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

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

Introduction

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

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

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

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

Purpose, tasks of the work, material and methods

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

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

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

doi: 10.6084/m9.figshare.707097

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

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

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

Results of the researches

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

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

Table 1

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

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

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

N o t e s. Here and below confidential difference of two means for connected and not connected samples at level: «*» - *p<0,05*, «**» - *p<0,01*, is marked.
«***» - *p<0,001*

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

Analysis of the same indicators, which were obtained in thoracic somatic type girls‘ control group (KT_0), showed the absence of substantial changes, that witnessed about manifestation of these indicators on the reached previously level, including systolic BP. The latter, though it increased during academic year by 6,1 % (*p<0,05*), at the end of the year remained within existing standards (see table 1).

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

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

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

Table 2

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Table 3

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

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

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

Table 4

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

Indicators	Group	At the beginning		At the end		Change ($\bar{x}_1$ - $\bar{x}_2$)			
		$\bar{x}_1$	*m*	$\bar{x}_2$	*m*	*Absolute value*	*%*	*t* during year	*t* at the end
Functional indicators									
VCL, millilitre	EM_x	3597	86,9	3950	51,5	353,0	9,8	3,49**	2,88*
	CM_x	3682,5	82,66	3665	84,61	-17,5	-0,5	0,15	
HBF in rest, ск.·min^{-1}	EM_x	74,1	1,7	64,4	1,8	-9,7	13,1	3,92***	3,48**
	CM_x	73,2	1,87	74,7	2,35	1,5	-2,0	0,50	
HBF after dozed load, , ск.·min^{-1}	EM_x	104,9	2,8	90,2	2,5	-14,7	14,0	3,92***	4,25***
	CM_x	103,6	3,17	108,1	3,39	4,5	-4,3	0,97	
Systolic BP, mm. merc. Col.	EM_x	126,3	2,1	120,2	1,4	-6,1	4,8	2,42*	3,58**
	CM_x	128,2	2,72	129,2	2,09	1,0	-0,8	0,29	
IHST, Conc. units	EM_x	78,2	1,8	88,8	1,5	10,6	13,6	4,52***	4,51***
	CM_x	79,6	1,7	78,9	1,6	-0,7	-0,9	0,30	
Test M-K, % of Initial value	EM_x	42,4	2,1	32,3	2,3	-10,1	23,8	3,24**	2,04*
	CM_x	41,6	2,53	47,6	7,29	6,0	-14,4	0,78	
Indicators of physical preparedness									
20 m run, sec.	EM_x	2,8	0,04	2,7	0,05	-0,1	3,6	1,56	3,71**
	CM_x	2,8	0,02	2,9	0,02	0,1	-3,9	3,8**	
Long jump from the spot, cm.	EM_x	225,4	2,4	234,3	1,7	9,0	4,0	3,04**	3,11**
	CM_x	226,8	2,91	225,3	2,36	-1,5	-0,7	0,40	
Shuttle run 4x9 m, sec.	EM_x	9,5	0,06	9,0	0,04	-0,5	5,3	6,93***	7,44***
	CM_x	9,6	0,04	9,6	0,07	0	0	0	
Forward bending from sitting position, cm.	EM_x	9,7	1,04	14,2	0,5	4,5	46,4	3,90***	3,33**
	CM_x	10,4	1,05	11,0	0,82	0,6	5,8	0,45	
Pressing ups, quantity	EM_x	34,6	1,42	46,5	1,9	11,9	34,4	5,02***	3,09**
	CM_x	35,8	1,60	38,8	1,61	3,0	8,5	1,35	
Rising in sitting position 1 min., quantity	EM_x	52,1	2,1	67,8	1,12	15,7	30,1	6,60***	2,41*
	CM_x	53,3	2,02	60,9	2,63	7,6	14,2	2,28*	
Throwing of heavy ball in sitting position, m.	EM_x	6,9	0,16	7,9	0,11	1,0	14,5	5,15***	2,04*
	CM_x	7,1	0,18	7,5	0,17	0,4	5,2	1,47	
Cooper‘s test, m	EM_x	2310,0	34,9	2480,0	28,3	170,0	7,4	3,78**	2,68*
	CM_x	2356,3	50,33	2367,5	31,08	11,2	0,5	0,19	
Backbone dynamometry, kg	EM_x	115,6	2,7	135,4	2,1	19,8	17,1	5,79***	6,61***
	CM_x	116,3	3,11	117,7	1,66	1,4	1,2	0,38	
Tapping test, q-ty per 10 sec.	EM_x	69,0	0,15	70,0	0,11	1,0	1,4	5,38***	2,74*
	CM_x	69,0	0,10	69,0	0,13	0	0	0	

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

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

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

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

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

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

Summary:

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

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

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

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

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Cite this article as: Lukavenko A.V. The effectiveness of the pilot program of differentiated correction of psycho-physical condition of students in physical education. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2013, vol.5, pp. 37-44. doi:10.6084/m9.figshare.707097

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Received: 03.04.2013
Published: 31.05.2013