to present time team meetings with group fulfillment of physical fitness training programs have been being practiced. However, this direction often negatively influences on team's level in general, because training program can not suit every player completely [11, 12, 17, 18, 19].

The above presented aspect is rather important also in children-junior hockey. Training program, built without consideration of players' individual responses to load, their bent to definite type of energy supply (for example sprinter, long distance runners, mixed) [10], because it is the factor, which influence on further formation of player. Application of training cycles' models with earlier known effect would significantly make easier planning of training process and exclude using of inadequate training influences. However, this direction in hockey is fragmentary and to large extent belongs to works in cyclic kinds of sports. Construction of such models is possible only if great quantity of empiric material is available as well as high level of organization of training process's control.

Control is one of links of management cycle. Without timely objective information about state of player, scopes of trainings, effectiveness of technical tactic actions it is impossible to formulate correct decision for one or another situation [18, 20, 22, 23]. These aspects have been developed at high level in hockey, however at first stages of training they practically do not exist in Ukrainian hockey. In most cases coaches limit themselves only by visual control during

training. Application of medical-biologic, pedagogic and bio-chemical control, which are widely spread abroad, permits for a coach to optimize training process and selectively choose training means in compliance with existing tasks.

As it was mentioned above, timely analysis of obtained information data and appropriate corrections in training plan make training process more effective and controlled and, as a result, decreases probability of negative influences and coach's mistakes.

Conclusions:

Generalization and discussion of presented above theoretical research point that optimization of training in children junior hockey can be realized only with consideration of main factors, which influence on training process:

- Improvement of organization and ensuring of training process – individualization of training process, involving of coaches into separate kinds of training, material provisioning of training process;
- Improvement of control over training process;
- Working out of model characteristics of special and functional fitness;
- Rational selection of means depending on trainees' fitness;

The prospects of further researches imply development of complexes for special training of 6-10 years old hockey players, with consideration of different types of functional adaptation to load.

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Cite this article as: Kygaevskiy S.A. Direction for optimization of the training process in junior hockey. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2014, vol.2, pp. 37-41. doi:10.6084/m9.figshare.923512

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

Received: 09.12.2013
Published: 28.12.2013

COMPLEX INTEGRATED METHOD OF DYNAMIC MEDITATION WITH BUDDHISTS' BREATHING IN CASE OF NEUROTIC REACTIONS

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Annotation. *Purpose:* to elaborate complex integrated method of psychological influence upon sport dancers in time of training on base of Buddhists' meditation "conscious breathing" for neurotic reactions elimination, professional skill improvement and psycho emotional stability advance. *Material*: twenty dancers at the age of 40-50 with neurotic reactions participated in the research. At the first stage of the research all the subjects' ability to focus attention at breathing during sports dancing performance was examined. At the second stage training in method of dynamic meditation applied for martial arts of the experimental group of 10 subjects was conducted. Both individual and group training sessions were held. At the third stage the experimental group joined dynamic meditation and breathing at dance performance. At the fourth stage the experimental group's results were compared with the control group's results. *Results*: at the first stage of the research all the subjects noted difficulties in focusing attention on Buddhists' nasal breathing and dance technique come-down. 3-5 sessions of training in method of dynamic meditation were necessary for the subjects of the experimental group at the second stage of the research. At the third stage of the research all the subjects of the experimental group could control their nasal breathing at dance performance without dance technique come-down. At the fourth stage the comparative evaluation of the results of the experimental and control groups revealed that it was necessary 3-7 sport dance practice sessions for elimination of the neurotic reactions. No such effect was observed in the control group. *Conclusions*: The results of the research prove that Buddhists' meditation "conscious breathing" may be joined with dynamic meditation successfully. It's impossible to focus attention continuously on breathing at time of sport dance performance. The elaborated technique of the integration of the dynamic meditation and Buddhists' "conscious breathing" provides improvement of dancers' psycho emotional state eliminates neurotic reactions, polishes sports dance performance.
Keywords: dances, meditation, breathing, neurotic reactions, training.

Introduction

In sports practice there are many cases when there appears state of the so called oversaturation with trainings, followed by neurotic symptoms [6]. In order not to admit such phenomena training program is constructed with periodical changes of sport measures and places of trainings. However, such approach does not guarantee complete psychological comfort of sportsmen, who, alongside with full physical loads, endure significant psycho-emotional strain. Neurotic symptoms can appear as a result of sportsmen "anxious expectation" before competitions and are expressed in pale face, absentmindedness and fussiness [8]. If sportsman works at the end of tether, he feels tiredness; his sport results worsen and pre-pathologic state appears and can transforms into neurotic state [10]. Neurotic sportsmen, feeling tiredness, have to leave sports.

Sportsmen with neurotic symptoms are often conflictive or try to isolate themselves that hinders their professional contacts with coach. Sportsman responses to coach's remarks by rudeness and even by refuse to fulfill training task. Absence of psychological contact between coach and sportsman results in the fact that sportsman leaves for other collective, where new conflicts also are inevitable, because his ill state will be a source of new problems, which sooner or later will cause neurosis. It should be noted that with growing of social tension neurotic symptoms appear oftener even among coaches that even more aggravates their relations with sportsmen.

The reason of neurotic symptoms can be mental overstrains that are caused by "start fever", when sportsman "burns away", having lost his forces before competition [7]. As it is known neurosis are caused by conflicts and stresses. Sportsman can endure stress during trainings and competitions.

Neurotic responses of sportsmen were studied by psycho-therapists (B.M. Schertsis, 1970; T.P. Fanagorskaya, 1971; L.D. Gissen, 1975). Frequent manifestation of neurotic responses is psychogenic anorexia – absence of appetite in days of competitions with symptoms of nausea. Ahypnosis is manifested as delay of sleeping, early awakening, shallow sensitive sleeping, which does not result in rest. There appears irritability, weakness, headache.

Neurotic responses are cured with hypnosis, autogeneous training and medically. Apparatus psycho-technologies in psycho-therapeutic process can be used only by specialists with higher medical education. In connection with the fact that medical and psycho therapeutic treatment of psychogenic diseases is little effective and durable than the problem of sportsman's provisioning with psychological protection from development of neurosis with prophylaxis measures for timely elimination of neurotic responses still remains an urgent one [4].

Psycho-therapeutic technologies are based on techniques of nervous-muscular relaxing (E. Jakobson, 1978), duration of trainings – 15-45 minutes, quantity – 10-20 trainings).

Method of deep breathing (MDB) by K.P. Buteyko, which is carried out both in static (sitting) and dynamic (walking, running) state is well-known and is oriented on reducing of breathing will movements' (chest and abdomen) amplitude. In practice of sports this method has not become popular, because sportsman shall direct his will not to

doi: 10.6084/m9.figshare.923513

breathing but to fulfillment of main competition task. This method can be used after training but it requires presence of free time, which is very valuable for sportsmen.

In Buddhism there exists well known method of meditation "conscious breathing", with which breathing is an object of concentration. It is required to observe breathing during inhaling and exhaling. For concentration of attention beginners are recommended to count; with it breathing slows. To concentrate on breathing it is necessary to render certain effort; with it slight feelings on muscosae of nose with air's passing is sensed. Buddhism breathing calms and improves human health; it is effective in rest state [5,8,12].

It is known that dances also favorably influence on mental state of patients with neurotic symptoms, but only long term trainings result in positive effects [11,13-15].

Sportsmen do not like to fulfill mental training in free time. Not every sportsman with neurotic symptoms has enough patience and diligence to practice durable concentration of attention on breathing. Besides, the wider is the range of neurotic symptoms, the more difficult to concentrate attention on breathing. Sufficient concentration on breathing can be achieved with the help of dynamic meditation.

Application of dynamic meditations in martial arts results in comprehensive physical and psychological perfection of an individual [3]. In oriental martial arts meditation is understood as complete attention to the least signal and, alongside with it, ability to percept every such signal simultaneously with other. Such ability to simultaneous perception of any information, coming from outside and from different organism's systems, ensures adequate response to conditioned or unconditioned irritator that is extremely required for those, who practice sports.

If medical treatment with tranquilizers results in inhibition of neurons and reducing of workability, then dynamic meditation will increase activity of brain's neurons and workability.

In connection with the above mentioned there appears acute demand in working out of methodic, which would reduce neurotic symptoms and at the same time improve training process directly in period of trainings.

Considering advantages of Buddhism meditation "conscious breathing", which calms nervous system, we have offered to apply its breathing principles in sport ball dances with simultaneous application of dynamic meditation, because dancer is constantly in movement. The novelty of the method is that dynamic meditation, taken from martial arts, is fulfilled simultaneously with Buddhism "conscious breathing", directly in the process of sport ball dances' trainings. This method removes neurotic symptoms, improves dancers' techniques and develops interaction between two partners.

The work has been fulfilled as per plan of S&RW of higher sportsmanship school in Nikolayev.

Purpose, tasks of the work, material and methods

The purpose of the work is to develop complex integrated methodic of psychological influence on persons, who practice sport ball dances, applying it directly during fulfillment of composition with dynamic meditation of martial arts and Buddhism "conscious breathing" for elimination of neurotic symptoms, improvement of professionalism and increasing of dancers' psycho emotional state in its base.

The object of the research is sport ball dancers of seniors' category.

The subject of the research is the process of complex integrated influence on dancers' nervous system by dynamic meditation, which is applied in martial arts, together with Buddhism "conscious breathing".

For carrying out of the research it was necessary to solve the following *tasks:*

1. Select 20 dancers with neurotic symptoms for participation in the research.
2. Train 10 dancers of experimental group to Buddhism meditation and to dynamic meditation.

Hypothesis of the research: we assumed that application of dances and Buddhism breathing directly with training physical loads will permit to eliminate neurotic symptoms, increase psycho-emotional stability and dancers' professionalism. Realization of such breathing is possible in dynamic meditation.

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

Organization of the research: in the research 20 sports ball dancers with neurotic symptoms of seniors' category in age from 40 to 50 years old took part. The research was carried out in School of higher sportsmanship of Nikolayev during trainings on sport ball dancers.

At 1st stage of the research all tested were examined for ability to concentrate attention on breathing during dancing. At the 2nd stage we trained experimental group (10 tested) to methodic of dynamic meditation from martial arts with application of hypnotic suggestions for accelerated mastering of the method. We used both individual and group training sessions. At the 3rd stage of the research experimental group dancers practiced dynamic meditation with Buddhism breathing. At the 4th stage we compared results of experimental group with the results of control group.

Examples of application of the offered method:

Example 1. After death of husband tested B. complained on increased irritability, headache, disordering of sleep. Application of the method during 7 trainings resulted in restoration of her previous mental state.

Example 2. Tested S. complained on increased tiredness, frequent giddiness, feeling of stress for her ill child. During 7 sessions her self-feeling improved. She was recommended to continue this methodic as supporting psycho-therapy.

Example 3. Tested Ts. had bad appetite, apathy, weakness. Improvement of general state appeared after 3 sessions.

Example 4. Tested D. complained on feeling of uncertainty, strong excitation before dancing. These symptoms vanished after 5 sessions.

Example 5. In home conditions Tested T. dances variations and different figures of dances in state of dynamic meditation, observing air flows, which pass though nostrils by Buddhist methodic. It calms her and improves her mood.

Results of the research

During 1st stage of the research all tested faced difficulties in concentration of attention on breathing through nose by Buddhist method, while their dancing technique worsened.

At the 2nd stage it was required from 3 to 5 sessions to train the tested of experimental group to dynamic meditation with the help of hypnotic suggestion.

