

Formation of Students' Motorial Culture by Means of "Rhythmic Gymnastics"

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Abstract

The pedagogical character, structure, dynamic pattern and the ratio of functional and psychophysiological opportunities during the educational process of "rhythmic gymnastics" has not been studied yet, that today is a significant gap in pedagogical process in Kazakhstan universities. Aim of the research is an optimization of the educational process on physical education of students of pedagogical high school by means of the "rhythmic gymnastics".

Keywords: rhythmic gymnastics, Kazakhstan, motorial culture

1. Introduction

Introduction of "rhythmic gymnastics" in university physical education will provide continuity of educational material, allow to use the most progressive form of physical education - sports specialization and on this basis solve the overarching problem - the training of future teachers and mastery of regulatory requirements of "the Presidential test of RK" (Goranko, 1998) and the study program. The successful solution of this problem in universities is the primary training task of highly qualified specialist (Ivanov, 2002; Abdykadyrova, 1998). However, the pedagogical character, structure, dynamic pattern and the ratio of functional and psychophysiological opportunities during the educational process of "rhythmic gymnastics" has not been studied yet, that today is a significant gap in pedagogical process in Kazakhstan universities.

2. Method

Aim of the research is an optimization of the educational process on physical education of students of pedagogical high school by means of the "rhythmic gymnastics".

Tasks of the research:

- To identify the pedagogical factors determining the need for introduction of "rhythmic gymnastics" in physical training of students of pedagogical high school;
- To justify the content and impact of the experimental work on the physical, psychomotor characteristics, performance and attendance of students;

Methods of the research: analysis of scientific and methodical literature: questioning, teacher observation, recording of performance and attendance of students.

3. Results

Students of 1-3 courses of the Kazakh State Women's Pedagogical University took a part in the experiment, where we came from the experience of a traditional physical education in the universities of earlier developed methods of improving the physical and psychomotor characters of students (Menchin, 1997).

Research of influence of the experimental work was carried out by comparing the initial and final level of students' physical development (PD), physical training (PT) and comparison of results between two groups: the experimental group (EG) -1 with the EG-2, as well as the results of the experimental group with the control group (CG).

During the experimental work it was revealed that orienteering (direction) of the educational process should be determined taking into account the manifested subtle sense (interest) to the chosen sport. The goals of physical

education with a consideration of the chosen specialization, as well as tasks that were put forward by “rhythmic gymnastics” in our research work was solved in an objective relationship with the objectives of the students’ overall physical condition (OFC). Due to the physical and motor fitness of students in a particular semester, both OFC techniques and means of “rhythmic gymnastics” were favoured. Thus, at the beginning of training in high school the educational process had an expressed general physical orientation within the regulatory requirements of “the Presidential test of RK”. On the 3rd year we strive to solve the specific problems by means of “rhythmic gymnastics”. While solving the problems, we proceeded from the individual abilities of each individual student and constitutional-typological features. Experimental work has shown pedagogical solutions to the research tasks over the three years of teaching the students with regard to the content of the experimental program. Table 1 shows the dynamics of the physical development of students in EG-1 and EG-2 for the period of experimental work.

Table 1. Dynamics of physical development of students in EG-1 and EG-2

Indicators	Groups	1 course	2 course	P ₁	course	P ₂
		X±m	X±m		X±m	
Height (sm)	EG -1	155,2±0,76	156,6±0,82	0,05	157,1±0,8	0,05
	EG -2	155,0±0,75	156,6±0,68	0,05	157,5±0,8	0,05
Weight (kg)	EG -1	51,5±1,06	53,4±0,99	0,05	54,4±1,01	0,05
	EG -2	51,6±0,89	52,0±1,03	0,05	51,9±1,12	0,05
Chest circumference (sm)	EG -1	76,1±1,08	76,8±1,08	0,05	76,9±1,06	0,05
	EG -2	76,8±1,13	76,0±1,17	0,05	76,1±0,10	0,05
Chest excursion (sm)	EG -1	10,9±0,49	11,9±0,05	0,05	14,0±0,16	0,05
	EG -2	10,9±0,45	11,2±0,32	0,05	14,0±0,18	0,05
VC (sm)	EG -1	3126±88,6	3360,0±88,2	0,05	3754,0±0,77	0,05
	EG -2	2746±101,0	3271,0±93,3	0,05	3838,0±0,61	0,05
The strength of the right hand (kg)	EG -1	32,5±0,50	38,4±0,63	0,05	39,2±0,49	0,05
	EG -2	26,5±0,49	33,1±0,69	0,05	33,2±0,77	0,05
The strength of the left hand (kg)	EG -1	28,4±1,01	27,7±0,55	0,05	31,3±0,44	0,05
	EG -2	23,3±0,86	23,3±0,39	0,05	32,2±0,55	0,05

