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IMPROVEMENT OF SHOOTING TECHNICAL SKILLS IN THE SHOOTING RANGE WITHIN THE BIATHLON TEST FOR JUNIORS

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Abstract: *The aim of the research is to identify ways to achieve a biathlon test capacity that will favor the achievement of an optimal biological state needed to make shooting range pull more efficient.*
In the experimental research, the psychomotricity state is manifested through the stability of some coordinated coordinating capacities, obtained by individualized training in the field of shooting, applied by 4 junior biathlonists from CSS Dinamo Râşnov.
As a result of the scientific research, we can say that the working hypothesis has been confirmed, so by individualized proprioceptive training that leads to the regulation of the biological state it is possible to optimize the technical ability of shooting in the biathlon test in the junior category.

Key words: *biathlon ski,proprioceptive training, heart rate, efficient shooting.*

1. Introduction

In recent years, the biathlon has made a considerable leap both from the point of view of running on the skis, as well as that of firing with the gun, in terms of running times and the efficiency of the firing. To these results remarkably contributed the modern industry involved in the production of contest materials (skis, sticks, boots, weapons, cartridges), optimal arrangement of the routes, and last but not least the continuous improvement of the training methodology [2].

Making a qualitative jump is not possible without training in the process [7]:

- the continuous modernization of the training process, the knowledge and application of the latest conquests of theory and practice;
- workload to world-class performance range of 1300-1400 training hours, 8000-10000 km, 9000-11000 bullets per year for high performance athletes;
- increasing the value of physical fitness indices and specific physical training;
- work on the skill and skill improvement (both skiing and shooting) that must be an important and constant concern at all

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levels, especially at the level of children and juniors;
- development and improvement of psychic qualities - will, dullness, combativity;
- conducting training processes with as many objective data as possible.

2. High Performance Biathlon

The maximum performance in sports, that is, in biathlon, can only be achieved by those athletes who possess a certain biological dowry.

The psycho-motric qualities that a performance biatlonist must have [1] :

- good cardio-respiratory resistance, resulting in a maximum oxygen consumption of at least 75 02 / kg body and an anaerobic capacity of over 45 kgm / kg body;
- local muscular strength of the lower limbs and very good scapular belt;
- Very good general skill, in which the sense of balance and coordination play the leading role;
- good reaction and execution speed, good span, good appreciation of distances and good space-temporal orientation.

3. Shooting Training

Draw technique training is divided into two parts [7] :
1. Training with gun without ammunition.
2. Training for the technique under stress.

Basic learning, improvement and maintenance of the firing technique is achieved by simulated (tube) drawing throughout the year.

Neglecting pull-out drops control of the following factors:
- weapon - body complex;
- eye - to - finger reflex;
- Sight-trigger connection.

Methodological guidelines [6]:

a) After specific training (competitive, etc.), biathlonists resume extensive training.
b) Every training or contest must be considered under its good and bad aspects, the new experience must be combined with the old one.
c) The measurement mechanisms (shooting technique) are changing and can decrease as accurately and efficiently; for this they must be watched closely in the competitive season.
d) An inadequately stable movement mechanism due to inadequate training can not be effective under the intense request during the contest.

4. Breathing Technique and Proprioceptive Training at Junior Biathlonists

Drawing in the biathlon, breathing should be directed to interruption of the increased frequency during eye contact, caused by prior physical stress. The quality of the breathing technique is determined by the uniformity of the interval between the fires, a balanced rhythm (succession between inspiration, expiration and apnea) and by appropriate coordination with the other elements of the technique [3].

Drawing from biathlon, the breathing technique is a component part of the sensomotor adjustment level.

In the experimental research we can see the psychomotric state manifested through the stability of coordinated capacities, obtained by individualized training in the field of shooting.

The visual analyzer is paramount in traveling along the route and helps to form a space-temporal orientation, due to the fact that the route has bumps. This determines an increase in kinestetic and equilibrium differentiation capability by careful and differential control of temporal and spatial dynamic parameters as well as of sample-specific movements.

Very important is the ability of the athlete to enter at different rhythms of movement in relation to space and time, conditioned by different muscular interventions, formed mainly by proprioceptive training.

The coordinating ability to transform movements involves the breathing rate, the frequency of the limb movement, the tactic approached with the coach, the pace of departure, the change in the pace of the test according to the denim on the ground, and the quality of the snow (which involves the tactile sense of slippage), and the environment.

The presence and the accommodation in the shooting range refers to the coordinating ability to combine and couple the specific movements, because the athlete resorts to breathing control, the coordinating capacity of the kinesthetic state-dynamic equilibrium, the coordination of weapon maneuvering and the spatial visual control centralized on the target in the polygon. By training the optical analyzer, you get the fixation and control of the image, the target of the polygon, which through long exercise leads to the rapid preparation of the firing position and firing execution.

The dermatological-tactile analyzer plays a key role in getting into the gun (its shape and weight) as well as in the action on the tragac, since it has to be maneuvered slowly, without any sudden shake, in order not to deflect the bullet trajectory.

We note that on the trail due to the fact that the contact surface of snow skiing is narrower in maintaining balance, kinesthetic and strength skills have an important role to add to that of vestibular and visual skills.

The acoustic analyzer is important due to the fact that the audience information acts as an additional element in motion caused by the environment and the opponent. Hearing control is required by communicating with the coach with the team coach or referees, leading to optimal action decisions and anticipating the route of variable climate, wind, snow, snow quality. All this determines the orientation requirements as well as the coordination, adaptation and transformation of the motor act.

