TESTING THE PSYCHOMOTOR TRAINING IN THE MILITARY PENTATHLON AT THE 50 M RACE WITH OBSTACLE

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ABSTRACT

Psychomotor development has become more and more important in obtaining performance in sports. Our experiment focused on analyzing the differences in training of two groups of military students with age between 18 and 22. The methods used in our investigation were the observation method, the experiment method – that consisted in psychomotor test both on land and in water and statistical method. The results of our research showed statistical significant differences between the experiment and the control group proving that the program performed with the students from the experiment group is valid. The conclusions of our research showed that the experiment group registered better performance with statistical significant differences compared with the control group.

KEYWORDS: psychomotor testing, military pentathlon, military sport, 50 m swimming with obstacles

1. Introduction

“Swimming is the only sport to be recommended in more than 80 % of the medical cases and to have a large target audience, accessible to both children and the elderly” (Koroglu & Yigiter, 2016, p. 1882). From a psychological perspective, “swimming reduces the mental tensions and anxiety, caused by everyday stress and the competition one, while avoiding hostility and frustration in life, in a beneficial way” (Petrescu et al., 2014, p. 75). So “regular physical activity has benefits for both physiological and psychological health” (Binsinger, 2006, p. 255).

The area of the military pentathlon has developed spectacularly from one edition to the next. “Today, more than 30 nations are present in the circuit of

international pentathlon competitions. Most of the time the military pentathlon is included in the World Military Games” (Ene, 2003, p. 205).

“Modern pentathlon is a combined athletic game in which final scores represent an aggregate of individual event scores from fencing, swimming, horseback riding, pistol shooting, and running (Chang-Hyun Lim et al., 2018, p. 62). “This game was initiated in ancient Greece with the purpose of testing the general physical strengths of Greek soldiers” (Jeong, 2006, p. 63).

“Well-planned psychological skills training (PST) programs are an opportunity to nurture positively young athletes’ personal development in competitive sport

and to facilitate their growth in other areas of their life by generalizing the use of mental skills” (Tremayne & Tremayne, 2004, p. 530).

“In the last two decades, a variety of intervention techniques have been promoted to help athletes develop mental skills to enhance their performance” (Weinberg & Williams, 2001, p. 348). “Swimming also promotes excellent physiological fitness because it is a low-impact, aerobic activity, minimizing stress on the joints while exercising all of the major muscle groups of the body” (Luebbers, 2009). “Participation in aquatics-oriented activities can also foster social, emotional, and psychological well-being” (Lepore, Gayle & Stevens, 2007, p. 144).

2. Objectives of the Research

The objectives of our research were focused on testing the psychomotor parameters of military students that participate in the 50 m swimming pentathlon with obstacles. The research consisted in applying both land psychomotor tests and in water psychomotor test, following the development of motor qualities (speed, strength, coordination and resistance) and also finding new ways of training the military students for the 50 m swimming pentathlon with obstacles.

3. Material and Method

3.1. Research Sample

In our research we used two groups, the first group, the experiment group, was formed by 30 military students with age between 18-22 years old components of the pentathlon military team, the second group, the control group, was formed by 30 military students with the same age between 18-22 years old that practice military physical education.

3.2. Research Method

Testing of psychomotor training specific to 50m of obstacle swim

A. Psychomotor tests carried out on land

Test for the perception of the kinesthetic sensations

This test was adapted and applied in order to highlight the level of kinetic perceptions under the conditions specific to land-based training for military students who benefited from special experimental analytical curriculum themed from the 50m obstacle swimming test.

Description of the test

The subject is in the standing position facing the wall and activates the handle of a weighing. It is fixed in the wall and balanced at the 0 kilogram gradient, the 30 kilogram gradient representing the maximum weight. At the signal, the subject activates the handle by pulling to the maximum. Maintain for 3 seconds, and at the signal releases the handle, continuing to hold it with half the force for 3 seconds. It will be recorded: the first gradient where the force was maximum and the second gradient where the force must be reduced to half.

