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PROFESSIONAL-APPLIED PHYSICAL TRAINING IN THE PROFESSIONAL FORMATION SYSTEM OF POLICE OFFICERS

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Abstract: *As a specific form of physical education, professional-applied physical training is an independent psycho-pedagogical process, aimed at ensuring specialized physical training on a continuous basis, towards a preferred professional activity, wishing to be an instructive process that completes the individual background of professionally useful psychomotor skills and abilities. Continuous improvement of motor, mental, moral and volitional qualities depends entirely, directly or indirectly, on the person's personality, psychomotor ability and the development of professional skills. The application of an efficient contemporary system of professional-applied physical training of police officers will produce major changes, which will be useful in training and strengthening professional behaviour during professional activity due to the simplicity, homogeneity and efficiency of this method and principles of training. The professional-applied physical training ensures the quantitative and qualitative bio-psychomotor basis, which increases the morphofunctional indices through a complex as varied as possible of the means, methods and principles specific to the activity of the police officers.*

Key words: *professional formation, police officers, professional-applied physical training, physical education.*

1. Introduction

Professional-applied physical training (PAPT) is an integral part of the physical education system of different population groups, aiming at the complete development of the specialized physical condition for the chosen professional activity [1], [2]. At the same time, professionally important motor skills or qualities include those on which the effectiveness and positive prognosis of behavior depend on the conditions that arise in the performance of tasks [4].

Practical work requires special unit staff not only adequate fitness to maintain a high level of combat readiness, but also a sufficient level of professionalism to act in extreme situations when detaining members of criminal groups [3], [7], [8].

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However, due attention is not paid to the intentional development of professionally necessary motor skills, as this section of vocational and applied physical training of special unit staff has not been properly studied.

Thus, there is a contradiction between: 1) the increased requirements of society for the activity of special units of the Ministry of Internal Affairs, the need to ensure the safety of citizens and the protection of the constitutional order in suppressing illegal actions, which in turn is associated with the need to maintain a high level of professional qualifications, in particular a high level of general and special and applied physical training of employees, and 2) insufficient level of development of professionally necessary motor skills, which is caused by the lack of targeted regulatory requirements professional capacity for the special capacity of the employees of the special units, the lack of the development of efficient scientifically based methods of professional and applied physical training of the employees of the special police units.

In this regard, it is relevant to identify the scientific and methodological approaches to the organization of professional-applied physical training that would ensure a higher level of development of the professionally necessary motor skills of the employees of the special police units, which would ultimately ensure high efficiency in performing service and operational tasks.

2. Purpose

The purpose of the study: elaboration and experimental substantiation of the methodology of professional-applied physical training of the employees of the special units of the internal affairs bodies.

3. Methodology

To achieve this goal and solve the tasks of the study, the following methods were used:

1. Pedagogical and informational-analytical methods: analysis and generalization of scientific and methodological literature and normative documents, questionnaires and interviews, pedagogical observation, timekeeping, affirmation and formation of pedagogical experiments;
2. Medical and biological methods: anthropometry, heart rate, spirometry, physical aptitude testing, determination of overall performance (Harvard Step test);
3. Mathematical statistics methods: calculating the arithmetic mean, calculating the error of the arithmetic mean, evaluating the reliability of the means differences according to the Student criterion.

The experiment involved 52 people (26 - control group and 26 - experiment group) from the Service for Special Actions (SAS) of the Iasi County Police Inspectorate.

4. Results and Discussion

The generalization of the results made it possible to develop an experimental methodology for improving the professional-applied physical training of special police officers, the essence of which was the introduction of additional

sets of exercises in the program within the prescribed training hours to develop speed and power skills of the employees. At the same time, we started with the comprehensive development of professionally significant qualities. The complex nature involved the development of fighting techniques, possession of service weapons, as well as physical training based on the development of power, speed, motor coordination skills, but with a significant emphasis on improving speed-power skills.

This study presents experimental materials based on the analysis of changes in the indicators of professional-applied physical qualities of special police officers assigned to the three main age groups, in accordance with regulatory requirements.

Thus, in order to determine the influence of the experimental methodology, the dynamics of the physical development indicators and the individual characteristics of the functional state of the employees in the process of the formative pedagogical experiment were studied (Table 1).