The quality of motor coordination during competition depends on individual physical and training capacity to cope with fatigue in a long-lasting effort, taking into account that the athlete has to concentrate in the polygon to correctly position the visual image and execute precisely the target goal so that pulling does not negatively affect the result [5].

5. Experimental Research

The experimental research took place between 02.12.2017-02.02.2018. The research area was the training base of the Dinamo Rasnov School Sport Club, located on Valea Cărbunării.

The investigated sample consisted of 4 junior athletes (2 boys + 2 girls) of 15-16 years from the CSS performance group Dinamo Râşnov. The 4 juniors were admitted to the experimental program based on the acceptance and

recommendations of the club coaches Gheorghe Pelin and Nicoale Garnita.

The direct observation allowed the recording of the data obtained from the subjects' verification at the beginning of the period and at the end of the period using the observation lists. It takes place on a thematic plan designed to make the results gleaned.

The observation sheets were designed to allow a quantitative and qualitative processing of the data obtained:

1. identity data
   - time: 02.12.2017-02.02.2018;
   - place: training base Valea Cărbunării;
   - subjects: 4 athletes from the CSS Dinamo Râşnov group.
2. entries for tracking values:
   - heart rate at the entrance to the range;
   - heart rate at the exit of the range;
   - Shooting in the prone position;
   - Shooting standing position.

6. Testing of the Subjects

A set of tests (those listed above) that were performed once at the beginning of the period-02.12.2017 and the second time at the end of this period-02.02.2018 were used to carry out the experiment. Each athlete ran on the distance of 10 km, taking 4 draws (PSPS). Heart rate was recorded using pulse-tester to monitor the efficacy on the firing line.

Throughout this period, the experimental group was present at every training programmed by club coaches (5 trinings / week) and worked with a greater weight on the shooting technique, along with a proprioceptive training adapted to the biathlon.

Table 1

Initial testing of the subjects of the research

Subject	Name/Surname	H.R. entry	H.R.exit	Shooting P	Shooting S
1	G.R.-Male	178 b/min	170 b/min	1-1	2-1
2	A.S.-Male	181 b/min	174 b/min	0-2	3-2
3	G.A.-Female	175 b/min	162 b/min	0-1	1-2
4	P.I.-Female	180 b/min	172 b/min	2-1	1-3
arithmetic mean		178,5 b/min	169,5 b/min	Efficiency 80%	Efficiency 62,5%

Legend- H.R.=heart rate
P=Prone /S=standing
b/min=beats per minute

As can be seen from the table above, we note an initial arithmetic mean for the heart rate at the shooting range entry of athletes at 178.5 beats per minute.

The arithmetic mean for the heart rate at the exit of the range is 169.5 beats per minute.The efficiency of the shooting is at the value of 80% on the prone position and 62,5% on standing position.

Table 2

Final testing of the subjects of the research

Subject	Name/Surname	H.R. entry	H.R.exit	Shooting P	Shooting S
1	G.R.-Male	175 b/min	162 b/min	1-0	0-1
2	A.S.-Male	180 b/min	172 b/min	1-1	1-1
3	G.A.-Female	170 b/min	161 b/min	0-0	1-1
4	P.I.-Female	177 b/min	170 b/min	1-1	0-2
arithmetic mean		175,5 b/min	166,25 b/min	Efficiency 87,5%	Efficiency 82,5%

Legend: H.R.=heart rate;
P=Prone /S=standing
b/min=beats per minute

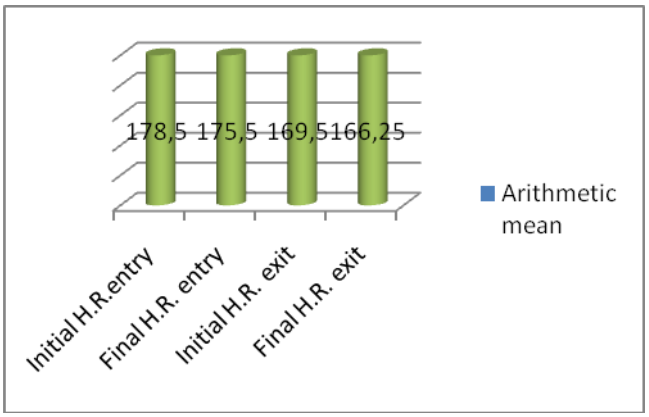

Chart 1. *Heart Rate. Arithmetic mean comparison (final and initial test)*

From the table above we note that on the final testing the arithmetic mean for the heart beat at the entry of the range has a value of 175,5 beats per minute and at the exit of the range indicate a value of 166,25 beats per minute.About the efficiency of the shooting in the range the group show up a value in the final testing of 87,5% for the prone position and 82,5% for the standing position.

From the chart nr.1 above we can note that the arithmetic mean for heart rate at the entrance of the shooting range was decrease from initial value of 178,5 beats per minute to 175,5 beats per minute.Also the arithmetic mean regarding the heart rate at the exit of the range had a decrease from 169,5 beats per minute to 166,25 beats per minute.All this decrease of the heart rates of the athletes manage to increase the efficiency of the shooting for both positions (prone-from 80% to 87,5%/standing-from 62,5% to 82,5%).

7. Conclusions

The longitudinal experimental research found that the parameters recorded in the

initial testing and final testing have undergone relevant changes in the improvement of the biological state and the shooting pullout performance in the end. We can conclude that a repetition of the shooting methods in the biathlon test is due to the improvement of the coordinating capacities (temporal space, kinesthetic sense of balance and coordinating capacity of the drawing pace) that contributed to the improved optimization of the technical shooting skills in the range.

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