Scale of appreciation

Interpretation:

- if the difference between the initial and the final grade is 0 kg then the rating is very good (F.B.)
- If the difference between the initial and the final grading is between 0 kg and 0.500 kg then the grade is good (B).
- if the difference between the initial and final grading is between 0.500 kg and 1 kg, then the rating is weak (S).

B. Psychomotor tests performed in water

Testing of the self-control capacity in coordinating swim test (50m) for the movement of arms. In our research, we considered it appropriate to apply this test to assess the self-control capacity under the

specific coordination effort in swimming. Statistically processed results will highlight the extent to which the positive transfer of skills in land training (the perception of kinesthetic sensations) can be transferred to specific training in water. Subjects will start in the test at the whistle on the block start: push-fly-entry into the water, swim-out on the first obstacle. At the end of the swim, the arm will reach the first obstacle (gate) according to the preferential side. Followed by the climbing to support the squat on the obstacle; detachment – jumping – sliding under the movable beam. And then will follow the exit from the obstacle. By two arm cycles, the subject will reach the second obstacle (raft) and will reach its anterior part with the first arm movement of the third arm cycle. After the raft entry it will follow the next sequence: traction – pushing – sliding – hooking of the raft's anterior part – traction (arm) – pushing (foot) – sliding. At the third obstacle (50 cm above the water level), the subject will arrive through two arm cycles. This is a new fixed block start. Starting from the start position, the subject will go through three cycles of arms to the last obstacle (mobile beam), the number of arms cycles (3) being considered optimal. The motion algorithm after touching the last obstacle is: hang – pull (arm) – push (foot) – slip. The slip is followed by an arm cycle, through which the subject will reach the edge of the swimming pool. The test is performed counter-clockwise, and the performances are recorded in seconds and tenths of a second. Given that this complex test involves four obstacles, in our research, we applied the method of suggestion and autosuggestion by specific means to establish the self-control capacity of subjects under the specific conditions imposed by the applied swim. So we set 5 repeats x2 times, twice 2 x 50 m, active break 2 min: The subject traverses the 9 m distance to the first obstacle by sliding. Recorded performance, expressed in

seconds and tenths of a second, was registered. Between the first and second obstacles, respectively 8 meters away, the subject was advised to execute 2 and a half arm cycles, and at the middle of the third cycle to reach the second obstacle. For the 8 m distance of the second and third obstacles, the subject was suggested to maintain the same number of arm cycles (two and a half). Between the obstacle 3 and the obstacle 4, the subject was advised to travel the distance of 11.8 m by increasing the number of arm cycles over the previously traveled distances, respectively by 3 and a half arms. The subject was suggested to reduce the number of arm cycles in the distance from the last obstacle to the end of the test (6m).

Appreciation scale

Interpretation:

- performances at the first time are recorded in seconds and tenths of a second;
- for moments 2, 3, 4, 5;
- the number of arms cycles is kept constant, identical in both repetitions the rating is very good (FB);
- the number of arms cycles is +/- 0.5, the rating is good (B);
- the number of arm cycles is +/- 1, the rating is weak (S).

Psychomotor training in learning crawl swimming style

The complexity of the psychomotor training and its prognosis can be achieved through the training process while observing the development of the following components of psychological training in general and psychomotor training in particular:

- perceptions, muscular-motor sensations, concentrated memory qualities, attention, speed and precision of perception that provide all operations related to obtaining information from receiver segments (analyzers);

- psychomotor qualities: the speed of the movement reaction, the speed, and pace of execution of the movement, which ensures the effectiveness of human activity;

Research aimed at highlighting the role of psychomotor training in order to be more efficient in the learning process of specific swimming skills was carried out at Indian National Sports Center and in Armenia. The implementation of psychodiagnostic tests has succeeded in completing the series of psychological and psychomotor training. Scientific research from the State Physical Culture Academy of Siberia (OMSK, Russia) argues that the psychological aspects of training and competition often escape the attention of the coach, especially in working with young athletes. If these aspects enter in the attention of coaches, when their disciples become adults, they acquire a high level of sports craftsmanship, but their progress is further complicated and sometimes impossible. At this stage, it becomes obvious the lack of psychological assurance in the training of athletes from the first stage of the selection. In the psychological plan, completing the gaps left in the first stages of training the athletes give rise to poor results in the stage of sports craftsmanship. Successful solving of problems in the training process – coaching and training the athletes for competitions is