At the 3rd stage all tested of experimental group could control individual breathing through nose during dancing without worsening of dancing technique.

At 4th stage of the research we carried out comparative evaluation of experimental and control groups' results. It showed that for elimination of neurotic symptoms in experimental group it was required from 3 to 7 trainings of sport ball dances with the help of offered by us method. In control group we did not registered such positive results.

In many kinds of sports sportsmen's breathing passes involuntary. Not all sportsmen could control breathing during trainings and more over to control it owing to frequent distractions of attention to main actions of physical program or to foreign objects. Concentration of attention on breathing can be realized in dynamic meditation.

If according to K.P. Buteyko's method (MCB) it is necessary to control breathing by will during walking or slow run, the, by Buddhist methodic breathing changes involuntary, without efforts of an individual.

Method of Buddhist "conscious breathing" is fulfilled in sitting position. In connection with the fact that for a dancer motion functioning is of the same great significance as breathing, we used dynamic meditation in combination with breathing. Dynamic meditation permits to realize simultaneous control of many processes, taking place in organism, including air passing thorough nostrils; it has a unique mechanism of simultaneous perception and reflexive adequate response to coming information. It permits concentrate attention for long period of time on air, passing though nostrils during involuntary breathing. Attempts to practice Buddhist breathing without dynamic meditation gave no expected effect. The proposed by us method can be used with high physical loads. If a person has counter indications to high physical loads owing to state of health, then it is recommended to use dances of European program, slow waltz, slow foxtrot.

Mastering of dynamic meditation took from 2 to 5 sessions; hypnosis was required for suggestion of body senses, which were characteristic for this kind of meditation. However it was cleared up that many dancers had already felt such senses, even not guessing that it was dynamic meditation, which appeared spontaneously. The repeatedly caught themselves thinking that at certain moment of dance they stopped to sense body or hear music; they felt that legs are dancing without their will or their bodies dissolved in space and so on. Having listened to our information about dynamic meditation they only enriched their knowledge on this topic.

It should also be noted that spontaneous dynamic meditation with poor dance technique is impossible, because in this case dancers feel contraction of muscles, uncertainty, dissatisfaction with movements, resulted in irritation.

It is known that dances favorably influence on patients with neurotic symptoms, but positive results become only after long time trainings. Not every sportsman will practice Buddhist meditation in free time, not every man with neurotic symptoms has enough patience and diligence for long concentration of attention on breathing; with it the more neurotic symptoms re expressed, the more difficult is concentration of attention on breathing. Dynamic meditation permits to achieve rather deep concentration of attention. Medical treatment of neurotic symptoms by tranquilizers reduces physical workability, inhibiting neurons, that is inadmissible in sports. Meditation increases brains' activity. Dynamic meditation is not intended for elimination of neurotic state, it only reduces constraints, uncertainty, fear and improves sportsmanship. Everybody will agree that dynamic meditation in sport ball dance is more aesthetic than dynamic meditation in jumps by Osho's method or meditation with 15 minutes grunting. In this case, during grunting it is necessary to sense vibrations in head, chest and abdomen [2,9].

Buddhist meditation on the base of "conscious breathing" results in calming of nervous system, relaxation of muscles; it normalizes sleep and should be fulfilled with completely immobile body. As far as the basis of this meditation is breathing, we attempted to use breathing in dynamic meditation in dancing. Application of "conscious breathing" did not take additional time because it used in the course of dynamic meditation, just in dancing trainings.

Advantage of this method is that it requires no effort for concentration of attention on breathing. It is ensured by dynamic meditation, which permits to control many senses in organism directly during training process without worsening of sportsmen's techniques. Different kinds of meditation, including Buddhist meditation on the base of "conscious breathing", can remove neurotic responses during several sessions, but not every sportsman wants to practice meditation. Many of them lay no emphasis to neurotic symptoms, considering them a variant of normal state. It is known that dynamic meditation in martial arts increases technique. Positive effect of dynamic meditation is manifested also in dancing. If, for example there is a number of critical remarks directed to Buteyko's breathing, then positive effect of "conscious breathing" on human organism has been proved by thousands of years. If for Buteyko's breathing will efforts are required then for our method not effort is necessary; breathing is natural, it is necessary only to observe its process. Such observation of breathing permits to fulfill dynamic meditation in the process of dancing.

In East there are exist many kinds of breathing; all they influence on man in certain way. For example Yoga pranayama not only trains lungs but also calms nervous system. All these kinds of breathing require further studying [1,9].

Conclusions:

1. As a result of conducted research we have proved that Buddhist "conscious breathing" can be successfully combined with dynamic meditation of martial arts during training of sport ball dances.

2. Without dynamic meditation it is impossible to imagine long concentration of attention on involuntary breathing with simultaneous dancing.

3. The worked out by us method of integration of dynamic meditation with "conscious breathing" of Buddhists ensures improvement of dancers' psycho-emotional state, removes neurotic symptoms, increases quality of dancing technique.

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

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Cite this article as: Omelyanenko V.I. Complex integrated method of dynamic meditation with Buddhists' breathing in case of neurotic reactions. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2014, vol.2, pp. 42-47. doi:10.6084/m9.figshare.923513

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

Received: 08.11.2013
Published: 28.12.2013

ISOMETRIC EXERCISES WITH ELEMENTS POSTISOMETRIC RELAXATION TO ELIMINATE THE KNEE JOINT CONTRACTURE AFTER ARTHROSCOPIC PLASTICS OF ANTERIOR CRUCIATE LIGAMENT

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Annotation. *Purpose*: to determine the efficiency of isometric exercises and post isometric relaxation of character for removal and prevention of contractures and recovery of motor function after arthroscopic reconstruction of the anterior cruciate ligament in the late postoperative period. *Material:* The study involved 22 patients aged less than 40 years. *Results:* The results showed that the level of pain decreased equally in patients of main and control group from 3 to 0 points, the performance difference in the amplitude of the bending of the knee joint during the goniometry in the treatment group was 70^0 in the control group – 30^0 and the extension 10^0 – fixed, reaching 5^0 hyperextension and not changed in the control group ($P < 0.05$). *Conclusions:* The use of isometric exercises and post isometric relaxation prevent postoperative contracture of the knee joint. Methods of their application are recommended for use in the comprehensive rehabilitation of patients after arthroscopic plastics anterior cruciate ligament.
Keywords: knee joint, arthroscopy, contracture, isometric exercises, post isometric relaxation.

Introduction

In accordance with the special literary sources knee joint injury amount 50 % of all injuries of the joints [6, 7]. At the same time, damage the ligament apparatus of the knee joint, including anterior cruciate ligament (ACL), up more than 30%. During sport activity this mark rises to 60 % [1, 2, 5].

Regeneration of a damaged ACL is possible only by operation. Postoperatively, often immobilization of the knee joint is used by splint. The analysis of special scientific and methodical literature [1, 2, 3, 6] showed that the average term postoperative immobilization is 4-6 weeks. A sufficiently stable flexion-extension contracture forms in the complete absence during this time which is based on the formation of arthrofibrosis, prolonged weakness thigh and shin, breaking mechanisms and proprioception and trophics. Furthermore, the increase in muscle wasting significantly weakens the stability of the knee joint and it increases considerably the likelihood of re-injury without an appropriate rehabilitation.

According to many native and foreign authors [5, 7, 9, 10], an optimal decision for this situation is the immobilization of the knee joint by functional brace with adjustable angles of movement, which provides the necessary stability and protection of the operated joint doesn't allowed except the movements in it. However, for various reasons (for example: high cost functional brace, comorbidities) using of such immobilizers limited in practice in the postoperative period, in compare with static braces, contributing to the oppression of the injured extremity motor function and elimination of postoperative complications.

Static and dynamic stabilizers provide functional stability of the knee joint. The former includes the ligaments, the second – the muscle [6, 7, 9]. That is why for development of complex therapeutic exercises were chosen isometric exercises because it's considered by most authors [2, 6, 7], firstly, it allows to except an axial load on the joint and ligaments of the operated limb, secondly, it improves an intermuscular coordination, proprioceptive mechanisms and trophic processes. Besides, it is quite easy for an adoption.

Thus, the analysis of special literature suggests that one of the ways to solve the above problem for patients after arthroscopic ACL reconstruction is urgent development and practice of special complexes of therapeutic exercises with using isometric exercises and postisometric relaxation (PIR) in the conditions of immobilization of the limb.

The work is implemented according to the consolidated plan of research work in the sphere of physical culture and sports in 2011-2015 relating to 4.4. "Improving organizational and methodological foundations of programming of physical rehabilitation with dysfunctional disorders in various systems of the human body" (state registration number: 0111U001737).

Purpose, target, materials and methods.

The target of this research was to determine the effectiveness of isometric exercises and PIR for prevention of contractures and recovery of motor function after arthroscopic ACL reconstruction of the knee joint in the late postoperative period.

Objectives:

- Substantiate the possibility of inclusion isometric exercises and PIR in the complex of therapeutic exercises;
- To explore the effect of training on motor recovery of knee function.

Research methods. Theoretical analysis and synthesis of the literature, pedagogical experiment, the method of goniometry, testing, methods of mathematical statistics.

Research organization. In order to research the effectiveness of isometric exercises and PIR, was organized a pedagogical experiment in the rehabilitation department SI "Institute of orthopedics and traumatology NAMS of

doi: 10.6084/m9.figshare.923514

Ukraine" in the period since 2012 till 2013. The research involved 22 patients (n = 22) at the age of 40, after arthroscopic ACL replacement, which developed flexion-extension contracture of the knee joint. The reason for its appearance was prolonged immobilization in the postoperative period (from 2 to 6 weeks). 16 women and 6 men were among the patients. The main complaint of patients had significant limitation of motion in the knee joint. All patients were divided into two groups – control and main, 11 persons were in each group. Patients in the control group received full conventional treatment for these cases: physiotherapy (magnetic therapy, EMS, laser therapy, cryotherapy), conducted therapeutic exercises, CPM therapy. In the main group it was except for the prescribed treatment, with patients conducted classes therapeutic exercises using isometric exercises and PIR on the proposed method.

Results.

Patients in both groups, according to the recommendations of the late postoperative period, used a hard brace, which is completely excluded motion in the operated knee joint. Therapeutic exercises for patients in the control group were conducted in brace, and the patients of the main group took off in a time of employment of brace.

Late postoperative period was divided into two parts: I – part: 2-3 weeks after surgery (beginning of loading) and Part II – I: 4-5 weeks after surgery (increasing loads. An axial load on the operated extremity and movement in the operated joint of rehabilitation were limited during whole period.

To assess the effectiveness of the rehabilitation treatment indicators used goniometry (volumes flexion and extension in knee joint), which were measured with a goniometer and anthropometric indicators (volume of the thigh and shin). Pain assessment was performed on a 10-point visual analog scale (VAS).

Given that the patients in both groups had an opportunity to move to full load on the operated extremity, all exercises were performed in a sitting position, lying and standing without support her. Therapeutic exercises were done for 20 minutes, 2 times per a day in the I-st part of the late postoperative period and 3 times per a day – in the II-nd part. The interval was 2 hours between sessions

Methodology of PIR which we were used in the process of rehabilitation was as follows: the muscles relax by their isometric tension in the stretched state for 5-7 seconds, followed by passive stretching during the same time. Repeated 5-6 times, which results in a stable muscle relaxation and pain relief.

