THE INFLUENCE OF THE AUTHOR'S PROGRAM ON SPEED QUALITIES IN SWIMMING TRAINING MILITARY PENTATHLON

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The popularity of applied military sports in the modern world, its intensive commercialization and professionalization, as well as the constantly high political significance of the successes of athletes has led in recent years to the formation and improvement of highly effective systems for training athletes. This is evidenced by the multitude of scientific studies, which say that the results of the international level are available only in exceptional cases, gifted athletes with pronounced natural inclinations. achievements in a particular sport (Platonov, 2013; Shinkaruk, 2013; Romanchuk & Arabsky, 2019) or were able to realize them through the process of long-term improvement (Krasova, 2012).

Purpose: The purpose of the study is to improve the process of swimming training of military pentathlon fighters and to determine pedagogical methods of controlling the level of strength development to gradually inform the functional state of the body of athletes in order to select candidates for national teams.

Material: The increase in athletic performance in military pentathlon requires the continuous improvement of many provisions regarding training techniques. The practice of sports training puts forward new options for the construction of the training process and requires their improvement. The article describes the method of determining the level of development of strength of military pentathlon, by which it is possible to select candidates for national pentathlon teams in conditions of insufficient educational and material resources (absence of obstacles), and the results of the exercises by this method are presented and analyzed (Aleksandrov I. S., 1970; Varakin A. P., 1983).

Results: According to the results of testing of experimental technology, a significant improvement in the strength preparedness in the study group was recorded, the difference between the test and control group is very significant in terms of maximum thrust on land and wrist dynamometry, which in turn confirms the effectiveness of using special exercises for special exercises (Oderov, A., Romanchuk, S., Fedak, S., Kuznetsov, M., Petruk, A., Dunets-Lesko, A., et al. (2017).).

Key words: swimming, athletes, all-rounders, technique, physical fitness, obstacle course, military pentathlon.

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Анотація. Популярність прикладного військового спорту в сучасному світі, його інтенсивна комерціалізація та професіоналізація, а також постійно висока політична значимість успіхів спортсменів призвели за останні роки до формування та вдосконалення високоефективних систем підготовки спортсменів. Про це свідчить безліч наукових досліджень, які стверджують, що результати міжнародного рівня доступні лише у виняткових випадках, обдарованих спортсменів з яскраво вираженими природними нахилами. досягнень у певному виді спорту (Платонов, 2013; Шинкарук, 2013; Романчук та Арабський, 2019) або змогли реалізувати їх у процесі тривалого вдосконалення (Красова, 2012).

Мета дослідження – покращити процес навчання плавання військових бійців п'ятиборства та визначити педагогічні методи контролю рівня розвитку сили, щоб поступово інформувати про функціональний стан організму спортсменів з метою відбору кандидатів у збірні команди.

Матеріал: Збільшення спортивних результатів у військовому п'ятиборстві вимагає постійного вдосконалення багатьох положень щодо техніки тренування. Практика спортивного тренування висуває нові варіанти побудови навчально-тренувального процесу та потребує їх удосконалення. У статті описано метод визначення рівня розвитку сили військового п'ятиборства, за допомогою якого можна відбирати кандидатів до національних команд з п'ятиборства в умовах недостатніх навчальних та матеріальних ресурсів (відсутність перешкод), а результати вправ представлено та проаналізовано (Александров І. С., 1970; Варакін А. П., 1983).

Результати: За результатами випробування експериментальної технології було зафіксовано значне поліпшення підготовленості до міцності у досліджуваній групі. Різниця між випробувальною та контрольною групами дуже значна з точки зору максимальної тяги на суші та динамометрії зап'ястя, що в свою чергу підтверджує ефективність використання спеціальних вправ для спеціальних спрямованості у військовому п'ятиборстві (Одеров А., Романчук С., Федак С., Кузнєцов М., Петрук А., Дунець-Лесько А. та ін. (2017)).

Ключові слова: плавання, спортсмени, багатоборці, техніка, фізична підготовленість, смуга перешкод, військове п'ятиборство.

Introduction

The increase in athletic performance in military pentathlon requires the continuous improvement of many provisions regarding training techniques. The practice of sports training puts forward new options for the construction of the training process and requires their improvement. In general, the training process develops by increasing the volume and intensity of training, as well as increasing effective special exercises that can improve the level of physical performance. Also, do not forget about the selection of candidates and the right selection of techniques for this, which in turn can provide maximum information about the level of fitness and technical skill of the athlete (Klymovych, Olkhovyi & Romanchuk, 2016).