The results show the changes in both experimental groups. In the anthropometric data it is much less, compared to physiometric one. Thus, the vital capacity (VC), by the end of the first course in the EG-1 increased by 234sm³, and in the EG-2 - 238 sm³, and by the end of the 3rd year in the EG-1 increase was 394 sm³, the EG-2 - 567 sm³. The strength of students’ right hand of the EG-1 by the end of the 3rd year increased by 5.7 kg, and in the EG-2 - 6.7 kg, the strength of left hand in the EG-1 increased by 5.8, and EG-2 - 5.9 kg.

Dynamic shifts occurred in PD led to the conclusion that the growth trend of the results in absolute numbers is higher in the EG-2, compared to the EG-1. Comparing the growth dynamics of PD of students in EG with the CG (Table 3 and 4) it should be noted that on the investigated parameters in both experimental groups positive changes were revealed. At the same time, the total gain, especially in physiometric terms is significantly higher in the EG. VC over the three years of teaching in the EG increased by 860 sm³, and in the CG - 217 sm³, the gain in strength of the right hand in the EG is 6,8 kg and in the CG - 5.8 kg, strength of the left hand by 6.9 –the EG and CG - 5.6 kg.

EG and CG programs included mainly general physical focus in the initial stage of training in high school, at senior courses, especially in the third year - a special, i.e. educational work on “rhythmic gymnastics” in the EG. The effectiveness of an experimental approach was determined by comparison of the results of appropriate pedagogical effects after 1, 2 and 3 courses of students in high school (Table 2).

However, the positive shifts in both groups in the 2nd and 3rd year, compared to the first year are not significant in all examined indexes. In the EG-2 increase in PD is higher than in the EG-1. Provided two-times educational classes, this level for them can be considered as the most optimal.

Analyzing the dynamics of PD in the EG, compared to the similar data from the CG, it should be noted that in both groups during the experiment positive changes in the examined indexes were revealed. They are more important at the end of the second course. In the third year with regard to the second year they are insufficient. Total gain in PD during the research period is higher in EG.

Table 2. Comparative characteristics of the dynamics of the physical development EG-1 and MG-2

Indicators	Groups	1 course x±m	2 course x±m	P	x±m	P _g
Height (sm)	EG	155,1±0,75	156,6±0,75	0,05	157,2±0,8	0,05
	CG	156,1±0,75	156,6±0,79	0,05	157,4±0,7	0,05
Weight (kg)	EG	47,4±0,83	46,3±0,43	0,05	48,1±0,5	0,05
	CG	47,4±0,66	46,3±0,36	0,05	50,1±0,56	0,05
Chest circumference (sm)	EG	76,4±1,09	76,4±1,08	0,05	76,4±0,58	0,05
	CG	10,9±0,47	76,4±0,92	0,05	74,4±0,62	0,05
Chest excursion (sm)	EG	10,9±0,47	11,4±0,26	0,05	14,0±0,17	0,05
	CG	9,3±0,33	9,5±0,33	0,05	14,0±0,17	0,05
VC (sm)	EG	2936±94,8	3315±90,7	0,05	3796±0,69	0,05
	CG	2952±97,3	3315±78,15	0,05	3169±0,55	0,05
The strength of the right hand (kg)	EG	29,5±0,50	35,8±0,66	0,05	36,3±0,99	0,05
	CG	29,0±1,26	32,8±0,56	0,05	34,8±0,75	0,05
The strength of the left hand (kg)	EG	25,8±0,93	25,0±0,47	0,05	32,7±0,05	0,05
	CG	25,2±0,99	23,3±0,60	0,05	30,1±0,1	0,05

Improvement of students' physical development in the EG during classes of "rhythmic gymnastics" is one of the most important problems to be solved in our work. Positive dynamics that occurred during the period of the experiment, proving the level of development of physical qualities, is one of the irrefutable evidences of the need for "rhythmic gymnastics" in preparation for the comprehensive physical training of future teachers.