In I-st part of the late postoperative rehabilitation (2-3 weeks after surgery) the special attention was spared to the anaesthetic measures and eliminate edema. For this it were used the positional placement limb, cryotherapy, compression bandaging and physiotherapy facilities, such as: magnetic therapy, laser and EMS. Therapeutic exercises began with preliminary acquaintance with the proposed patient exercises and determine individual capabilities to perform them. Further, from the offered exercises picked up those that a patient could execute without effort and pains only. One lesson of therapeutic exercises lasted 20 minutes and included no more than four exercises, which, as they are digested gradually replaced by more complex.

Thus, at the time of completion of this phase, the patient is completely digested and well-performed all the exercises proposed technique.

Since the third week from the moment of operation at the end of every engaging in therapeutic exercises added PIR for the purpose of the initial mobilization of the knee joint and reduce pain it.

In the II-nd part of the late postoperative period (4-5 weeks after surgery) rehabilitation measures were aimed at strengthening and stabilizing the knee joint to provide the necessary support ability of the operated limb during the upcoming walk. Physiotherapy at this stage complement EMS of quadriceps. Hydrocortisone phonophoresis were used of remaining pain syndrome. Therapeutic exercises complicated and complementary exercises with rubber cord, non-elastic tape and fitball. Training sessions were conducted for 20 minutes three times per a day with more frequent changes of exercise. It allowed not only to increase the functional loading but also do therapeutic exercises more various and improve the emotional state of the patient.

Below it is one of the options set of exercises that are used during rehabilitation treatment.

Exercise 1. Starting position: sitting, legs are straight ahead. Isometric tension quadriceps. Hold the position during 7-10 seconds. Repeat 7-10 times;

Exercise 2. Starting position: the same. Ball is between the thighs. Compress the ball hips with maximum retention of muscle tension during 7-10 seconds. Repeat 7-10 times;

Exercise 3. Starting position: lying on the back. Heels are on a roller. With support on heels and shoulder-blades, to heave up a pelvis. Hold the position during 7-10 seconds. Repeat 7-10 times;

Exercise 4. Starting position: lying on the stomach, socks still are on the roll, hips are on the floor. Drawing on socks straight legs at the knee joints, raise your pelvis. Hold the position during 7-10 seconds. Repeat 7-10 times;

Exercise 5. Starting position: standing. A rubber band is fixed on the wall bars. Hold the foot, straight leg raise to the maximum tension. Hold the position during 7-10 seconds. Repeat 7-10 times. Exercise is carry out in all directions – abduction, flexion, extension;

Exercise 6. Starting position: the same. A leg is arcuated in a knee joint at an angle of $15\text{-}20^0$. Hold the tape foot, lift the bent leg up to the maximum tension. Hold the position during 7-10 seconds. Repeat 7-10 times. Exercise is carry out in all directions – abduction, adduction, flexion, extension .

Exercise 7. Starting position: standing. Stiff tape fastened to the wall bars and ankle. A leg is arcuated in a knee joint at an angle of $15\text{-}20^0$. Hold the tape foot, lift the bent leg up to the maximum tension. Hold the position during 7-10 seconds. Repeat 7-10 times. Exercise is carry out in all directions-abduction, adduction, flexion, extension;

Exercise 8. Starting position: standing . Stiff tape fastened to the wall bars and ankle. Raise a straight leg to the maximum tension and hold during 7-10 seconds. Repeat 7-10 times. Exercise is carry out in all directions – abduction, adduction, flexion, extension.

As a result of rehabilitation, in the both groups – main and control, pain was 3 points early in the late postoperative period, decreased to score 1st in the exercise movements and 0 points alone in the end of the period.

Anthropometric measures and in the main and in the control group by the end of the period have not changed significantly. Swelling of the soft tissues of femur and tibia in both groups decreased to the same extent. At the same time indicators range of motion to the knee joint in the patient groups had differences (Table 1).

Table 1

Goniometry data in the late postoperative period in patients of basic and control group (n = 22)

Research groups						
Indicators	main			control		
	at the beginning of the period	at the end of the period	P	at the beginning of the period	at the end of the period	P
Flexion	$30^0 \pm 3^0$	$110^0 \pm 2^0$	< 0,05*	$30^0 \pm 3^0$	$60^0 \pm 3^0$	< 0,05*
Extension	$5^0 \pm 2^0$	$-5^0 \pm 2^0$	<0,05	$5^0 \pm 2^0$	$5^0 \pm 2^0$	< 0,05

*Note: * P – significance differences in the indices of both groups.*

Analysis of indicators of range of motion to the knee joint found that the amount of flexion and extension improved in both groups, but the dynamics of the patients of basic group was better than in the control group (P <0.05).

Conclusions.

Thus, using in the first month after arthroscopic ACL reconstruction isometric exercise and post isometric relaxation in complex of therapeutic exercises is an effective way of preventing postoperative contracture knee joint. The developed method of application of isometric exercises and PIR can be recommended for using in rehabilitation complex for patients with knee joint contractures after arthroscopic anterior cruciate ligament reconstruction.

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Cite this article as: Pylypenko O.V., Zakharov A.A., Sribniy K.A., Nikanorov A.K. Isometric exercises with elements postisometric relaxation to eliminate the knee joint contracture after arthroscopic plastics of anterior cruciate ligament. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 48-52. doi:10.6084/m9.figshare.923514

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

Received: 20.11.2013
Published: 28.12.2013

JUSTIFICATION INCLUSION OF PHYSIOTHERAPY AND SELF-REFLEXOTHERAPY PROGRAM PHYSICAL REHABILITATION OF ADOLESCENTS WITH SHORT-SIGHTEDNESS

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Annotation. *Purpose*: To substantiate the combined use of therapeutic exercises and Onnuri therapy to restore vision in teenagers with myopia. *Material:* analysis of more than 80 sources of literature on the subject to study the prevalence of myopia in adolescents and the impact of physical rehabilitation for restoration of view. *Results*: It was established that the increase in the prevalence of myopia in adolescents with greater visual load, requires the development of new approaches to rehabilitation. Data on the impact kinesotherapy and reflexology on the body. Presents the rationale of their use in rehabilitation, with the principles of conduct, with myopia. *Conclusions*: kinesis therapy, compliance with recommendations for the application of different directivity exercises limited power voltage, over- load of a physical and jumping, should be combined with the methods of self-reflection therapy (self-massage, application of seed, color effects) for more high effect of restoring vision.
Keywords: short-sightedness, myopia, rehabilitation, physical, exertion.

Introduction

In everyday life people fulfils numerous actions in educational, professional and social life and in leisure with the help of visual perception [44, 20]. Eyesight endures heavy loads, which were not envisaged by evolution, and modern level of educational loads does not correspond to functional abilities of child's organism [V.I. Serdiuchenko, 2002].

As per the data of World health protection organization, at present more than 160 million of people in the world have serious eyesight problems. Every forth of them lost eyesight in childhood [6; E.I. Saydasheva, 2010; 46].

But, unfortunately, restoration of eyesight is not always possible. That is why foundation of rehabilitation measures is an important element of eyesight problems' therapy.

In to-day's physical rehabilitation and ophthalmology the problem of eyesight restoration of teen ages, who have progressing myopia, is of great medical-biological, medical-social, psychological-pedagogic and social importance [8]. In this connection there appears a demand in conducting of further scientifically grounded works and rehabilitating measures with application of traditional and new rehabilitation means and methods [6; Ye.V. Shmaley, 2007]. For improvement of life quality, progress in education, prospects of career and social economic status it is necessary to rehabilitate weakened eyesight [25].

Purpose, tasks of the work, material and methods

The purpose of the work was foundation of therapeutic gymnastic and Onnury's therapy's combined application on the base of analysis of scientific-methodic and special literature for restoration of eyesight of teen-agers with myopia.

Material and methods of the research: theoretical analysis and generalization of more than 80scientific-methodic and special literature sources, devoted to the studied problem.

Results of the research

Eye is the most developed and perfect organ of body. It has spherical shape. Not without reason it corresponds to the Sun. Two eyes, like two suns irradiate light of human soul. Eye balls have projections of all body and internal organs, including brains (the subject of iridology) and elements of human energy system [10].

Weakening of eyesight hinders cognition of world, restricts choice of profession and worsens life quality [13, 20; 26, 34].

Visual perception is negatively influenced by insufficiency of visual stimuli that can result in weakening of positive results of any everyday life actions. These actions include both skills of everyday behavior (for example: posture, gait [19], eating, bathing etc.) and skills in writing, reading at school [18], interaction with peers [41], as well as difficulties of communication and social functioning [24, 34, 35, 41].

Reina R et al., gave information that children with eyesight problems shall be paid more attention than healthy children, for creation of understanding and interaction with peers. After six - days' program children communicate more effectively than after one day program [41].

Not diagnosed worsening of eyesight can change motion and cognitive progressing of children with numerous health problems, limiting their access to information, to social interaction and visual control of limbs and body [42].

Development of skills with disorders of eyesight depends on children's age as well as on contribution of family and teachers in their development [20, 35].

Myopia is very rare in baby's age, but it constantly increases and covers approximately 20-25% of young full age people in Western countries and 80% of young full age people of South-Eastern Asia [28, 32, 37].

doi: 10.6084/m9.figshare.923515

Significant part of school age children (50 %-60 %) suffer from low quick sightedness [36, 43], that results in reducing of activity of 9-16 years old teen-agers, both boys and girls [17, 38].

One of main reasons of eyesight worsening is myopia (form Greek –Myo" – to peep and –Opsis" – eyesight, vision). Myopia is a result of non-correspondence between axial length of eye and central part of its refracting elements, cornea and eye lens [32]. Progressing of myopia is connected not only with genetic bents but also with non-observance of hygienic regulations for works at close distance [V.I,. Serdiuchenko, 2002].

Myopia is an important problem of public health protection for many industrial countries of the world. Abundance of myopia is increasing in the whole world. During recent three decades myopia level has increased by from 24% to 33% of total quantity of young people [O.B. Chendrova, 2007; 29] and up to 41% of total population [49]. Abundance of myopia of 19-years old men-recruits was 96.5% [47].

In other research it was noted that in the United States progressing of myopia was the quickest at 6-9 years old age. Myopia progressing of 6-11 years old girls is quicker than boys' [50]. Differences between indicators were partially related by the fact that girls spent more time for reading and work at close distance and relatively less time for being outdoors.

Myopia of school age children became more abundant in Asian countries, among populations of Japan, Hong Kong, Singapore and was from 71% to 96% of natural persons' quantity [O.B. Chentsova, 2007; 29]. According to recent reviews, continental China has one of the highest morbidity with myopia – 78.4% - of people of 5-15 years old age [22, 30]. By the data of other authors myopia of schoolchildren varies from 2,3% to 16,2 %, and more – up to до 31 %. This percentage is even higher among HEEs students [T.A. Zipunnikova, I.A. Biriukova, 2004; 6; 40].

The works of a number of authors witness that portion of children with myopia is increasing with level of their education [29, 39, 51].

There are works, which inform that progressing of myopia correlated with starting of puberty period (between 8.9 and 11.2 years old age) [23, 25, 27] and with age of peak growth of body, both of boys and girls [25].

Progressing of the disease happens when regulations of visual loads and hygienic conditions are not observed, when there are no therapeutic measures for myopia disorders. All these result in complications, in irreversible changes of visual analyzer and loss of eyesight, in decreasing of mental and physical workability, appearing of sense of inferiority as well as disablement [Ye.I. Saydasheva, 2010; 6; 28]. Many kinds of activity, including practicing of some kinds of sports, are restricted [48], because they can lead to traumatism [37], owing to insufficient accuracy of movements [48].