In military pentathlon, which includes five disciplines (50m hurdles; slow and fast shooting; grenade throwing for accuracy and range; overcoming the obstacle course of the NATO sample and 8000m). Obstacle swimming is one of the key disciplines (Lototskyi, 2017; Lototskyi & Romanchuk, 2017; Platonov, 2004; Klymovych, 2020). The specifics of this discipline, which distinguishes it from the classical disciplines of swimming, are four obstacles that must be overcome in the process of swimming 50 meters. In this discipline of all-around, the most important types of training that affect the result of the athlete are: technical, speed and strength training. That is why when selecting candidates for national teams it is necessary to pay attention first of all to the level of speed and power preparedness of the candidate.

Rolyuk O. (2016) state that the current experience of fighting in the east of Ukraine and other local conflicts, the results of military readiness tests of military units and units testify to the insufficient level of physical preparation of personnel, and above all endurance, overcoming water obstacles, training in effective use. weapons, throwing grenades, the ability to overcome natural and artificial obstacles and perform other military-professional techniques and actions (Bondarchuk I. Y, 1987; Borilkevich V. E., 1989).

Nobody has been involved in the preparation of military pentathlon in Ukraine so far, so this topic is relevant. Issues related to this topic have been addressed by such scholars as: Lenart D., Romanchuk S., Andres A., Lesko O. & Romanov I. (2019) but their research has addressed other types of all-around competitions, the training of athletes being significantly different from that of military pentathlon.

The purpose of the study is to improve the process of swimming training of military pentathlon fighters and to determine pedagogical methods of controlling the level of strength development to gradually inform the functional state of the body of athletes in order to select candidates for national teams.

Materials and methods

During the study the following methods were used: analysis of literature, scientific research, results shown during the training process and during the use of test exercises both on land and in water, methods of mathematical statistics. Test exercises used:

1. Maximum thrust on land.

2. Wrist dynamometer - to determine the strength of the brush.

3. Measurement of jump height by Abalakov's method.

4. The maximum thrust in water is recorded by a dynamometer.

5. The thrust force in the water when starting.

6. Maximum jumping out of the water.

7. Maximum thrust at 45-second swim.

Hurdles include different techniques and difficulty techniques. According to the nature of the performance of the motions of navigation with obstacles belongs to speed-force exercises with strictly defined (optimal) technique of overcoming each obstacle. The basic techniques of obstacle course swimming are: taking a starting position at the start, starting from the starting table, entering the water and sliding in the water after the start, swimming between the obstacles, accepting the position that precedes the attack of the obstacle, the attack of the obstacle, overcoming the obstacle, the jump (jump) from (h) obstacles, entering the water and sliding in the water after overcoming the obstacle, finishing (Tovstonoh, 2010).

Rational obstacle control technique is based on the ability of athletes to carry out continuous, fast, translational movement at the expense of minimal delays in overcoming individual obstacles, making the most streamlined position when sliding, ensuring minimal fluctuation of the total center of mass (SCM) (Klymovych, V., Korchagin, M., Olkhovyi, O., Romanchuk, S., & Oderov, A. (2019)).

As the main method of swimming used in the obstacle course is the chest crawl.

Results

In the training system of military pentathlon it is of great importance to gradually inform about the functional state of the body of athletes and the level of their general and special physical fitness (Serhii Romanchuk and all., 2020; Ostapenko Y.A., 2014). A sufficiently accurate and informative assessment of general and specific physical fitness can be obtained by using special control test tasks, which in their structure and nature of work of the neuromuscular apparatus and the activity of the organism generally correspond to the specificity of sports activities of all-rounders. In this way it is possible to determine the reaction of the organism to the means and methods used in training work, to identify the dynamics of physical fitness of athletes and to make appropriate adjustments to the training process.

To control the state of development of strength of physical qualities of all-rounders, it is advisable to use the tests recommended by specialists (Linets M.M, 1994). These tests provide accurate and reliable information on the fitness status of athletes (Table 1).

Let's take a closer look at the method of test measurements.

1. Maximum thrust on land. Measurement is carried out using a DPU-200 serial dynamometer, measuring ± 0.3 kg, which is recorded on the H320 recorder or by computer. Lying on his chest, the athlete develops maximum effort in imitation of the comb by hands with the method of «dolphin».