Thus, a comparative analysis of the received data, reflecting the dynamics of change in the PD level of students in the EG-1, the EG-2 and the CG during the main phase of the research allowed us to conclude about a more dynamic development of complex physical qualities of EG students under the influence of targeted pedagogical influences.

The experimental program of training of future teachers for pedagogical and methodological activities included improving life support systems of the students' organisms (Table 3, 4).

Table 3. Characteristics of physical fitness of students of experimental and control groups

Indicators	Groups	1 course x±m	2 course x±m	3 course x±m	P
Running 100m	EG	17,6±0,15	17,2±0,09	16,8±0,08	<0,05
	CG	17,5±0,09	17,3±0,08	16,9±0,09	<0,05
Cross 500m	EG	2,09±1,01	2,02±0,95	1,70±1,05	<0,05
	CG	2,08±1,00	2,05±0,88	2,04±0,90	<0,05
Long jump from place	EG	155±1,17	160±1,11	170±1,05	<0,05
	CG	156±1,08	159±1,04	163±1,00	<0,05
Raising the trunk from a prone position on his back, hands behind head	EG	28±1,01	40±1,00	50±1,15	<0,05
	CG	30±0,99	36±1,01	44±1,05	<0,05

Study of the dynamics in the functional state of students' organisms during the experimental work shows a trend of improvement in tests that reflect the activities of the cardiorespiratory system in all study groups (EG-1, EG-2, CG).

More intensive growth of final results with the regard to the original ones in the EG was found in Ruffier test, proving the positive changes in the health of the cardiovascular system (27.39%). The average value of the index of the test in the EG decreased by 4.2 standard units and increased from a satisfactory level to a good one ($P < 0.001$). In the CG these indicators were not conclusively significant ($P > 0.05$).

A significant criterion proving the improving the function of the cardiovascular system is an analysis of the pulsometry data, where it was revealed that during the experimental work changes in heart rate (HR) in the EG had more pronounced bradycardic character than in the CG. Heart-rate fall in the EG on average by 8.0 beats per minute (in the CG - 4.5 beats) with growth rates of 10.0% (in the CG -5.62%) was marked by a significant

reliability of intragroup differences in initial and final indicators in the EG $P < 0.01$, and in the CG > 0.05 , as well as the significance of differences between groups at $P < 0.01$.

Table 4. Dynamics of change in the functional fitness of students during the experiment

functional indicators	Groups	Initial indices	Totals	Growth	P ₁	P ₂	
1	Harvard step test	EG	72,3±1,02	78,08±0,90	5,78	<0,01	<0,001
		CG	71,01±1,14	73,90±0,92	2,89	<0,01	<0,001
2	Sample Rufe	EG	15,04±0,40	10,92±0,35	4,12	<0,01	<0,001
		CG	15,01±0,36	13,91±0,42	1,1	<0,01	<0,001
3	Heart Rate	EG	80,0±0,80	72,0±0,78	8,0	<0,01	<0,001
		CG	80,0±0,80	75,5±0,70	4,5	<0,01	<0,001

Note. P₁ - reliable significance between baseline and outcome indicators; P₂ - the importance of reliable outcome indicators between groups

Identification of the PWC₁₇₀ level based on the Harvard step test, confirmed the above mentioned provisions on the normal flow of adaptive processes in the life-support system of the students' organisms in the EG, in connection with the use of "rhythmic gymnastics". Fairly significant increase in the EG index value by 5.72 standard units ($P < 0.001$), compared with the same indicators in the CG (4.5) of conventional units ($P > 0.05$), indicates positive changes in responses to PD of students in the EG.

The results of the conducted experimental research convince in reasonability and scientific viability of introduction of "rhythmic gymnastics" into students' physical education. Practical use of this pedagogical impact on students predetermined an obtaining of interesting results, as training of students was focused on the implementation of the basic tasks of experimental work:

- Creation of pedagogical basis for the PD and PP in accordance with the tasks;
- Improving knowledge and skills in the "rhythmic gymnastics" through the development of physical qualities, improving overall mental and physical performance and meeting the regulatory requirements of "Presidential tests of RK";
- Improvement of technical movements in "rhythmic gymnastics" with the development of the necessary physical qualities, meeting regulations of "Presidential test of RK" and achievement good results in selected form of gymnastics.