impossible without planned and systematic psychometric assurance of sports activity, which leads to the development of psychomotor training, also carried out in physical education lessons sports and training. From a psychomotor point of view, we propose the following type of neuro-motor exercises for the crawl swimming style (Table no. 1). Based on the analysis of the previous ones on the models of learning, coaching and training on the distance of 50 m free swimming, as well as the psychomotor models on the crawl swimming style, we can say that the information is insufficient, but to a certain extent these concepts can be adapted to the coaching, training, and preparing of military students in the 50 m swim test with obstacles, with the obligation to add to the training the novelties of our specific research above mentioned. As a general conclusion we can state that the motivation for this thesis was the fact that, until now, the technique of obstacle crossing the 50 m swimming obstacle test of the military pentathlon and the psychomotor training of the students for the same test was not described, on the one hand, and on the other hand, the lack of a scientifically supported methodology of learning and training, in this case a specific analytical program.

Table no. 1
Examples of prior neuro-motor exercises for a transition to the next level

Level	Type of neuro-motor	Examples of exercises
Beginners	Fundamental functions	
	Cross and parallel synergies	<ul style="list-style-type: none"> - swim the crawl and backstroke style (cross-synergy) stop/start - swim the bras and butterfly style (parallel synergy) - swim the bras, crawl or backstroke style and specific brass leg movement or butterfly - swim the butterfly style or bras with specific crawl leg movement - started on one leg - begin on 2 boards - one under each leg - swimming slips only with one foot and two arms - complete tours are carried on a floating carpet
	Equilibrium adjustments	

Level	Type of neuro-motor	Examples of exercises
Beginners	Fundamental functions	
	Steering adjustments	<ul style="list-style-type: none"> - swim and change direction only with the trunk - swim and change the direction only by placing the legs and steering only with the trunk - slip and shift direction with trunk, head, and arms
	Adjusting the environment to the body	<ul style="list-style-type: none"> - swim the crawl, backstroke, bras, butterfly style with arms crossed - swim 4 styles with legs crossed - swim by crossing a single member, left or right - swim without touching the middle of the body
	Fundamental motor actions	<ul style="list-style-type: none"> - side turns are made in two directions - climbing on a wall with a string or spider cloth - crawl swimming, backstroke, butterfly style with backward turns (withdrawals) - all basic motor moves with withdrawals are made
	Sequences of motor actions	<ul style="list-style-type: none"> - vary the ways of rotation in front and backward - combine the diving actions - combine the returning actions - simple gymnastics routines involving all the fundamental motor actions are made

4. Results

Comparative Analysis, Dynamics of Statistical Indicators and Interpretation of the Results of the Psychomotor Training Specific to Swimming

A. Psychomotor tests executed on land

Test for the perception of kinesthetic sensations

In the military physical education lesson, a very important role is played by the methods used to improve performance

in the 50 m swimming with obstacles, permanently checked by standardized tests, adapted or proposed new tests. In this aspect, a psychomotricity test conducted on land is fundamental. Applying the ground-based psychomotor test allowed data to be collected at all stages of the experiment. The statistical processing of the data on the proposed indicators was performed by the comparative analyzes of the centralized group average.

Figure no. 1: Dynamics of the perception of kinesthetic sensations

The graphical representation (Figure no. 1) made for this test permits to observe for the control group: if at the initial test the average of the results was for the first grading 32.50 kg, for the intermediate test 33.45 kg, and for the final test 35.65 kg; at the second gradient, where the subjects were suggested to act with half the maximum force, the mean of the results was 18.53 kg at initial testing, 17.25 kg on the intermediate test, and 18.50 kg at the final test. Concerning the experimental group, if at the initial testing the average of the results was for the first grading 32.72 kg, for the intermediate testing 35.70 kg, and for the final testing 39.45 kg; at the second gradient, where the subjects were suggested to act with half the maximum force, the average of the results was 16.40 kg in the initial test, 18.00 kg in the intermediate test and 19.72 kg in the final test. The result obtained in the final test expresses exactly half of the first gradation. The result of this test is significant. The calculation of the average mean difference in the final test between the control and the experimental group is t of $2.43 > 2.145$ at $p \leq 0.05$, the difference between the averages being significant at the second gradation.