Table 1 – Tests to determine the strength level of military pentathlon in swimming training

№	Types of control tests	Tested quality	Control methodology	Number attempts
1.	Maximum thrust on land, kg	power	dynamometer	3
2.	Right and left hand strength, kg	power	dynamometer	2
3.	Jump up from place, cm	power	the Abalakov method	3
4.	Maximum thrust when starting from water, kg	power	dynamometer	1
5.	Starting force, kg	power	dynamometer	1
6.	Maximum water jump, m	power	longometry	3
7.	Maximum thrust when sailing	power	dynamometer	1

2. Wrist dynamometer – to determine the strength of the brush. It is measured by a wrist dynamometer with an accuracy of ± 0.2 kg. The subject takes turns alternately right and left hands, fully straightened in the elbow joint, to the side with the dynamometer and performs a sharp compression of the device, without violating the starting position. Exercise is performed three times in 30-40 seconds. Score the maximum score.

3. Measurement of jump height by Abalakov's method. Record the best result of three attempts, one at a time, at 1 minute intervals. The jump is made in a circle with a diameter of 40 cm. The zero position of the tape for measurement is fixed in the initial position «stable on the toes». This eliminates the errors that can be caused by the different sizes of the feet being examined. The measurement accuracy is ± 1 cm.

4. The maximum thrust in water is recorded by a dynamometer. At the signal, the subject begins to swim with the maximum available intensity. Measurements are made using a DPU-200 series dynamometer, measuring ± 0.3 kg, recorded using a H320 recorder or computer equipment.

5. The thrust force in the water at the start of the start is registered with a serial dynamometer brand DPU-200 measuring accuracy ± 0.3 kg, the indicators of which are recorded on the recorder H320. At the signal the water polo player starts the start in the water. The maximum dynamometer value corresponds to the maximum thrust force.

6. Maximum jumping out of the water. At the signal, the athlete jumps out of the water with his left or right hand extended to the highest possible height. The jumping is performed from the undisputed position by the repulsion of the feet. Measurements are made using a measuring bar that is rigidly secured to the wooden panel. The athlete should touch the ruler with any hand.

7. Maximum thrust at 30-second swim. The measurement is carried out using a DPU-200 serial dynamometer, measuring ± 0.3 kg, the recordings of which are recorded on the H320 recorder or by computer equipment. The water polo player is given a 45-second work with the maximum available intensity. The figures take 10, 20 and 30 seconds after the start of work. Strength is evaluated by the index – the ratio of each of the three indicators to the maximum available indicator calculated previously.

First, they carry out control exercises on land and then in water. In this case, the five-man performs rest exercises with a rest interval until full recovery.

Testing to determine strength preparedness was conducted with control and experimental groups of 15 athletes from 2 adults to the category of candidate for masters of sports.

As can be seen from Figure 1, significant ($p \leq 0.05$) positive changes occurred in all six exercises tested. The most significant changes occurred in the indexes of maximum thrust when starting in water, maximum thrust on land and wrist dynamometry of the left hand (Table 2).

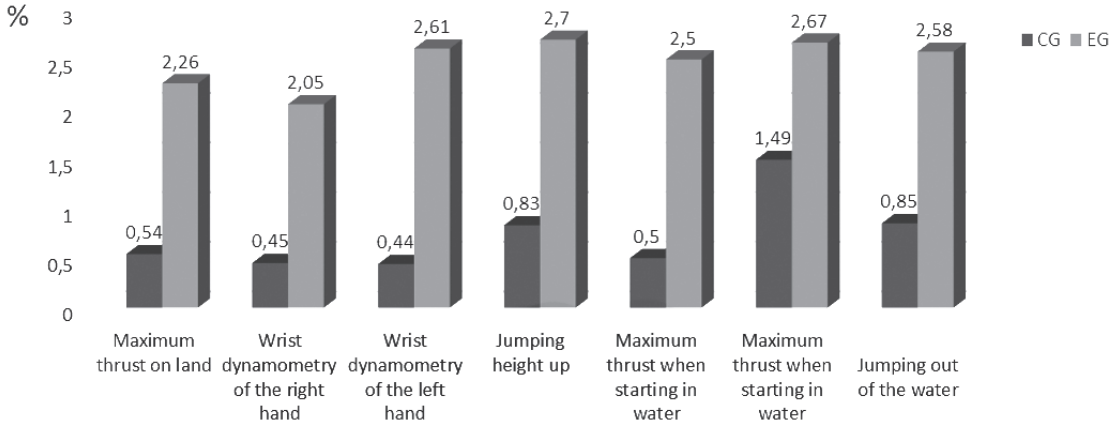

Fig. 1 Indicators of strength preparedness in control and experimental groups

Table 2 – Indicators of military pentathlon strength training in swimming training