According to data of Brazil coaches of para-Olympic swimmers, having visual problems, during 5 competitions there were 1.5 traumas of every of swimmer [37].

In researches of H.et Myrowitz O.D. [25] it was elucidated that for 8-15 years old children reduction of myopia level for the period of research was connected with duration of period of their being outdoors. Much time, spent in the open air, is, partially, protective factor against myopia.

Analysis of scientific methodic literature, devoted to restoration of eyesight with myopia, showed that there exists quiet insufficient quantity of works about organization of assistance for children with myopia in the process of their education at comprehensive schools, during working day, when load on eyesight is the highest [O.B. Chentwova, 2005; 4, 16, 18]. In existing literature there was presented a system of schoolchildren's and organized groups' of children with poor eyesight physical education. Also there were given some ways of prophylaxis and correction of visual disorders under condition of observance of hygienic regulations. According to literature data the reasons of myopia have not been studied completely yet. Some risk factors of visual disorders have been studied more profoundly.

Hereditary factors cause weakening of sclera, number of defects in synthesis of collagen, dysplasia of connective tissue, deficit of microelements Zn, Mn, Cu, Cr and other, which are required for building of sclera [2, 4]. Deficit of blood circulation of eye's internal envelopes, insufficiency of central and orbital blood circulation, systemic hyper tension promote progressing of myopia [Ye. N. Iomdina, 2000; G.I. Dolzhych, 2008; A.V. Solodnikov, 2011].

Overstraining of eyes results from durable and intensive visual loads at close distance, poor illumination of working place, wring posture when reading or writing, excessive work with computer, wrong correction, using of incorrectly chosen glasses of absence of correction with first signs of myopia [8; A.S. Skuratovich, 2009].

In case of stabilized myopia of moderate and low degree they carry out optimal correction for distant and close vision (glasses, contact lenses) and medical treatment, oriented on restoration of all structures of eye and muscles, with participate in fixation of image on retina.

Restoration measures for myopia envisage solution of the following tasks:

- Restoration of visual functions;
- Promotion of correct functioning of visual organs;
- Develop activity of children's eye muscles, mobility of eye ball;
- Perfection of visual analyzer; способствовать профилактике возможных осложнений;
- Formation of motion skills and abilities;
- Development of cognitive functions, correction of emotional states, control over negative emotions, stabilization of general and mental state of a teen ager;

- Qualitative improvement of children-parents interaction, increase parents' interest in system of children's physical education for formation of healthy life style [G.D. Zhaboyedov, 2002; V.G. Kovylina, 2008; 2; 12; 13].

Fro creation of teen-agers' motivation for active participation in physical rehabilitation process, appropriate mood and conscious attitude to trainings, for observing of main didactic principles of physical education in practicing of therapeutic gymnastics it is necessary to conduct psycho-therapeutic talks [L.A. Yermakova, 2007; Ye.V. Bismak, 2007].

Leading place among means of teen-agers' with myopia physical rehabilitation, for training of adaptation reserves, is allotted to therapeutic gymnastics (TG), including general, special, breathing, yoga and other exercises [1, 2; 15, Gopinathan G., 2012]. For prevention from progressing of myopia, a number of orthopedic exercises was offered for improvement of ciliary muscle's functional state [15].

Muscular functioning stimulates metabolism oxidation-restoration and regenerative processes in organism [L.I. Ivanova, 2009]. Exercises for eyes are more effective than treatment with placebo. However, owing to absence of accessible scientific researches, which would determine quantity of eye exercises, their application still has been remaining arguable [33]. We also have not found researches, which would show that exercises of visual therapy could prevent from myopia progressing [Kazumi Kawahira et al., 2005; 33].

Restoration effect of physical exercises is reflected in stimulation of intensity of biological processes and organism's protective abilities, in activation of its functions, acceleration of development and perfection of compensation mechanisms, improvement of metabolism and regenerative processes, restoration of motion functions, including eye muscles' functioning, strengthening of sclera, reducing of after-effects of motion deficit, increasing of organism's workability and strength [2, 5, 6, 31]. In the process of movement special exercises facilitate generation of pro-prio-receptive impulses, which go to higher sectors of nervous system and vegetative centers, reconstructing their functional state, promoting of improvement of trophism of organs and tissues, connected with them by mechanism of motor visceral reflexes. Complexes of special exercises are oriented on normalization of adaptation, convergence and divergence reserves [I.A. Akhmadulina, 2009].

Special exercises can include exercises with rotational movements of eyes [10]. Such complex is called twist of therapy gymnastics. Eye balls can twist in eight directions with closed and open eyes. These eight directions make four axes. Twist with open eyes is combination of eyes' twist with their active visual function.

General approach, which is used in eyes treatment, includes main treatment methods: eye balls' twist, twist of eyelids, twist of eyebrows, twist of jaws and twist of neck.

Fulfillment of twisting causes of patient's state of emotional and physical comfort, helps to accept the offered medical effect with readiness, guarantees stability of results, fixes the achieved effect of treatment [N.V. Borisova, 2003; L.V. Gospodarova, 2003]**.**

Eye balls' twisting promotes preservation of good eyesight, prevents from its weakening and from eye diseases. Eye twisting can cure some eye diseases [10].

Muscles' motion functioning renders decisive influence on formation of brains, psycho-physical, sensor and mental abilities of a child. Especially important role is played by development of fine motor system of a hand (finger gymnastics) because hand is to the highest extent represented in cortex and is in close connection and functional unity with speech, visual and coordination centers [M.M. Koltsova, 1973].

Alternation of different physical exercises facilitates restoration of normal mobility of nervous processes, involves in response all kinks of nervous system, causing neurohumoral character of functions' regulation in organism's responses that is very important with myopia.

Physical exercises can be used in independent morning exercises, in therapeutic gymnastics (eye gymnastics); physical culture's break in the process of work or learning; in self massage; in organism's hardening. [2; 6; T.A. Zipunnikova, I.A. Biriukova, 2004;]. Physical culture, outdoor games, sports shall take important place in prophylaxis measures, oriented on prevention from myopia and its progressing, because physical exercises facilitate both general strengthening of organism, activation of its functions and increasing of eye muscles' workability, strengthening of sclera [2, 6].

When fulfilling physical exercises, for children with myopia it is necessary to exclude heavy physical loads, sharp movements, jumps, lifting of weight [I.A. Akhmadulina, 2009].

In opinion of a number of authors application of physical exercises in complex physical rehabilitation can be successfully combined with medical therapy and different physical methods [M. Makhov, 2010; E.I. Saydasheva, 2010], massage, psycho-correction and other rehabilitating means and methods [Ye,V, Bismak, 2007; L.A. Yerakova, 2005; L.O. Tovchenko, 2007; U. Ostermayer-Sitkovsky, 2010; S.I. Statyev, 2010].

Degree of myopia manifests in presence of different by level disorders in connective, muscular and nervous tissues of eye and vessels. Disorders can be both functional and organic. For elimination of functional disorders reflex therapy methods can be included in physical rehabilitation program [14, 15]. Reflex therapy is a medical –prophylaxis system, based on evaluation of parameters of periphery reflexogenic zones and influencing on them for regulating of organism's functional systems [4]. Reflex therapy can include all kinds of reflexogenic actions: somatic-sensor, visual, hearing and other and, therefore, medical methods as well, which are based on stimulation of appropriate receptors, including light and color-therapy, acu-pressure, musical therapy, aroma therapy and etc. [4].

In literature there are some data about restoration of eyesight with acquired myopia by methods of corporal and auriculo-corporal acupuncture [2; 16; 45; 51; A.S. Skuratovich, 2009; S.V. Shmaley, 2007; Caceres V., 2008], with application of micro-puncture system of hands and soles (Su Joke therapy) [3; 9; 11; 12; 15; 19; F.B. Agayev, 2010; S.A. Obrubov, 2005; M.V. Kuznetsova, 2007], electric puncture, laser puncture [1; A.S,. Strogal, 2003; M.V. Kuznetsova, 2007]. Specifying of appropriate part of body for micro-puncture system is carried out on the base of somatic topically organized diagram of body and internal organs [2; 3]. Estimation of zones' state permits to carry out diagnostic and treatment procedures both by reflex and rehabilitation specialists and by patients themselves [L.Ye. Gospodarova, 2003; 4].

As per theory and laws of Sy Joke (Onnury's) therapy, every organ of human body is represented in zones of correspondence, which are located in other parts of body and on hands and soles. Change of electric, magnetic properties of organ results in disorders of interaction in zones of correspondence and facilitates formation of painful points. With disorders of organs' functions, it is possible to restore electric interactions in appropriate reflexogenic zone and, consequently, in organ, with which this zone is connected, by influencing on zones with different methods [4].

Restoration of energetic properties of reflexogenic zones can be conducted with the help of application of plants' seeds, fixing them by plaster. It is also possible to fulfill point massage by fixed seeds. In our case, zones, corresponding to eyes are used [11].

In some cases, color painting of reflex zones is used for the same purpose [9].

Some authors dealt with development of rehabilitation program with optimal schema of needle therapy's application, oriented on improvement of visual analyzer's functional state, correction of clinical-functional indicators, reduction of asthenopic symptoms and on secondary symptoms of myopia [1; 11; 12; 14; S.S. Strogal, 2003].

Independent usage of point massage by patients, of magnetic properties of fingers, application of plants' seeds and color were determined as effective methods for self reflex therapy [3, 11]. Chinese schoolchildren compulsory practice traditional self massage of acupuncture points around eyes twice a day in order to reduce eyes' tiredness and prevent from myopia [36].

Methods of reflex therapy are universal by their influence on functional activity of all organism systems. RT regulates functional state of central nervous system, increases excitability of nervous centers, improves conducting of nervous impulses by periphery nerves. With purely local irritation of skin-nervous, muscular-sinew-nervous and vascular-nervous receptors in certain points of body we receive logical responsive, segment-organ and general responsive. System of biologically active points manifests pain-killing, anti-inflammation, myo-relaxing, lymph-draining, trophic, re-constructive, tonic and sedative effects [1; 9; 15; M.V. Kuznetsova, 2005; V.V. Neroyev, 2006]; it regulates homeostasis and adaptation level of organism [4]. However, at present, potentials of needle therapy has not been studied yet in the aspect of improvement of visual analyzer's functional state in complex treatment of progressing myopia of different degrees, as a method, facilitating elimination of asthenotopy, normalizing blood circulation in eye ball that prevents from eye myopia and from development of eye's dystrophic changes [1; M.V. Kuznetsova, 2005; F.B. Agayev, 2010].

For confirmation of effectiveness of rehabilitation with the help of reflex therapy of teen-agers with myopia complex examination implies application of classic ophthalmologic methods with optimal correction and without it, determination of dynamic and static refraction, tone of adaptation, reserve of relative adaptation's positive portion, adaptation reserve [S.A. Obrubov, 2005; O.V. Arutiunova, 2007].

In our opinion, considering influences on teen-ager's with myopia visual organs and organism, it is necessary to use:

- Direct communication with child in the process of studying and using of psycho-therapy methods in form of talks for creation of steady motivation for rehabilitation;
- Individual training of special exercises;
- General and special physical exercises, breathing exercises and other, which shall be fulfilled at classes as individual and group trainings;
- Individual teaching to methods of sel reflex therapy;
- Methods of self reflex therapy: point self massage, application of plants' seeds, color therapy, twist gymnastic;
- Twist gymnastic for eye muscles in combination with exercises for fingers' and hands' muscles, alternated by breathing exercises.