The analysis of the dynamics of the indicators made it possible to state that the experimental technique developed as a whole had a positive effect on the studied indicators of physical development and functional state of employees, without having a negative impact on the cardiovascular and respiratory systems of the body.

Thus, in the experimental group of all age groups, positive changes took place until the end of the experiment:

- body weight decreased: in the 1st and 2nd - up to 5 kg, and in the 3rd - by almost 10 kg .;

- increased vital capacity of the lungs in all age groups - from 0.2 to 0.4 liters;

- the heart rate decreased: in 1 - with 7 beats / min, in the 2nd - with 3.8 beats / min, in the 3rd - with 7.1 beats / min;

1. - such an important integrative indicator of physical performance, such as the Harvard Step test in the first age category increased by 2.7 units, in the second age category - by 5.4 units and in the third age category - with 2.5 units.

During the study, we followed the dynamics of the results of motor skills control tests that characterize the development of different motor skills of experienced and control groups of employees of the special police detachment. At the same time, positive trends were identified (Table 2).

In the control exercise “number of torso lifts in 20 seconds”, reflecting the dynamics of improving the speed-power abilities of the torso flexor muscles, positive increases were detected in all age groups (Table 2).

In the “20-second bar pull” control exercise, which reflects the level of development of arm flexor strength in the experimental group employed in a specially developed technique, significant changes took place. In the control group, they were less significant, which is why we can talk about an insufficient intensive process of training the necessary physical qualities.

Dynamics of indicators of physical development of SAS employees Table 1

Experimental groups	Age groups	Body length (cm)			Body weight (kg)			Spirometry (L)		
		Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P
Control	I	182,2±0,2	182,5 ±0,2	>0,05	89,4±0,2	86,4±0,2	>0,05	4,7±0,1	4,7±0,1	>0,05
Experimental		179,1 ±0,2	179,7±0,1	>0,05	89,7±0,2	83,6±0,1	<0,01	40,6±0,1	4,8±0,1	>0,05
Control	II	181,7±0,1	181,0±0, 1	>0,05	91,0±0,1	89,3±0,1	>0,05	4,4±0,1	4,4±0,1	>0,05
Experimental		180,0±0,1	179,3±0, 1	>0,05	89,4±0,1	86,7±0,1	<0,01	4,4±0,1	4,8±0,1	<0,01
Control	III	181,1±0,1	180,8±0,1	>0,05	95,5±0,2	94,2±0,2	>0,05	4,2±0,1	4,4±0,1	>0,05
Experimental		176,2±0,2	175,8±0,1	>0,05	85,8±0,2	84,8±0,1	>0,05	4,2±0,1	4,5±0,1	>0,05

Experimental groups	Age groups	Resting heart rate (bpm)			Harvard Step test		
		Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P
Control	I	73,1±0,1	71,4±0,1	<0,01	88,0±0,1	88,5±0,1	>0,05
Experimental		75,6±0,1	68,3±0,1	<0,01	86,6±0,1	89,3±0,1	<0,01
Control	II	75,6±0,1	74,8+0,1	>0,05	82,7±0,1	85,7±0,1	>0,05
Experimental		75,9±0,1	72,1±0,1	<0,01	80,7±0,1	86,1 ±0,1	<0,01
Control	III	75,0±0,1	71,|±0,1	>0,05	80,2±0,1	80,9±0,1	>0,05
Experimental		76,7+0,1	69,9±0, 1	>0,05	80,1 ±0,1	82,6±0, 1	<0,01

Physical fitness indicators of SAS employees Table 2

Experimental groups	Age groups	Number of torso lifts in 20 seconds (reps)			20-second bar pull (reps)			Throwing the medicine ball (m)		
		Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P
Control	I	15,2±0,2	16,0±0,2	<0,05	11,7±0,2	12,1±0,1	<0,05	10,0±0,2	10,7±0,2	<0,05
Experimental		15,1 ±0,2	16,1±0,2	<0,05	11,3±0,2	13,1±0,1	<0,05	9,7±0,1	10,8±0,2	>0,05
Control	II	14,4± 0,2	15,1±0,2	<0,05	9,8±0,2	10,3±0,1	<0,05	10,7±0,2	11,1±0,2	>0,05
Experimental		13,9±0,2	15,2±0,2	<0,01	9,0±0,2	12,0±0,2	<0,01	10,1±0, 2	11,2±0,2	<0,01
Control	III	13,6±0,2	13,8±0,2	<0,05	8,1 ±0,2	8,8±0,2	>0,05	9,4±0, 2	10,1±0,2	>0,05
Experimental		12,0 ±0,2	14,3±0,2	<0,01	7,8±0,2	12,3±0,1	<0,01	9,3±0,2	10,4±0,2	<0,05