Before the experimental work there were set goals of "rhythmic gymnastics" activities for students. Program material for both experimental groups (EG-1 and EG-2) was formed from the corresponding theoretical and practical activities: depending on the characteristics of the study groups, about 35% of the time was provided to the overall physical condition and 65% - to "rhythmic gymnastics"

Comparative characteristics of the dynamics of PD in the EG-1 and the EG-2 shows that the VC by the end of the first course in the EG-1 increased by 234 sm³, the EG 2-567sm³. The strength of the right hand in the EG-1 by the end of the third year increased to 5,7kg, and in the EG-2 - 6.7 kg. Similar changes occurred in other indicators of PD.

The dynamic shifts also happened in the PD indicators: race at 100m, cross at 500m, standing long jumps and sit up. Improvements in PD of the EG-1 and the EG-2 are fairly significant. The largest changes are observed in the EG-2, in the CG they are insignificant ($P > 0.05$).

The obtained results reflect the complex unity of the corresponding sides of PD and PP.

An important step in this research is an experimental work on identifying and improving psychomotor qualities of students, which were the leading element in the educational process of physical education, carried out at the university in the form of academic training sessions on the experimental program.

Identification the level of development of psychomotor qualities of students was due to their paramount importance in description of specific professionally and educationally significant personal qualities of the future teachers in the period of global computerization and intensification of production. Volume, distribution, switching and concentration, as well as operational thinking have important pedagogical value.

The data reported in Table 5 show that in order to find, display and read aloud 25 numbers in the Schulte tables in the arithmetical order (from 1 to 25) second-year students spent the least time (the average reading time of 5 tables is 37.9).

Table 5. Averages volume, distribution and switching attention of students in the course of employment "ritmoplastikoy" ($x \pm m$)

Indicators	Group of students in a course of study (EG and CG)			
	1 course	2 course	3 course	CG
Test Schulte				
X	42,4±1,33	9±0,99	40,4±0,97	49,7±1,60
Test 12,75				
View the number of letters	44,5±0,85	51,1±2,8	51,3±2,4	38,4±1,9
0	1,23±1,19	0,90±1,0	0,51±0,59	1,36±1,88
Average time spent on the search for the single digits	10,04±1,5	8,9±0,82	9,0±0,77	13,9±1,8
1 View the number of letters	93,5±2,7	10,1±2,1	10,2±1,7	75,9±1,7
Attention span	0,96±0,11	0,95±0,2	0,98±0,1	0,90±0,2
И	84,9±1,7	11,2±1,7	10,9±1,7	65,5±2,3
Final test				
2 View the number of letters	90,9±2,5	92,1±1,8	96,3±1,8	84,5±2,7
Attention span	0,93±0,1	0,98±0,1	0,99±0,1	0,77±2,2
Indicator of the intensity of attention	93,5±1,8	100±1,8	99,6±2,0	75,5±2,7
3 View the number of letters	96,1±1,3	98,9±1,7	99,9±2,0	78,6±3,3
Attention span	0,92±0,1	0,88±1,0	0,90±0,2	71,2±2,0
Indicator of the intensity of attention	87,3±2,2	99,9±1,5	99,7±1,9	75,7±2,1

They exceeded the data of the third course by 6.6% ($P < 0.05$). The difference in indexes of AS between the CG and third-year students is 35.3% ($P < 0.001$). It should be emphasized that there is no difference in the dynamics of AS, according to reading of one Schulte table; it adequately shows the changes in AS of students in various courses in rhythmic gymnastic activities.

Similar results were obtained during the study of students' attention in this test. The best results were found at second-year students -12.75. Third year students conceded to second year students (the difference between them and second year students was 1.12%, with first year students - 13.46%, $P < 0.05$).

The average time spent on finding the single number - a third-year students' performance data exceeded CG by 33.65% ($P < 0.001$).

In switching attention in proofreading test with 4x30 there were revealed changes in the studied parameters. These changes in different educational groups mostly coincided in direction, but differed in value.

During the first 30 seconds, the largest number of correctly viewed numbers appeared at the third year students - $53,3 \pm 12,2$ in terms of IV, data of the third-year students conceded 2.75% to the second course ($P < 0.05$). For example, the CG conceded to the third-year students at 53.1% ($P < 0.001$).