In the base of patient's participation in rehabilitation process there is training of physical exercises and methods of self reflex therapy, which, in this connection, are not only medical but also pedagogic processes [12, 13].

After familiarizing of patients with micro-puncture systems of hands' and soles' correspondence, training of methods of influencing on zones of problematic organs in these systems, certain training on mastering of point massage methodic, application of plants' seeds and color therapy it is possible to use the above listed Su Joke methods for self reflex therapy [9, 10, 11].

The described influences of physical exercises on organism can be supplemented by methods of reflex therapy, intensifying their general influence on organism and, in particular, on functional state of eyesight organs.

Propaganda of healthy life style among children of school age and intensification of recreational functioning can help to prevent from appearance and progressing of myopia [46].

Analysis of scientific methodic literature, devoted to studying of rehabilitation measures' influence with myopis, showed that combined application of therapeutic gymnastics and reflex therapy results in significant

improvement of teen-agers' physical condition and increasing of their functional abilities [G.D. Zhaboyedov, 2002;V.G. Kovylina, 2008].

Conclusions:

Theoretical analysis of special scientific methodic literature permitted to make the following conclusions:

1. Increasing of myopia prevalence among children of school age against the background of risk factors' rising, which is connected with intensification of visual load during studying at school, requires development of new approaches to rehabilitation measures' realization.
2. Method of kinetic-therapy, with application of different by orientation exercises and twist gymnastics for eye muscles shall be applied for teen-agers with myopia, but with compulsory observance of recommendations for their using, with restricting of significant power strains, excessive physical loads and jumps.
3. Application of reflex therapy methods during rehabilitation of teen-agers with myopia is justified by positive effect, received after rehabilitation course.
4. Complex regulated application of therapeutic gymnastic and self reflex therapy methods (point massage, application of plants seeds, color therapy), in our opinion will ensure higher effect of rehabilitation measures.
5. The course of physical rehabilitation with application of kinetic therapy and self reflex therapy shall gradually go into long term rehabilitation process with creating of maximal motivation of its necessity for improvement of life quality in the future.

Foundation and development of physical rehabilitation program for patients of different age groups with different degrees of myopia with the help of kinetic therapy, reflex and self reflex therapy is, in our opinion rather promising direction.

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Cite this article as: Redkovets T.G., Romman Haytham J.M. Justification inclusion of physiotherapy and self-reflexotherapy program physical rehabilitation of adolescents with short-sightedness. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 53-60. doi:10.6084/m9.figshare.923515

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

Received: 23.12.2013
Published: 28.12.2013

CHANGES OF VALUES PARENTS' SCHOLARSHIP IN PHYSICAL CULTURE UNDER THE INFLUENCE OF REALIZATION SET OF ACTIVITIES ON OPTIMIZATION OF PHYSICAL EDUCATION OF ELDER PRESCHOOLERS

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Annotation. *Purpose*: to consider results of values of parents' scholarship in physical training, also degree of its changes, originated under influence of set of activities on optimization physical education of elder preschoolers. Material: 117 parents took place in experiment, children of those were in control and experimental groups. *Results:* for improving level of theoretical and practical readiness of parents in the issues of physical education there were conducted different forms of work and developed methodical recommendations. It is found out that values of parents' physical scholarship of experimental group improved by 38% as compared to the beginning of research. *Conclusions:* under influence of set of activities on optimization of physical scholarship of elder preschoolers there were marked increase of parents' scholarship in physical training that allows to recommend its use in preschool institutions.
Keywords: parents, values, physical culture,set of activities, ways of work.

Introduction

Nowadays the most essential note of modern concept of physical scholarship is improvement the role of parents' scholarship in physical training and forming physical culture personality of preschoolers. In the concept of improving preschool education during years 2012-2016 [4], also in the basic component of preschool education [1], it is foreseen that one of the main directions in the forming personality of preschoolers is improvement cooperation with families and wide attraction of parents in the process of education.

Growth of preschool age children who constantly get ill, submit the teachers to necessity of rethinking contents and forms of work with parents. This necessity is caused by such reasons as age reduction of those children who go to school; presence of different types of families (single-parent, multi-child, with insufficient financial means) [3; 6; 13].

Analysis of theoretical research showed that while formation positive attitude to classes of physical training and sports of preschool age children the most important is the factor of knowledge and influence of parents [5; 7; 11; 14]. N. Pangelova points out that forms of behavior inherited by a child are defined by the influence of parents. That is why the role of educational environment and a teacher, which provide purposive formation of self-preservation culture and responsibility for own health and health of native people, is remarkable [8].

It should be noted that according to data of scientists [2; 9; 15], the level of knowledge and skills of parents in the issues of organization healthy way of life, strengthening children's health is not sufficient for formation physical culture personality of a child.

In the first place it is connected with insufficient implementation of informational influence on elder preschoolers' parents. Owing to this, we should agree to the idea of scientists about intensification of educational concentration to physical culture in those families where preschool age children are brought up. The better the primary physical culture education is in the family and preschool educational establishments, the most effective will form the necessity in physical training exercises [3; 10; 12].

According to H.N. Lidjieva, for involvement preschool age children to values of physical training, first of all, it is necessary to improve physical culture literacy of future parents [5].

Summarizing thoughts of the scientists we also consider the question of improvement level of parents' physical culture scholarship of preschool age children as an actual and such that needs a detailed examination.

The research was conducted according to plan of scientific and research work of Sumy state Teachers' Training University named after A.S. Makarenko Ministry of education and science of Ukraine as per 2007 – 2011 on issue «Optimization process of education and upbringing of various groups of population by means of physical culture», approved by department of state registry of Ukraine institute of scientific and technical information in the city of Kyiv (number of state registration 0107U002255) and «Improvement level of health and physical conditioning of various groups of population by means of physical culture» (state registration number 0111U005736) as per years 2011 – 2015.

Purpose, tasks of the work, material and methods

Objective of the research is detection the influence of set of activities in optimization physical culture of elder preschoolers on values of physical scholarship of parents.

Task of research:

1. Define values of physical culture scholarship of parents whose children belong to control and experimental groups.

2. Research changes of values physical culture scholarship of parents under influence of developed set of activities.

doi: 10.6084/m9.figshare.923516

Methods and organization of research: analysis of scientific and methodical literature, pedagogical experiment, questionnaire survey, methods of mathematical statistics.

Research was conducted in the period from September 2012 to May 2013 on the basis of preschool education establishments № 18 and № 28 Sumy city. 117 parents of preschoolers took part: 58 – control group and 59 - experimental.

Results of the research

Detection of physical culture scholarship of parents was held by means of self-appraisal of their knowledge in the questions connected with physical culture upbringing of preschoolers under the method of H.N. Lidjieva [5]. In accordance with outgoing data of pedagogical experiment in results of questioning parents of control and experimental groups (Table 1) there were no statistical authentic discrepancies both according to separate and integral values. Values of arithmetical mean of parents from both groups made 2 grades from three possible (p>0,05).

Table 1

Comparative measures of physical culture scholarship of parents from control and experimental groups at the beginning of experiment

Tasks for parents	CG (n= 58)	EG (n= 59)	p
	grade ($\bar{x}$ ± m)	grade ($\bar{x}$ ±m)	
1. Make set of morning exercises according to age of a child	2±0,08	1,78±0,07	p>0,05
2. Have a conversation on significance of physical culture	2,1±0,07	2,2±0,07	p>0,05
3. Propose an outdoor game	2,06±0,09	2,2±0,07	p>0,05
4. Have a demonstration while study physical exercises	2±0,08	1,9±0,07	p>0,05
5. Give recommendations on use of health-improving and conditioning to the cold procedures	2±0,07	1,8±0,07	p>0,05
Mean value	2,07±0,07	2,02±0,04	p>0,05

Having analyzed statistical data of research we found out that parents cannot give necessary recommendations on use of health-improving and conditioning to the cold procedures, show correct execution of physical exercises, cannot choose exercises for morning training. This is, according to the idea of authors [5; 6], should be considered as one of the basic reasons of physical illiteracy of parents.

For improvement level of theoretical and practical scholarship of parents in the issues of physical culture there were developed forms of work (pic. 1), with the help of which two times a month during a study year essential knowledge on physical culture were given.

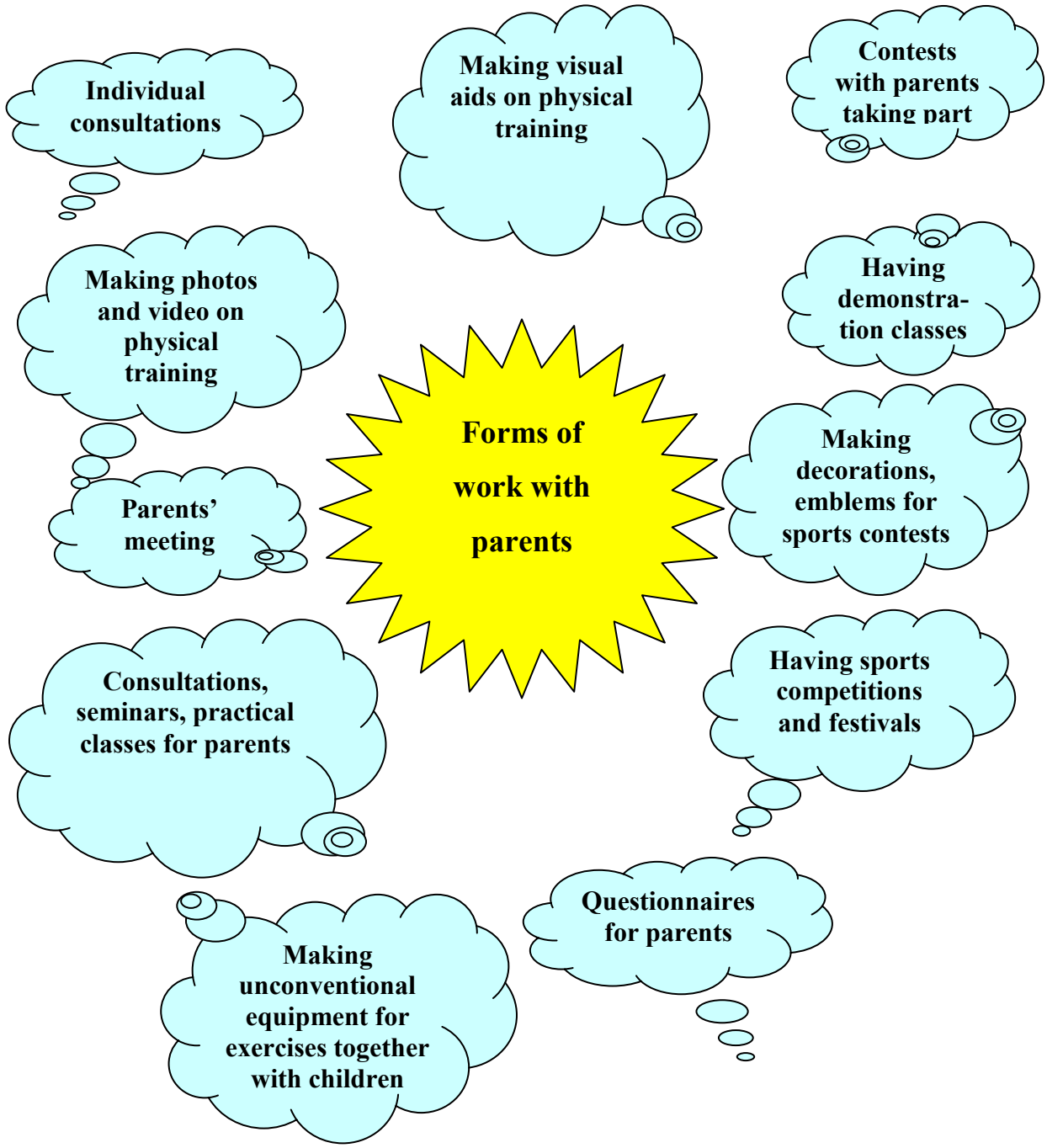
In the course of planned work with parents there were foreseen solving of the following tasks:

1. Provide parents with theoretical knowledge in physical culture that is necessary for all-round development of preschoolers and their further readiness to study at school;
2. To introduce to the modern methods of improvement of children's health;
3. Teach parents set of exercises for morning training;
4. Demonstrate set of exercises, directed to formation vitally important motoric skills and habits of senior preschoolers by means of children fitness;
5. Contribute to problem solving of physical readiness of a child to study at school;
6. Contribute to systematic conducting health-improving work in families;
7. Attract parents to participation in sports festivals and contests.