Experimental groups	Age groups	Long jump			Running for 100 m (sec)			Running for 30 m (sec)		
		Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P
Control	I	220,5±0,2	222,2±0,1	>0,05	14,1±0,1	14,0±0,1	>0,05	5,0±0,1	4,9±0,1	>0,05
Experimental		219,6 ±0,2	228,7±0,2	<0,001	14,1±0,1	13,7±0,1	<0,05	5,2±0,1	4,7±0,03	<0,05
Control	II	214,8±0,2	219,4±0,2	>0,05	14,7±0,1	14,3±0,1	<0,01	5,2±0,1	4,8±0,1	<0,01
Experimental		211,1±0,2	221,6±0,2	>0,05	15,2±0,1	14,1±0,2	<0,001	5,5±0, 1	4,7±0,04	<0,001
Control	III	212,3±0,2	221,7±0,2	<0,01	16,0±0,2	15,0±0,1	<0,01	5,4±0, 2	5,4±0,2	>0,05
Experimental		208,1±0,2	225,3±0,2	<0,01	17,3±0,2	14,6±0,1	<0,001	6,3±0,2	5,2±0,2	<0,001

The analysis of the dynamics of the development of the explosive force of the muscles by the back extensor in the control exercise "throwing the medicine ball", found that in the experimental group it has a positive character, although the differences with the control group were not significant.

When considering the dynamics of the development of the explosive force of the extensor muscles of the legs in the control exercise "long jump", positive but insignificant differences from the control group were also highlighted.

In the control exercise "running for 30 m", the dynamic indicators in the experimental group were stable, while in the control group they were less pronounced.

We note that when comparing the results obtained with the data on the characteristics of the model, it was found that in the experimental group of all age groups this test was performed on "satisfactory". In the control group of all ages, there was an "unsatisfactory" rating.

The analysis of the dynamics of the results shown by the subjects from the shuttle race "3 by 10 meters" makes it possible to see that in the experimental group until the end of the experiment the increase of indicators became more significant, while in the control group there were no significant changes (Table 3).

Physical fitness indicators of SAS employees Table 3

Experimental groups	Age groups	Shuttle race "3 by 10 meters" (sec)			"10 by 10 meters" shuttle race (sec)		
		Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P
Control	I	7,2±0,1	7,1±0,1	>0,05	26,0±0,1	25,5±0,2	<0,05
Experimental		7,2±0,1	7,0±0,04	>0,05	26,0±0,1	25,4±0,2	<0,05
Control	II	7,3±0,1	7,2±0,1	<0,05	26,4±0,2	26,4±0,2	>0,05
Experimental		7,8±0,1	7,1±0,1	<0,01	27,1 ±0,2	26,3±0,2	<0,05
Control	III	8,0±0,2	7,8±0,2	<0,05	29,3±0,2	27,8±0,2	<0,05
Experimental		8,1+0, 1	7,6±0, 1	<0,01	30,2 ±0,2	27,2±0, 2	<0,001

The results shown by the subjects in the "10 by 10 meters" shuttle race showed that in the experimental group until the end of the formative pedagogical experiment, the increase in indicators was significant, while in the control there were no significant changes. At the end of the experiment in the experimental age group 1, the level of development of this motor quality corresponded to the "satisfactory" evaluation, and in the 2nd and 3rd - "good"; in the control group in age groups 1 and 2, the level is assessed as "satisfactory" and in the age group 3 as "good".

In the "pullups" control exercise, reflecting the level of development of the flexor muscles of the arms, the dynamics of the indicators in the experimental group was significantly increased, while in the control group it was less pronounced (Table 4).