The first direction of attention caused declines in amount of work on an average of 18.7%, in the intensity of 22.8% in significant proportion of students (except of third-year students). Significant reduction was found at second-year students, respectively, 2.97 and 2.75%. The best indicator of the intensity of the second 30-second time interval was at the third-year students (20.8%).

Changes in intensity performance of study groups during the second time interval are similar to the data of the first time interval.

The second attention switching caused increase in the intensity students' results on an average of 6.45% ($P < 0.05$) compared to the first one.

After the third AS intensity indicator compared to the available data of the previous time period decreased by 21.7%, and compared to the data of the second 30-second time period increased by 15.3% ($P < 0.05$). Consequently, after the third AS at students was at a higher level as compared with the first attention switching.

Dynamics of improving the AS during “rhythmic gymnastics” activities is revealed in averages IV indicators. Third year students conceded the CG by 35.3% ($P < 0.001$); second course by 35.8% ($P < 0.001$); first course by 25.2% ($P < 0.05$).

Thus, the influence of rhythmic gymnastics activities with orienteering on students’ psychomotor qualities confirmed the effectiveness of the proposed experimental program.

Also an important period in our research was experimental work on identifying the impact of rhythmic gymnastics activities on the basis of sports specialization on academic performance and attendance of students.

It was found that the academic performance of students of the EG is higher compared to the CG. To this end, we carried out analysis of the results of four sessions over two academic years - 2009-2010 and 2010-2011 academic years. With two-times (2x2) training sessions for four hours a week at the students involved in “rhythmic gymnastics”, the average score for the winter examination session of 2009-2010 academic year was 0.36 higher compared with students of the CG (the EG - 3.94, the CG - 3.58). The average score on the summer exam session at students of the EG is 3.88, while the students of the CG - 3.70 or 0.18 below. During the 2010-2011 academic year, the average score for the winter session at the EG students was equal to 4.10, while the students of the CG - 3.84, the difference was 0.26. Average score for the summer session at the students who were engaged in the experimental program was equal to 4.01, while the students of the CG- 3.81, or 0.20 below. Improvement in the performance of the EG students is purely explained by pedagogical influence of rhythmic gymnastics that due to significant requirements for physical and mental fitness of students contributes to the manifestation of psychomotor qualities: attention, self-discipline, attention switching, etc.

The CG students, in the 2009-2010 academic year missed an average of 25 sessions due to illness. EG students missed 11 sessions due to illness, i.e., 27.2% lower compared to the CG. Counting the number of illness recorded in the 2010-2011 academic year showed that the number of missed classes at the CG increases. At the same time, the number of missed classes at the EG due to illness continued to decline and was 6.7 sessions, which is 23% less than in the CG.

Reducing the absence during rhythmic gymnastics activities is explained by the increased interest in physical education in general, and in particular to rhythmic gymnastics, by well-being, health promotion, improved body posture. Also high intensity training conducted under the musical accompaniment during the whole period of the experiment had a positive effect on the nervous system, cardiovascular and respiratory systems of the students’ organisms.

Obtained interesting experimental data allow to note that the proposed form of exercises, i.e. rhythmic gymnastics, served as the theoretical and methodological basis of the hypothesis (forming motor culture students by means of rhythmic gymnastics activities will be effective if a number of pedagogical conditions implement) of our pedagogical research corresponds to the actual state of practice of physical education on rhythmic gymnastics.

4. Discussion

Thus, the results lead to the conclusion that theoretically justified and methodologically adjusted use of “rhythmic gymnastics” in high school practice proves the need for it in improving the physical, mental and other qualities, in addressing the harmonization of the students

References

- Abdykadyrova, D. R. (1998). *Formirovanie gotovnosti studentov pedagogicheskikh vuzov k ozdorovitel'no-fizkul'turnoj dejatel'nosti: dis....kand. peda. Nauk* (p. 156). Almaty.
- Goran'ko, M. I., & Kul'nazarov, A. K. (1993). *Prezidentskie testy Respubliki Kazahstan* (p. 116). Almaty.
- Ivanov, G. D. (2002). *Fizicheskoe vospitanie studentov* (p. 222). Almaty.: KazAST.
- Menhin, Ju. V. (1997). Metodologicheskie osnovy fizicheskoy podgotovki gimnastov. *Teorija i praktika fizicheskoy kul'tury*, 11, 26-32.

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