It should be noted that in majority of children preschool education establishments the methodical literature for parents is not sufficient; it could help them to understand issues of physical upbringing of preschoolers, favor the readiness to school study not only mentally, but also physically.

With this purpose we developed methodical recommendations "Physical education in a family", which helped to brush up necessary theoretical knowledge, and also practical skills necessary for all-round development of preschoolers, especially today, when children go to school at the age of six.

After implementation of work on improvement the level of parents' physical scholarship at the end of academic year, we defined statistically possible difference in all experimental values (pic. 2).



Pic. 1. Ways of work with parents of preschool age children

Table 2

Comparative values of parents' scholarship in physical training from control and experimental groups after experiment

Tasks for parents	CG (n= 58)	EG (n= 59)	p
	grade ($\bar{x}$ ± m)	grade ($\bar{x}$ ± m)	
1. Make set of morning exercises according to age of a child	2,12±0,08	2,57±0,06	<0,05
2. Have a conversation on significance of physical culture	2,25±0,07	2,93±0,03	<0,05
3. Propose an outdoor game	2,13±0,08	2,89±0,03	<0,05
4. Have a demonstration while study physical exercises	2,09±0,1	2,76±0,05	<0,05
5. Give recommendations on use of health-improving and conditioning to the cold procedures	2,06±0,07	2,72±0,05	<0,05
Mean value	2,13±0,07	2,79±0,03	<0,05

Having summarized data of all questionnaires we found out that the best improvement was in the answers of parents from experimental group on question five – 46% that defines their skills to provide children with recommendations on use health-improving and conditioning to the cold procedures. Parents from the control group improved only by 3% as compared to the start values (table 3).

Table 3

Difference in the values of parents' scholarship in physical culture from control and experimental groups

Tasks for parents	CG (n= 58)		Changes %	EG (n= 59)		Changes %
	start	end		start	end	
	grade ($\bar{x}$ ± m)			grade ($\bar{x}$ ± m)		
1. Make set of morning exercises according to age of a child	2±0,08	2,12±0,08	6**	1,78±0,07	2,57±0,06	44*
2. Have a conversation on significance of physical culture	2,1±0,07	2,25±0,07	7**	2,2±0,07	2,93±0,03	33*
3. Propose an outdoor game	2,06±0,09	2,13±0,08	3,3**	2,2±0,07	2,89±0,03	31*
4. Have a demonstration while study physical exercises	2±0,08	2,09±0,1	3**	1,9±0,07	2,76±0,05	43*
5. Give recommendations on use of health-improving and conditioning to the cold procedures	2±0,07	2,06±0,07	3**	1,8±0,07	2,72±0,05	46*
Mean value	2,07±0,07	2,13±0,07	2,8**	2,02±0,04	2,79±0,03	38*

Notes: * – probability of distinction p<0,05; ** – probability of distinction p>0,05

We achieved faithful changes in the answers of parents from experimentl group on questions that discover their skills to make set of exercises for morning training. Average values positively changed from 1,7 to 2,5 grades with growth to 44% (p<0,05), in control group growth comprised 6% however changes were defined statistically improbable (p>0,05).

Conducting of demonstration and individual classes for parents with use of fit ball gymnastics and game fitness positively influenced their potential to show while studying physical exercises, outdoor games, also ability to have a conversation about significance physical culture and sports for organization healthy way of life of senior preschoolers.

Comparative analysis of results after accomplishment forth task between starting and final stage of experiment showed that parents from experimental group have progressive changes of results, which improved significantly by 43%, while in control group improvement comprised only 3%.

Obtained data as for parents' skills to have a conversation about physical culture in the control group testify to its improvement by 7% with probability (p>0,05), and in the experimental – by 33% (p<0,05) as compared with the results at the beginning.

In the experimental group statistically likely improved results of execution of the third task by parents, with the help of which we defined their skills to have an outdoor game and had 2,9 grade, and in the control comprised 2,1 grade ($p>0,05$). It should be mentioned that at demonstration lessons in EG we paid parents' attention to the importance to be able to present an outdoor game with a child both at home and in the street; so we can make a conclusion that these theoretical knowledge and practical skills helped parents in the answers.

Comparing final values of level of parents' scholarship in physical culture in the experimental group with the beginning of experiment, we defined that they improved by 38%, that proves efficiency of conducted activities. Results of parents' knowledge in physical culture being in control group did not have major changes ($p>0,05$) that is why they are not sufficient for formation physical culture scholarship of senior preschoolers.

Conclusions.

1. Values of parents' scholarship in physical culture, whose children are from the control and experimental groups, at the beginning of experiment comprised two grades from three possible and statistically did not have major changes ($p>0,05$).
2. Under the influence of developed set of activities on optimization physical education of senior preschoolers there were statistically probable changes according to all researched values of the parents from experimental group. At the beginning of experiment level of knowledge of parents from experimental group was 2,02 grades and by the end it improved by 38% and comprised 2,79 grades ($p<0,05$). In control group parents' growth in the values of scholarship in physical culture comprised 2,8% however the results were statistically improbable ($p>0,05$).

Perspectives of further research will be connected with search of most effective ways of improvement parents' scholarship in physical culture and definition of its correlation with the level of mastering vitally important motor skills and habits of preschoolers.

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Cite this article as: Tomenko O.A., Starchenko A.U. Changes of values parents' scholarship in physical culture under the influence of realization set of activities on optimization of physical education of elder preschoolers. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 61-66. doi:10.6084/m9.figshare.923516

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

Received: 25.11.2013
Published: 28.12.2013

HORMONAL RESPONSE TO DIFFERENT REST INTERVALS DURING RESISTANCE TRAINING WITH LIGHT LOADS

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Annotation. *Purpose:* The purpose of the present study was to determine the appropriate rest time between sets during weight training with light load. *Material:* Seventeen cadet wrestlers (age =16.7±0.6 yrs.; height =169.2±8.2 cm; and weight =51.4±7.9 kg) were recruited from wrestling clubs in the Iranian province of Kurdistan and served as subjects in this study. This study was conducted over seven sessions with 48 hours recovery between sessions. In the first session, the characteristic features of subjects were recorded and the one repetition maximum in the bench press test was determined for each subject. On 6 separate occasions, subjects performed a 4 set of bench press at 60% 1RM with a 90 and 240 seconds rest interval until volitional fatigue. The numbers of repetition performed by the subjects, and also, cortisol and testosterone levels and 1RM were recorded. The results showed that there was a significant difference in the sustainability of repetitions during 4 sets bench press with 60 % load between 90 and 240 seconds rest intervals (rest interval effect) ($p<0.05$) as well as with 90% load. *Results:* Additionally, there was a significant difference in the sustainability of repetitions during 4 sets bench press in 90 and 240 seconds rest intervals, both, between light and heavy loads (load effect). Plasma cortisol concentrations significantly increased after all bench press trials. Also, the rest interval effect was statistically significant in both 60 % and 90% load trials. But, the load effect was only statistically significant in 90 seconds rest interval trial ($p<0.05$). In contrast, plasma testosterone concentrations significantly increased after 4 sets bench press only in 90 seconds rest interval with heavy load and 240 seconds rest interval with light load ($p<0.05$). Accordingly, testosterone to cortisol (T:C) ratio were significantly decreased after 4 sets bench press in 90 seconds rest interval with light load and 240 seconds rest interval with heavy load. Also, load effect was statistically significant only in 90 seconds rest interval trials and rest interval effect was statistically significant only in heavy load trials ($p<0.05$). *Conclusions:* Based on these results it can be concluded that when resistance training with light loads, higher resting interval (240 seconds) may be provides a better anabolic environment for muscle growth and keep the training intensity.
Key words: rest interval, training load, resistance training

Introduction

In recent years, one of the important issues that have attracted the attention of many researchers is the optimum recovery time in exercise training and sports competition. Due to the nature of the sports and different needs of fitness, there is a specific training method for obtaining the necessary preparations for any sport [4]. Among the training factors, the rest interval time between workouts is a key element of success in any training program [3].

Recovery or return to the base state is the time between the end of a workout or strenuous activity and the next activity or in other words, the duration between the end of one activity and the start next break [15].

Due to the great diversity of sports, the optimal recovery time varies between different fields. Therefore, athletes should train with different methods based on the nature of their sport and the need for strength, endurance and speed.

Weight training in many sports is important for improving physical fitness factors. Hence, athletes to achieve the desired level of performance and increase overall physiological abilities, should use strength-endurance training. According to many studies in the past two decades, rest interval and a proper recovery time between activities is one of the main factors for the success of any training program [6, 15, 17]. In the absence of adequate rest and recovery, athletes will not benefit from the full effect of exercise.

There has been enough information about the optimal weights, repetitions and sets in weight training programs. Much research was done in the area of weight training based on principles of overload, resistance and features. De Salles et al (2009) studied the rest interval between sets in strength training [6]. They reported that resting 3-5 minutes between sets produced greater increases in absolute strength, due to higher intensities and volumes of training. Furthermore, they reported that higher levels of muscular power were demonstrated over multiple sets with 3 or 5 minutes versus 1 minute of rest between sets. Jensen and Ebben (2003) studied the kinetic analysis of complex training rest interval effect on vertical jump performance [9]. They showed that to optimize jump performance it appears that athletes should not perform jumps immediately following resistance training. It may be possible that beyond 4 minutes of recovery performance could be enhanced. Robinson et al (1995) investigated the effects of different weight training exercise/rest intervals on strength, power, and high-intensity exercise endurance [20]. They showed that except for maximum strength, adaptations, to short-term, high-volume training may not be dependent on the length of rest intervals. Matuszak et al (2003) studied the effect of rest interval length on repeated 1 repetition maximum back squats [13]. They reported that indicate that 1-minute rest intervals are sufficient for recovery between attempted lifts during 1RM testing or training for the free-weight back squat when involving lifters of this caliber. Willardson et al (2006) investigated the effect of rest interval length on bench press performance with heavy vs. light loads [25]. They showed

doi: 10.6084/m9.figshare.923517

that when the training goal is the maximal strength development, 3 minutes of rest should be taken between sets to avoid significant declines in repetitions. The ability to sustain repetitions while keeping the intensity constant may result in a higher training volume and consequently greater gains in muscular strength. Rahimi (2005) studied the effect of different rest intervals on the exercise volume completed during squat bouts [17]. He reported that the 5-minute rest condition resulted in the highest volume completed, followed in descending order by the 2- and 1-minute rest conditions. The ability to perform a higher volume of training with a given load may stimulate greater strength adaptations.