Indicators of strength training	Control group		t	P	Experimental group		t	P	t (CG - EG)	P	t (CG - EG)	P
	start	finishing			start	finishing						
	$\overline{X} \pm m$	$\overline{X} \pm m$			$\overline{X} \pm m$	$\overline{X} \pm m$						
1. Maximum thrust on land, kg·s^1	33,61 ± 0,34	33,87 ± 0,33	0,54	>0,05	33,90 ± 0,33	35,03 ± 0,38	2,26	<0,05	0,61	>0,05	2,32	<0,05
2. Wrist dynamometry of the right hand, kg·s^1	56,65 ± 1,35	55,81 ± 1,34	0,45	>0,05	56,54 ± 1,25	59,92 ± 1,08	2,05	<0,05	0,06	>0,05	2,40	<0,05
3. Wrist dynamometry of the left hand, kg·s^1	50,43 ± 1,33	51,27 ± 1,36	0,44	>0,05	50,62 ± 1,37	55,44 ± 1,24	2,61	<0,05	0,10	>0,05	2,28	<0,05
4. Jumping height up (by Abalakov's method, sm)	40,35 ± 0,61	41,08 ± 0,62	0,83	>0,05	40,17 ± 0,83	43,11 ± 0,70	2,70	<0,05	0,17	>0,05	2,15	<0,05
5. Maximum thrust when starting in water, kg·s^1	8,31 ± 0,18	8,43 ± 0,16	0,50	>0,05	8,35 ± 0,17	8,95 ± 0,17	2,50	<0,05	0,16	>0,05	2,18	<0,05
6. Maximum thrust in water for 30 seconds, kg·s^1	13,58 ± 0,19	13,96 ± 0,21	1,49	>0,05	13,73 ± 0,21	14,52 ± 0,21	2,67	<0,05	0,52	>0,05	2,06	<0,05
7. Water jumping, m	0,85 ± 0,02	0,87 ± 0,02	0,85	>0,05	0,87 ± 0,02	0,93 ± 0,02	2,58	<0,05	0,85	>0,05	2,71	<0,05

N o t e Mean data of the arithmetic mean at the beginning of the study; km – data of the arithmetic mean at the end of the study; T – growth rate; Pp£0.05-significance of differences at the beginning of the study; P ≤ 0.05 – significance of differences at the end of the study; P ≤ 0.05 between T – significance of differences between the growth rates of the studied groups

Discussion

As we can see in Table 2, in both groups studied there is an increase in strength readiness. Here, the difference between the study group and the control group is more noticeable towards the study group, especially in terms of maximum traction on land and wrist dynamometry, especially the left hand, which in turn confirms the effectiveness of using special exercises selected for the experimental group.

The results obtained confirm the high informativeness and reliability of the tests offered by specialists and scientists for athletes in military pentathlon (Ivanova, 1992; Korchagin, Kurbakova & Olkhovyi, 2017; Lyzogub, 1999; Makarenko, 1984).

As can be seen from the above material, the discipline of 50 meters obstacle course in military pentathlon is a very specific type and requires the athlete's coordination, a high level of development of strength. The technical preparedness of the athlete plays an important role in the passing of obstacles and the ability to technically correct them, is strongly reflected in the end result. And because of the inability to use obstacles all the time, or even the absence of obstacles, both in the selection of candidates for national teams and in the training process, one of the main indicators that can be rested on is the level of strength preparedness. Thus, the application of the described methodology for determining the level of development of the strength of military pentathlon allows to obtain plausible and informative indicators and to objectively assess the state of fitness of athletes.

Conclusions

Thus, as can be seen from the above material, the discipline of swimming 50 meters with obstacles in military pentathlon is a very specific type and requires from the athlete coordination, a high level of development of speed qualities (De Jesus K., 2012). The technical readiness of the athlete plays a big role during the passage of obstacles and the ability to overcome them technically correctly, is strongly reflected in the end result. And due to the impossibility of constant use of obstacles or even its absence both in the selection of candidates for the national team and in the training process, one of the main indicators that can be relied on is the level of speed training.

Thus, the test exercises developed by us are an effective means of monitoring the level of development of high-speed physical qualities of military pentathletes in the discipline of obstacle swimming. They can be recommended for use in military institutions of higher education of the Armed Forces of Ukraine in the training of athletes in military pentathlon.

Conflict of interest. The authors declare no conflict of interest.

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