B. Psychomotor tests performed in water

Testing of self-control capacity in coordinating swim test (50 m) for arm movement

From the recorded data, we notice that for the control group the average times recorded during the initial test were: 7.96 s for the first repetition of the 9 m distance traveled by the subjects to the first obstacle by sliding; 8.06 s at the second repetition of the distance. In this test, we observed from the recorded data that the subjects of the experimental group registered near-value performances. In the final test, at the second repeat, there was an improvement in the average time recorded by 0.25 s compared to the initial test, in favor of the experimental group, respectively 7.76 s.

In the test, a complex of 4 obstacles and five moments specific to the applied swimming in the military pentathlon took place. If for the first time the counter-clock performances were recorded, the following moments aimed at checking the self-control capacity in the conditions of self-management of the specific skills. With regard to the second moment (8 m), in which subjects were suggested to execute two and a half cycles, and in the third cycle to reach the second obstacle, we notice that both in initial and final testing 100 % of subjects achieved this goal at first repetition. The same percentage is maintained at all times in the complex developed at the first repeat, for both groups under investigation. In Figure no. 2 it can be observed that the percentage differences are significant for the last two moments imposed on the subjects. Thus, in final testing, between obstacle 2 and obstacle 3 (8 m), where subjects were suggested to maintain constantly the number of arm cycles (two and a half), at the second repeat, the good score was obtained only 34.64 % of the control group subjects, 42.66 % of the experimental group scored well and 22.00 %, the rating was very good. Between Obstacle 3 and Obstacle 4 (11.8 m), where subjects were suggested to increase the number of arm cycles over the distances previously traveled, at the second repeat, 29.33 % of the experiment sample components obtain the rating very well and only 17.66 % of representatives of the control group. At the last moment of the elaborated complex, in which it was suggested to reduce the number of arms cycles for the distance from the last obstacle to the finishing of the test, a final increase was observed in the experimental group compared to the control group at the second repetition. The subjects of the experiment group obtained the mark very well in the proportion of 31.33 %, 11.66 % more than in the initial testing. From the graphical representation it can be seen that the

percentage difference of 11.66 % is the same in the study compared to the results obtained by the subjects of the control

sample in the final testing, where only 12.66 % of the subjects obtained the qualification very well.

Figure no. 2: *Percentage dynamics of the results of specific psychomotor training tests – self-control capacity in conditions of swimming test of coordination in experimental stage 1*

The superiority of the results obtained by the subjects of the experimental group demonstrates that the implementation in the optimal program of training of the psychomotor actuation systems specific to self-learning skills fosters the self-control capacity. The transformation of the performances obtained in the qualifiers in

the experimental stage 2 according to the appreciation scale we have formulated for the following moments of this test is represented in Figure no. 2. From the graphical representation, it is observed that the percentage differences are significant in favor of the experimental group at the final test, at all times.

Figure no. 3: *Percentage of the dynamics of specific psychomotor test results Self-control capacity under coordinated swim sample in experimental stage 2*

5. Discussions

If at the first repetition of the tested distances (8m, 8m, 11.8m, 6m), the subjects of both groups achieved the initial and 100% psychomotor load on the second repetition of the distances while the subjects of the experimental group - ranked well and very well in the qualifying grids, the control group subjects remained at the level of the qualifying grids satisfactory and well. Petrescu et al., (2014) investigated the effects of practicing swimming on the psychological tone in adulthood. Their study results showed that regular swimming practice has significant effects in terms of psychological tone. This result allows them

to say that the practice of swimming has significant influence on the mental tone.

6. Conclusions

The results that are graphically described in Figure 1, 2 and 3, confirm that the results in the experimental group were better than the results obtained by the control group in the psychomotor tests. Also swimming trainings influence the mental and psychological level of our military athletes. Implementation of optimal programs of training regarding psychomotor development systems specific to self-learning skills helps in developing the self-control capacity.

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