In recent years, several studies have examined the effect of exercise loads, number of repetitions and sets discussed. However, there is no general consensus about rest periods between sets. Furthermore, the period of rest between weight training sessions are different in strength and endurance sports. Therefore, the purpose of the present study was to determine the appropriate rest time between sets during weight training with light load.

Methods

Subjects

Seventeen cadet wrestlers were recruited from wrestling clubs in the Iranian province of Kurdistan and served as subjects in this study. They all had at least 3 years training experience and were representative of the top wrestlers of Kurdistan competing in national competitions. Before participating, the subjects' parents were informed of the potential risks and gave their written informed consent for their children to participate in this study, which was consistent with the human subject policy of the University of Guilan Research Center. Subject characteristics were as follows (mean ± SD): age =16.7±0.6 yr; height =169.2±8.2 cm; and weight =51.4±7.9 kg.

This study was conducted over seven sessions with 48 hours recovery between sessions. In the first session, the characteristic features of subjects were recorded and the one repetition maximum in the bench press test was determined for each subject. On 6 separate occasions, subjects performed a 4 set of bench press at 60% 1RM with a 90 and 240 seconds rest interval until volitional fatigue.

The numbers of repetition performed by the subjects were recorded. 5 ml blood was drawn from the antecubital vein before and 5 minutes after exercise and transferred immediately to the lab for assessing blood testosterone and cortisol levels. Serum levels of testosterone and cortisol were measured by radioimmunoassay (RIA) using the commercial kit (IM1119, IMMUNOTECH) and (IMMUNOTECH, IM1841). The one-repetition maximum (1RM) of subject measured by bench press test and Brzycki formula:

$$1RM=\text{weight (kg)} \times (1.0278-(0.0278 \times \text{repetition})) \text{ [18].}$$

Statistical Methods

All descriptive data are expressed as means ± SD. Data were analyzed using ANOVA with repeated measure and Bonferroni post hoc test. Statistical analysis was conducted using SPSS 16.0 for Windows.

Results

The results of sustainability of repetition, Cortisol concentrations, Testosterone concentrations, and Testosterone to Cortisol (T: C) ratio during 4 sets bench press in different trails are shown in Fig 1. There was a significant difference in the sustainability of repetitions during 4 sets bench press with 60 % load between 90 and 240 seconds rest intervals ($p<0.05$; Fig 1-A).

Plasma cortisol concentrations significantly increased after both bench press trials. Also, the rest interval effect was statistically significant in 60 % load trial ($p<0.05$; Fig 1-B). In contrast, plasma testosterone concentrations significantly increased after 4 sets bench press only in 240 seconds rest interval with light load ($p<0.05$; Fig 1-C). Accordingly, testosterone to cortisol (T:C) ratio were significantly decreased after 4 sets bench press in 90 seconds rest interval ($p<0.05$; Fig 1-D).

Discussion

One of the experimental methods to evaluate the physically and mentally state of athletes is the investigation of the anabolic and catabolic hormones changes during exercise. In this context, the role of cortisol as a primary catabolic hormone is important. It has been suggested that cortisol changes in response to exercise and, mental and physical stress [12].

Our results showed that plasma cortisol concentrations increased significantly after 4 sets bench press exercise with 90 and 240 seconds rest intervals between sets with light and heavy loads. Interestingly, mean changes were significantly higher in 90 seconds rest interval with 60% load in compare to 90% load.

It is reported that changes in core temperature during exercise can affect plasma cortisol levels and there is a direct correlation between core temperature and cortisol levels [5]. Furthermore, other researchers showed that exercise is a powerful stimulant for the central nervous system (CNS) and hypothalamic-pituitary-adrenal axis [1].

Moreover, other authors reported that increase in core temperature during exercise via stimulating hypothalamic-pituitary-adrenal axis increases cortisol values [23]. If you don't get sufficient rest between workouts, this hormone will change in a way that puts your body in a catabolic state. Cortisol is a catabolic and steroid hormone which is largely involved in regulation of metabolism and the body's response to exercise stress. However, long-term elevation will cause the problems that immune system disorders and protein degradation are most important of these [24].

Cortisol changes during exercise training are explained by different mechanisms. In the high intensity exercise, a 2-fold increase in plasma cortisol is observed, which is due to the increased hormone secretion rather to the excretion [10].

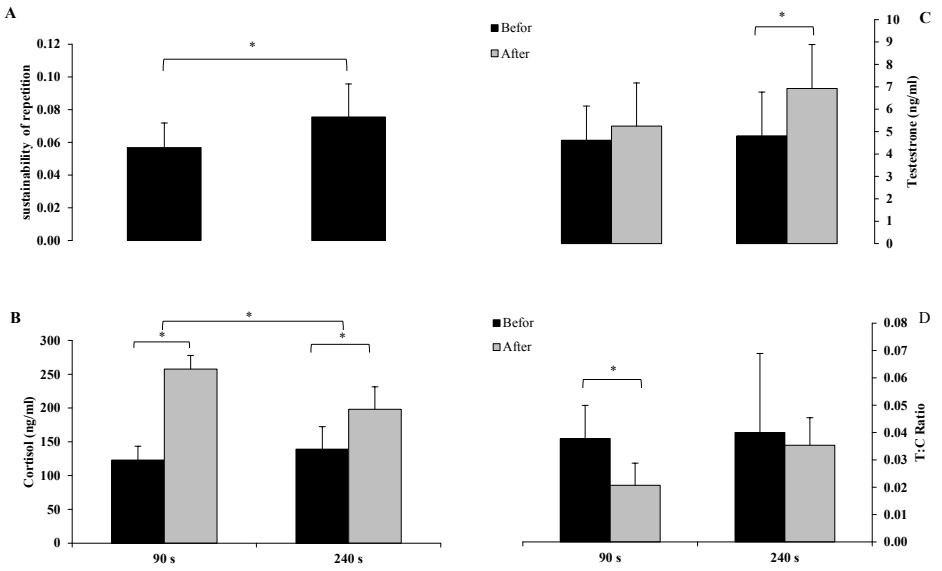

*Fig 1. Means and standard deviations of (A) Sustainability of repetition, (B) Cortisol concentrations, (C) Testosterone concentrations, and (D) Testosterone to Cortisol (T:C) ratio, during 4 sets bench press in different trails. *, Significant difference between line-delineated trails; $p<0.05$.*

The intensity and duration of physical activity are important factors that affect cortisol response. In the exercise with intensity of higher than 60 % maximum oxygen consumption, the levels of this hormone is increased [10].

Although, more increase in cortisol level in 240 seconds in compare to 90 seconds rest interval is unaccountable in heavy load trials, using light load, lower the rest interval resulted in higher cortisol levels in current study. Many factors such as stress, physiological circadian rhythm and body temperature affects on the acute cortisol response to exercise [10].

We observed that mean plasma testosterone concentrations do not change significantly after 4 sets bench press with light load and 90 seconds rest interval, as similar as, with heavy load and 240 seconds rest interval. In contrast, as mentioned above, cortisol level has significantly increased in these trials. Since cortisol is the inhibitor of testosterone secretion and the level of this hormone increased, it is expected that in this rest intervals, testosterone does not change significantly [7].

On the other hand, it is known that skeletal muscle fibers have specific androgen receptors that can remove these hormones from the circulation and cleansing by the increase in the metabolism of these. Therefore, in the present study, may be increased removal of testosterone by muscle result in increased insignificant testosterone [2, 21].

As a result of cortisol and testosterone changes, the testosterone to cortisol ratio, a criteria for balance of anabolic-catabolic processes [14, 22], significantly changed in those trials that testosterone has no significant changes, i.e. light load with 90 s rest interval and heavy load with 240 s rest interval.

Mechanisms underlying testosterone changes following physical activity is not well understood. However, one of the possible mechanisms that proposed for testosterone changes is shifts in blood volume [16]. If blood volume reduced during physical activity is likely that increased blood viscosity and increase's hormone was unreal.

Based on the intensity and duration of physical activity, temporary changes occur in the balance of anabolic-catabolic processes. Repetitive exercises without adequate and appropriate recovery can cause prolonged irregularities in the balance of anabolic-catabolic processes [8, 11]. Furthermore, this ratio decreases with increasing intensity and duration of exercise [8].

The results showed that the testosterone to cortisol ratio has significantly changed after 4 sets of bench press with 90 seconds rest interval. Although, increased the levels of testosterone and cortisol, both, the testosterone cortisol ratio was significantly reduced due to higher levels of cortisol in compare to testosterone.

Finally, the ability to maintain repetitions of bench press is higher in long vs. short rest intervals. It is possible that insufficient time for recovery and reconstruction energy stores and waste disposal in the short rest intervals is the main cause. It can be concluded that in the situations that muscle hypertrophy is a goal; it can be obtained by assigning a long time rest interval and heavy load in resistant exercise training.

Overall, the results indicated that the Sustainability of repetition, Testosterone concentration and testosterone to cortisol ratio in training with light load and rest intervals of 240 seconds was more than 90 seconds. Also, the cortisol concentration in 240 seconds resting interval was less than 90 seconds resting interval. Based on these results it can be concluded that when resistance training with light loads, higher resting interval (240 seconds) may be provides a better anabolic environment for muscle growth and keep the training intensity.

Acknowledgments

The authors wish to thank the Vice Chancellor for Research of Islamic Azad university of Ghorveh branch for their finance assistants and athletes and coaches of Takhti wrestling club who participated in present study. This work was supported by the Islamic Azad university of Ghorveh branch.

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Cite this article as: Payam Mohamad-Panahi1, Hadi Rohani2, Navid Lotfi. Hormonal response to different rest intervals during resistance training with light loads. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2014, vol.2, pp. 67-71. doi:10.6084/m9.figshare.923517

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

Received: 28.12.2013
Published: 28.12.2013

STRESSFUL SITUATIONS IN TEACHING PROFESSION – CAUSES AND CONSEQUENCES

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Annotation. *Purpose*. Determination which areas of teacher's work are primary sources of stress, denomination of the extent to which disciplinary problems with students were stress inducing, and what was the frequency and intensity of these situations. *Material and methods.* The study involved 180 teachers from junior high schools, among which two groups were selected: physical education teachers (74 persons) and teachers of other subjects (106 persons). The reason for this division was the necessity of identifying the groups of teachers differing in specifics of school subjects, studies which they graduated from, and determine the typical areas of difficulty experienced. The research was based on a diagnostic survey and a questionnaire. *Results*. Teaching profession is considered as psychologically challenging occupation due to numerous occurrences of stressful situations. Yet it is not equally aggravating for everyone – there are well-functioning teachers who cope easily, but on the other hand, there are cases of serious psychosomatic consequences caused by frequent and prolonged pressures. Abilities of dealing with difficult situations largely depend upon one's individual predispositions, resistance to stress, way of assessing a situation and resulting type of action. *Conclusions*. The ability (or lack of it) of coping with range of educational activities may determine the intensity of experienced difficulties, and therefore the frequency of occurring stressful situations. Lack of skills in the area of interpersonal relations translates to inability to coping with problematic situations with pupils. This leads the teacher to awareness of own inefficiency and helplessness, which increases the intensity of experienced stress.
Keywords: teacher, stress, difficult situations, educational, skills.