A comparison of the final indicators of the employees of the special police detachment of the experimental and control group showed that in the

experimental group the increase of the resistance indicator was, on average, 2 times in this test for all age groups, while in the group control - only an average of 1 time.

Physical fitness indicators of SAS employees Table 4

Experimental groups	Age groups	"Pullups" (reps)		
		Beginning of the experiment	End of experiment	P
Control	I	16,9 ±0,2	17,7 ±0,2	<0,05
Experimental		16,2 ± 0,2	18,0 ±0,2	<0,001
Control	II	14,8 ± 0,2	15,3 ±0,2	<0,05
Experimental		14,0 ±0,2	16,0 ±0,2	<0,01
Control	III	15,0 ± 0,2	15,8 ±0,2	>0,05
Experimental		14,8 ± 0,2	16,3 ±0,2	<0,01

The dynamics of changes in the indicators in the "1000-meter run" test exercise as a whole during the experiment changed little in the experimental groups (Table 5). We remind you that we are talking about the motor capacity of "general endurance", which is not professionally significant for the employees of the special units.

Physical fitness indicators of SAS employees Table 5

Experimental groups	Age groups	1000-meter run (min, sec)		
		Beginning of the experiment	End of experiment	P
Control	I	3,22±0,01	3,20±0,01	>0,05
Experimental		3,27±0 02	3,19±0,01	>0,05
Control	II	3,42±0,06	3,33±0,02	>0,05
Experimental		3,50±0,09	3,30±0,02	>0,05
Control	III	4,36±0,08	4,25±0,08	>0,05
Experimental		4,36±0,16	4,23±0,10	<0,05

Thus, the analysis of the dynamics of the indicators of the physical abilities of the employees of the special police detachment studied based on the strength-speed qualities allows us to conclude that the experimental technique developed had a positive effect on the development of the abilities of the main muscle groups. At the same time, the final indicators in the experimental group were evaluated according to the criteria of the model developed slightly higher than the requirements of the "good" and, in some cases, - "excellent".

In order to determine the impact of the experimental technique developed on special physical abilities, we performed a control test on the test: "Throw over your shoulder, in a minute" classification for self-defense without weapons and fighting (Table 6).

Special physical fitness indicators of SAS employees Table 6

Experimental groups	Age groups	Throw over your shoulder, in a minute (reps)			Self-defense without weapons (average score)			Hand-to-hand combat (no matches won in one competition)		
		Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P	Beginning of the experiment	End of experiment	P
Control	I	17,6±0,1	18,5±0,1	>0,05	3,7±0,1	3,9±0,1	>0,05	1,2±0,2	0,ft±0,2	<0,05
Experimental		17,2 ±0,1	20,8±0,1	-<0,01	3,6±0,1	4,1±0,1	<0,05	1,4±0,2	1,6±0,2	<0,05
Control	II	17,8±0,2	18,0±0,2	>0,05	4,4±0,2	4,6±0,2	>0,05	1,5±0,2	1,1±0,2	<0,05
Experimental		17,2±0,2	18,9±0,2	<0,05	4,1±0,2	4,7±0,2	<0,05	1,3±0,2	1,8±0,2	<0,05
Control	III	17,0±0,2	17,5±0,1	<0,05	4,7±0,2	4,8±0,2	>0,05	0,5±0, 2	0,1±0,1	>0,05
Experimental		16,5 ±0,2	18,2±0,1	<0,05	4,7±0,2	4,8±0,2	>0,05	0,2±0,2	0,5±0,1	<0,05

The final data on the number of meetings won per participant in the melee control contest showed that the employees in the experimental group by the end of the experiment won against those in the control group, which confirms the effectiveness of the methodology we developed to improve professional and applied physical capacity based on speed-speed qualities.

Thus, during the training hours planned by the physical training program in special purpose units, it is possible to significantly increase the level of professional and applied fitness of the employees of the special police detachment through a rational combination of means and methods of physical training [5], [6].

5. Conclusions

The professional activities of SAS police officers impose increased requirements on the level of development of special physical qualities and certain skills, but the physical training system in these units does not fully fulfill the tasks. It has been established that fitness is one of the necessary factors that have a significant impact on the effectiveness of the performance of official and operational tasks by employees. Therefore, the whole system of professional-applied physical training should be built on a scientific basis, taking into account the specifics of the professional activity.

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