Introduction

The occupation of a teacher bases on direct subjective relation which implies cooperation and emotional exchange. The role of pedagogue requires personal engagement, particular care and the ability of creating and sustaining interpersonal interactions [1]. Because of that, the role of a teacher is burdened with above-average difficulties [2].

To describe the modern profile of a teacher Konarzewski defines it as a vague, internally inconsistent, psychologically difficult and incompatible with other important roles [3].

The ambiguity of teacher's role stems from the fact that it is difficult to find consensus concerning the criteria for evaluating it. It is linked with the absence of predetermined and simultaneously measurable indicators of professional excellence in areas of didactics, education and care. The expectations towards a teacher are evidence of lack of integrity as they are often contradictory or very difficult to meet. Following factors influence the psychological difficulties of teaching profession: responsibility for the other person, relative irreversibility of the decision, the difficulty of correcting own mistakes, necessity to work at a pace and rhythm forced by specific conditions, need to constantly confront the expectations of students and readiness to respond quickly [1]. Inconsistency with other roles occurs when the meeting the expectations linked with given role impedes or prevents meeting the expectations imposed by other roles. In the case of a teacher conflict can occur in two ways - professional and non professional [3].

Another difficulty with the teaching profession is a requirement of having a broad spectrum of diverse competencies that should be continually developed and improved rapidly due to the cultural transformations taking place and changing social needs [4].

The teacher is expected not only to impart knowledge but also to possess educational, organizational and creative the teacher is expected to not only imparting knowledge but also educational skills, organizational and creative, while the effects of his work are indirect, and gratuities usually very uncertain and deferred. In Polish conditions, there are additional factors resulting from the current socio-political and economic situation. For example: low wages, insecurity, underestimation of the teaching profession.

Consequently, teachers too often experience stressful situations, which are not without effect on their health, social relationships and careers. The stress connected with the profession of a teacher is of great interest of pedeutology, psychology and sociology. Borg's application of factor analysis led to the isolation of the root causes of stress in the teaching profession:

Factor 1 – incorrect behavior of students: difficult classes, arrogance and audacity of students, noise, difficulty in maintaining discipline, lack of sufficient interest in school work by students, too numerous classes.

Factor 2 – time pressure as a source of difficulties: lack of time for individual work with children, poorly designed textbooks, lack of adequate equipment and labor saving devices, the need to perform a variety of administrative work, numerous substitutions, the continuation of work at home (preparation for lessons, checking notebooks, tests).

Factor 3 – difficulties in achieving the needs of professional satisfaction: small chance of making a career, awareness of insufficient pay, lack of recognition and gratification for the work.

Factor 4 – insufficient collegial relationships as a source of bad relationships among teaching staff, pressure from the headmaster or education authorities, pressure from parents [5].

doi: 10.6084/m9.figshare.923518

Purpose

Stressful situations occurring in the teaching profession have been discussed in many works devoted to the specifics of the profession and professional burnout, which is regarded as a consequence of the strong, chronic stress experienced in the context of their work [6,7,8]. In these studies, however, little space is devoted to the educational competence of teachers, who in their work primarily deal with the difficulties of educational nature. The ability or lack of ability to cope with this scope may be critical in severity of experienced difficulties, and thus the frequency of stressful situations.

The aim of the research was to pay particular attention to the sphere educational influence of teachers, and to determine to what extent the educational problems of the students lead to the emergence of a state of stress.

The research focused on the following issues: Which areas of teacher's work are primary sources of stress? What is the frequency of experienced difficult situations? How teachers define the intensity of experienced stress? Does professional stress have influence on family lives of the teachers?

Material and methods

The study involved 180 teachers from junior high schools, among which two groups were selected: physical education teachers (74 persons) and teachers of other subjects (106 persons). The reason for this division was the necessity of identifying the groups of teachers differing in specifics of school subjects, studies which they graduated from, and determine the typical areas of difficulty experienced. The study was conducted using a questionnaire, which was one of the research tools used in the comprehensive study carried out in terms of teacher professional burnout.

Results

Areas of the work of teachers which are the main sources of stressors

To obtain information relating to the stressors that are specific to individuals, examined teachers were asked open-ended question, not to suggest areas that could be a source of stress in their work. It was assumed that, in the first place frequently recurring, and most problematic situations will be listed. Through their annoyance they are the most vivid and settled in the perception of people experiencing them.

Among the stressful events mentioned by the teachers, the vast majority concerned educational situations. Difficulties in maintaining discipline in the classroom repeated most frequently (73%), followed by rude (arrogant or disrespectful) behavior of students (61%). Physical education teachers equally often mentioned the noise in the classroom, and therefore the need for increased tone of voice (52%). A further, though at a much less mentioned source of stress was enormous amount of responsibilities and pressure of time to cope with them (29%). Few teachers have identified as stressful relationships with management (7%) and teaching staff (5%).

On the basis on the results of previously conducted studies, that showed significantly lower levels of educational competence of teachers in relation to their substantive and methodological expertise [9], it was assumed that the sphere of educational interaction may be the area most stressful for teachers, causing strong emotional reactions. Therefore, an attempt find out how often teachers react in a raised voice or shout to students hampering the lesson. It turns out that this phenomenon is quite common and frequent, because this type of reaction is admitted by 57% of teachers. A raised voice is on the one hand a way of intimidating the other person and exerting pressure, a sign of aggression. On the other hand it is an expression of helplessness. The above behaviors of teachers indicate some important aspects that could provide the cause of such proceedings:

- Teacher's lack of awareness of the impact of verbal aggression on their students, which triggers its further escalation,
- Ignorance of constructive supportive methods in the maintenance of discipline and proper relationship education,
- Too impulsive responding resulting from the inability to cope with emotions and lack of understanding of the essence of this mechanism.

The frequency of difficult situations and intensity of the experienced stress.

Difficult situations are perceived subjectively - what for one person is troublesome, annoying or threatening, for another may not be a problem. The evaluation of these situations and individual perception depends largely on personal predispositions and skills of coping with stress, which also determines its intensity.

To learn the specifics of difficult situations that cause stress reactions of varying severity, three levels of intensity of stress were adopted:

a). low intensity - a short and moderate anxiety

b). medium intensity - a nervousness persisting for about an hour, with a significant level of anxiety

c) high intensity - a tension lasting a few hours, which is characterized by strong psycho physiological responses.

The determination of the frequency was also clarified: very rarely means once a month or less, rarely 1-2 times a week, often - once a day, very often - several times during the day. On the basis of obtained results it can be concluded that teachers often and very often experience stress of low intensity. They are somehow placed in vocational routine and relate to almost all teachers (90%). Stress of medium intensity, often and very often is experienced by nearly half of the respondents, which is already a concern. However, strong stress reactions are experienced (with varying frequency) by 1/3 of the study group (Table 1).

Table 1

The frequency and intensity of stress experienced by teachers

intensity of stress / frequency of experience stress	low intensity	medium intensity	high intensity
very rarely	-	4%	13%
rarely	15%	48%	10%
often	53%	32%	7%
very often	23%	16%	3%

Some differences were noted in determining the intensity of stress among teachers of physical education and other subjects. Physical education teachers mentioned mostly low and medium level of experienced stress. What is more, there are none who would experience high level of stress in their work. This is important information that requires further steps of research, in order to determine the factors that determine the occurrence of these differences.

Occupational stress and the sphere of family life

The specificity of the teaching profession is the need to perform some of the related duties at home, i.e. preparing for lessons, checking and evaluating the tests, filling in school documentation. These activities reduce the time that could be devoted to the family. For some of the teachers working hours almost never end, which is an additional and significant source of stress. Among the surveyed teachers one third believes that professional duties take them a lot of time and cause a permanent state of tension. This problem generally does not apply to physical education teachers. Another important issue is the transfer of negative emotions from the work onto the ground of family life. Groups of teachers were distinguished for specific types of behavior in reaction to the psychological burden associated with work:

- Teachers, for whom work is not stressful - characterized by their inner calm in relations with students and family relationships.
- Teachers who suppress negative emotions and manage to respond in a calm manner to students, but after returning home, give vent to their tension accumulated at work.
- Teachers characterized by a certain impulsiveness of reactions in stressful work situations, but also in the family life. At this stage of research it is difficult to determine whether such behavior is conditioned by temperament, whether it is due to learned (habitual) ways of responding and low resistance to stress.
- Teachers who react in stressful school relationships both impulsively and calmly, but consciously try not to carry negative emotional states to the sphere family life; they control their reactions towards household members, as they realize that the source of their arousal are different people and situations.

Conclusions

The ability to cope with difficult situations largely is conditioned by individual predispositions of a person, one's resistance to stress and a way to assessing the situation and the consequent action. There are two typical patterns of addressing the stress: optimistic-realistic focused on the success, and the catastrophe pattern set to fail. The experience of stress is thus affected by subjective assessment of the situation. This evaluation may depend on the mood physical and mental forms, external influences and determinants of personality [10]. However, remember that you can also have an impact on the improvement of individual remedial measures and developing the skills limiting the frequency and intensity of the experienced stress, which means learn how to undertake preventive measures [11]. Therefore, in the teacher education system stress coping workshops should necessarily be included, which main purpose is to enrich the internal resources and improving the remedial skills of future teachers. Furthermore, it is essential to teach students relaxation techniques, assertiveness, social and emotional skills [12]. However, this type of course in Polish universities is not sufficient. This means that the development of personality predispositions of the students is neglected. Previous research conducted by the author of study showed that schools educating future teachers, prepare them for psycho-social performance in minimal extent, resulting in, among others, insufficient educational competencies that are necessary in this profession [13]. Moreover, other authors on the basis of the study concluded that greater importance in teacher training is applied to the substantive and methodical knowledge, while neglecting their training in parenting skills, which have a direct relationship with the social skills that are necessary for effective functioning in relationships with students [4,14,15].

As a result of these deficiencies in the competence, teachers encounter many educational problems to which they feel helpless, or act in an incorrect manner [16]. The result of such actions is the formation of abnormal and sometimes destructive relationships that are equally detrimental to the student and the teacher. A student subjected to an incorrect upbringing interactions react with aggression or withdrawal, whereas, a teacher not coping with difficult situations in the school is aware of its own inefficiency and helplessness which increases the intensity of experienced stress.

The teaching profession undoubtedly requires a certain personality predispositions that facilitate the exercise of the profession. According Tucholska [1] personal characteristics and social skills of teachers determine in a special way a proper fit to the profession and protect against excessive stress. However, their deficit carries the risk of exhaustion,

discouragement, disappointment, or excessive professional withdrawal, accompanied by the whole range of psychosomatic symptoms and consequences in social relations in different aspects of life.

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Cite this article as: Anna Romanowska-Tołłoczko. Stressful situations in teaching profession – causes and consequences. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2014, vol.2, pp. 72-75. doi:10.6084/m9.figshare.923518

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

Received: 31.12.2013
Published: 28.12.2013

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- Belgorod State Shukhov Technological University,
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SCIENTIFIC EDITION (journal)
Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports. 2014, vol.2, 80 p.

Editorial to the publisher department KSADA:
certificate DK №860 20.03.2002.

designer - Masterova Y.
editing - Iermakova T.
designer cover - Bogoslavets A.
administrator of sites - Ulanchenko Y.

———————————————————————————

passed for printing 28.12.2013.
Format A4.
KSADA.
Red Banner str. , 8, Kharkov, 61002, Ukraine.
PRINTHOUSE (B02 № 248 750, 13.09.2007).
61002, Kharkov, Girshman, 16a.